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THE COMMONS PHASE 4 MEDIUM DENSITY DEVELOPMENT

Servicing and Stormwater Management Report

**THE COMMONS PHASE 4
MEDIUM DENSITY DEVELOPMENT**

3610 INNES ROAD

**SITE SERVICING AND
STORMWATER MANAGEMENT REPORT**

Prepared for:

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November 1, 2024

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November 1, 2024

City of Ottawa
Planning Real Estate and Economic Development Department
Development Review - East Branch
Infrastructure Approvals Division
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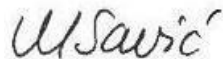
Attention: Derek Unrau, Project Manager

**Reference: The Commons - Phase 4
Medium Density Development
Site Servicing and Stormwater Management Report
Novatech File No.: 118224**

Enclosed is the Site Servicing and Stormwater Management Report for The Commons Phase 4 Medium Density Development. This report addresses the approach to site servicing and stormwater management for the proposed development and is submitted in support of the Site Plan Control application.

Yours truly,

NOVATECH



Miroslav Savic P. Eng.
Senior Project Manager | Land Development

cc: Melissa Pettem, Glenview Homes (Innes) Ltd.

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1.0 INTRODUCTION

Novatech has been retained by Glenview Hommes (Innes) Ltd. to complete the site servicing and stormwater management design for The Commons Phase 4 Medium Density Development. This report addresses the approach to servicing and stormwater management and is being submitted in support of the Site Plan Control application

1.1 Site Description and Location

The subject site is a part of The Commons subdivision development and consist of two blocks of land: Block 85 and Block 86. The Block 85 is located on the east side of Ventus Way and is bound by U Haul storage facility to the north, The Commons subdivision to the south, and by future development lands owned by Richcraft Homes to the east. The Block 86 is located on the west side of Ventus Way and is bound by Halo carwash to the north, The Commons subdivision to the south, and by future development lands owned by Caivan Communities to the west. The site location is show on **Figure 1.1** – Key Plan.

1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on July 3, 2024, at which time the client was advised of the general submission requirements. Refer to **Appendix A** for a summary of the pre-consultation meeting with the city.

1.3 Proposed Development

The proposed development consists of 10 back-to-back townhouse blocks having a total of 98 units, including private roads, a public park, and associated landscaped areas. Refer er to **Appendix B** for the proposed Site Plan.

The proposed development will be serviced by connecting to the existing watermain, sanitary and storm sewers in Ventus Way.

1.4 References and Supporting Documents

The following documents were reviewed in preparation of the report:

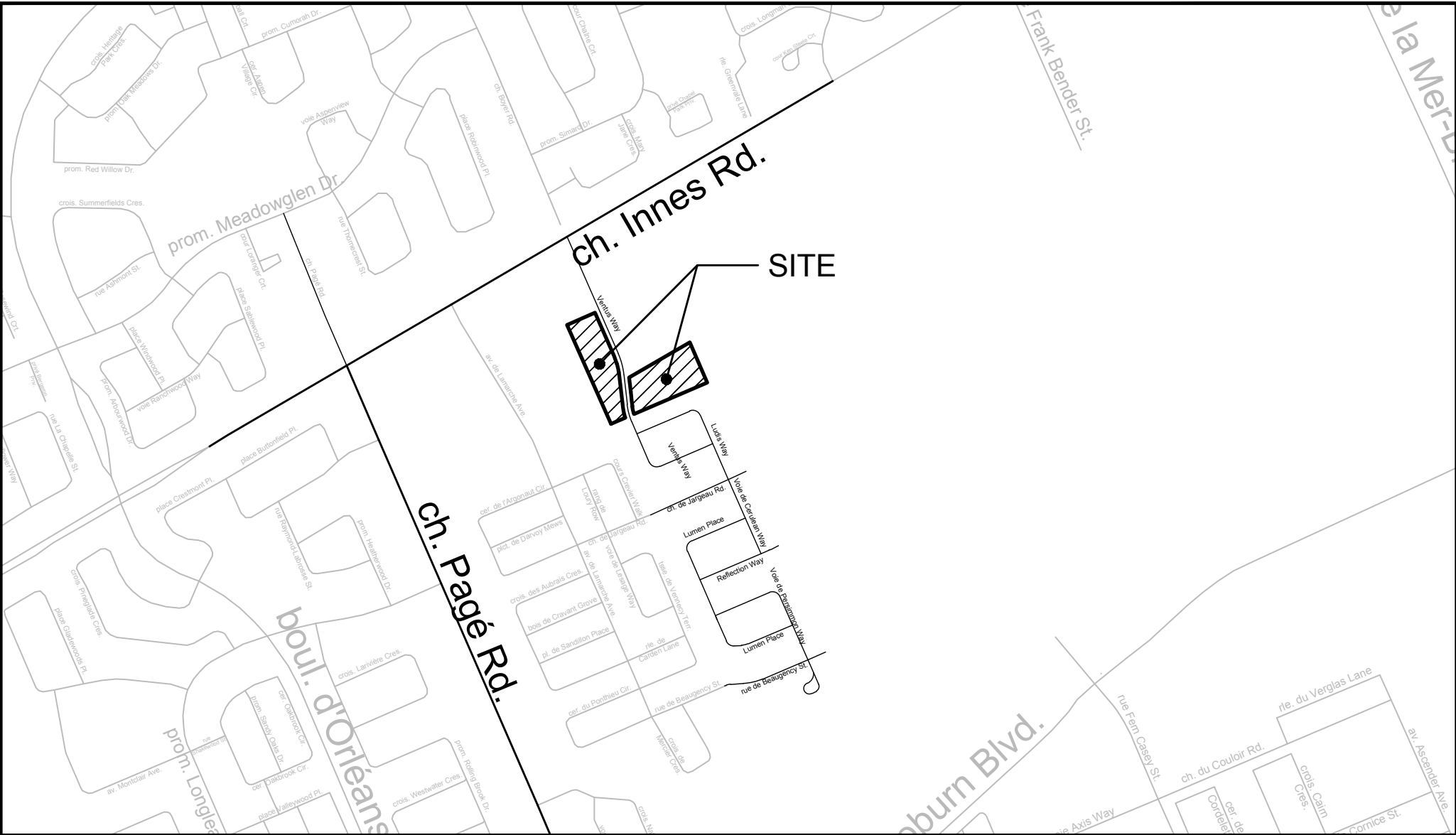
- The Commons (3610 Innes Road) – Phase 2&3, Site Servicing and Stormwater Management Report, Novatech, January 17, 2024.
- Geotechnical Investigation – Proposed Residential Development, The Commons -Phase 4, 3604-3646 Innes Road, Ottawa, Ontario; Report No. PG4026-3, Paterson Group Inc., July 8, 2024.
- City of Ottawa Sewer Design Guidelines (October 2012)
- Ottawa Design Guidelines – Water Distribution (July 2010)
- Stormwater Management Planning and Design Manual (MOE, March 2003)

2.0 SERVICING AND GRADING

2.1 General Servicing

The subject site will be serviced by private storm and sanitary sewers, and watermain. The storm /stormwater management, sanitary and water servicing strategy is discussed in further detail in the following sections.

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THE COMMONS (PHASE 4)

KEY PLAN

SCALE NOT TO SCALE

DATE	SEPT 2024	JOB	118224	FIGURE	1.1
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Storm servicing for the subject site will outlet into the existing 600mm and 1050mm diameter storm sewers in Ventus Way. Sanitary servicing will connect to the 200mm sanitary sewer in Ventus Way. Water service will connect to the existing 200mm watermain in Ventus Way.

Refer to General Plan of Services (Drawings 118224-MD-GP) included in the enclosed drawing set.

2.2 General Grading

The private roadways within the subject site will be graded in a saw-toothed pattern to promote surface storage of stormwater. The grading will direct emergency overland flows from the private roads to Ventus Way.

Refer to the Grading Plan (Drawings 118224-MD-GR) included in the enclosed drawing set.

3.0 STORM SEWER SYSTEM AND STORMWATER MANAGEMENT

The post-development storm sewer and stormwater management system will adhere to the criteria outlined as a part of the MSS EUC-Phase 3. Storm runoff from the site will outlet to the Ultimate EUC Pond 1 stormwater management facility at the south end of the site.

The following sections outline the stormwater management design and analysis. J.F. Sabourin and Associates Inc. (JFSA) was retained to prepare a Stormwater Management (SWM) Plan Report (SWMR Ph1) for Phase 1 and the initial stage of the Subject Site. The findings and recommendations can be found in the SWMR Ph1 in **Appendix C**.

Novatech has previously expanded the stormwater modelling and analysis of the SWMR Ph 1, to account for Phase 2 and 3 of the Subject Site, along with preliminary stormwater allowances for future site plans as part of Phase 4. Refer to the Phase 2&3, Site Servicing and Stormwater Management Report (Novatech, January 2024) for model details.

The model for the subject site has been built into the Novatech model prepared for the above mentioned report.

Given that these upcoming phases require the EUC Pond 1 Expansion, the SWM modelling also considers the recently approved design brief in support of the pond expansion, EUC Pond 1 Expansion PDR.

3.1 Stormwater Management Criteria

The Subject Site is located within the Ottawa River East Subwatershed, and are tributary to the Ottawa River, which falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA). The following stormwater management criteria have been developed based on the criteria in the MSS EUC-Phase 3, and requirements of the RVCA and the OSDG.

Minor System (Storm Sewers)

- Storm sewers are to be designed using the Rational Method as follows:
 - 1:2-year return period for local streets;
- Ensure that the 100-year hydraulic grade line in the storm sewer is at least 0.3 m below the underside of footing (USF) elevations and ensure that the 100-year + 20% (stress test) hydraulic grade line in the storm sewer is below the USF for the proposed development;

- Note that this site consists of slab-on-grade dwellings that will not have basements.
- Inlet control devices (ICDs) are to be installed in road and rearyard catchbasins to control inflows to the storm sewers;

Major System (Overland Flow)

- Overland flows are to be confined within the right-of-ways and/ or defined drainage easements for all storms up to and including the 1:100-year event;
- Storm runoff that exceeds the capacity of the minor system will be stored within road sags;
 - Runoff that exceeds the capacity of the road sags will be conveyed overland along defined major system flow routes towards the proposed major system outlet to the Ultimate EUC Pond 1 stormwater management facility;
- Major system storage in backyards is not to be included/ accounted for in design computations;
- Maximum depth of flow (static + dynamic) on local and collector streets shall not exceed 0.35 m and shall be confined to the road right-of-way, as well as not touch any part of the building envelope and must remain below the lowest building opening during the stress test event;
- For front yards, there must be 0.15 m of vertical clearance between the spill elevation on the street and the ground elevation at the nearest building envelope that is in the proximity of the flow route or ponding area;
- For rear yards, there must be 0.30 m of vertical clearance between the rear yard spill elevation and the ground elevation at the adjacent building envelope;
- The product of the 100-year flow depth (m) on street and flow velocity (m/s) shall not exceed 0.60.

Water Quality & Quantity Control – Ultimate as part of Phase 2, 3, and 4

- An *enhanced* (80% TSS removal) level of quality control will be provided by the EUC Pond 1 SWM Facility in the ultimate as part of the pond expansion (under separate cover), which outlets to Mud Creek, and ultimately outlets to Green's Creek and then the Ottawa River.

3.2 Proposed Storm Drainage System

Storm servicing for the Subject Site will be provided using a dual drainage system: Runoff from frequent events will be conveyed by storm sewers (minor system), while runoff from larger storm events which exceed the capacity of the minor system will be conveyed overland along defined overland flow routes (major system). The EUC Pond 1 SWM facility is the outlet for both the major and minor systems.

3.2.1 Storm Sewer Design (Minor System)

The minor system has been designed using the Rational Method per the City of Ottawa's Design Guidelines. The storm sewer design sheets are provided in **Appendix C**. Refer to the Storm Drainage Area Plan (Drawings 118224-STM1 and 118224-STM2) for details. The criteria used to size the storm sewers are summarized in **Table 3.1**.

Table 3.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2-year Return Period
Storm Sewer Design	Rational Method/Modeling
IDF Rainfall Data	OSDG
Initial Time of Concentration (T_c)	10 minutes
Minimum Velocity ⁽¹⁾	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

¹A minimum gradient of 0.65% is required for any initial sewer run with less than 10 residential connections.

Inlet control devices (ICDs) are to be installed in roadway catchbasins and rear yard catchbasin outlets to limit inflows to the minor system during larger storm events.

3.2.2 Overland Flow Path (Major System)

The Subject Site has been graded to provide an engineered overland flow route (major system) for large, infrequent storms or in the event that the storm sewer system becomes obstructed. Flows will be directed to the Ultimate EUC Pond 1 SWM facility. The major system is to be designed to conform to the design standards outlined in Section 5.5 of the OSDG.

3.2.3 Best Management Practices and Low Impact Development

As outlined within the MSS EUC-Phase 3, the results from site-specific testing found that the vertical movement of water is restricted by the low permeability of the clay soils and the perched water table. As such, implementation of stormwater best management practices (BMPs) and low impact development (LID) techniques to mitigate the reduction in groundwater infiltration / recharge resulting from the proposed development is not being proposed.

3.2.4 SWM Facility – EUC Pond 1

Water quantity control and water quality treatment will be provided by an end-of pipe stormwater management pond, 'EUC Pond 1'.

Development of Phase 2, 3, and 4 of the Subject Site, as well as lands within the EUC, will require the EUC Pond 1 expansion. Refer to the EUC Pond 1 Expansion PDR for further information.

The EUC Pond 1 expansion is now complete, and has been in service as of July 2024.

3.3 Hydrologic & Hydraulic Modeling

The OSDG requires hydrologic modeling for all dual drainage systems. The performance of the proposed storm drainage system for the Subject Site was evaluated using the PCSWMM hydrologic/hydraulic model.

The PCSWMM model schematics and 100-year model output data are provided in **Appendix C**. Digital copies of the modeling files for all storm events are provided with the digital report submission.

3.3.1 Design Storms

The hydrologic analysis was completed using the following synthetic design storms and historical storms. The IDF parameters used to generate the design storms were taken from the *Ottawa Design Guidelines - Sewer* (October 2012).

Chicago Storms:

25mm 3-hour Chicago storm
 2-year 3-hour Chicago storm
 5-year 3-hour Chicago storm
 100-year 3-hour Chicago storm

SCS Type II Storms:

2-year 24-hour SCS Type II storm
 5-year 24-hour SCS Type II storm
 100-year 24-hour SCS Type II storm

The 3-hour Chicago distribution generates the highest peak flows for both the minor and major systems and was determined to be the critical storm distribution for the design of the storm drainage system.

The proposed drainage system has also been stress tested using a 3-hour Chicago design storm that has a 20% higher intensity and total volume compared to the 100-year event.

3.3.2 Model Development

The PCSWMM model has been developed to account for both minor and major system flows from the proposed development and ensure appropriate storage is provided such that the allowable release rates to each of the outlets are not exceeded. The results of the analysis were used to:

- Determine the total major and minor system runoff from the site;
- Determine the required underground storage volume;
- Calculate the storm sewer hydraulic grade line for the 100-year storm event;
- Evaluate overland flow depths and ponding volumes during the 100-year event.

Although the site is to be developed in multiple phases, the model was built assuming full build-out of the site and includes all phases of the proposed development. This was done to determine the allowable per hectare release rate for each phase and to determine the approximate underground storage volumes for each future phase.

Infiltration

Infiltration losses for all catchment areas were modeled using Horton's infiltration equation, which defines the infiltration capacity of the soil over the duration of a precipitation event using a decay function that ranges from an initial maximum infiltration rate to a minimum rate as the storm progresses. The default values for the City of Ottawa were used for all catchments.

Horton's Equation:

$$f(t) = f_c + (f_o - f_c)e^{-k(t)}$$

Initial infiltration rate: $f_o = 76.2$ mm/hr
 Final infiltration rate: $f_c = 13.2$ mm/hr
 Decay Coefficient: $k = 4.14$ /hr

Depression Storage

The default values for depression storage in the City of Ottawa were used for all catchments.

- Depression Storage (pervious areas): 4.67 mm
- Depression Storage (impervious areas): 1.57 mm

The building rooftops are flat and will provide some depression storage.

Equivalent Width

'Equivalent Width' refers to the width of the sub-catchment flow path. This parameter (Table 5.1) is calculated as described in the *Sewer Design Guidelines, October 2012, Section 5.4.5.6*.

Impervious Values

Runoff coefficients for each subcatchment area were determined based on the proposed site plan. Refer to the Storm Drainage Area Plan (**118224-MD-STM**) for details. Percent impervious values were calculated using the following formula:

$$\%imp = \frac{c - 0.2}{0.7}$$

3.3.3 Storm Drainage Areas

For modeling purposes, Phase 4 lands have been divided into subcatchments based on the drainage areas tributary to each inlet of the proposed storm sewer system. The subcatchment areas are shown on the Storm Drainage Area Plan (**118224-MD-STM**) at the back of this report.

The hydrologic parameters for each subcatchment were developed based on the proposed Site Plan and drawing **121009-MD-STM** specified above. An overview of the modeling parameters is provided in **Table 3.2**.

Table 3.2: Hydrologic Modeling Parameters

Area ID	Catchment Area (ha)	Runoff Coefficient (C)	Percent Impervious (%)	No Depression (%)	Flow Path Length (m)	Equivalent Width (m)	Average Slope (%)
A-01	0.114	0.31	16%	50%	8.74	130.43	3.0%
A-02	0.004	0.22	3%	0%	2.61	15.34	1.5%
A-03	0.013	0.79	84%	40%	16.76	7.76	1.5%
A-04	0.079	0.81	87%	40%	16.12	49.00	4.4%
A-05	0.024	0.22	3%	0%	9.58	25.05	1.5%
A-06	0.066	0.36	23%	0%	13.57	48.65	1.5%
A-07	0.120	0.80	86%	40%	18.29	65.62	3.9%
A-08	0.020	0.73	76%	40%	19.10	10.47	2.2%
A-09	0.019	0.68	69%	40%	19.00	10.00	2.0%
A-10	0.124	0.80	86%	40%	18.74	66.16	3.5%
A-11	0.036	0.22	3%	0%	8.43	42.68	1.5%
A-12	0.125	0.76	80%	40%	18.64	67.05	3.5%
A-13	0.027	0.74	77%	40%	18.68	14.45	2.5%
A-14	0.025	0.67	67%	40%	16.65	15.02	5.6%
A-15	0.096	0.78	83%	40%	16.96	56.59	5.5%
A-16	0.050	0.79	84%	40%	16.96	29.48	4.3%
A-17	0.031	0.22	3%	0%	6.46	47.99	1.5%
A-18	0.017	0.57	53%	0%	12.46	13.64	4.0%
B-01	0.021	0.20	0%	0%	8.83	23.79	1.5%
B-02	0.075	0.81	87%	40%	15.78	47.54	4.5%
B-03	0.029	0.22	3%	0%	10.51	27.58	1.5%

Area ID	Catchment Area (ha)	Runoff Coefficient (C)	Percent Impervious (%)	No Depression (%)	Flow Path Length (m)	Equivalent Width (m)	Average Slope (%)
B-04	0.061	0.83	90%	20%	15.98	38.17	3.9%
B-05	0.022	0.22	3%	0%	8.63	25.51	1.5%
B-06	0.094	0.75	79%	40%	15.97	58.85	3.0%
B-07	0.097	0.78	83%	40%	16.32	59.42	4.2%
B-08	0.015	0.22	3%	0%	2.09	71.87	1.5%
B-09	0.035	0.84	91%	0%	8.08	43.32	0.5%
B-10	0.025	0.22	3%	0%	7.48	33.43	1.5%
B-11	0.195	0.76	80%	40%	14.82	131.54	4.0%
B-12	0.041	0.84	91%	10%	13.97	29.35	1.6%
B-13	0.016	0.22	3%	0%	6.44	24.85	1.5%
B-14	0.072	0.80	86%	40%	15.92	45.22	4.1%
B-15	0.025	0.22	3%	0%	5.01	49.94	1.5%
B-16	0.045	0.79	84%	0%	7.88	57.08	1.5%
B-17	0.143	0.22	3%	0%	32.32	44.24	1.4%
B-18	0.003	0.22	3%	0%	2.17	13.81	0.5%

3.4 Minor System Design and Analysis

The following sections outline the model parameters and results of the PCSWMM model, pertaining to the minor system (storm sewers).

3.4.1 Allowable Release Rates

The allowable release rates for Phase 4 medium density blocks were determined as a part of the SWMR Ph1 (JFSA, May 2022). Refer to the report included in **Appendix C**, page 8. Allowable release rates are outlined in the table below:

Table 3.3: Allowable Release Rates (JFSA)

Block ID	Total Release Rate (cms)	Area (ha)	Release Rate (cms/ha)
B1 (Area A)	0.228	0.990	0.230
B3i (Area B)	0.245	1.014	0.242

Both Area A and Area B will have some uncontrolled overland flow directed to Ventus Way. To determine the allowable release from each of the storm sewer connections to the Ventus Way sewer, the 100-year uncontrolled flow from the PCSWMM model was subtracted from the total allowable from each block. As Area A has three connections to the Ventus Way storm sewer, the allowable release rate for each connection was calculated based on tributary area. Supporting calculations have been included in **Appendix C**.

Area A Flows

Area A01 uncontrolled 100yr flows = 0.046 cms (0.114 ha)

Remaining allowable release rate = 0.228 cms – 0.046 cms
= 0.182 cms

Remaining area (A02-A18) = 0.876 ha
Per hectare release rate = 0.182 cms / 0.876 ha
= **0.208 cms/ha**

Street 1 Allowable Flow (0.326 ha) = 0.068 cms

Street 2 Allowable Flow (0.295 ha) = 0.061 cms

Street 3 Allowable Flow (0.255 ha) = 0.053 cms

Area B Flows

Area B17 uncontrolled 100yr flows = 0.026 cms (0.143 ha)

Area B18 uncontrolled 100yr flows = 0.001 cms (0.003 ha)

Remaining allowable release rate = 0.245 cms – 0.026cms – 0.001 cms
= **0.218 cms**

3.4.2 Orifice Controls

Inflows to the storm sewer were modeled based on the characteristics of each inlet. Inflows to the storm sewer are based on the orifice specified for the inlet and the maximum depth of ponding. Orifices have been sized to limit the outlet peak flows. Details are outlined in **Table 3.4**.

Table 3.4: Orifice Parameters

Structure	ICD Size & Inlet Rate					Approach Flow** (L/s)
	Diameter 1 (mm)	Diameter 2* (mm)	Max Head (m)	Calculated 2-yr Capture Rate (L/s)	2-yr Capture Rate** (L/s)	
CB50-51	IPEX LMF 65	IPEX LMF 65	2.06	12.53	7.60	8.04
CB52-53	IPEX LMF 70	IPEX LMF 70	2.03	12.44	6.20	6.47
CB54-55	IPEX LMF 75	IPEX LMF 65	2.04	13.96	11.00	11.88
CB56-57	IPEX LMF 75	IPEX LMF 65	2.05	13.99	12.80	14.15
CB58-59	IPEX LMF 100	IPEX LMF 100	1.73	23.96	21.60	22.31
CB60-61	IPEX LMF 75	IPEX LMF 85	1.69	15.51	14.10	14.89
CB62-63	IPEX LMF 95	IPEX LMF 95	1.76	24.16	20.20	21.63
CB64-65	IPEX LMF 95	IPEX LMF 95	1.76	24.16	22.00	23.04
CB66-67	IPEX LMF 70	IPEX LMF 70	1.74	12.86	8.70	9.10
CB68-69	IPEX LMF 95	IPEX LMF 95	1.73	20.43	16.80	17.30
CB70-71	IPEX LMF 80	IPEX LMF 80	1.95	15.04	14.80	16.09
CB72-73	IPEX LMF 85	IPEX LMF 85	2.00	18.47	16.60	17.46
CB74-75	83	83	1.97	41.70	33.40	33.90

Structure	ICD Size & Inlet Rate					Approach Flow** (L/s)
	Diameter 1 (mm)	Diameter 2* (mm)	Max Head (m)	Calculated 2-yr Capture Rate (L/s)	2-yr Capture Rate** (L/s)	
CB78-79	83	83	1.69	38.62	8.02	8.04
CB80-81	IPEX LMF 75	IPEX LMF 75	2.04	13.92	12.30	13.42
CB82-83	83	83	1.70	38.73	2.40	23.53
CB84-85	83	83	1.66	38.27	3.20	3.28
CB86-87	83	83	1.66	38.27	2.80	2.83
CB88-89	83	83	1.68	38.50	4.40	4.49
CB90-91	83	83	1.82	40.08	3.60	3.66
CB92-93	83	83	1.72	38.96	2.00	2.00
Grassed Areas						
RYCB20	83	-	1.11	15.64	0.18	0.22
RYCB21	83	-	1.16	15.99	0.10	0.55
RYCB22	83	-	1.46	17.94	3.00	0.33
RYCB23	83	-	1.46	17.94	0.27	0.36
RYCB24	83	-	1.16	15.99	0.24	0.34
RYCB150	83	-	1.96	20.79	0.18	0.26
RYCB151	83	-	1.96	20.79	0.21	0.31
RYCB153	83	-	1.96	20.79	0.16	0.21
RYCB154	83	-	1.96	20.79	0.21	0.27
RYCB155	83	-	1.46	17.94	0.19	0.30
RYCB156	83	-	1.96	20.79	0.13	0.17
RYCB158	83	-	1.96	20.79	0.03	0.07
Manholes - Outlets from Phase 4						
MH100	178	-	2.29	103.44	40.13	40.13
MH202	152	-	2.35	76.46	43.23	43.23
MH302	127	-	4.06	70.07	28.34	28.34

*Diameter 2 only specified where catchbasins are not interconnected

**From PCSWMM Model, 2-year 3-hour Chicago storm distribution

Table 3.4 also includes the sizing for the orifices required in MH100, 202, and 302 to control the peak flows from Street 1, 2, and 3 to the allowable release rates discussed in the above section. The catchbasin and grassed area controls are sufficient to control the peak flows from Area B without needing an ICD in MH502. Refer to the peak flows in the following section.

3.4.3 Peak Flows

The modeled peak flows at the various outlets of the Phase 4 site for each storm event (25mm, 2-year to 100-year+20%) are summarized in **Table 3.5**.

Table 3.5: Peak Flows

Storm Distribution->		4hr Chi.	3hr Chicago			
Return Period->		25mm	2yr	5yr	100yr	100yr+20%
Area A Uncontrolled (A01)		0.003	0.004	0.016	0.046	0.060
Street 1	<i>minor flows</i>	0.032	0.040	0.048	0.064	0.067
	<i>major flows</i>	0	0	0	0	0
Street 2	<i>minor flows</i>	0.034	0.045	0.052	0.059	0.061
	<i>major flows</i>	0	0	0	0	0
Street 3	<i>minor flows</i>	0.023	0.028	0.037	0.053	0.055
	<i>major flows</i>	0	0	0	0	0
Area A TOTAL		0.092	0.117	0.153	0.222	0.243
Area B Uncontrolled (B17, 18)		0.001	0.001	0.005	0.027	0.041
Street 4	<i>minor flows</i>	0.090	0.118	0.150	0.185	0.216
	<i>major flows</i>	0	0	0	0	0
Area B TOTAL		0.091	0.119	0.155	0.212	0.257

The results of the PCSWMM analysis indicate that outflows from the proposed development to the Lumen Place storm sewer will not exceed allowable release rates as outlined in **Section 3.4.1**.

An expanded table with the 24hr SCS storm events has been included in **Appendix C**.

3.4.4 Hydraulic Grade Line

The results of the analysis were used to determine if there would be any surcharging from the storm sewer system during the 100-year storm event. As the proposed units are slab-on-grade construction, there are no proposed storm lateral connections required; therefore, 100-yr HGL elevations have been analyzed for clearance to the top of grates (T/G) of the storm system. USFs are shown in **Table 3.6** for reference only and will not be compared against the HGL.

The **Table 3.6** provides a summary of the 100-year HGL elevation at each storm manhole within the proposed development, as well as a summary of the HGL elevations for a 20% increase (rainfall intensity and total precipitation) in the 100-year design event.

Table 3.6: Storm Sewer Hydraulic Grade Line

Manhole ID	MH Invert Elevation (m)	T/G Elevation (m)	HGL Elevation - 100yr4hr (m)	HGL Elevation - 100yr4hr+20% (m)	Min USF (m)	Clearance from T/G (100yr) (m)	Clearance from T/G (100yr+20%) (m)
MH100	88.48	90.86	89.68	89.76	89.98	-1.18	-1.10
MH102	88.69	91.02	89.81	89.90	90.11	-1.21	-1.12
MH104	88.78	91.12	89.83	89.92	90.13	-1.29	-1.20
MH106	88.90	91.07	89.84	89.93	90.14	-1.23	-1.14
MH108	89.00	90.99	89.85	89.94	90.15	-1.14	-1.05
MH110	89.19	90.79	89.85	89.95	90.15	-0.94	-0.84
MH202	88.25	90.68	89.84	89.97	90.14	-0.84	-0.71
MH204	88.46	90.85	89.92	90.06	90.22	-0.93	-0.79

Manhole ID	MH Invert Elevation (m)	T/G Elevation (m)	HGL Elevation - 100yr4hr (m)	HGL Elevation - 100yr4hr+20% (m)	Min USF (m)	Clearance from T/G (100yr) (m)	Clearance from T/G (100yr+20%) (m)
MH206	88.57	91.01	89.94	90.08	90.24	-1.07	-0.93
MH208	88.69	91.08	89.96	90.10	90.26	-1.12	-0.98
MH210	88.79	90.99	89.97	90.11	90.27	-1.02	-0.88
MH212	88.98	90.96	89.97	90.12	90.27	-0.99	-0.84
MH302	86.34	90.46	89.13	89.47	89.43	-1.33	-0.99
MH304	86.46	90.60	89.16	89.49	89.46	-1.44	-1.11
MH306	86.95	90.54	89.20	89.53	89.50	-1.34	-1.01
MH308	87.15	90.55	89.28	89.62	89.58	-1.27	-0.93
MH310	87.26	90.60	89.30	89.64	89.60	-1.30	-0.96
MH312	87.44	90.38	89.30	89.64	89.60	-1.08	-0.74
MH402	86.53	90.67	87.81	88.53	88.11	-2.86	-2.14
MH404	86.64	90.54	87.51	88.57	87.81	-3.03	-1.97
MH406	86.74	90.81	88.02	88.74	88.32	-2.79	-2.07
MH408	86.90	90.87	88.09	88.82	88.39	-2.78	-2.05
MH410	87.06	90.58	88.10	88.83	88.40	-2.48	-1.75
MH412	87.18	90.62	88.11	88.84	88.41	-2.51	-1.78
MH414	87.40	90.69	88.12	88.84	88.42	-2.57	-1.85
MH502	86.27	90.20	87.42	88.14	87.72	-2.78	-2.06
MH504	86.29	90.29	87.45	88.17	87.75	-2.84	-2.12
MH506	86.33	90.64	87.54	88.26	87.84	-3.10	-2.38
MH508	86.38	90.79	87.58	88.30	87.88	-3.21	-2.49
MH510	87.11	90.62	88.07	88.79	88.37	-2.55	-1.83
MH512	86.92	90.56	88.04	88.76	88.34	-2.52	-1.80
MH602	87.00	90.69	88.11	88.83	88.41	-2.58	-1.86
MH604	87.21	90.65	88.11	88.84	88.41	-2.54	-1.81

3.5 Major System Design and Analysis

The major system network was evaluated using the PCSWMM model to ensure that the ponding depths conform to City standards. A summary of ponding depths and volumes for the 100-year event is provided in **Table 3.7**. Ponding depths for all storm events (2yr to 100yr+20%) are provided in **Appendix C**.

Table 3.7: Ponding Depths at Catchbasins (2yr Event)

Structure	T/G (m)	Max. Static Ponding (Spill Depth)		2-yr Event (4hr)			
		Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)
CB50-51	90.42	90.74	0.32	89.12	0.00	N	0.00
CB52-53	90.46	90.75	0.29	88.94	0.00	N	0.00
CB54-55	90.50	90.77	0.27	89.73	0.00	N	0.00

Structure	T/G (m)	Max. Static Ponding (Spill Depth)		2-yr Event (4hr)			
		Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)
CB56-57	90.59	90.86	0.27	90.26	0.00	N	0.00
CB58-59	90.82	91.06	0.24	90.52	0.00	N	0.00
CB60-61	90.81	91.10	0.29	90.51	0.00	N	0.00
CB62-63	90.74	90.95	0.21	90.43	0.00	N	0.00
CB64-65	90.84	91.07	0.23	90.64	0.00	N	0.00
CB66-67	90.40	90.69	0.29	89.46	0.00	N	0.00
CB68-69	90.52	90.73	0.21	89.96	0.00	N	0.00
CB70-71	90.54	90.83	0.29	90.46	0.00	N	0.00
CB72-73	90.48	90.77	0.29	90.09	0.00	N	0.00
CB74-75	90.36	90.61	0.25	89.66	0.00	N	0.00
CB80-81	90.41	90.61	0.20	89.95	0.00	N	0.00

4.0 SANITARY SEWER SYSTEM

4.1 Existing Sanitary Infrastructure

The sanitary outlet for the subject site will be an existing 200mm diameter sanitary sewer located in Ventus Way, constructed as a part of Phase 2&3. Sanitary Sewer Drainage Area Plan and Sanitary Sewer Design Sheet from *The Commons (3610 Innes Road) – Phase 2&3, Site Servicing and Stormwater Management Report*, demonstrating that the subject site was accounted for in the downstream sewers, can be found in **Appendix D**.

4.2 Proposed Sanitary Infrastructure

The proposed works will require approximately 378m of 200mm diameter gravity sanitary sewer to collect wastewater flows from Block 85 located on the west side of Ventus Way and approximately 377m of 200mm diameter gravity sanitary sewer to collect wastewater flows from Block 86 located on the east side of Ventus Way. The proposed sanitary sewers from both blocks of land will direct flows to the existing 200mm diameter sanitary sewers in Ventus Way.

Refer to the General Plan of Services (118224-MD-GP) and the Sanitary Drainage Area Plan (118224-MD-SAN) included in the enclosed drawing set for details of the proposed sanitary sewer connections and layout details.

4.3 Sanitary Demand and Design Parameters

The peak design flow parameters in **Table 4.1** have been used in the sewer capacity analysis. Unit and population densities and all other design parameters are specified in the OSDG.

Table 4.1: Sanitary Sewer Design Parameters

Design Component	Design Parameter
Unit Population: Townhomes	2.7 people/unit
Residential Flow Rate, Average Daily	280 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0) Harmon Correction Factor = 0.8
Extraneous Flow Rate	0.33 L/s/ha
Minimum Pipe Size	200mm
Minimum Velocity ¹	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Cover	2.0 m (Unless frost protection provided)

¹A minimum gradient of 0.65% is required for any initial sewer run with less than 10 residential connections.

The sanitary sewer design sheet, enclosed in **Appendix D**, confirms the combined peak sanitary flows from the subject site to the existing 200mm sewer on Ventus Way is 4.07 L/s.

5.0 WATER SUPPLY SYSTEM

5.1 Existing Water Infrastructure

There is an existing 200mm diameter watermain in Venus Way that was constructed and connected to the existing 400mm diameter watermain in Innes Road as a part of Phase 2 and 3 construction works.

5.2 Proposed Water Infrastructure

The Subject Site will be serviced by connecting to the existing 200 mm diameter watermain in Ventus Way. The proposed works will require approximately 396m of 200mm diameter watermain to service Block 85 and approximately 121m of 250mm diameter watermain and 402m of 250mm diameter watermain to service Block 86. For fire fighting purposes six on-site hydrants are being proposed, two on Block 85 and four on Block 86. Refer to the General Plan of Services (Drawings 118224-MD-GP) included in the enclosed drawing set for details of the proposed water supply system.

5.3 Watermain Design Parameters

Boundary conditions were provided by the City of Ottawa, based on the OWDG water demand criteria for the proposed development comprising of 10 back-to-back townhouse blocks. The boundary conditions are included in **Appendix E**.

The domestic demand design parameters, fire fighting demand design scenarios and system pressure criteria design parameters used to determine the size of the watermain required are outlined in **Table 5.1** below.

Table 5.1: Watermain Design Parameters and Criteria

Domestic Demand Design Parameters	Design Parameters
Unit Population: Townhomes	2.7 people/unit
Average Day Demand (AVDY)	280 L/c/d
Maximum Day Demand (MXDY)	2.5 x Avg Day
Peak Hour Demand (PKHR)	2.2 x Max Day
FUS Fire Flow	Design Flows
Back-to-Back Townhomes Blocks 1 (12-units), and 5 (10-units)	14,000 L/min
Blocks 2 (8-units), 3 (8-units), 4 (8-unites), 6 (8-units), 7 (8-units), and 9 (8-units) ¹	12,000 L/min
Block 8, and 10	12,000 L/min
Block 6 (4 units) ¹	11,000 L/min
Blocks 2 (4-units), 3 (4-units), and 4 (4 Units) ¹	10,000 L/min
System Pressure Criteria Design Parameters	Criteria
Maximum Pressure (BSDY) Condition	< 80 psi
Minimum Pressure (PKHR) Condition	> 40 psi
Minimum Pressure (MXDY+FF) Condition	> 20 psi

¹ Blocks 2, 3, 4, 6, 7, and 9 will have 2-hour fire walls. Refer to Site Plan markup enclosed in **Appendix E** showing fire wall locations.

The firefighting water demands for the Subject Site have been estimated per OWDG which refers to the Fire Underwriters Survey (FUS, 1999).

Detailed FUS calculations can be found attached in **Appendix E**.

5.4 System Pressure Modeling and Results

The proposed watermain system pressures for the subject site were estimated using the hydraulic model EPANET. The EPANET model layout is demonstrated in Watermain Layout Plan (118224-WM). The plan depicts the junction and pipe numbers, pipe sizes, and fire flow demand scenarios used in the model.

Domestic Demand

The water demand and pressure summary for the Average Daily demand and Peak Hour Demand conditions has been provided in **Table 5.2** below. For detailed results refer to the tables provided in **Appendix E**.

Table 5.2: Domestic Demands and Pressures

Domestic Demand Condition	Demand	Allowable Pressure	Max/Min Pressure
Average Daily Demand	0.88 L/s	80 psi (Max)	58 psi
Peak Hour Demand	4.77 L/s	40 psi (Min)	51 psi

Fire Flow Demand

Furthermore, an analysis was carried out to determine the available fire flow under maximum day demand while maintaining a residual pressure of 20psi. This was completed using the hydraulic model EPANET.

It is anticipated that a multi-hydrant approach for fire fighting will be required to supply adequate FUS fire flow to the proposed townhouse blocks. Therefore, the fire flows were modeled at multiple hydrants in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02, Table 1 – Maximum flow to be considered at any given hydrant.

Table 5.3 summarizes the demands and pressures under the varies fire flow demand scenarios. For detailed results refer to the tables provided in **Appendix E**.

Table 5.3: Fire Flow + Max Day Demands and Pressures

Fire Flow Demand Condition	Maximum Day Demand	Allowable Pressure	Minimum Pressure
95 L/s at J26, 46 L/s at J5, 46 L/s at J8, 46 L/s at J11	2.17 L/s	20 psi	21 psi
95 L/s at J11, 46 L/s at J8, 46 L/s at J13	2.17 L/s	20 psi	22 psi
95 L/s at J18, 52.5 L/s at J21, 52.5 L/s at J25	2.17 L/s	20 psi	25 psi
95 L/s at J24, 52.5 L/s at J21, 52.5 L/s at J25	2.17 L/s	20 psi	22 psi

The watermain hydraulic analysis demonstrates that the proposed watermain sizing meets the City of Ottawa design criteria.

6.0 EROSION AND SEDIMENT CONTROL AND DEWATERING MEASURES

Temporary erosion and sediment control measures will be implemented during construction in accordance with the “Guidelines on Erosion and Sediment Control for Urban Construction Sites” (Government of Ontario, May 1987). Details will be provided on an Erosion and Sediment Control Plan, prepared as part of detailed design. Erosion and sediment control measures may include:

- Placement of filter fabric under all catch basin and maintenance covers
- Silt fence around the area under construction placed as per OPSS 577 / OPSD 219.110
- Mud mat at construction entrances

The erosion and sediment control measures will need to be installed to the satisfaction of the engineer, the City, the Ontario Ministry of Environment, Conservation, and Parks (MECP), and the RVCA, prior to construction and will remain in place during construction until vegetation is established. The erosion and sediment control measure will also be subject to regular inspection to ensure that measures are operational.

Refer to the Erosion and Sediment Control Plan (Drawing 118224-MD-ESC) included in the enclosed drawing set.

7.0 SUMMARY AND CONCLUSIONS

This report demonstrates that the proposed development can be adequately serviced with storm sewers, sanitary sewers and watermain. The report is summarized below:

Stormwater Management

- The Subject Site will be serviced with on-site storm sewers ranging from 300 mm to 450 mm in diameter. The on-site storm sewers will ultimately outlet to the proposed expansion of the EUC Pond 1 SWM facility to the south of the Subject Site, being completed by others.
- Storm servicing for the Subject Site will be provided using a dual drainage system: Runoff from frequent events will be conveyed by storm sewers (minor system), while runoff from larger storm events which exceed the capacity of the minor system will be conveyed overland along defined overland flow routes (major system). The EUC Pond 1 SWM facility is the outlet for both the major and minor systems.
- Peak flows from the Subject Site will be controlled to the allowable release rates as determined by the SWMR Ph1 (JFSA, May 2022).
- Inlet control devices (ICDs) are to be installed in all catchbasins to limit inflows to the minor system during larger storm events.
- Road Right-of-Ways will be used for surface storage (i.e. road sags – saw-toothed grading).

Sanitary Sewer System

- The proposed development will be serviced by an on-site sanitary sewer system connected to the existing 200mm diameter sanitary sewers in Ventus Way.
- There is adequate capacity within the proposed sanitary sewers and the existing sanitary infrastructure downstream of the site to service the proposed development.

Water Supply System

- The proposed development will be serviced by an on-site watermain system connected to the existing 200mm diameter watermain in Ventus Way Cedar Creek Drive.
- The water supply for fire protection will be provided from the seven on-site fire hydrants and the three existing hydrants in Ventus Way.
- The proposed watermain system will provide adequate water supply and pressures to the proposed development.

Erosion and Sediment Control

- Temporary erosion and sediment control measures will be implemented during construction.

8.0 CLOSURE

This report is respectfully submitted for review and subsequent approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:



Miroslav Savic, P.Eng.
Senior Project Manager
Land Development



Kallie Auld P.Eng.
Project Engineer
Water Resources

Reviewed By:

A handwritten signature in blue ink, appearing to read "Bassam Bahia".

Bassam Bahia, M.Eng., P.Eng.
Senior Project Manager
Land Development

**Appendix A
Correspondence**

July 8, 2024

James Ireland
Novatech
Via email: j.ireland@novatech-eng.com

**Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 3610 Innes Road**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on July 3, 2024.

Pre-Consultation Preliminary Assessment

1 <input type="checkbox"/>	2 <input checked="" type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
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One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City’s key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. As of June 6, 2024, planning pre-consultations are no longer mandatory as per the Province of Ontario’s Bill 185. However, given staff’s comments and suggestions on the provided development concept, the applicant is greatly encouraged to proceed with the phased pre-consultation process.

If the applicant chooses to proceed with further pre-consultation, please complete a Phase 3 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.
3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, it is recommended that you complete the Phase 2 pre-consultation process.

Submission Requirements and Fees

1. Fees related to planning applications can be found [here](#).
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
 - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on [Ottawa.ca](#). These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the below comments or issues should be addressed to ensure the effectiveness of the application submission review.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

2. The site is within the Suburban Transect of the City of Ottawa's Official Plan (2022) and is designated Mainstreet Corridor as per Area-Specific Policy 48 within Volume 2c, and is subject to the Evolving Neighbourhood Overlay. The site is zoned Arterial Mainstreet (AM).
 - a. A [Planning Rationale](#) is not required for a site plan control application in this area. The applicant should still consider how the proposed development is consistent with the vision, goals, and objectives of the Official Plan, and responses that reference OP policies could strengthen the final submission.
 - b. A [Zoning Confirmation Report](#) that shows conformity with the City of Ottawa's Zoning By-law (ZBL) is required for Site Plan Control applications.
 - c. An [Impact Assessment Study](#) – Waste Disposal Site is required since the site is within 3km of an active waste disposal site.
3. A full [Landscape Plan](#) is required for all Site Plan Control applications. Opportunities to provide trees on the site must be explored early in the site servicing process.

General Comments on Design:

4. There may be opportunities for greater cohesion between the park spaces on this site and the adjacent site to the west. The applicant should consider moving the park block from Phase/Block 2 to the east of Ventus Way over to the west.

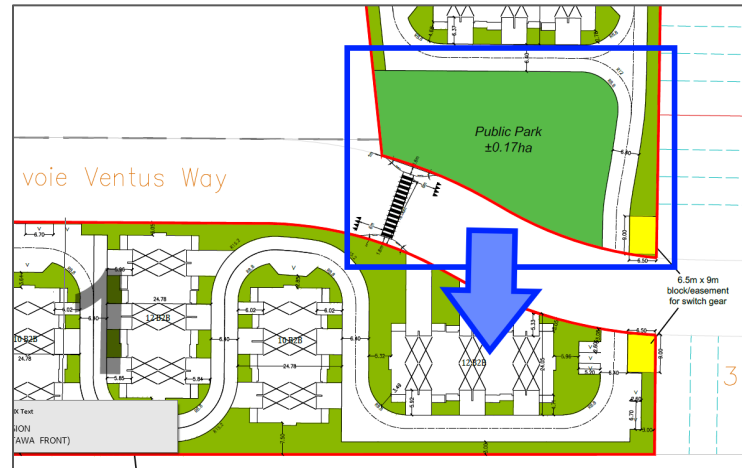


Figure 1: Clipping of the concept plan showing movement of the proposed park block.

5. The concept plan shows visitor parking spaces parallel to the street. The applicant should be aware that under section 102.4 of the Zoning By-law visitor parking is not required in the case of a planned unit development where each dwelling unit has a driveway accessing its own garage or carport. Eliminating the visitor parking spaces may be desirable if it results in more soft landscaping on the site.
 - a. If the applicant would like to provide visitor parking over the By-law minimums, the width of the private way should be at least 8.5m and the parking spaces at least 6.7m in length where parallel to the street. Additional parking on the site will require some form of planning justification.
6. The applicant should consider alternate designs of the private road network to decrease hardscaping on the site. There may be opportunities to waive requirements of the Private Approach By-law if there are strong planning justifications for additional connections to Ventus Way. See Figure 2 below for one such example in Stittsville.

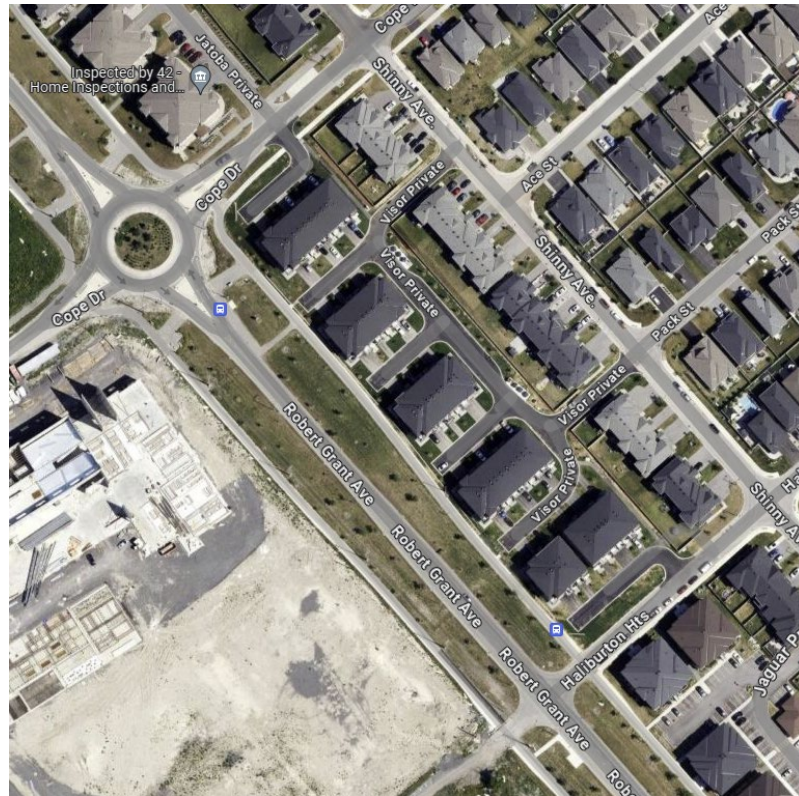


Figure 2: Example of an alternative private way network.

7. The applicant noted that the private road network would be subject to a common elements condominium. Provide a complete list of the easements required to facilitate the development and an accompanying draft reference plan showing all of the Parts subject to easements.
8. The City of Ottawa's [10-Year Housing and Homelessness Plan](#) aims to create 5,700 to 8,500 affordable housing options throughout Ottawa through partnerships with not-for-profit and private housing providers. There may be [opportunities for developing affordable units for low- and medium-income households](#) that the developer should consider exploring.
9. The applicant should be aware of the City's [Urban Design Guidelines for Greenfield Neighbourhoods](#) as well as the City's study on [Building Better and Smarter Suburbs](#).

Please contact Jerrica Gilbert, Planner II, for follow-up questions related to planning policy.

Urban Design

Comments:

10. Submission Requirements:

- a. An Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation of the submission.
 - i. The Urban Design Brief should be structured by generally following the headings highlighted under **Section 3 – Contents of these Terms of Reference**.
- b. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of reference ([Planning application submission information and materials | City of Ottawa](#)) to prepare these drawings and studies. These include (ie. The UDRP drawings):
 - i. Landscape Plan.

11. Comments on Preliminary Design:

- a. The proposed internal road network appears to be very inefficient.
- b. Staff recommend the applicant consider moving the park location to connect with a potential park block to the west.
- c. Staff recommend relocating the southern access road of Block 2 to be a shorter leg to the north, adjacent to the industrial lands as opposed to its current location.
- d. Staff have concerns over the sensitive relationship between private roads and rear yard private amenity spaces. It is recommended that additional protections like privacy fencing along all rear yard private amenity space adjacencies (south and west property lines).
- e. A robust tree planting approach should be undertaken with a minimization of hard surfacing.

Please contact Christopher Moise, Planner II, for follow-up questions related to urban design.

Engineering

Comments:

12. The Stormwater Management Criteria, for the subject site, is to be based on the following:
 - a. Application of the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

- b. For separated sewer systems built up until 2016, the design of the storm sewers were based on a 5-year storm; storm systems after such time are, generally, based on a 2-year level-of-service. Refer to The Commons subdivision for the allocated capacity for each block.
- c. In separated areas, the pre-development runoff shall be the lower of the existing coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
- d. For a combined sewer system, the maximum $C = 0.4$ or the pre-development C value, whichever is less. In the absence of other information, the allowable release rate shall be based on a 2-year storm event.
- e. A calculated time of concentration (cannot be less than 10 minutes).
- f. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including the 100-year storm event, must be detained on site.
- g. Storm sewer outlets should not be submerged.
- h. Quality control criteria.

13. Deep Services (Storm, Sanitary and/or Water Supply)

- a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.
- b. Connections to trunk sewers and easement sewers are typically not permitted.
- c. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. not in a parking area).
- d. Review provision of a high-level sewer.
- e. Sewer connections to be made above the springline of the sewermain as per:
 - i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.
 - ii. Std Dwg S11 (For rigid main sewers) – lateral must be less than 50% the diameter of the sewermain.
 - iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not

available; lateral must be less than 50% the diameter of the sewermain.

- iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

14. An MECP Environmental Compliance Approval may be required for the proposed development. A Ministry contact has been provided below, but please work with City staff on the need (or not) of an application.

- a. Patrick Lalonde at (613) 521-3450 or Patrick.Lalonde@ontario.ca

15. Water

- a. For the units fronting Ventus Way, the City would like the amount of servicing to be greatly reduced and/or be services from within the property.
- b. Take effort to reduce the amount of required water meters, if possible.
- c. A Water Data Card will be a future requirement.
- d. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:
 - i. Location of service.
 - ii. Type of development.
 - iii. The amount of fire flow required (per OBC or FUS).
 - iv. Average daily demand: ___ l/s.
 - v. Maximum daily demand: ___ l/s.
 - vi. Maximum hourly daily demand: ___ l/s.

16. Sewer (sanitary and storm)

- a. Refer to The Commons subdivision for the allocated capacity for each block.

17. Stormwater

- b. The Commons subdivision for the allocated capacity for each block.

Please contact Derek Unrau, Project Manager, for follow-up questions related to Engineering.

Noise

Comments:

18. A road noise study is required.

Please contact Mike Giampa, Transportation Project Manager, for follow-up questions related to noise studies.

Transportation

Comments:

19. Ensure that the largest design vehicle can access/egress and navigate the site.

20. Right-of-way protection.

- a. See [Schedule C16 of the Official Plan](#).
- b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

21. A full Transportation Impact Assessment is not required. A TIA addendum to the previously approved subdivision TIA is sufficient. The signalized Innes/Ventus intersection should be reviewed for any possible queuing which may impact the private approach.

22. As these are private roads, a geometric road design drawing is not required. But if a PXO is proposed, the previously submitted GRDD (subdivision) must be updated. Or the applicant can submit a Road Modification Approval package.

Please contact Mike Giampa, Transportation Project Manager, for follow-up questions related to transportation.

Environment

Comments:

23. There are no natural heritage features or surface water features present that would trigger the need for an Environmental Impact Statement (EIS). Species-at-risk Butternut may be present on site, but that matter will be resolved through a Tree Conservation Report (see below). An EIS is not required as part of this application.

24. A Tree Conservation Report is required for this application. Of particular importance is identifying any Butternut on the property as well as noting the Critical Root Zone (CRZ) of any trees that may be on a neighbouring property. Development must be kept out of the CRZ of neighbouring trees unless the landowner has given permission.
25. The applicant is encouraged to review the City's Bird Safe Design Guidelines and implement mitigation measures from that document where relevant. Note that the guidelines are not required for low-rise residential but are highly recommended.
26. Additional tree plantings to help meet the City's forest canopy goals, as well as reducing the impacts of climate change and the urban heat island effect are recommended. The current streetscape layout may not be the most efficient use of space, leading to more impermeable surface than is necessary. Consider alternative routing for the access road that may open up the possibility of more greenspace for tree planting.
 - a. Please note that the City prefers that all tree plantings be of native and non-invasive species.

Please contact Mark Elliott, Environmental Planner, for follow-up questions.

Forestry

Comments:

27. The applicant believes all trees have been removed from the site. If there are any trees 10 cm or greater on the subject site or adjacent property (with the CRZ extending onto the development site), a Tree Conservation Report (TCR) would be required. A Landscape Plan (LP) is also a submission requirement. If a TCR is triggered, it can be combined with the LP.
28. Section 4.8.2 of the Official Plan has strong direction on incorporating trees into development sites. Adequate soil volume and space for trees must be provided. Planning Forestry is concerned about the limited space available interior of the site to accommodate trees. Plan the location of driveways, services, fire hydrants, transformers, swales and other infrastructure to maximize space for trees.
29. The geotechnical investigation associated with the Plan of Subdivision identified sensitive marine clay soil in some areas. This information must be examined early on as it will heavily influence the site design as trees are incorporated on site. Identify on the LP where there are geotechnical restrictions on the site. The LP must be prepared in conjunction with the Geotechnical Report. The Landscape Plan shall include a note indicating that it has been developed as per the Geotechnical Report (date, author).

30. The Delegated Authority Report for the Plan of Subdivision (D07-16-19-0027) includes three landscape plan conditions. Review and account for these conditions in this site plan application. For single and semi-detached units, 1 tree per lot and 2 trees per corner lot are planting requirements. For stacked townhouses, 1 tree per lot may not be feasible, tree planting must be incorporated in the front yards to align with this condition.
31. The following [Tree Conservation Report \(TCR\)](#) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines. For more information on these requirements, please contact hayley.murray@ottawa.ca.
- a) A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
 - b) Any tree 10cm in diameter or greater and City-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340). The permit will be based on an approved TCR and made available at or near plan approval.
 - c) The TCR must contain 2 separate plans/maps:
 - i. Plan/Map 1 - show existing conditions with tree cover information.
 - ii. Plan/Map 2 - show proposed development with tree cover information.
 - d) The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.
 - e) Please identify trees by ownership – private on-site, private on adjoining site, city owned, co-owned (trees on a property line).
 - f) If trees are to be removed, the TCR must clearly show where the trees are and document the reason they cannot be retained.
 - g) The removal of trees on a property line will require the permission of both property owners.
 - h) All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at [Tree Protection Specification](#) or by searching Ottawa.ca.
 - i) The City encourages the retention of healthy trees. If possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

j) Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

32. The [Landscape Plan \(LP\) Terms of Reference](#) must be adhered to for all tree planting.

33. The following items are additional elements for tree planting in the Right of Way (ROW):

a) Please ensure any retained trees are shown on the Landscape Plan.

b) Please follow the [City's 2017 Tree Planting in Sensitive Marine Clay guidelines](#).

c) Please demonstrate, as per the Landscape Plan Terms of Reference, that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.

d) The City requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

e) Efforts shall be made to provide as much future canopy cover as possible at a site level through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years

f) Minimum Setbacks

i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

ii. Maintain 2.5m from the curb.

iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

iv. Maintain 7.5m between large growing trees and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.

v. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

g) Tree Specifications

i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

- ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
 - iii. Tree planting on City property shall be in accordance with the City of Ottawa's Tree Planting Specification and shall, if possible, include watering and warranty as described in the specification.
 - iv. No root barriers, dead-man anchor systems, or planters are permitted.
 - v. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree).
- h) Hard surface planting
- i. If there are hard surface plantings, a planting detail must be provided.
 - ii. Curb style planters are highly recommended.
 - iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
 - iv. Trees are to be planted at grade.

Please contact Hayley Murray, Planning Forester, for follow-up questions related to trees.

Parkland

Comments:

- 34. Cash-in-lieu of parkland / parkland dedication
 - a. Parkland Dedication [By-law No. 2022-280](#)
 - b. Parkland dedication is requested in the form of land.
- 35. The applicant is strongly encouraged to coordinate the park location with the adjacent landowner to the west (Caivan) to form one larger park.
- 36. A park location on the west side of the street will facilitate connectivity (by way of park or pathway connection) to the adjacent neighborhood.
- 37. The park is to be located away from the adjacent industrial use.
- 38. Land required for the switch gear cannot be counted towards parkland dedication.
- 39. Pending traffic approval, a PXO crossing to the park is strongly encouraged, regardless of the location of the park.



40. A Facility Fit plan will be required for the park design. Amenities may differ depending on final park layout the status of the adjacent property. Kindly connect with the Parks Planner when this plan is being prepared.

41. A Record of Site Condition is required for the park block.

Please contact Jessica Button, Parks Planner, for follow-up questions related to parks.

Other

42. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

- a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. Please be advised that this is expected to occur in Q3 2024.
- b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Jerrica Gilbert, Planner II

Encl. Supplementary Development Information, List of Technical Agencies, City of Ottawa Accessible Design Standards Site Plan Checklist, High Performance Development Standard Pre-application Consultation Handout & Example Checklist, Urban Design Brief Terms of Reference, Study and Plans Identification List (emailed as separate PDF)

c.c.

Kelly Livingstone, Planner III
Steve Belan, Planner II
Mike Giampa, TPM
Derek Unrau, IPM
Alex Polyak, IPM
Kris Haynes, IPM
Christopher Moise, Planner II
Mark Elliott, Planner II
Hayley Murray, Planning Forester
Jessica Button, Planner II

Melissa Pettern, Glenview Homes
Sam Bahia, Novatech
Greg Winters, Novatech
Jillian Normand, Glenview Homes
Jennifer Luong, Novatech
Bradley Reed, Novatech

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Proposed Site Plan Control Application – 3610 Innes Road – PC2024-0252

Legend: **R** = Required, the study or plan is required with application submission

A = Advised, the study or plan is advised to evaluate the application or satisfy a condition of approval/draft approval

1 - OPA, **2** - ZBA, **3** - Plan of Subdivision, **4** - Plan of Condominium, **5** - SPC

Core studies required for certain applications all the time (Remaining studies are site specific)

For information and guidance on preparing required studies and plans refer [here](#):

ENGINEERING

R	A	Study/ Plan Name	Description	When Required					Applicable Study Components & Other Comments
				1	2	3	4	5	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Environmental Site Assessment (Phase 1 & Phase 2)	Ensures development only takes place on sites where the environmental conditions are suitable for the proposed use	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Record of Site Condition Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
				<u>Study Trigger Details:</u> All cases					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Geotechnical Study	Geotechnical design requirements for the subsurface conditions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> All cases					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Grading and Drainage Plan	Grading relationships between connecting (or abutting) properties and surface runoff control	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> All cases					
<input type="checkbox"/>	<input type="checkbox"/>	4. Hydrogeological and Terrain Analysis	A scientific study or evaluation that includes a description of the ground and surface hydrology, geology, terrain, affected landform and its susceptibility	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Reasonable Use Study Yes <input type="checkbox"/> No <input type="checkbox"/> Groundwater Impact Study Yes <input type="checkbox"/> No <input type="checkbox"/>
				<u>Study Trigger Details:</u> When developing on private services or when urban development is in close proximity to existing private serviced development					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. Noise Control Study	Potential impacts of noise on a development	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Vibration Study Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
				<u>Study Trigger Details:</u> See Terms of Reference for full details.					

<input type="checkbox"/>	<input type="checkbox"/>	6. Rail Proximity Study	Development on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan, to follow rail safety and risk mitigation best practices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Within the Development Zone of Influence for existing and future rapid transit stations and corridors, as shown on Annex 2 of the OP OR on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan	Rail Safety Report Yes <input type="checkbox"/> No <input type="checkbox"/> O-Train Network Proximity Study Yes <input type="checkbox"/> No <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. Site Servicing Study	Provides servicing details based on proposed scale of development with an engineering overview taking into consideration surrounding developments and connections.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> All cases	Fluvial Geomorphological Report Yes <input type="checkbox"/> No <input type="checkbox"/> Assessment of Adequacy of Public Services Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Servicing Options Report Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Erosion and Sediment Control Plan / Brief Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydraulic Water Main Analysis Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Stormwater Management Report and Detailed Design Brief Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	8. Slope Stability Study	Assessment of slope stability and measures to provide safe set-back.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where the potential for Hazard Lands exists on a site.	Retrogressive Landslide Analysis Yes <input type="checkbox"/> No <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. Transportation Impact Assessment	Identify on and off-site measures to align a development with City transportation objectives.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> If the development generates 60 person-trips or more; or if the development is located in a Location Trigger; or if the development has a Safety Trigger.	Roadway Modification Functional Design (only if pedestrian crossing contemplated) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	10. Water Budget Assessment	Identify impact of land use changes on the hydrologic cycle and post-development mitigation targets.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> May be required for site plan control applications for sites with private servicing and / or proximity to hydrogeologically-sensitive areas. Draft plans of subdivision are required to integrate water budget assessments into supporting stormwater management plans and analysis for the study area.</p>
<input type="checkbox"/>	<input type="checkbox"/>	11. Wellhead Protection Study	Delineate a Wellhead Protection Area (WHPA) and characterize vulnerability for new communal residential drinking water well systems, in accordance with Technical Rules under <i>Clean Water Act</i> .	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Required for all new communal residential drinking water well systems; including new municipal wells, new private communal wells (small water works) that require a Municipal Responsibility Agreement (MRA), expansions or increased water takings from an existing municipal well or existing private communal well and new private communal wells.</p>

PLANNING

R	A	Study/Plan Name	Description	When Required					Applicable Study Components & Other Comments
				1	2	3	4	5	
<input type="checkbox"/>	<input type="checkbox"/>	12. Agrology and Soil Capability Study	Confirm or recommend alterations to mapping of agricultural lands in the City.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<u>Study Trigger Details:</u> For the expansion of a settlement area or identification of a new settlement area through a comprehensive review; or where it is demonstrated that the land does not meet the requirements for an Agricultural Resource Area.					
<input type="checkbox"/>	<input type="checkbox"/>	13. Archaeological Assessment	Discover any archaeological resources on site, evaluate cultural heritage value and conservation strategies	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> When the land has either: a known archaeological site; or the potential to have archaeological sites; or where the City's Archaeological Resource Potential Mapping Study indicates archaeological potential, outside of the historic core; or upon discovery of any archaeological resource during construction in the City's historic core area.					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14. Building Elevations	Visual of proposed development to understand facing of building including direction of sunlight, height, doors, and windows.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> Site Plan: for residential buildings with 25 or more residential units; or for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area. Official Plan or Zoning By-law: if staff deem it necessary to determine compliance with OP policies, the Zoning By-law or City of Ottawa Urban Design Guidelines.					

<input type="checkbox"/>	<input type="checkbox"/>	15. Heritage Impact Assessment	Determine impacts of proposed development on cultural heritage resources.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where development or an application under the Ontario Heritage Act is proposed on, adjacent to, across the street from or within 30 metres of a protected heritage property; or for any development adjacent to the Rideau Canal UNESCO World Heritage Site and its landscaped buffer.	Conservation Plan Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	16. Heritage Act Acknowledgement Report	A submission requirement to demonstrate that the <i>Ontario Heritage Act</i> requirements have been satisfied, to ensure that multiple applications are considered currently.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where the subject property is listed on the Heritage Register and the applicant must submit a Heritage Permit Application (designated heritage property listed on the Heritage Register) or provide notice of intent to demolish or remove a building (non-designated property listed on the Heritage Register).	Heritage Permit Application Yes <input type="checkbox"/> No <input type="checkbox"/> Notice of Intent to Demolish Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	17. Impact Assessment Study – Mineral Aggregate	Mineral aggregate extraction activities; and to protect known high quality mineral aggregate resources from development and activities that would preclude or hinder their existence (ability to be extracted) or expansion.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> New Development within 500 metres of lands within the Bedrock Overlay , or within 300 metres of lands within the Sand and Gravel Resource Area Overlay.	
<input type="checkbox"/>	<input type="checkbox"/>	18. Impact Assessment Study – Mining Hazards	To identify or confirm known mineral deposits or petroleum resources and significant areas of mineral potential. To protect mineral and petroleum resources from development and activities which would preclude or hinder the establishment of new operations or access to the resources.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> For all applications in proximity to mining operations.	

<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Impact Assessment Study – Waste Disposal Sites / Former Landfill Sites	<p>To identify or confirm known proximity of existing or former waste disposal sites.</p> <p>To ensure issues of public health, public safety and environmental impact are addressed.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> For the establishment of any new Solid Waste Disposal Site or for a footprint expansion of an operating Solid Waste Disposal Site; or development within three kilometers of an operating or non-operating Waste Disposal Site.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. Landscape Plan	<p>A plan to demonstrate how the canopy cover, urban design, health, and climate change objectives of Official Plan will be met through tree planting and other site design elements.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Site Plan, Plan of Subdivision, and Plan of Condominium: always required, except where it is demonstrated that the landscape component of a project is not relevant to the review of the application.</p> <p>A high-level conceptual Landscape Plan may be required to support Zoning By-law and Official Plan Amendment applications.</p>
<input type="checkbox"/>	<input type="checkbox"/>	21. Mature Neighbourhood Streetscape Character Analysis	<p>In the Mature Neighbourhoods a Streetscape Character Analysis is required to determine the applicable zoning requirements.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><u>Study Trigger Details:</u> Zoning By-law amendment application in areas covered by the Mature Neighbourhoods zoning overlay for applications of residential development of four storeys or less located in a R1, R2, R3, or R4 zone.</p>
<input type="checkbox"/>	<input type="checkbox"/>	22. Minimum Distance Separation	<p>Provincial land use planning tool that determines setback distances between livestock barns, manure storages or anaerobic digesters and surrounding land uses, with the objective of minimizing land use conflicts and nuisance complaints related to odour.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><u>Study Trigger Details:</u> Applications in the Rural Area, outside of a village.</p>

<input type="checkbox"/>	<input type="checkbox"/>	23. Parking Plan	A tool to assess the sufficiency of on-street parking in plans of subdivision.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Study Trigger Details:</u> For new or revised plans of subdivision with public streets.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	24. Plan of Survey	A Plan of Survey depicts legal boundaries and is a specialized map of a parcel of land and it delineates boundary locations, building locations, physical features and other items of spatial importance.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	25. Plan of Subdivision	Proposed subdivision layout to be used for application approval	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Study Trigger Details:</u> Always required with the submission of plan of subdivision application. Only required with a Zoning By-law Amendment application, where such ZBLA is in response to enable a subdivision.
<input type="checkbox"/>	<input type="checkbox"/>	26. Plan of Condominium	Proposed condominium layout to be used for application approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	27. Planning Rationale	Provides the planning justification in support of the <i>Planning Act</i> application and to assist staff and the public in the review of the proposal.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Integrated Environmental Review Summary Yes <input type="checkbox"/> No <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	28. Preliminary Construction Management Plan	A checklist that shows a development proposal's anticipated impacts to all modes of transportation and all elements in the right of way during construction.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

<input type="checkbox"/>	<input type="checkbox"/>	29. Public Consultation Strategy	Proposal to reach and collect public input as part of development application.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<p><u>Study Trigger Details:</u> Official Plan Amendment, Zoning By-law Amendment and Subdivision: Always required.</p> <p>Condominium: Vacant Land only</p> <p>Site Plan: At the discretion of the City's file lead in consultation with the Business and Technical Support Services Manager.</p>									
<input type="checkbox"/>	<input type="checkbox"/>	30. Shadow Analysis	A visual model of how the proposed development will cast its shadow.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<p><u>Study Trigger Details:</u> When there is an increase in height or massing proposed for a residential, commercial or office use.</p> <p>Two triggers:</p> <p>1. Inside the Greenbelt: proposed development is over 5 storeys in height (≤ 15 meters). If a development proposal is 5 storeys or less, but is proposing an increase in height and/or massing and is in close proximity to a shadow sensitive area, a shadow analysis may be requested.</p> <p>2. Outside the Greenbelt: proposed development is over 3 storeys in height (≤ 9 meters) and is in close proximity to a shadow sensitive area. Where a proposed development is not in close proximity to a shadow sensitive area (e.g. industrial development) the trigger for a shadow analysis is over 5 storeys in height (≤ 15 meters).</p>									
<input checked="" type="checkbox"/>	<input type="checkbox"/>	31. Site Plan	A Site Plan is a visual drawing that illustrates the proposed development of a site in two dimensions.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Site Plan Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Concept Plan Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p><u>Study Trigger Details:</u> Site Plan: All</p> <p>Other applications: where a layout of the</p>									

				public realm, building massing, heights, densities or massing of the proposal provides changes to the planned context; sites proposing multiple land uses; sites with multiple landowners; sites with two or more buildings, on-site park dedication, and/or a new public or private street(s); sites with proposed changes to connectivity (such as active transportation networks, vehicular circulation or access to transit); sites where the development potential on adjacent properties may be impacted by or could be integrated into the proposed site.	Facility Fit Plan Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	32. Urban Design Brief	Illustrate how a development proposal represents high-quality and context sensitive design that implements policies of the Official Plan, relevant secondary plans, and Council approved plans and guidelines.	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <u>Study Trigger Details:</u> For all Official Plan amendment, Zoning By-law amendment, and plan of subdivision applications. For SPC applications: proposals for residential buildings with 25 or more residential units, or for proposals for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area where OP Policy 11.3 (3) is relevant; for non-residential and mixed-use proposals.	
<input type="checkbox"/>	<input type="checkbox"/>	33. Urban Design Review Panel Report	Demonstrates that a development proposal has attended an Urban Design Review Panel formal review meeting, received, and responded to the associated recommendations, if applicable	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <u>Study Trigger Details:</u> Required for all planning act applications subject to UDRP review, in accordance with the UDRP Panel Terms of Reference.	
<input type="checkbox"/>	<input type="checkbox"/>	34. Wind Analysis	A visual model and a written evaluation of how a proposed development will impact pedestrian-level wind conditions.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <u>Study Trigger Details:</u> Applications seeking an increase in height and/or massing which is either: a tall building(s), 10 storeys or more or a proposed building that is more than twice the height of	

				adjacent existing buildings and is greater than five storeys in height and is adjacent to existing or planned low rise development, open spaces, water bodies and large public amenity areas.	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	35. Zoning Confirmation Report	The purpose of the Zoning Confirmation Report (ZCR) is to identify all zoning compliance issues, if any, at the outset of a planning application.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	
				<u>Study Trigger Details:</u> Required for all SPC and ZBLA applications.	

ENVIRONMENTAL

R	A	Study / Plan Name	Description	When Required					Applicable Study Components & Other Comments
				1	2	3	4	5	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	36. Community Energy Plan	Includes a community energy analysis, alongside mitigation measures, and other associated information. The community energy analysis refers to the overall assessment process to identify on and off-site measures to align the design of the development with City climate objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NOT IMPLEMENTED & NOT REQUIRED
<input type="checkbox"/>	<input checked="" type="checkbox"/>	37. Energy Modelling Report	The Energy Modeling Report is a Site Plan Control application submission requirement to show how climate change mitigation, and energy objectives will be met through exterior building design elements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	38. Environmental Impact Study	Assessment of environmental impacts of a project and documents the existing natural features, identifies the potential environmental impacts,	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Assessment of Landform Features Yes <input type="checkbox"/> No <input type="checkbox"/> Integrated Environmental Review Yes <input type="checkbox"/> No <input type="checkbox"/>
				<u>Study Trigger Details:</u> Is required when development or site alteration is proposed in or within a					

			recommends ways to avoid and reduce the negative impacts, and proposes ways to enhance natural features and functions.	specified distance of environmentally designated lands, natural heritage features, the City's Natural Heritage System, or hazardous forest types for wildland fire. The EIS Decision Tool (Appendix 2 of the Environmental Impact Study Guidelines) provides a checklist of the natural heritage features and adjacent areas within which an EIS is required to support development applications under the <i>Planning Act</i> .						Protocol for Wildlife Protection during Construction Yes <input type="checkbox"/> No <input type="checkbox"/> Significant Woodlands Guidelines for Identification, Evaluation, and Impact Assessment Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	39. Environmental Management Plan	A comprehensive environmental planning document that identifies, evaluates, and mitigates the potential impacts of proposed development on the natural environment and its ecological functions at local planning stage.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Study Trigger Details:</u> Official Plan amendments for local plans (area-specific policy or secondary plan, where: there is significant change in the conditions upon which the original study was based; there are proposed changes to planned infrastructure needed to service a subdivision that would have a significant impact on the infrastructure needs of another subdivision within the EMP study area, or the applicable Class Environmental Assessment approval has expired.	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	40. High-performance Development Standard	A collection of voluntary and required standards that raise performance of new building projects to achieve sustainable and resilient design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NOT IMPLEMENTED & NOT REQUIRED	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	41. Tree Conservation Report	Demonstrates how tree cover will be retained and protected on the site, including mature trees, stands of trees, and hedgerows.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Study Trigger Details:</u> Where there is a tree of 10 centimeters in diameter or greater on the site and/or if there is a tree on an adjacent site that has a Critical Root Zone (CRZ) extending onto the development site.	
										Can be waived if proof is provided that all existing trees on site and adjacent sites, with CRZ extending into the development site, are no longer alive.

**Appendix B
Site Plan**

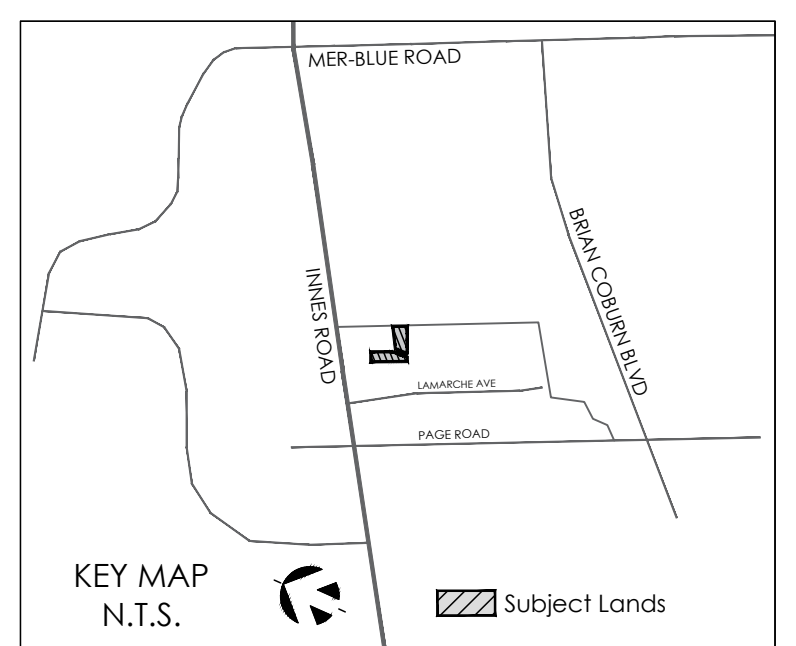
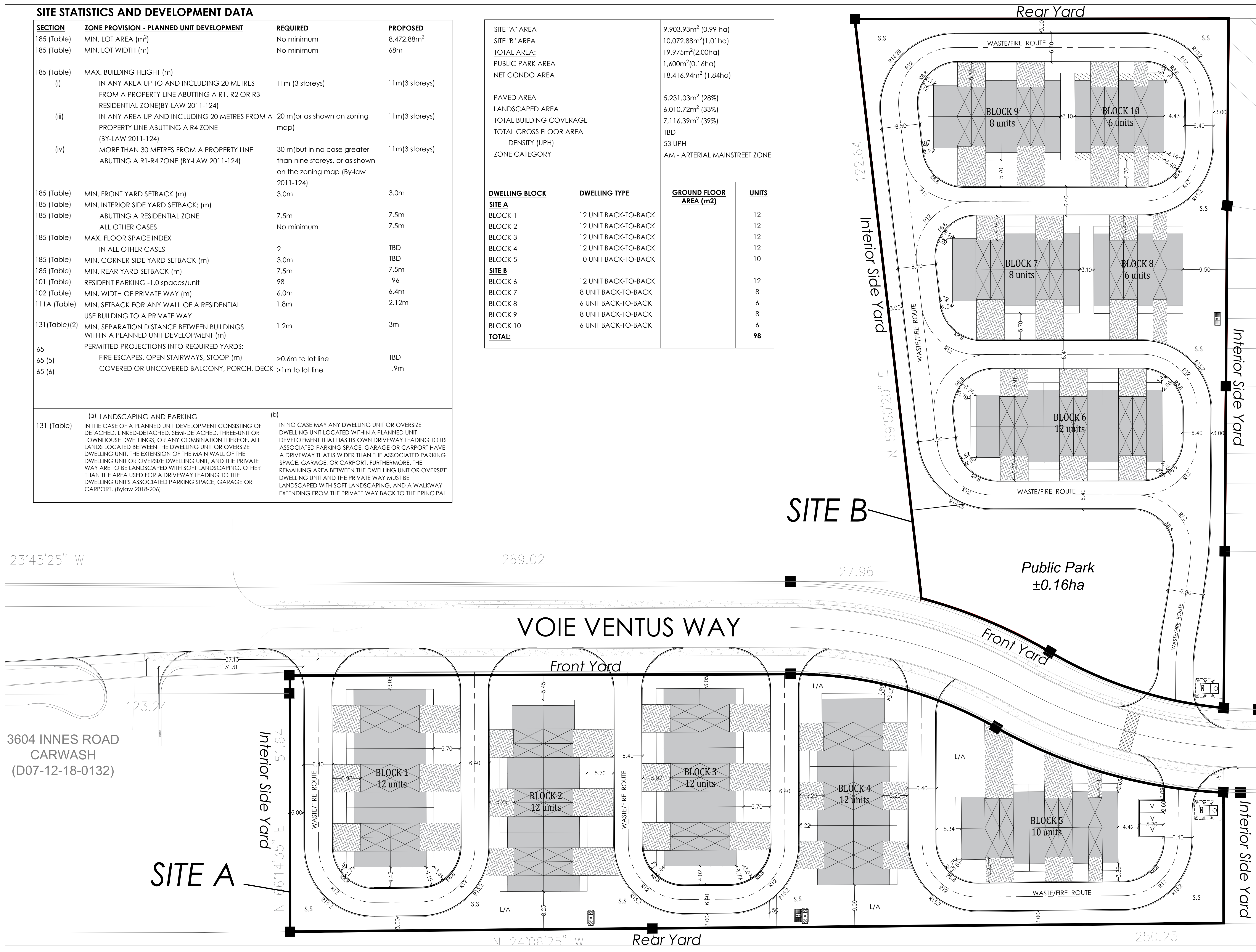
SITE STATISTICS AND DEVELOPMENT DATA

SECTION	ZONE PROVISION - PLANNED UNIT DEVELOPMENT	REQUIRED	PROPOSED
185 (Table)	MIN. LOT AREA (m ²)	No minimum	8,472.88m ²
185 (Table)	MIN. LOT WIDTH (m)	No minimum	68m
185 (Table)	MAX. BUILDING HEIGHT (m)		
(i)	IN ANY AREA UP TO AND INCLUDING 20 METRES FROM A PROPERTY LINE ABUTTING A R1, R2 OR R3 RESIDENTIAL ZONE(BY-LAW 2011-124)	11m (3 storeys)	11m(3 storeys)
(iii)	IN ANY AREA UP AND INCLUDING 20 METRES FROM A PROPERTY LINE ABUTTING A R4 ZONE (BY-LAW 2011-124)	20 m(or as shown on zoning map)	11m(3 storeys)
(iv)	MORE THAN 30 METRES FROM A PROPERTY LINE ABUTTING A R1-R4 ZONE (BY-LAW 2011-124)	30 m(but in no case greater than nine storeys, or as shown on the zoning map (By-law 2011-124)	11m(3 storeys)
185 (Table)	MIN. FRONT YARD SETBACK (m)	3.0m	3.0m
185 (Table)	MIN. INTERIOR SIDE YARD SETBACK: (m)		
185 (Table)	ABUTTING A RESIDENTIAL ZONE	7.5m	7.5m
185 (Table)	ALL OTHER CASES	No minimum	7.5m
185 (Table)	MAX. FLOOR SPACE INDEX		
	IN ALL OTHER CASES	2	TBD
185 (Table)	MIN. CORNER SIDE YARD SETBACK (m)	3.0m	TBD
185 (Table)	MIN. REAR YARD SETBACK (m)	7.5m	7.5m
101 (Table)	RESIDENT PARKING -1.0 spaces/unit	98	196
102 (Table)	MIN. WIDTH OF PRIVATE WAY (m)	6.0m	6.4m
111A (Table)	MIN. SETBACK FOR ANY WALL OF A RESIDENTIAL USE BUILDING TO A PRIVATE WAY	1.8m	2.12m
131 (Table)(2)	MIN. SEPARATION DISTANCE BETWEEN BUILDINGS WITHIN A PLANNED UNIT DEVELOPMENT (m)	1.2m	3m
65	PERMITTED PROJECTIONS INTO REQUIRED YARDS:		
65 (5)	FIRE ESCAPES, OPEN STAIRWAYS, STOOP (m)	>0.6m to lot line	TBD
65 (6)	COVERED OR UNCOVERED BALCONY, PORCH, DECK	>1m to lot line	1.9m
131 (Table)	(a) LANDSCAPING AND PARKING	(b)	
	IN THE CASE OF A PLANNED UNIT DEVELOPMENT CONSISTING OF DETACHED, LINKED-DETACHED, SEMI-DETACHED, THREE-UNIT OR TOWNHOUSE DWELLINGS, OR ANY COMBINATION THEREOF, ALL LANDS LOCATED BETWEEN THE DWELLING UNIT OR OVERSIZE DWELLING UNIT, THE EXTENSION OF THE MAIN WALL OF THE DWELLING UNIT OR OVERSIZE DWELLING UNIT, AND THE PRIVATE WAY ARE TO BE LANDSCAPED WITH SOFT LANDSCAPING, OTHER THAN THE AREA USED FOR A DRIVEWAY LEADING TO THE DWELLING UNIT'S ASSOCIATED PARKING SPACE, GARAGE OR CARPORT. (Bylaw 2018-206)	IN NO CASE MAY ANY DWELLING UNIT OR OVERSIZE DWELLING UNIT LOCATED WITHIN A PLANNED UNIT DEVELOPMENT THAT HAS ITS OWN DRIVEWAY LEADING TO ITS ASSOCIATED PARKING SPACE, GARAGE OR CARPORT HAVE A DRIVEWAY THAT IS WIDER THAN THE ASSOCIATED PARKING SPACE, GARAGE, OR CARPORT. FURTHERMORE, THE REMAINING AREA BETWEEN THE DWELLING UNIT OR OVERSIZE DWELLING UNIT AND THE PRIVATE WAY MUST BE LANDSCAPED WITH SOFT LANDSCAPING, AND A WALKWAY EXTENDING FROM THE PRIVATE WAY BACK TO THE PRINCIPAL	

SITE "A" AREA	9,903.93m ² (0.99 ha)
SITE "B" AREA	10,072.88m ² (1.01ha)
TOTAL AREA:	19,975m ² (2.00ha)
PUBLIC PARK AREA	1,600m ² (0.16ha)
NET CONDO AREA	18,416.94m ² (1.84ha)

PAVED AREA	5,231.03m ² (28%)
LANDSCAPED AREA	6,010.72m ² (33%)
TOTAL BUILDING COVERAGE	7,116.39m ² (39%)
TOTAL GROSS FLOOR AREA	TBD
DENSITY (UPH)	53 UPH
ZONE CATEGORY	AM - ARTERIAL MAINSTREET ZONE

DWELLING BLOCK	DWELLING TYPE	GROUND FLOOR AREA (m ²)	UNITS
SITE A			
BLOCK 1	12 UNIT BACK-TO-BACK		12
BLOCK 2	12 UNIT BACK-TO-BACK		12
BLOCK 3	12 UNIT BACK-TO-BACK		12
BLOCK 4	12 UNIT BACK-TO-BACK		12
BLOCK 5	10 UNIT BACK-TO-BACK		10
SITE B			
BLOCK 6	12 UNIT BACK-TO-BACK		12
BLOCK 7	8 UNIT BACK-TO-BACK		8
BLOCK 8	6 UNIT BACK-TO-BACK		6
BLOCK 9	8 UNIT BACK-TO-BACK		8
BLOCK 10	6 UNIT BACK-TO-BACK		6
TOTAL:			98



12/09/24	Revision 1	JH
12/08/24	Draft for review	WS
DATE (mm-yy)	REVISION	BY

- GENERAL NOTES**
- DO NOT SCALE DRAWINGS FOR PRINT.
 - THIS DRAWING IS THE EXCLUSIVE PROPERTY OF KORSIK URBAN PLANNING AND MATAMY HOMES. COPYRIGHT RESERVED.
 - WALKWAYS AND CURBS TO BE TIED INTO PUBLIC ROW WHERE APPLICABLE.
 - REFERENCES CITY OF OTTAWA T.W.S.I. DETAIL SC7.3

PROJECT TEAM

SITE PLAN DESIGN: KORSIK Urban Planning

LANDSCAPE ARCHITECTURE: NAK design strategies

MECHANICAL/ELECTRICAL: L R J

PLANNING: NOVATECH

TRANSPORTATION: NOVATECH

ARCHITECTURE: Glenview Homes

GEOTECHNICAL & STRUCTURAL: paterson group

CIVIL ENGINEERS: NOVATECH

Glenview homes

GLENVIEW THE COMMONS SITE PLAN

PART OF LOT 4
CONCESSION 3 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
REGISTERED PLAN #

CITY OF OTTAWA

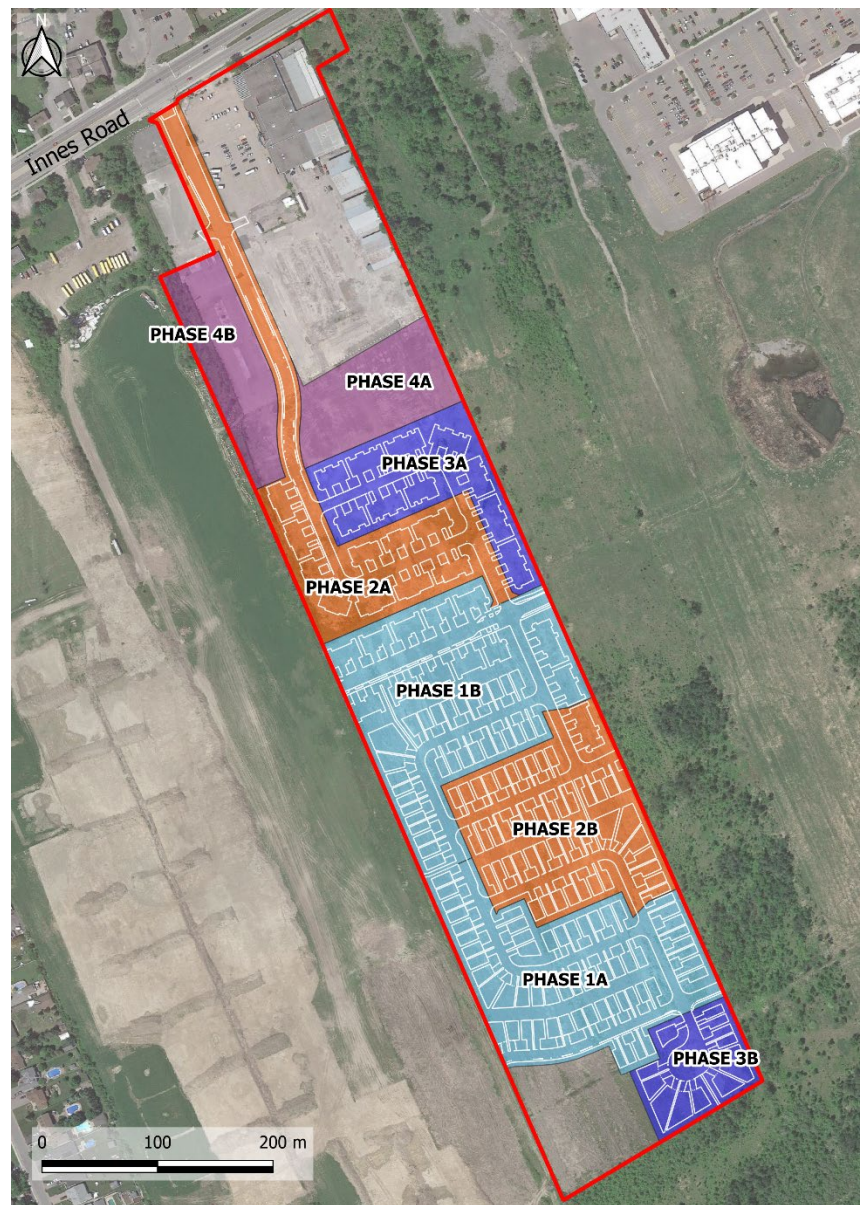
TITLE:	SITE PLAN	
DATE:	OCTOBER 7, 2024	DRAWN BY: JH
FILE NO.:		CHECKED BY: CR
JOB NO.:		DRAWING NO.:

Appendix C
Stormwater Management



Stormwater Management Report BMR The Commons

Novatech Engineering Consultants
May 2022



JFSA Ref. No.: 2102-21

Prepared for: *Novatech Engineering Consultants*

Prepared by:

J.F. Sabourin and Associates Inc.
www.jfsa.com

JFSA Water Resources and Environmental Consultants 



Stormwater Management Report BMR – The Commons Subdivision

in the City of Ottawa

May 2022

Prepared for :

Novatech Engineering Consultants

Prepared by :

Tamarra Lewis, B.Eng., EIT.



Reviewed by :

Jonathon Burnett, B.Eng., P.Eng.

Stormwater Management Report

BMR The Commons

in the City of Ottawa

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Background Rational for Report Update

May 2022

This report is an update of the March 2022 “Stormwater Management Report BMR The Commons”. The previous version of the report has been updated to address several City of Ottawa comments.

These updates include the addition of two columns to Table D-11 to describe the theoretically calculated ICD sizes based on design flows compared to the ICD sizes used in the model. Some sizes were larger than theoretical due to major system ponding or other similar variables.

Two subcatchments were changed due to the addition of CB-59, A42 is now split into two catchments as A42i and A42iii. Catch basin “CB-59” was added to the PCSWMM model and ICD was sized. Additional minor edits to tables and figures to address comments on Table 2, Table D-10, and RYCB’s (minor ICD sizes adjusted).

Some spot checks were addressed in the reporting and modelling, however some spot checks it was noted discrepancies between values provided in the SWM report and those indicated by the City reviewer are due to differences between simulated maximum results and reported maximum results. Further information provided in the City of Ottawa comment responses.

It is important to note that all values presented in this report are based on the maximum reported value (at 1-minute intervals), instead of the maximum simulated values (at 1-second intervals) as this avoids the model reporting any small blips/instabilities that may occur during any model simulation as real values, the justification for this being that there may be simply short-term model convergence issues reflected in the maximum simulated values that are not reflective of the real result. Taking the results reported by the model every minute, instead of every second ensures that these minor model convergence issues are not reported as real results.



Stormwater Management Report

BMR The Commons

in the City of Ottawa
May 2022

1 INTRODUCTION AND OBJECTIVES

J.F. Sabourin and Associates Inc. (JFSA) were retained by Novatech Engineering Consultants (Novatech) to prepare a Stormwater Management (SWM) Plan for the BMR – The Commons Subdivision, located in Orleans, within the City of Ottawa. As shown by the image provided on the cover page, the future development is located at 3610 Innes Road and is split into four phases. The Interim SWM scenario includes the development of Phase 1A and 1B only, and the Ultimate SWM scenario includes Phases 1 – 4. The proposed development will be serviced by the existing East Urban Community Stormwater Pond #1 (EUC SWM Pond 1) that is located southwest of the site. EUC SWM Pond 1 will discharge under Page Road and into Mud Creek.

The BMR – The Commons development has a total drainage area of 19.19 ha, including a 0.95 ha of park block, 13.61 ha of residential development, 1.85 ha of medium density development and a 3.43 ha existing U-Haul site. The proposed development will be treated by a wet pond, the EUC Pond 1. Figure 1 provides an overview of the location of these respective blocks within the subdivision.

The purpose of this report is to evaluate the major and minor system flows of the proposed BMR – The Commons residential development with respect to the City's stormwater management guidelines and to check the adequacy of the proposed pipe sizes to convey the 2-year (5-year on collector) and the 100-year storm flows from within the development and from external areas. Background documents that were reviewed in preparing this report include the following:

- *Stormwater Management Planning and Design Manual*, Ministry of the Environment, March 2003.
- *Erosion and Sediment Control Guidelines for Urban Construction*, Conservation Halton et al., December 2006.
- *City of Ottawa Sewer Design Guidelines*, City of Ottawa, October 2012.
- *Technical Bulletin ISDTB-2014-01, Revisions to Ottawa Design Guidelines – Sewer*, City of Ottawa, February 2014.
- *City of Ottawa Technical Bulletin PIEDTB-2016-01*, City of Ottawa, September 2016.
- *City of Ottawa Technical Bulletin ISTB-2018-04*, City of Ottawa, June 2018.
- *EUC SWM Pond 1 – Original ECA and Amended ECA*, David Schaeffer Engineering Limited, April 2018
- *East Urban Community / Preliminary Hydraulic Gradeline Analysis and Pond Design Addendum*, J.F. Sabourin & Associates, August 2020
- *Design Brief 3636 Innes Road C/O Amerco Real Estate Company City of Ottawa*. IBI Group, February 2020



- *Master Servicing Study for East Urban Community Phase 3 Area Community Design Plan Richcraft Homes*, David Schaeffer Engineering Limited, December 2020
- *Novatech Conceptual Site Servicing and Stormwater Management Report for 3610 Innes Road (Former BMR Lands)*, Novatech Engineering Consultants, November 2020

As per the approach formalized in the September 2016 *City of Ottawa Technical Bulletin PIEDTB-2016-01*, the proposed subdivision has been designed with a 2-year minor system level of service on local roads and a 5-year level of service on collector roads (Rue De Jargeau Road). Where possible with grading and minor system capture limitations, road ponding areas up to 35 cm deep were used to contain the 100-year major system flows.

The PCSWMM computer program was used to model the major and minor systems, to ensure that all stormwater management requirements are satisfied. The general SWM design criteria and guidelines that are to be met are described in Section 2.



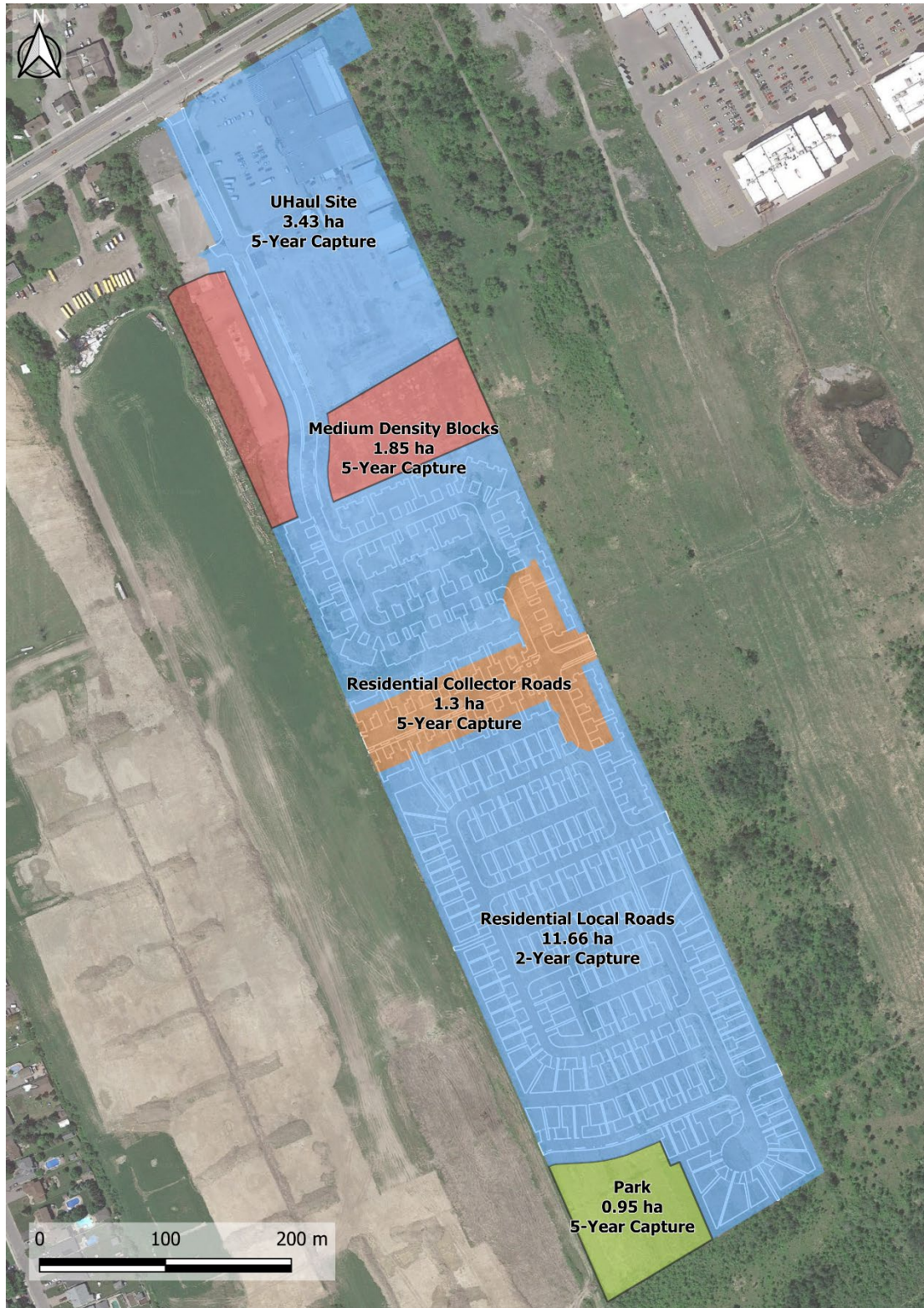


Figure 1: General Site Plan



2 DESIGN CRITERIA AND GUIDELINES

The design criteria and guidelines used for the stormwater management of the subject subdivision are those that were developed in the background documents, as well as those provided in the October 2012 *City of Ottawa Sewer Design Guidelines* and subsequent technical memorandums, and generally accepted stormwater management design guidelines.

The detailed design of the proposed BMR – The Commons development has a total drainage area of 19.19 ha with an average imperviousness of 70%. A detailed analysis of the proposed dual drainage system was required to confirm that the following general design criteria and guidelines for the minor and major systems would be met.

2.1 Minor System

- a) Storm sewers are to be designed to provide a minimum 2-year level of service, plus 5-year inflows on collector roads (Rue De Jargeau Road), as seen in Figure 1 above.
- b) The 100-year hydraulic grade line (HGL) within the development minor systems must be maintained at least 0.3 m below the underside of footing elevation where gravity house connections are installed.
- c) For less frequent storms (i.e. larger than 1:2 year or 1:5 year on collector), the minor system shall, if required, be limited with the use of inlet control devices to prevent excessive hydraulic surcharges and to maximize the use of surface storage on the road where desired.
- d) Catchbasins on the road are to be equipped with City standard type S19 (fish) grates or City standard type S22 side inlets, and grates for catchbasins in rear yards, park and open spaces with pedestrian traffic are to be City standard type S19, S30 and S31.
- e) Single catchbasins are to be equipped with 200 mm minimum lead pipes, and double catchbasins are to be equipped with 250 mm minimum lead pipes.
- f) Rearyard catchbasins are to be equipped with 250 mm minimum lead pipes. Catchbasins installed on the street, where rearyard catchbasins connect to the main storm sewer through the catchbasin, are to be equipped with 250 mm minimum lead pipes for both single and double catchbasins.
- g) Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80m/s and no greater than 3.0m/s. Where velocities over 3.0 m/s are proposed, provisions shall be made to protect against displacement of sewers by sudden jarring or movement. Velocities greater than 6.0 m/s are not permitted.



2.2 Major System

- a) The major system shall be designed with enough road surface storage to allow the excess runoff of a 100-year storm to be retained within road ponding areas where desired.
- b) Inlet control devices should be sized such that they do not create surface ponding on the road during the 2-year design storm on local roads (5-year design storm on collector and 10-year design storm on arterial roads); it should be noted that surface ponding over grates is present during rainfall under any design, as an appropriate depth of water is required for runoff to enter the grate (refer to Tables D-6 of Appendix D).
- c) Roof leaders shall be installed to direct the runoff to splash pads and onto grassed areas.
- d) For the 100-year storm, the maximum total depth of water (static + dynamic) on all roads shall not exceed 35 cm at the gutter.
- e) During the 100-year + 20% stress test, the maximum extent of surface water on streets, rearyards, public space and parking areas shall not touch the building envelope.
- f) When catchbasins are installed in rear yards, safe overland flow routes are to be provided to allow the release of excess flows from such areas.
- g) The product of the maximum flow depths on streets and maximum flow velocity must be less than $0.60\text{m}^2/\text{s}$ on all roads.
- h) For the majority of the developments, the excess major system flows up to the 100-year return period are to be retained on-site in development blocks such as parks, schools, commercial, unless specified otherwise.
- i) There must be at least 15 cm of vertical clearance between the spill elevation on the street and the ground elevation at the nearest building envelope that is in the proximity of the flow route or ponding area.
- j) There must be at least 30 cm of vertical clearance between the rearyard spill elevation and the ground elevation at the adjacent building envelope.

3 ASSUMPTIONS AND SOURCE OF DATA USED IN THIS STUDY

Sources of information and assumptions made in this study are listed below:

- Stormwater management model: *PCSWMM (version 7.4)*
- Minor system design: *1:2 year, plus 1:5-year inflows on collector roads. See the Rational Method Calculations in Appendix A.*
- Major system design: *1:100 year*
- Max. 100-yr water depth on roads: *35cm above the gutter*
- Extent of the major system: *Shall not touch the building envelope during the 100-year + 20% stress test*
- PCSWMM model parameters: *Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm (as per 2012 City of Ottawa Sewer Design Guidelines)
Detailed Area Imperviousness: based on development layout.*
- Design storms: *25mm 4-hour Chicago, 2-, 5-, and 100-year 3-hour Chicago and the 100-year 24-hour SCS Type II storms as per 2012 City of Ottawa Sewer Design Guidelines; peak averaged over 10 minutes.*
- Historical Events: *July 1st, 1979; August 4th, 1988; and August 8th, 1996 events as per 2012 City of Ottawa Sewer Design Guidelines.*
- Stress Test: *20% increase in the 100-year 3-hour Chicago storm.*
- Street catchbasin covers: *City Standard Type S19 (fish) or City Standard Type S22 (side inlet). Type S19 approach flow-capture curves as per MTO design charts (equivalent to OPSD 400.010). Type S22 approach flow-capture curves as per the 2004 City of Ottawa Guidelines.*
- Rearyard catchbasin covers: *City Standard Type S19, S30 and S31*
- Curb and gutter: *City Standard SC1.3 (mountable) and SC1.1 (barrier). In the absence of flow capture curves for these curbs and gutters, OPSD 600.010 curb and gutters are assumed.*
- Manning's' roughness coeff.: *0.013 for concrete and 0.013 for PVC pipes (free flow).*
- Minor system losses: *Refer to Appendix C for maintenance hole loss coefficients.*
- Underside of footing elevations: *As provided by Novatech.*
- Freeboard in HGL analysis: *0.3 m between the underside of footing elevation and 100-year hydraulic gradeline.*
- Inlet Control Devices: *Refer to Appendix B for Plas-Tech ICD details.*
- Depth of backyard swales: *As per Novatech's Grading Plan*
- Street and pipe dimensions: *As per Novatech's Plan and Profiles*
- Right-of-way characteristics: *As per Novatech's Details of Roads*
- Downstream HGL: *Boundary condition set at STM-111 as per JFSA East Urban Community/Preliminary HGL analysis and Pond Design Addendum, August 2020 (See Table D-12).*



4 ULTIMATE CONDITIONS PROPOSED MINOR AND MAJOR SYSTEM DRAINAGE

The proposed minor and major system drainage routes are shown in plan view in Figures 2 and 3. The residential areas where enough detail was available were modelled in PCSWMM.

As per City standards, the minor system has been designed to accommodate a minimum of the 2-year post-development flows from within the site and local roads, plus 5-year inflows on collector roads, the medium density areas and the U-Haul area. A Rational Method design was conducted by Novatech (refer to Appendix A) to estimate minor system flows based on the City of Ottawa IDF relationship and selected runoff coefficients. The rational method 5-year inflows were used to determine the release rates for the medium density and U-Haul lands. An additional rational method table can be seen in Appendix D, Table D-11, which compares rational method design flow to the respective CBs against that simulated in the PCSWMM model.

The minor system release rates from the 1.0 ha parklands area were assumed to be 5-year capture to the minor system with on-site storage up to the 100-year event with any excess flows to Rue De Beaugency street to the North of the park. The U-Haul land on the Northeast corner of the site was limited to the 5-year capture and 100-year storage on-site. The on-site storage volumes were determined by the IBI Group in the Pond Design Brief (Feb, 2020) and were then used in JFSA's PCSWMM model. The medium density blocks were limited to the 5-year capture, with onsite storage provided up to the 100-year event as determined in the MSS (December, 2020) and Novatech Conceptual Design (Nov, 2020). See Table 1 below for the storage requirements and release rates for the 100-year 3-Hour Chicago Storm. The collector road (Rue De Jargeau Road) was limited to the 5-year rational method as per the MSS (December, 2020) and Novatech Conceptual Design (Nov, 2020).

Table 1: Summary of Medium Density Blocks Results for the 100-Year 3-Hour Chicago Storm

Medium Density Blocks	Release Rate (m ³ /s)	Storage Required (m ³)
Uhaul	0.857	540
B1	0.228	230
B3i	0.245	240

As noted earlier in this report, where possible with grading limitations, road ponding areas up to 35 cm deep were used to contain the 100-year major system flows in the development. Note that rearyard catchbasins were connected to catchbasins on the road where possible, to allow rearyard runoff access to the storage in road ponding areas at regular intervals. In a design of this type where lots are serviced by gravity house connections, inlet control devices (ICDs) can be used to limit minor system capture at each catchbasin to the appropriate level of service.

Within the development, circular orifice plate type Inlet Control Devices (ICDs) of City standard diameters 83 mm, 94 mm, 102 mm, 108 mm, 127 mm, 152 mm and 178 mm will be used to limit minor system capture to a minimum of the 2-year flow (refer to Appendix B for Plas-Tech ICD details), allowing for sub-surface storage of 0.5 m³ in single catchbasins, 1.0 m³ in double catch basins, and 1.9 m³ in catchbasin manholes. Note that this subsurface catchbasin storage has not been included in the modelling to be conservative.

The street segments within the proposed development have been designed using a 'saw tooth' or 'sagged' road profile. The runoff from within these segments will be conveyed to catchbasins located at the lowest point within the street segment. Flows more than the catchbasin capture rate will be temporarily stored within the 'sagged' street segments and released slowly to the storm sewers, up to the 100-year design storm. When the storage on a specific street segment is surpassed due to blockage or an event greater than the 100-year storm, the excess water will flow towards the next downstream street sag, and eventually to the pond. It should be noted that the major system would outlet during the 100-year + 20% stress test without flooding any of the properties within the subdivision.

If the drainage system's capacity to capture surface flows is exceeded, Figures 5A-5C via Novatech present the maximum extent of static surface ponding and volume on the streets based on grading. Additionally, surface storage volumes that may exist in the rear yards have not been considered in this model, and the runoff from these areas have been directed straight to the catchbasins that the rear yard swales will discharge to. This has been completed to ensure that the peak flows and ponding volumes calculated in the model are conservative. The rear yard ponding depths for the 100-year Chicago Storm can be seen in Appendix D, Table D-10.

The PCSWMM analyses, discussed in Sections 4.1 and 4.2, have demonstrated that the proposed drainage system for the subdivision will have sufficient capacity to control the excess flow during a 100-year storm and safely capture and convey the 2-year (plus 5-year on collector roads) flow to the pond.

4.1 Ultimate Conditions Major System and SWM Analysis

The PCSWMM computer program was used to model the major and minor system flows within the proposed development.

The PCSWMM model was developed based on the information provided in Figures 2, 3, and 4. Eight (8) simulations were conducted, one for each of the following rainfall events:

- i) the 2-year, 3-hour Chicago storm;
- ii) the 5-year, 3-hour Chicago storm;
- iii) the 100-year, 3-hour Chicago storm;
- iv) the 100-year, 24-hour SCS Type II storm
- v) the July 1st, 1979 historical event;
- vi) the August 4th, 1988 historical event;



- vii) the August 8th, 1996 historical event; and
- viii) the 100-year, 3-hour Chicago storm + 20%.

Note that the purpose of simulating the 100-year, 3-hour Chicago storm with a 20% increase is to stress test the drainage system for potential flooding, as per the October 2012 City of Ottawa Sewer Design Guidelines. The depression storage and infiltration parameters in the PCSWMM model are as per the October 2012 City of Ottawa Sewer Design Guidelines. The percent imperviousness of the detailed drainage areas was measured based on the proposed development layout. The proposed development layouts have been established based on zoning requirements and represent the largest allowable footprint on each lot. The percent imperviousness of undetailed (lumped/external) drainage areas were calculated based on the runoff coefficient (C), where $C = 0.7 \times \text{imperviousness ratio} + 0.2$. Figure 2 provides an overview of the subcatchments, and Table D-3 provides a full summary of all subcatchment parameters modelled in PCSWMM, respectively. Figures representing the details of the C Value calculations provided by Novatech can be found in Appendix A.

Within the model, all CB grates have been explicitly represented using orifice connections, with the opening dimensions and configuration (side/bottom inlet) reflective of each specific grate. The grate allows flows into the CB based on the individual hydraulic properties of each specific grate configuration. Where required, inflows are limited by circular orifice plate type Inlet Control Devices (ICDs) of City standard diameters 83 mm, 94 mm, 102 mm, 108 mm, 127 mm, 152 mm and 178 mm. Each of these ICDs has been explicitly represented in the model through the use of circular orifices reflective of the standard ICD dimensions. Note that 200 mm diameter lead pipes were assumed and are required between single catchbasins and the storm sewers, and 250 mm diameter lead pipes were assumed and are required between rearyard catchbasins or single catchbasin maintenance holes and the storm sewers. In locations where no ICD is required either the 200mm or 250mm lead pipe has been represented as a short tube orifice ($C_o=0.82$). No temporary CBs are required within the development, note that the proposed ICDs are the controlling feature into the minor system, not the lead pipe, as such only the ICD has been represented in the model. Refer to Table B-1 for ICD's control rates, D-4A & D-4B for grate capacity, and D-5C to lead pipe flows.

Within the proposed subdivision, the dynamic flow depth on the road (at the gutter) will be minimal during the 100-year storms, as the 100-year flows are mostly retained within the road ponding areas and do not accumulate as in a typical subdivision design. Furthermore, it was determined that for the 100-year storm at all major system segments, the product of the depth of water (m) at the gutter multiplied by the velocity of flow (m/s) will not exceed the maximum allowable 0.6 m²/s (refer to Table D-8 of Appendix D, where the calculated maximum was determined to be 0.056 m²/s). Table D-9 of Appendix D presents the stress test results for dynamic flow depth on the road based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. As shown in Table D-9, the maximum dynamic flow depth under these conditions is calculated as 0.28 cm, and the product of the depth of water at the gutter multiplied by the velocity of flow is 0.07 m²/s. To note, all cross sections have a maximum depth of 0.6 m therefore the depth/full depth values in Tables D-8 and D-9 are multiplied by 0.6 m. Table 2 below presents a summary of the major system results within the development simulated in PCSWMM during the 100-year Chicago storm. As the CB configuration in the PCSWMM model involves multiple parts, Table 2 describes the flow on the



road as well as at the catch basin junction in the model to differentiate how much flow is on the road vs. flow through the grate and into the catch basin. The captured flow in Table 2 refers to the discharge through the ICD orifice.

Details of the 100-year street maximum water depth and water surface elevations are provided in Table D-7 of Appendix D. Based on Novatech's grading the major system has approximately 920 m³ of storage at these localized low points throughout the development (see Figures 6A-6C). Depths calculated by the PCSWMM model demonstrate that the total 100-year depth of water (static and dynamic) on the street at these ponding areas will not exceed the maximum depth of 35 cm.

Table D-7 of Appendix D also presents the street storage stress test results based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. As shown in Table D-7, the maximum depth of water (static + dynamic overflow) at any ponding area under these conditions is calculated as 30 cm. The maximum extent of surface water during the 100-year + 20% stress test will not touch the building envelopes, refer to Novatech drawings for the flood extent of these ponding depths provided in Figures 6A-6C.



Table 2: Summary of Major System Results for the 100-Year 3-Hour Chicago Storm

Catch Basin ID	Flow Depth (m)	Approach Flow On The Road (m ³ /s)	Approach Flow at Catch Basin (m ³ /s)	Captured Flow Through ICD (m ³ /s)
02 (CB)	0.16	0.065	0.027	0.026
03 (CB)	0.16	0.065	0.031	0.031
04 (CB)	0.15	0.067	0.027	0.027
05 (CB)	0.15	0.067	0.027	0.027
06 (CB)	0.03	0.054	0.030	0.030
08 (CB)	0.16	0.053	0.032	0.032
09 (CB)	0.16	0.053	0.027	0.027
10 (CB)	0.28	0.086	0.031	0.031
11 (CB)	0.28	0.086	0.087	0.043
12 (CB)	0.21	0.110	0.050	0.050
13 (CB)	0.21	0.110	0.048	0.048
14 (CB)	0.20	0.062	0.028	0.027
15 (CB)	0.20	0.062	0.028	0.027
16 (CB)	0.17	0.055	0.021	0.021
17 (CB)	0.17	0.055	0.027	0.027
18 (CB)	0.22	0.093	0.085	0.055
19 (CB)	0.22	0.093	0.071	0.071
20 (CB)	0.20	0.092	0.036	0.036
21 (CB)	0.20	0.092	0.035	0.035
23 (CB)	0.14	0.072	0.049	0.049
24 (CB)	0.14	0.072	0.049	0.049
25 (CB)	0.02	0.011	0.009	0.009
26 (CB)	0.02	0.011	0.004	0.004
27 (CB)	0.22	0.136	0.069	0.068
28 (CB)	0.22	0.136	0.069	0.068
30 (CB)	0.10	0.118	0.086	0.086
31 (CB)	0.10	0.119	0.100	0.100
32 (CB)	0.21	0.117	0.106	0.039
33 (CB)	0.21	0.144	0.072	0.059
34 (CB)	0.18	0.116	0.049	0.049
35 (CB)	0.18	0.116	0.049	0.049
36 (CB)	0.14	0.081	0.036	0.036
37 (CB)	0.14	0.081	0.049	0.049
40 (CB)	0.20	0.097	0.048	0.048
41 (CB)	0.20	0.097	0.050	0.050
42 (CB)	0.18	0.083	0.032	0.032
43 (CB)	0.18	0.083	0.036	0.036
44 (CB)	0.15	0.052	0.032	0.032
45 (CB)	0.15	0.052	0.021	0.021
46 (CB)	0.18	0.060	0.032	0.032
47 (CB)	0.18	0.060	0.026	0.026
48 (CB)	0.20	0.066	0.028	0.028
49 (CB)	0.20	0.066	0.027	0.027
50 (CB)	0.17	0.097	0.048	0.048
51 (CB)	0.17	0.097	0.047	0.047
52 (CB)	0.07	0.099	0.043	0.044
53 (CB)	0.19	0.107	0.050	0.050
54 (CB)	0.19	0.107	0.049	0.049
55 (CB)	0.17	0.098	0.049	0.049
57 (CB)	0.27	0.106	0.050	0.050

4.2 Ultimate Conditions Minor System and Hydraulic Gradeline Analysis

The minor system analysis was completed using the PCSWMM program based on the peak flows captured during the rainfall events. Note that the storm sewer design is as provided by Novatech, and a Manning's roughness coefficient of 0.013 was used for concrete and PVC storm sewer pipes. Refer to Appendix C for maintenance hole loss coefficients used in the PCSWMM model.

The minor system performance was analyzed using a dynamic water surface elevation time-series at STM-111 unique for each design storm based on the HGL determined in JFSA's "East Urban Community/Preliminary HGL analysis and Pond Design Addendum, August 2020". Table 3 presents the peak minor system outflows obtained with the above-mentioned simulations.

Table 3: Comparison of Ultimate Minor System Flows (3-Hour Chicago Storm) to the Pond from The Commons Development

Location	Novatech Rational Method Flow (m ³ /s)	2-Year PCSWMM Flow (m ³ /s)	5-Year PCSWMM Flow (m ³ /s)	100-Year PCSWMM Flow (m ³ /s)
STM-111 to Pond	2.49	2.07	2.99	4.29

⁽¹⁾The total flow is calculated as per PCSWMM model peak inflows.

Table 3 shows that the total 2-year flows simulated by the PCSWMM models are between the 2-year and 5-year PCSWMM flows. This is to be expected as the majority of the site is serviced by the 2-year storms with some locations within the development serviced by the 5-year storm.

The PCSWMM simulations have determined that for the selected 2-, 5- and 100-year 3-Hour Chicago storms, the total minor system flows from the BMR – The Commons development would be 2.07 m³/s, 2.99 m³/s and 4.29 m³/s, respectively. A freeboard of 0.3 m between the 100-year hydraulic grade line and the underside of footings has been provided throughout the proposed development.

Tables C-1A and C-1E of Appendix C summarizes the pipe data and hydraulic simulation results for the 100-year 3-hour Chicago storm, 100-year 24-hour SCS Type II storm and the three historical events. Note that a minimum freeboard of 0.3 m between the hydraulic grade line and the underside of footings has been provided throughout the proposed developments for the 100-year storms, and a minimum freeboard of 0 m has been provided throughout the proposed development for the historical events. Additionally, note that the majority of the flowing full pipe velocities are no less than 0.80 m/s and no greater than 3.0m/s. If velocities are over 3.0 m/s, provisions shall be made to protect against displacement of sewers by sudden jarring or movement. Velocities greater than 6.0 m/s are not permitted.

Table C-1F of Appendix C presents the climate change stress test results for the hydraulic grade line analysis based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. Under these conditions, no locations within the proposed developments have a USF freeboard less than 0 m.

Table 4 presents the Ultimate composite hydraulic grade line results for the 100-year 3-hour Chicago and 100-year 24-hour SCS Type II design storms. Note to simplify this analysis, the highest HGL and the lowest USF on a single pipe length are compared, if it is found that the freeboard between these two locations is either less than 0.3m or less than 0.0m this location is flagged yellow or red, respectively. This flag then initiates a detailed analysis for this segment, where the HGL is interpolated along the full length of the pipe and then compared with the individual USF along with the distance, to confirm whether there is an HGL issue along that segment.



Table 4: Composite Hydraulic Gradeline Results for 100-Year Design Storms

U/S MH	D/S MH	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard ⁽²⁾ (m)	Interpolated HGL		
							Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
102_(STM)	100_(STM)	83.291	83.170	145	85.8	2.509			
104_(STM)	102_(STM)	83.443	83.291	139	85.7	2.257			
106_(STM)	104_(STM)	84.189	83.443	23	85.85	1.661			
108_(STM)	106_(STM)	84.196	84.189	28	86	1.804			
110_(STM)	108_(STM)	84.566	84.196	26	86.1	1.534			
112_(STM)	104_(STM)	83.814	83.443	18	85.95	2.136			
114_(STM)	112_(STM)	84.156	83.814	113	86.05	1.894			
116_(STM)	114_(STM)	84.271	84.156	108	86.5	2.229			
118_(STM)	116_(STM)	84.540	84.271	104	86.35	1.810			
120_(STM)	112_(STM)	84.664	83.814	9	86.1	1.436			
122_(STM)	120_(STM)	84.786	84.664	46	86.35	1.564			
124_(STM)	122_(STM)	84.924	84.786	49	86.5	1.576			
126_(STM)	124_(STM)	85.224	84.924	3	86.5	1.276			
128_(STM)	126_(STM)	85.520	85.224	56	86.7	1.180			
130_(STM)	128_(STM)	85.888	85.520	115	86.85	0.962			
132_(STM)	130_(STM)	86.034	85.888	122	87.3	1.266			
134_(STM)	132_(STM)	86.034	86.034	125	87.4	1.366			
136_(STM)	128_(STM)	85.726	85.520	65	86.7	0.974			
138_(STM)	136_(STM)	85.854	85.726	70	87.05	1.196			
140_(STM)	138_(STM)	86.243	85.854	76	87.05	0.807			
142_(STM)	132_(STM)	86.497	86.034	113	87.35	0.853			
142_(STM)	140_(STM)	86.497	86.243	92	87.45	0.953			
144_(STM)	140_(STM)	86.641	86.243	91	87.45	0.809			
146_(STM)	144_(STM)	86.660	86.641	94	87.8	1.140			
148_(STM)	146_(STM)	86.690	86.660	97	87.28	0.590			
150_(STM)	144_(STM)	86.889	86.641	114	87.7	0.811			
152_(STM)	150_(STM)	87.012	86.889	115	87.9	0.888			
154_(STM)	152_(STM)	87.073	87.012	117	88.3	1.227			
156_(STM)	154_(STM)	87.408	87.073	118	88.2	0.792			
158_(STM)	150_(STM)	87.637	86.889	103	88	0.363			
160_(STM)	158_(STM)	87.769	87.637	106	88.4	0.631			
162_(STM)	160_(STM)	88.278	87.769	107	88.4	0.122			
				107	88.4	0.595	106.3	11.954	87.805
				108	88.4	0.595	106.3	11.954	87.805
				109	88.4	0.595	106.3	11.954	87.805

⁽²⁾ Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

⁽³⁾ Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

5 PERFORMANCE OF INTERIM B EUC POND 1

As detailed in the March 2014 *Design Brief for the Reconstruction of the East Urban Community Stormwater Management Pond 1 for the Trails Edge Subdivision*, East Urban Community (EUC) Pond 1 has been modified for Interim B conditions to support the development of the Trails Edge subdivision south of the hydro easement, and the extension of Brian Coburn Boulevard. Undeveloped area and existing commercial areas north of the hydro easement also drain to Pond 1 under Interim B conditions.

The Orleans Village and BMR - The Commons sites north of the hydro corridor were treated as undeveloped under Interim B conditions in the March 2014 *Design Brief* and lumped in with the development of the East Urban Community lands to the north of the hydro corridor, which will trigger an “Ultimate Conditions” expansion of the north main cell and north forebay in EUC Pond 1. However, it was proposed in the July 2018 *Stormwater Management Report for the Orleans Village Subdivision* that the development of Orleans Village be allowed under Interim B conditions, with the understanding that the 100-year water level in EUC Pond 1 would increase temporarily under these conditions. A maximum 100-year pond level of 83.05 m was reported for these conditions in the July 2018 *Stormwater Management Report for the Orleans Village Subdivision*; 5 cm above the target 100-year pond level of 83.00 m. All other quality, erosion and quantity control requirements identified in the March 2014 *Design Brief* are satisfied under these conditions. The Interim B drainage area to EUC Pond 1 as proposed in the July 2018 *Stormwater Management Report for the Orleans Village Subdivision* is presented in Figure E-1 of Appendix E of the current report. Refer to the July 2018 *Stormwater Management Report for the Orleans Village Subdivision* for further details.

It is proposed as part of the current study that the development of Phase 1 of BMR - The Commons be permitted under Interim B conditions, similar to Orleans Village, in exchange for Orleans Village mixed-use block 148 and future residential block 147 remaining undeveloped until the ultimate conditions expansion of the north main cell and north forebay in EUC Pond 1. Orleans Village mixed-use block 148 is identified as area B013DV2 in Figure E-1 of Appendix E (2.535 ha at 93% imperviousness), and Orleans Village future residential block 147 is identified as area B015RE2 in Figure E-1 of Appendix E (2.165 ha at 79% imperviousness). For comparison, Phase 1 of BMR - The Commons is 5.817 ha at 59% imperviousness.

To evaluate the performance of EUC Pond 1 under these proposed conditions, the PCSWMM model of BMR - The Commons was modified to represent interim conditions wherein only Phase 1 is developed, with 100-year capture to the minor system of undeveloped future phases and the existing commercial area to the north (refer to Figure 5). Similarly, the DDSWMM / SWMHYMO / XPSWMM model of drainage to EUC Pond 1 under Interim B conditions from the July 2018 *Stormwater Management Report for the Orleans Village Subdivision* was modified to remove the area occupied by the BMR - The Commons development (to avoid double-counting this area), and to represent Orleans Village areas B013DV2 and B015RE2 as undeveloped. The simulated outflow from the interim conditions model of BMR - The Commons Phase 1 was then input to the modified XPSWMM model of the EUC Pond 1 system under Interim B conditions.



The operation of Interim B EUC Pond 1 under these proposed conditions – Interim B + Orleans Village development (areas B013DV2 and B015RE2 undeveloped) + BMR – The Commons Phase 1 development – are summarized in Table 5 below.

Table 5: Summary of SWM Pond 1 Operating Characteristics Under Interim B Conditions (+ BMR - The Commons Phase 1)

Pond Component	Total Inflow (m ³ /s)	Water Level (m)				Volume Used ⁽²⁾ (m ³)	Allowable Outflow ⁽³⁾ (m ³ /s)	Provided Outflow (m ³ /s)
		North Forebay	North Main Cell	South Forebay	South Main Cell			
Permanent Pool ⁽⁴⁾	N/A	81.600	80.100	81.500	80.100	36400	N/A	N/A
Quality Control	N/A	N/A	80.684	N/A	80.684	14892	N/A	0.204
Extended Detention	N/A	81.650	81.650	81.650	81.650	43988	N/A	0.383
100-Year, 24-Hour SCS ⁽⁵⁾⁽⁶⁾	0.000	83.013	83.014	83.020	83.020	110017	8.000	6.909

⁽²⁾ Volumes are active storage only for all SWM facility components except the permanent pool.

⁽³⁾ Refer to the March 2014 Design Brief for target release rates and volumes.

⁽⁴⁾ Bottom elevations are 79.00 m in the north main cell, 79.10 m in the south main cell, 79.50 m in the north forebay and 80.00 m in the south forebay.

⁽⁵⁾ Maximum allowable 100-year pond level = 83.0 m in the main cell (per the April 2008 "East Urban Community Pond No. 1 Design Brief" by Stantec).

⁽⁶⁾ 100-Year 14-Hour SCS was used for Submission 2 as the critical storm to check against the allowable outflow

The above results show that the provided release rate for the critical 100-year storm does not exceed the allowable release rates for SWM Pond 1. Note that the maximum 100-year pond level is 83.02 m; 2 cm above the target 100-year water level of 83.0 m.

Interim B EUC Pond 1 has been equipped with two sediment forebays. Calculations for the minimum dispersion length, settling length and the average velocity in the north and south forebays under these Interim B conditions are presented in Calculation Sheets E-2 and E-3 of Attachment E. Note that the south forebay is not negatively affected by the Orleans Village and BMR - The Commons Phase 1 developments, as the proposed developments discharge to the north main cell and forebay of EUC Pond 1. Dispersion, setting and average velocity criteria are satisfied by the existing north forebay under these proposed conditions.

EUC SWM Pond 1 has a permanent pool volume of 36,400 m³, which is more than the minimum permanent pool volume the SWMP Design Manual requires for normal protection for a wet pond for the 372.298 ha drainage area at 42% imperviousness, as calculated below.

$$(97.00 - 40) \text{ m}^3/\text{ha} \times 372.298 \text{ ha} = 21,221 \text{ m}^3$$

The required quality control volume of 14,892 m³ (40 m³/ha) for the 372.298 ha drainage area is contained within the extended detention volume at an elevation of 80.684 m. The provided extended detention volume of 43,988 m³ exceeds the required volume of 33,922 m³ calculated based on detention of the 25 mm storm runoff.



It may therefore be concluded that the operation of EUC SWM Pond 1 under Interim B conditions, with the Orleans Village (with areas B013DV2 and B015RE2 undeveloped) and BMR The Commons Phase 1 developments in place, is in conformance with the requirements presented in the March 2014 *Design Brief for the Reconstruction of the East Urban Community Stormwater Management Pond 1 for the Trails Edge West Subdivision*, except for the 100-year pond level, which exceeds the maximum allowable elevation by 2 cm. It is also noted the 100-year outflow of 6.909 m³/s does not exceed the maximum allowable outflow of 8.0 m³/s.



EROSION AND SEDIMENT CONTROL DURING AND AFTER CONSTRUCTION

Silt and erosion control strategies shall be implemented during construction activities to minimize the transfer of silt off-site. The following measures should be implemented:

- i) Silt control fences shall be installed as required to prevent the movement of silt off-site during rainfall events.
- ii) Construction of a mud mat shall be installed at the site entrance to promote self-cleaning of truck tires when leaving the site.
- iii) All catch basins shall be equipped with a crushed stone filter to prevent the capture of silt in the storm sewer system.
- iv) Regular cleaning of the adjacent roads shall be undertaken during the construction activities.
- v) Regular inspection and maintenance of the silt control measures shall be undertaken until the site has been stabilized.
- vi) The erosion and sediment control devices shall be removed after the site has been stabilized.

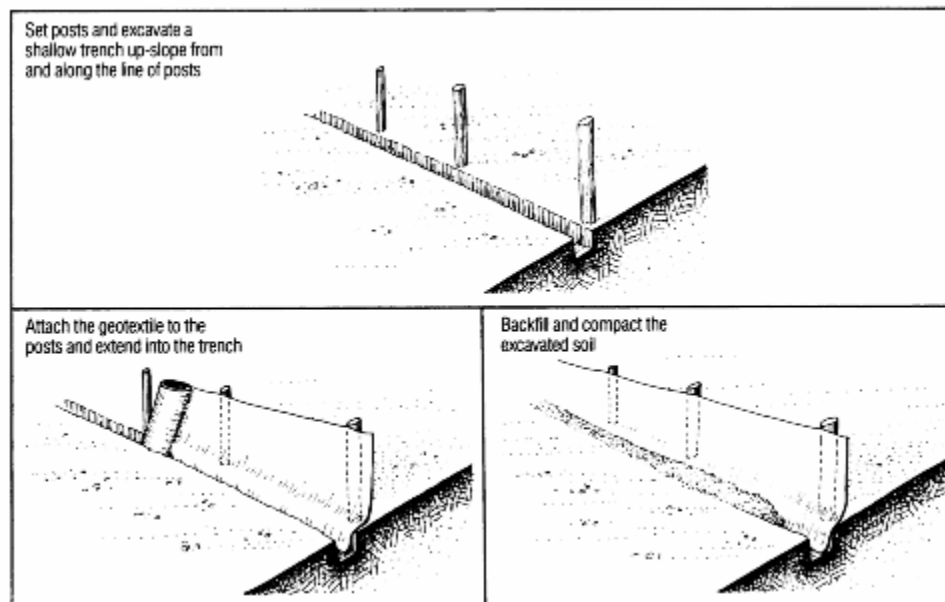


Figure 7: Typical installation of silt fences

6 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The BMR – The Commons development is in the City of Ottawa, on Innes Road and east of Page Road. The development has a drainage area of 19.19 ha, which will be treated by a wet SWM pond for quantity and quality control, which services a total drainage area of 372.298 ha.

Per the City of Ottawa design guidelines, the minor system has been designed to accommodate a minimum of the 2-year post-development flows from within the site and from external areas (plus 5-year flows on collector). The PCSWMM model analyses have determined that the minor system will surcharge in some parts of the system. However, with the use of Inlet Control Devices, a minimum freeboard of 0.3 m is provided between the 100-year hydraulic grade line and the underside of footings throughout the subdivision.

The PCSWMM simulations have determined that for the selected 2-, 5- and 100-year 3-Hour Chicago storms, the total minor system flows from the BMR development and associated external areas would be 2.07 m³/s, 2.99 m³/s and 4.29 m³/s, respectively.

Within the subdivision, the peak water depths do not exceed the maximum allowable 35 cm depth at the gutter for the simulated 100-year storm (Table D-7 of Appendix D). Furthermore, it was determined that for the 100-year event, the product of the velocity and depth of flow does not exceed the maximum allowable 0.60 m²/s. Also as required, the maximum extent of surface water during the 100-year + 20% stress test will not touch the building envelopes.

Table C-1A- C1F of Appendix C summarizes the hydraulic grade line analysis for the various storm. Note that the full pipe velocities are generally no less than 0.80 m/s and no greater than 3.0 m/s for the proposed pipes. Where velocities over 3.0 m/s are proposed, provisions shall be made to protect against displacement of sewers by sudden jarring or movement.

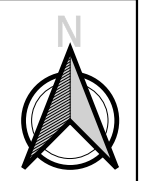
Stress test results for the major and minor drainage systems based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*, are summarized in Section 4.

The operation of EUC SWM Pond 1 under Interim B conditions, with the Orleans Village (with areas B013DV2 and B015RE2 undeveloped) and BMR The Commons Phase 1 developments in place, is in conformance with the requirements presented in the March 2014 *Design Brief for the Reconstruction of the East Urban Community Stormwater Management Pond 1 for the Trails Edge West Subdivision*, except for the 100-year pond level, which exceeds the maximum allowable elevation by 2 cm. It is also noted the 100-year outflow of 6.909 m³/s does not exceed the maximum allowable outflow of 8.0 m³/s.

Recommendations for silt and erosion control strategies to be implemented during construction are presented in Section 6.

In conclusion, the proposed design satisfies all selected design guidelines and requirements.





Legend

- Site Plan
- Manhole
- ◻ Catch Basins
- ◻ Rear Yard Catch Basin
- ➔ Minor System
- Rear Yard

- ICD Sizing
- 0.083
 - 0.094
 - 0.102
 - 0.108
 - 0.127
 - 0.152
 - 0.178
 - ⊗ No ICD

SCALE: 1:3700

0 100 200 m

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Figure 2: Minor System Overview

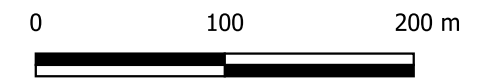
PROJECT	2102-21
DRAWN	TL
DATE	11-MAY-2022



Legend

- Site Plan
- Subcatchments

SCALE: 1:4000



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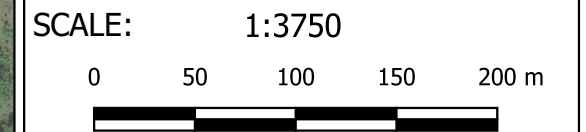
Figure 3: Subcatchment Overview

PROJECT	2102-21
DRAWN	TL
DATE	11-MAY-2022



Legend

- Site Plan
- High Point
- Low Point
- Spill Points
- Major System
- Rear Yard
- Major System Spill



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Figure 4: Proposed Major System

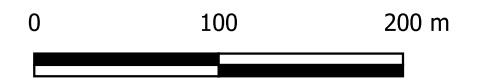
PROJECT	2102-21
DRAWN	MP/TL
DATE	03-11-2022



Legend

-  Site Plan
-  Site Area
-  Developed Areas
-  Undeveloped Areas

SCALE: 1:4100



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Figure 5: Interim Condition

PROJECT	2102-21
DRAWN	MP
DATE	06-24-2021

LEGEND

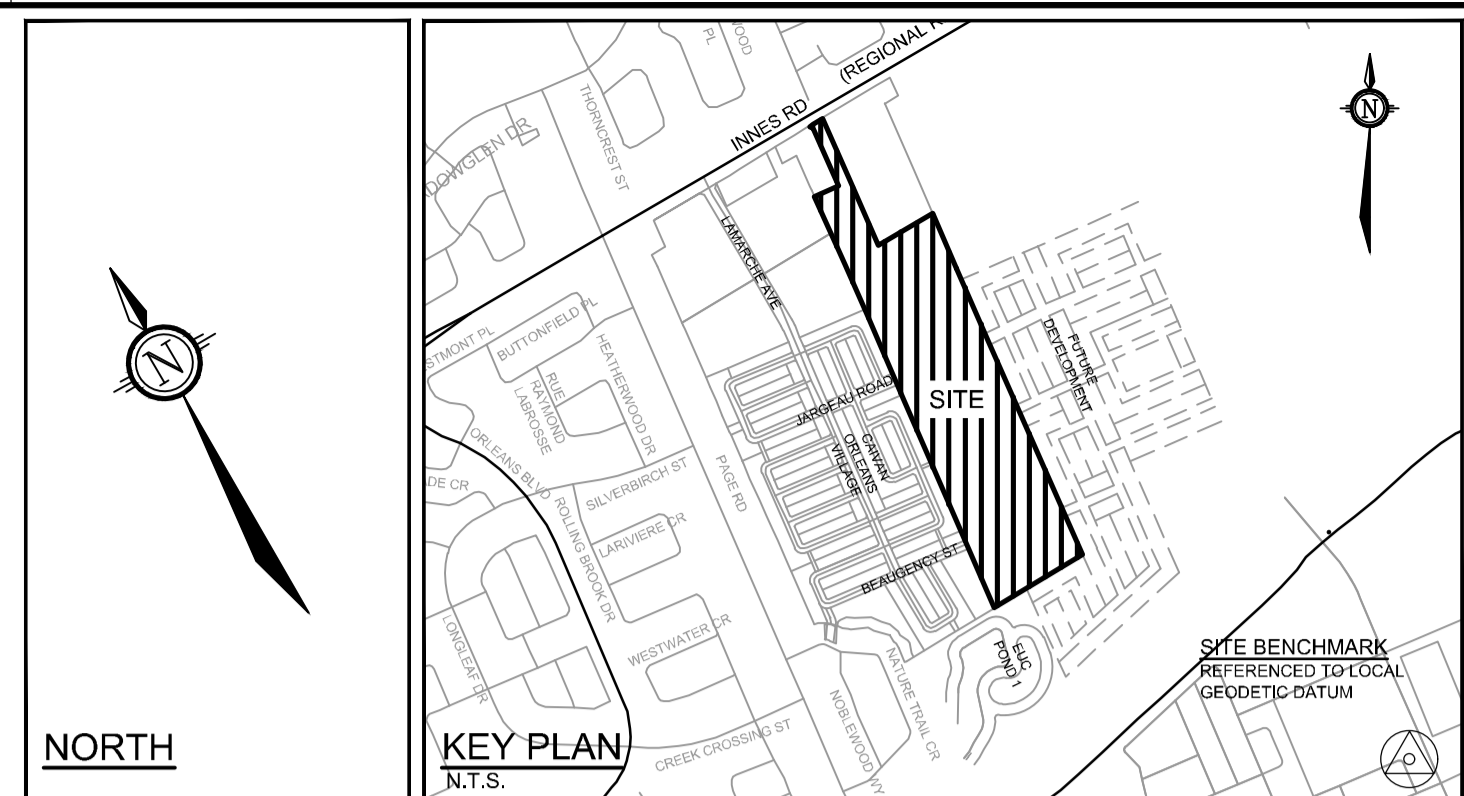
	PROPOSED ELEVATION
	EXISTING ELEVATION
	PROPOSED SWALE ELEVATION
	PROPOSED TOP OF GRATE ELEVATION
	PROPOSED VERTICAL POINT OF INTERSECTION ELEVATION
	PROPOSED TOP OF NOISE WALL ELEVATION
	PROPOSED BOTTOM OF NOISE WALL ELEVATION
	PROPOSED ELEVATION BY OTHERS (CAIVAN ORLEANS VILLAGE)

GRADE AND DIRECTION

	PROPOSED TERRACE ELEVATION
	SPILL ELEVATION
	FINISHED FLOOR ELEVATION
	TOP OF FOUNDATION ELEVATION
	UNDERSIDE OF FOOTING ELEVATION
	UNIT BASEMENT STYLE (CONVENTIONAL/LOOKOUT/WALKOUT)
	PRESSURE REDUCING VALVE

	EMERGENCY OVERLAND FLOW
	PROPOSED LANDSCAPE TEE CATCH BASIN
	PROPOSED LANDSCAPE ELBOW CATCH BASIN
	PROPOSED REAR YARD CATCH BASIN MANHOLE
	PROPOSED REAR YARD CATCH BASIN
	PROPOSED ROAD CATCH BASIN
	EXISTING TREE TO REMAIN IF POSSIBLE

	LIMITS AND ELEVATION FOR 100 YR PONDING
	LIMITS AND ELEVATION FOR 100 YR PONDING + 20%
	REAR YARD STATIC PONDING LIMITS



ROADWAY CATCHBASIN TABLE (PHASE 2A)

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m³/s)
30	2+235.53	89.07	87.27	200mm	600 x 600 CB	0.086
31	2+235.52	89.07	87.27	200mm	600 x 600 CB	0.100
32	2+172.35	89.47	87.67	127mm	600 x 600 CB	0.039
33	2+172.35	89.47	87.67	152mm	600 x 600 CB	0.059
34	9+535.97	89.51	87.71	127mm	600 x 600 CB	0.049
35	9+535.97	89.51	87.71	127mm	600 x 600 CB	0.049
36	9+396.24	89.79	87.99	108mm	600 x 600 CB	0.036
37	9+395.97	89.79	87.99	127mm	600 x 600 CB	0.049
38*	9+387.20	89.86	88.06	152mm	600 x 600 CB	N/A
39*	9+351.61	90.13	88.33	152mm	600 x 600 CB	N/A
40	9+294.95	90.13	88.33	127mm	600 x 600 CB	0.048
41	9+294.96	90.13	88.33	127mm	600 x 600 CB	0.050
42	9+139.87	90.30	88.50	102mm	600 x 600 CB	0.032
43	9+140	90.29	88.49	108mm	600 x 600 CB	0.036
52	9+382.52	89.81	88.01	178mm	600 x 600 CB	0.044

REAR YARD CATCHBASIN TABLE (PHASE 2A)

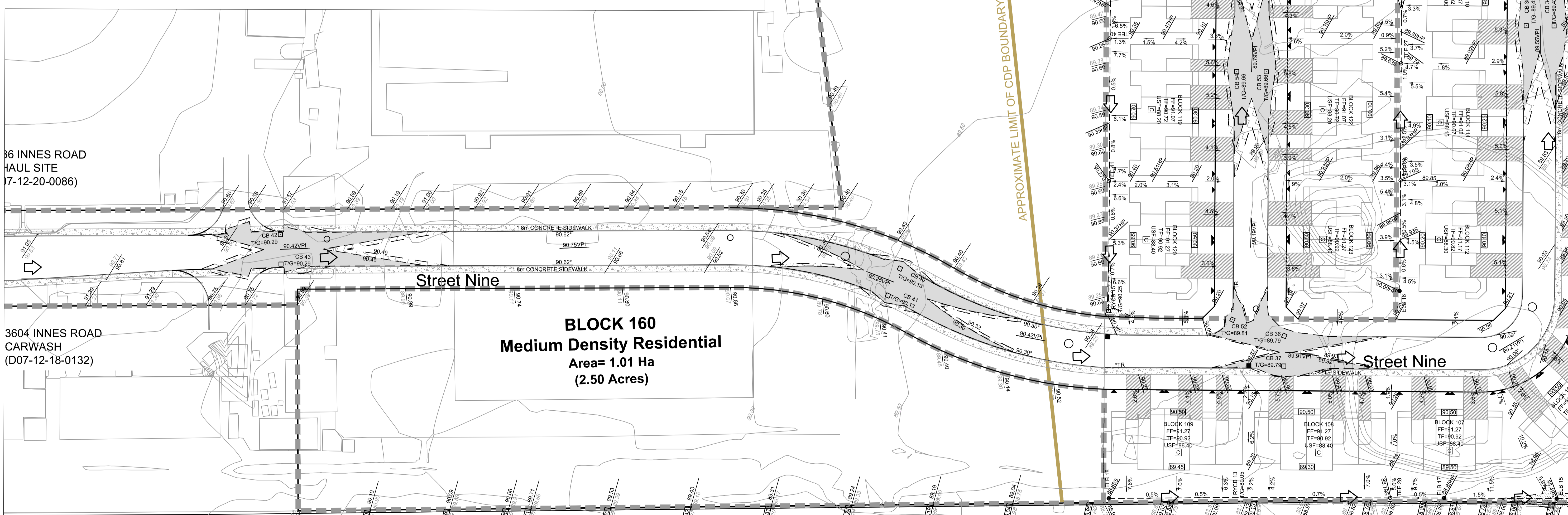
RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 12	89.68	88.00	-
RYCB 13	89.05	87.54	-

ROADWAY CATCHBASIN TABLE (PHASE 3A)

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m³/s)
53	2+079.97	89.86	87.86	127mm	600 x 600 CB	0.050
54	2+079.96	89.86	87.86	127mm	600 x 600 CB	0.049

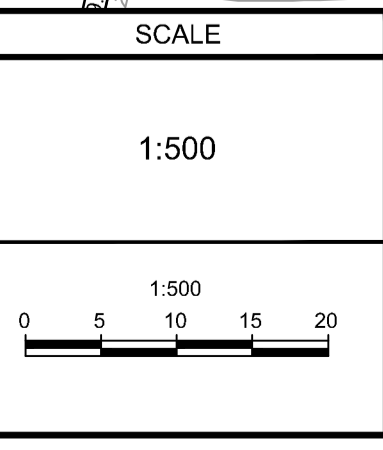
REAR YARD CATCHBASIN TABLE (PHASE 3A)

RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 14	89.85	88.14	-
RYCB 15	90.25	88.70	-



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4.	ISSUED FOR FINAL CITY APPROVAL AND ECA	MAY 11/22	BHB
3.	REVISED AND REISSUED FOR REVIEW	MAR 10/22	BHB
2.	REVISED AND REISSUED FOR REVIEW	NOV 28/21	BHB
1.	ISSUED FOR REVIEW	JUNE 18/21	BHB



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DESIGN	DJC
CHECKED	BCS
DRAWN	MFD
CHECKED	BCS
APPROVED	BHB

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LOCATION CITY OF OTTAWA THE COMMONS	PROJECT No. 118224-00
DRAWING NAME PONDING AND ICD PLAN	REV # REV # 4
	DRAWING No. 118224-P-ICD1

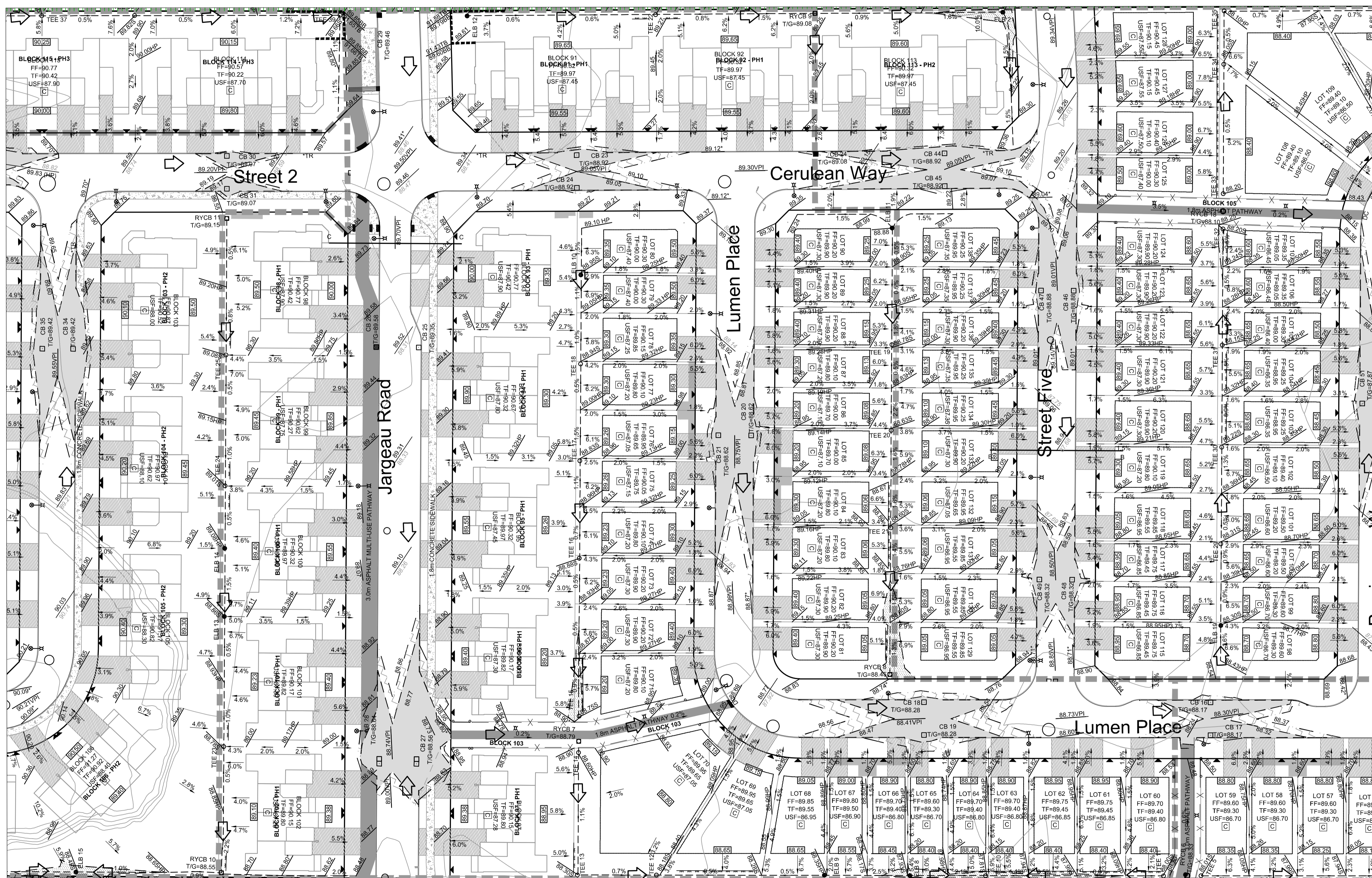
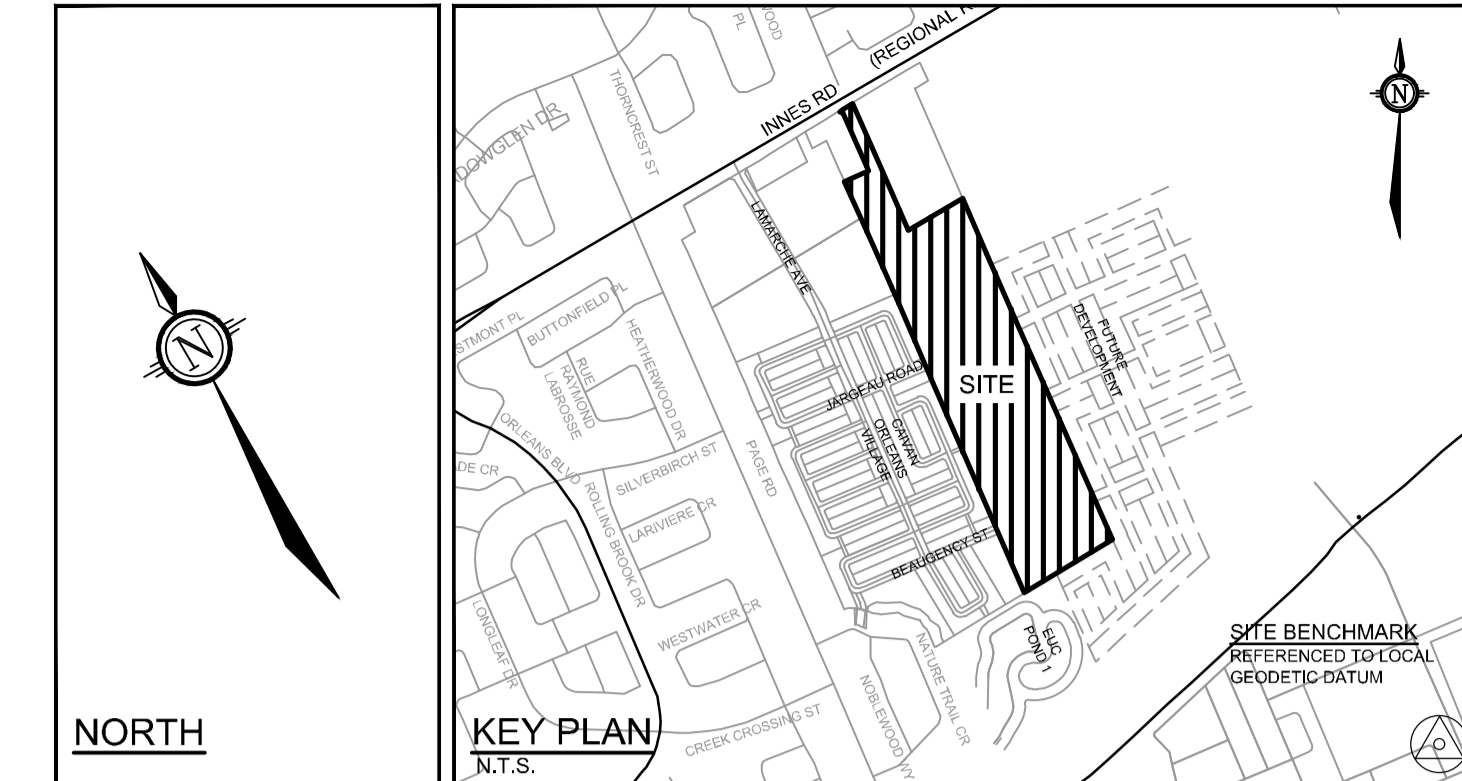
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#18535
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LEGEND

	PROPOSED ELEVATION		GRADE AND DIRECTION
	EXISTING ELEVATION		PROPOSED TERRACE ELEVATION
	PROPOSED SWALE ELEVATION		SPILL ELEVATION
	PROPOSED TOP OF GRATE ELEVATION		FINISHED FLOOR ELEVATION
	PROPOSED VERTICAL POINT OF INTERSECTION ELEVATION		TOP OF FOUNDATION ELEVATION
	PROPOSED TOP OF NOISE WALL ELEVATION		UNDERSIDE OF FOOTING ELEVATION
	PROPOSED BOTTOM OF NOISE WALL ELEVATION		UNIT BASEMENT STYLE (CONVENTIONAL / LOOKOUT / WALKOUT)
	PROPOSED ELEVATION BY OTHERS (CAIVAN ORLEANS VILLAGE)		PRESSURE REDUCING VALVE

	EMERGENCY OVERLAND FLOW		PROPOSED LANDSCAPE TEE CATCH BASIN
	PROPOSED LANDSCAPING		PROPOSED LANDSCAPE ELBOW CATCH BASIN
	PROPOSED TERRACING		PROPOSED REAR YARD CATCH BASIN MANHOLE
	PROPOSED SWALE		PROPOSED REAR YARD CATCH BASIN
	PROPOSED STORM MH		PROPOSED ROAD CATCHBASIN
	EXISTING TREE TO REMAIN IF POSSIBLE		LIMITS AND ELEVATION FOR 100 YR PONDING
			LIMITS AND ELEVATION FOR 100 YR PONDING + 20%
			REAR YARD STATIC PONDING LIMITS



ROADWAY CATCHBASIN TABLE (PHASE 1B)

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m³/s)
18	4+170	88.28	86.48	152mm	600 x 600 CB	0.055
19	4+170	88.28	86.48	152mm	600 x 600 CB	0.071
20	4+069	88.62	86.82	108mm	600 x 600 CB	0.036
21	4+069	88.62	86.82	108mm	600 x 600 CB	0.035
23	3+052	88.92	87.12	127mm	600 x 600 CB	0.049
24	3+052	88.92	87.12	127mm	600 x 600 CB	0.049
25	1+126.45	89.39	87.59	250mm	600 x 600 CB	0.009
26**	1+126.45	89.51	87.71	250mm	600 x 600 CB	0.004
27***	1+032.02	88.59	86.79	152mm	600 x 600 CB	0.068
28***	1+032.02	88.66	86.86	152mm	600 x 600 CB	0.068
29*	1+201.88	89.61	85.31	-	600 x 600 CB	N/A

* SOLID COVER
** CURB INLET
*** DUAL CATCHBASIN

REAR YARD CATCHBASIN TABLE (PHASE 1B)

RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 7	88.79	86.49	-
RYCB 8	88.46	86.97	-
RYCB 10	88.55	87.02	178mm
RYCB 11	89.19	87.35	-

REAR YARD CATCHBASIN TABLE (PHASE 2A)

RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 12	89.68	88.00	-
RYCB 13	89.05	87.54	-

ROADWAY CATCHBASIN TABLE (PHASE 3B)

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m³/s)
6*	8+042.40	87.39	85.39	83mm	600 x 600 CB	0.030
55	8+030	87.27	85.47	127mm	600 x 600 CB	0.049
56	8+030	87.27	85.47	-	600 x 600 CB	N/A
57***	8+069.55	87.40	85.60	127mm	600 x 600 CB	0.050

* SOLID COVER (CB TO BE INSTALLED AS A PART OF PHASE 1A)
*** DUAL CATCHBASIN

REAR YARD CATCHBASIN TABLE (PHASE 3B)

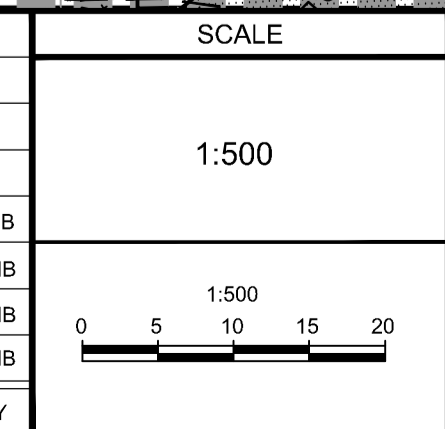
RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 1	87.31	86.00	127mm
TEE 43	87.75	86.11	-
TEE 44	87.76	86.04	-

* RYCB1 TO BE INSTALLED AS A PART OF PHASE 1A

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2.	REVISED AND REISSUED FOR RVIEW	NOV 26/21	BHB
1.	ISSUED FOR REVIEW	JUNE 18/21	BHB



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Website: www.novatech-eng.com

LOCATION CITY OF OTTAWA THE COMMONS	PROJECT No. 118224-00
DRAWING NAME PONDING AND ICD PLAN	REV # REV # 4
	DRAWING No. 118224-P-ICD2

#18535
D07-16-19-007

LEGEND

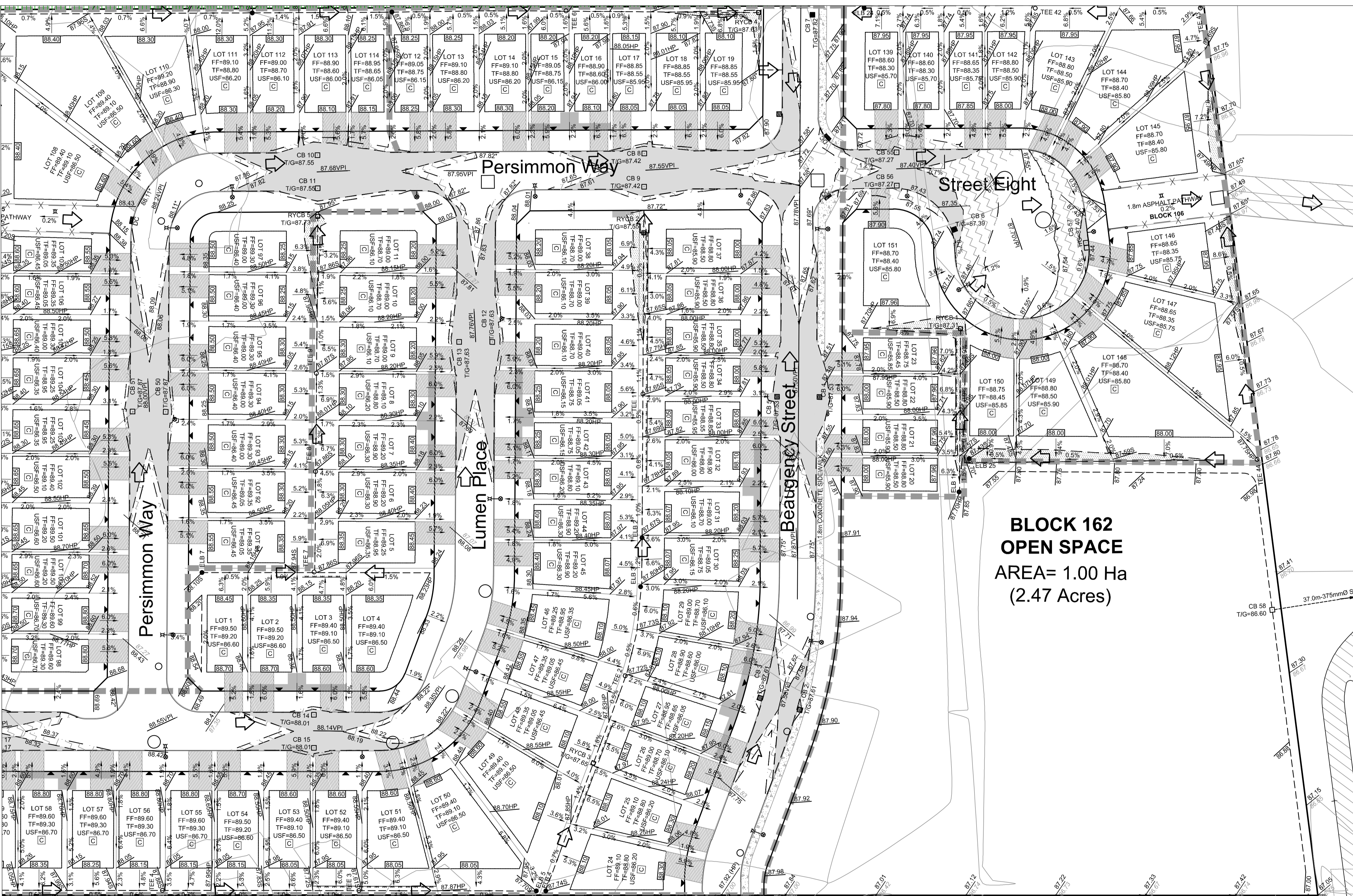
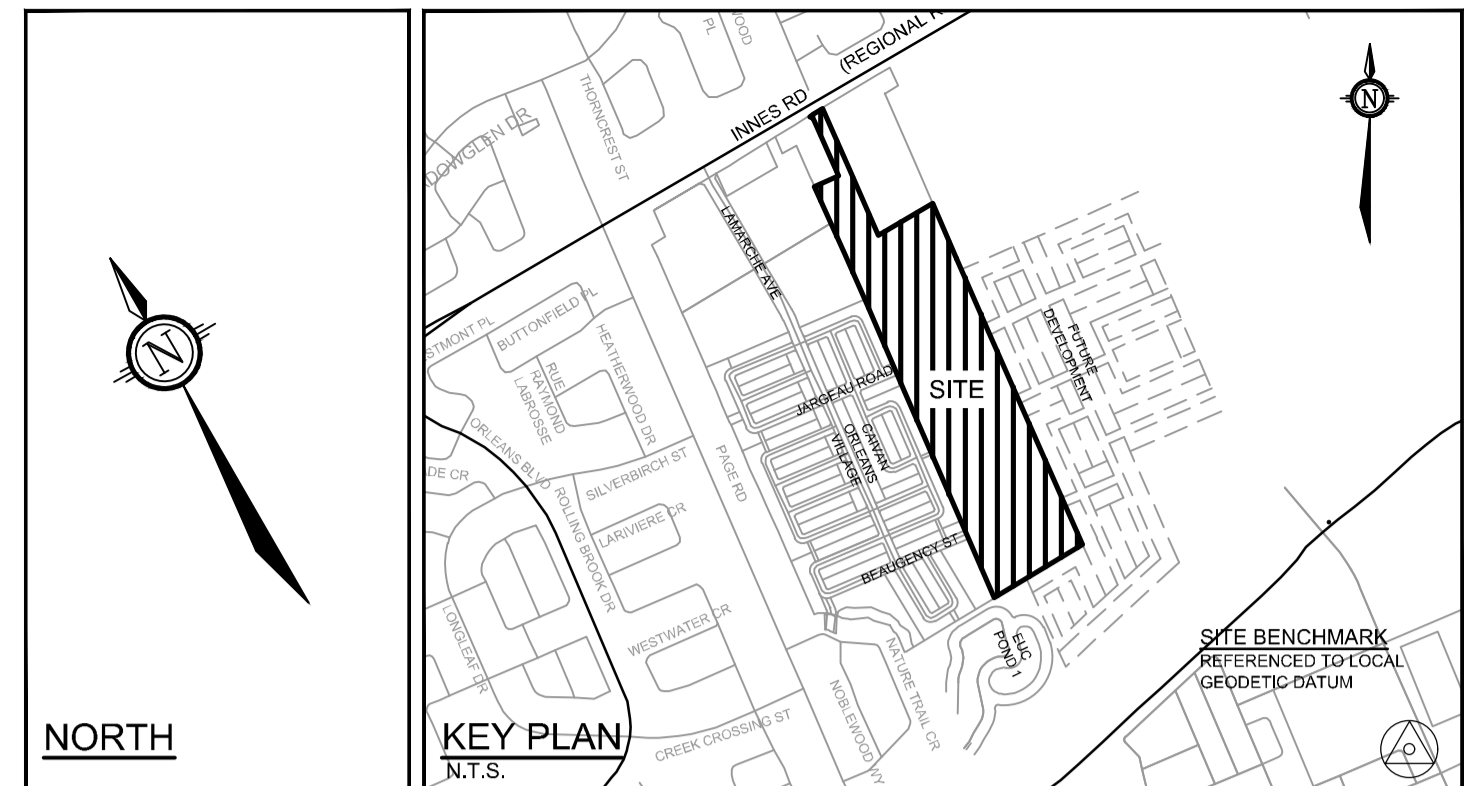
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116.00
- 120.48(S)
- 120.48(T)
- 120.48(VPI)
- ST PATN
65.99HW
- 120.40

- 3.2%
- 127.55
- 120.46
- FF=
- TF=
- USF=
- CL(OW)
- PROPOSED TOP OF NOISE WALL ELEVATION
- PROPOSED BOTTOM OF NOISE WALL ELEVATION
- PROPOSED ELEVATION BY OTHERS (CAIVAN ORLEANS VILLAGE)

- GRADE AND DIRECTION
- PROPOSED TERRACE ELEVATION
- SPILL ELEVATION
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- UNIT BASEMENT STYLE (CONVENTIONAL / LOOKOUT / WALKOUT)
- PRESSURE REDUCING VALVE

- EMERGENCY OVERLAND FLOW
- PROPOSED TERRACING
- PROPOSED SWALE
- PROPOSED STORM MH
- PROPOSED LANDSCAPE TEE CATCH BASIN
- PROPOSED LANDSCAPE ELBOW CATCH BASIN
- PROPOSED REAR YARD CATCH BASIN
- PROPOSED REAR YARD CATCH BASIN
- PROPOSED ROAD CATCHBASIN
- EXISTING TREE TO REMAIN IF POSSIBLE

- LIMITS AND ELEVATION FOR 100 YR PONDING
- LIMITS AND ELEVATION FOR 100 YR PONDING + 20%
- REAR YARD STATIC PONDING LIMITS



ROADWAY CATCHBASIN TABLE (PHASE 1A)

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m ³ /s)
1*	7+021.04	87.85	85.42	—	1,200 mm dia CBMH	N/A
2**	7+047.99	87.60	85.80	94mm	600 x 600 CB	0.026
3**	7+048.08	87.60	85.80	102mm	600 x 600 CB	0.031
4**	7+117.08	87.53	85.73	94mm	600 x 600 CB	0.027
5**	7+117.08	87.53	85.73	94mm	600 x 600 CB	0.027
7*	7+203.11	87.66	83.79	—	600 x 600 CB	N/A
8	6+238.27	87.42	85.62	102mm	600 x 600 CB	0.032
9	6+238.19	87.42	85.62	94mm	600 x 600 CB	0.027
12	4+421.50	87.63	85.83	127mm	600 x 600 CB	0.050
13	4+421.50	87.63	85.83	127mm	600 x 600 CB	0.048
14	4+310	88.01	86.21	94mm	600 x 600 CB	0.027
15	4+310	88.01	86.21	94mm	600 x 600 CB	0.027
16	4+235	88.17	86.37	83mm	600 x 600 CB	0.021
17	4+235	88.18	86.38	94mm	600 x 600 CB	0.027
69**	7+180.34	87.50	85.70	—	600 x 600 CB	N/A

* SOLID COVER
** CURB INLET

REAR YARD CATCHBASIN TABLE (PHASE 1A)

RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 2	87.56	86.01	127mm
RYCB 3	87.65	86.18	152mm
RYCB 4	87.63	86.12	152mm
RYCB 5	87.74	86.04	-
RYCB 6	88.33	85.72	-

ROADWAY CATCHBASIN TABLE (PHASE 2B)

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m ³ /s)
10	6+165.12	87.57	85.77	108mm	600 x 600 CB	0.031
11	6+165.12	87.56	85.77	127mm	600 x 600 CB	0.043
22*	3+106.23	89.08	87.28	152mm	600 x 600 CB	N/A
44*	3+135.44	88.92	87.12	102mm	600 x 600 CB	0.032
45	3+135.44	88.92	87.12	83mm	600 x 600 CB	0.021
46	5+063.76	88.88	87.08	102mm	600 x 600 CB	0.032
47	5+063.76	88.88	87.08	94mm	600 x 600 CB	0.026
48	5+129.30	88.37	86.57	94mm	600 x 600 CB	0.028
49	5+129.29	88.37	86.57	94mm	600 x 600 CB	0.029
50	6+080.50	87.87	86.07	127mm	600 x 600 CB	0.048
51	6+080.51	87.87	86.07	127mm	600 x 600 CB	0.047

* SOLID COVER

REAR YARD CATCHBASIN TABLE (PHASE 2B)

RYCB No.	T/G ELEVATION	INVERT	ICD DIA.
RYCB 9	88.09	87.54	-
RYCB 18	88.10	85.76	-

ROADWAY CATCHBASIN TABLE (PHASE 3B)

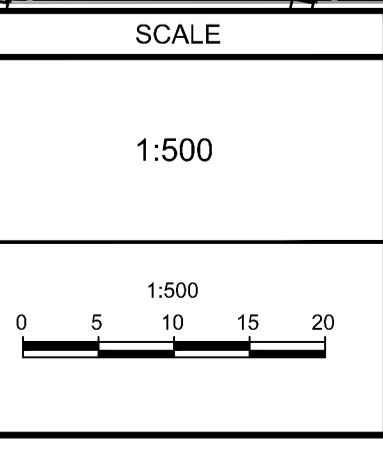
CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	SIZE	CAPTURED FLOW (m ³ /s)
6*	8+042.40	87.39	85.39	83mm	600 x 600 CB	0.030
55	8+030	87.27	85.47	127mm	600 x 600 CB	0.049
56	8+030	87.27	85.47	—	600 x 600 CB	N/A
57***	8+069.55	87.40	85.60	127mm	600 x 600 CB	0.050

* SOLID COVER (CB6 TO BE INSTALLED AS A PART OF PHASE 1A)
*** DUAL CATCHBASIN

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DESIGN

DESIGN	CHECKED	DRAWN	APPROVED
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			BHB

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LOCATION
CITY OF OTTAWA
THE COMMONS

DRAWING NAME
PONDING AND ICD PLAN

PROJECT No.
118224-00

REV #
REV # 4

DRAWING No.
118224-P-ICD3

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D07-16-19-007

APPENDIX

A

*Rational Method Design Sheets
(as per Novatech)*

*Example Calculations of
Total Imperviousness/C Value
(as per Novatech)*

JFSA

Water Resources and
Environmental Consultants



STORM SEWER DESIGN SHEET



Novatech Project #: 118224
 Project Name: The Commons - 3610 Innes Road
 Date Prepared: 10/4/2019
 Date Revised: 5/11/2022
 Input By: Bradley Reed
 Reviewed By: Sam Bahia/ Ben Sweet
 Drawing Reference: 118224-STM1, 118224-STM2 and 118224-GP

Legend: PROJECT SPECIFIC INFO
 USER DESIGN INPUT
 CUMULATIVE CELL
 CALCULATED DESIGN CELL OUTPUT
 USER AS-BUILT INPUT

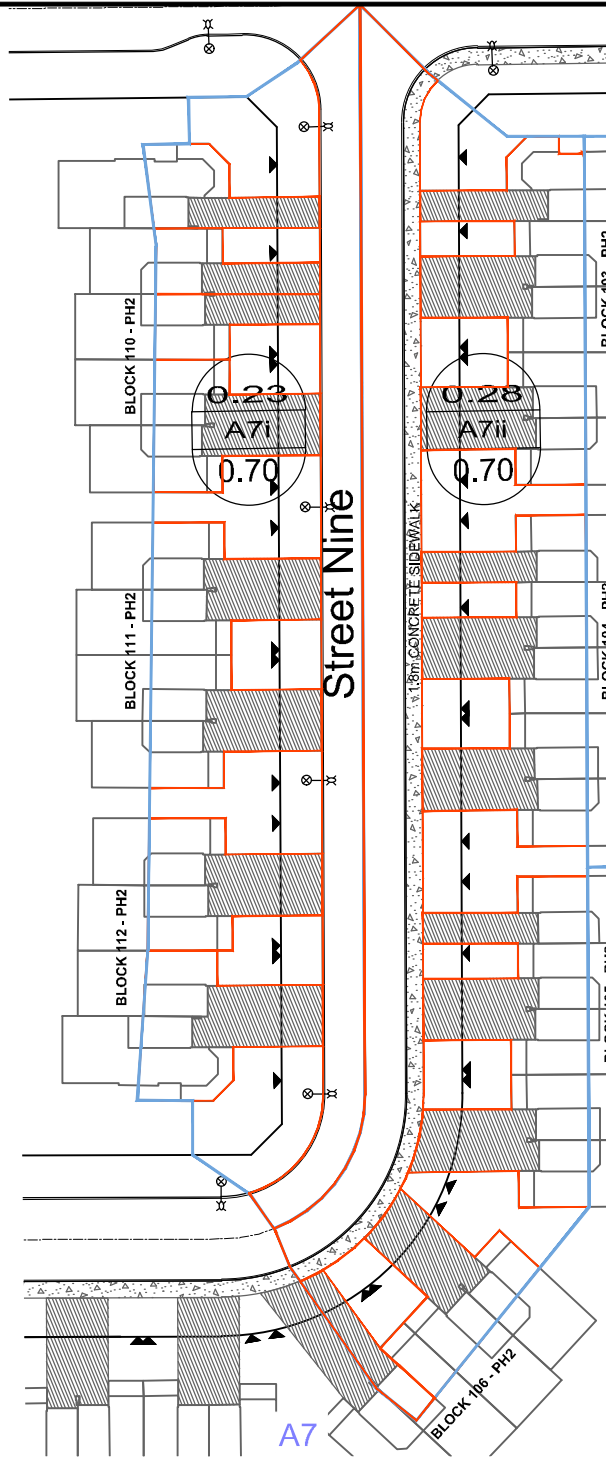
LOCATION			DEMAND										CAPACITY														
STREET	FROM MH	TO MH	AREA					TOTAL AREA (ha)	WEIGHTED RUNOFF COEFFICIENT	INDIVI 2.78 AR	ACCUM 2.78 AR	TIME OF CONC (min.)	RAIN INTENSITY (mm/hr)			TOTAL UNCONTROLLED PEAK FLOW (QDesign) (L/s)	TOTAL RESTRICTED PEAK FLOW (Q) (L/s)	PROPOSED SEWER PIPE SIZING / DESIGN									
			COMMERCIAL	HIGH DENSITY	ROAD 1	REAR YARD 1	REAR YARD 2						PARK	2yr	5yr			100yr	LENGTH (m)	SIZE / MATERIAL (mm / type)	ID ACTUAL (m)	ROUGHNESS	DESIGN GRADE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min.)	QPEAK DESIGN / QFULL (%)
			0.90	0.80	0.70	0.55	0.50	0.40																			
Street 9	170	168	A1			0.36			0.36	0.70	0.70	0.70	10.00	76.81		53.81		93.9	375 PVC	0.381	0.013	0.35	108.2	0.95	1.65	49.7%	
	168	166	B1		1.01				0.00	0.80	0.00	0.70	11.65	71.01	96.22	49.74	265.9		101.6	600 CONC	0.6096	0.013	0.33	368.0	1.26	1.34	72.3%
	166	164							0.00	0.90	0.00	0.70	12.99	66.95	46.90	250.6		29.2	600 CONC	0.6096	0.013	0.38	394.9	1.35	0.36	63.5%	
	164	162	A2, B2, B3	3.43	1.02	0.24			0.24	0.70	0.47	1.17	13.35	65.95	77.01	1246.4		60.1	1050 CONC	1.0668	0.013	0.40	1801.7	2.02	0.50	69.2%	
	162	160	A3, A4, A5, A6			0.45		0.29	0.74	0.62	1.28	2.45	13.85	64.63	158.10	1303.7		106.3	1050 CONC	1.0668	0.013	0.35	1685.4	1.89	0.94	77.4%	
	160	158	-						0.00	0.70	0.00	2.45	14.79	62.27	152.34	1255.7		14.3	1050 CONC	1.0668	0.013	0.50	2014.4	2.25	0.11	62.3%	
	158	150	A7			0.51			0.51	0.70	0.99	3.44	14.89	62.02	213.27	1312.1		108.0	1050 CONC	1.0668	0.013	0.35	1685.4	1.89	0.95	77.9%	
Street 2	156	154	A8			0.42			0.42	0.70	0.82	0.82	10.00	76.81	62.77	62.8		100.7	375 PVC	0.381	0.013	0.35	108.2	0.95	1.77	58.0%	
	154	152	-					0.00	0.70	0.00	0.82	11.77	70.62	57.72	57.7		12.6	375 PVC	0.381	0.013	0.50	129.3	1.13	0.19	44.6%		
	152	150	A9, A10, A11			0.25		0.49	0.74	0.57	1.17	1.98	11.95	70.04	139.02	139.0		59.4	525 CONC	0.5334	0.013	0.35	265.4	1.19	0.83	52.4%	
Street 2	150	144	A12, A13			0.29		0.23	0.52	0.61	0.88	6.31	15.85	59.83	377.43	1437.1		76.3	1200 CONC	1.2192	0.013	0.25	2033.7	1.74	0.73	70.7%	
Chemin de Jargeau Road	148	146	A14, A15			0.53		0.32	0.00	0.62	1.48	1.48	10.00	104.19	153.81	153.8		78.5	750 CONC	0.762	0.013	0.15	449.8	0.99	1.33	34.2%	
	146	144	A16			0.12			0.00	0.70	0.23	1.71	11.33	97.67	166.99	167.0		78.7	750 CONC	0.762	0.013	0.15	449.8	0.99	1.33	37.1%	
Voie de Cerulean Way	144	140	A17, A18			0.28		0.09	0.37	0.65	0.67	6.98	10.00	76.81	535.93	2078.6		77.3	1350 CONC	1.3716	0.013	0.30	3049.8	2.06	0.62	68.2%	
Voie De Cerulean Way	142	140	A19					0.19	0.19	0.50	0.26	0.26	10.00	76.81	20.28	20.3		20.7	250 PVC	0.254	0.013	0.65	50.0	0.99	0.35	40.6%	
Lumen Place	140	138	A20			0.40			0.40	0.70	0.78	8.02	10.62	74.49	597.42	2093.0		113.1	1350 CONC	1.3716	0.013	0.25	2784.1	1.88	1.00	75.2%	
	138	136	A21, A22, A23				0.49	0.03	0.52	0.55	0.79	8.81	11.62	71.08	626.33	2052.6		14.8	1350 CONC	1.3716	0.013	0.50	3937.3	2.66	0.09	52.1%	
	136	128	A24, A25			0.35	0.29		0.64	0.63	1.12	9.94	11.72	70.79	703.31	2123.5		62.5	1350 CONC	1.3716	0.013	0.25	2784.1	1.88	0.55	76.3%	
Voie de Cerulean Way	142	132	A26			0.23			0.23	0.70	0.45	0.45	10.00	76.81	34.38	34.4		53.4	250 PVC	0.254	0.013	0.65	50.0	0.99	0.90	68.7%	
Street 5	134	132	-						0.00	0.70	0.00	0.00	10.00		0.00	0.0		36.0	250 PVC	0.254	0.013	0.65	50.0	0.99	0.61	0.0%	
	132	130	A27			0.27			0.27	0.70	0.53	0.97	10.61	74.55	72.53	72.5		37.4	375 PVC	0.381	0.013	0.25	91.5	0.80	0.78	79.3%	
	130	128	A28			0.28			0.28	0.70	0.54	1.52	11.38	71.87	109.09	109.1		88.3	450 PVC	0.4572	0.013	0.20	133.0	0.81	1.82	82.0%	

STORM SEWER DESIGN SHEET

LOCATION			DEMAND										CAPACITY																	
STREET	FROM MH	TO MH	AREA							WEIGHTED RUNOFF COEFFICIENT	FLOW					TOTAL UNCONTROLLED PEAK FLOW (Q _{Design}) (L/s)	TOTAL RESTRICTED PEAK FLOW (Q) (L/s)	PROPOSED SEWER PIPE SIZING / DESIGN												
			AREA ID	COMMERCIAL	HIGH DENSITY	ROAD 1	REAR YARD 1	REAR YARD 2	PARK		TOTAL AREA (ha)	INDIVI 2.78 AR	ACCUM 2.78 AR	TIME OF CONC (min.)	RAIN INTENSITY (mm/hr)			PEAK FLOW (L/s)	LENGTH (m)	SIZE / MATERIAL (mm / type)	ID ACTUAL (m)	ROUGHNESS	DESIGN GRADE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min.)	QPEAK DESIGN / QFULL (%)			
Lumen Place	128	126	A29, A30, A31, A32			0.24		0.31		0.01		0.56	0.61	0.95	12.41	13.20	66.37		823.51	2154.0		76.0	1350 CONC	1.3716	0.013	0.25	2784.1	1.88	0.67	77.4%
	126	124	A33			0.27					0.27	0.70	0.53	12.93	13.87	64.56		835.02	2128.8		53.4	1350 CONC	1.3716	0.013	0.25	2784.1	1.88	0.47	76.5%	
	124	122	-								0.00			0.00	12.93	14.35	63.36		819.44	2088.8		16.9	1350 CONC	1.3716	0.013	0.50	3937.3	2.66	0.11	53.1%
	122	120	-								0.00			0.00	12.93	14.45	63.09		816.04	2080.1		24.6	1350 CONC	1.3716	0.013	0.25	2784.1	1.88	0.22	74.7%
	120	112	A34			0.49					0.49	0.70	0.95	13.89	14.67	62.56		868.79	2122.0		91.6	1350 CONC	1.3716	0.013	0.25	2784.1	1.88	0.81	76.2%	
Voie de Persimmon Way	118	116	A35			0.43					0.43	0.70	0.84	8.84	10.00	76.81		64.27	64.3		99.6	375 PVC	0.381	0.013	0.30	100.2	0.88	1.89	64.2%	
	116	114	A36, A37, A38				0.53		0.03		0.56	0.55	0.85	1.69	11.89	70.24		118.63	118.6		11.9	450 PVC	0.4572	0.013	0.50	210.3	1.28	0.15	56.4%	
	114	112	A39, A40, A41			0.29		0.30			0.59	0.62	1.02	2.71	12.04	69.76		189.17	189.2		64.6	525 CONC	0.5334	0.013	0.35	265.4	1.19	0.91	71.3%	
Voie de Persimmon Way	112	104	A42, A43			0.25		0.24			0.49	0.63	0.85	17.45	15.48	60.66		1058.67	2273.4		73.8	1350 CONC	1.3716	0.013	0.30	3049.8	2.06	0.60	74.5%	
Rue de Beaugency Street	110	108	A44, B4ii				0.20				0.20	0.55	0.31	0.31	10.00	76.81		23.49	23.5		29.1	250 PVC	0.254	0.013	0.65	50.0	0.99	0.49	47.0%	
	108	106	A45, B4ii			0.23				0.23	0.70	0.45	0.75	10.49	74.97		56.48	61.0		26.2	450 PVC	0.4572	0.013	0.25	148.7	0.91	0.48	41.0%		
	106	104	A46, B4iii			0.29			0.04	0.29	0.70	0.56	1.32	10.97	73.26		96.54	102.1		97.8	450 PVC	0.4572	0.013	0.25	148.7	0.91	1.80	68.6%		
Street 8	104	102	A47, A48, A49, A50			0.28		0.21			0.49	0.64	0.87	19.64	16.08	59.34		1165.25	2357.7		41.9	1650 CONC	1.6764	0.013	0.10	3006.9	1.36	0.51	78.4%	
	102	100	-							0.00			0.00	19.64	16.59	58.26		1143.97	2314.4		12.1	1650 CONC	1.6764	0.013	0.10	3006.9	1.36	0.15	77.0%	
	100	98	A51, A52, A53, A54			0.10		0.34		0.02	0.46	0.58	0.74	20.38	16.74	57.95		1181.00	2345.3		39.5	1650 CONC	1.6764	0.013	0.10	3006.9	1.36	0.48	78.0%	
	98	2121	-							0.00			0.00	20.38	17.22	56.98		1161.22	2305.8		40.0	1650 CONC	1.6764	0.013	0.10	3006.9	1.36	0.49	76.7%	
Park	CB 57	STM Outlet	B4i							0.95	0.40	1.06	1.06	10.00	104.19		110.07	110.1		37.0	375 PVC	0.381	0.013	0.50	129.3	1.13	0.54	85.1%		
STM Easement (Richcraft Lands)	2121	2142	EXT1			1.13					1.13	0.70	2.20	22.58	17.71	56.04		1265.15	2470.5		84.0	1650 CONC	1.6764	0.013	0.15	3682.6	1.67	0.84	67.1%	
	2142	2143	EXT2			0.37					0.37	0.70	0.72	23.30	18.55	54.49		1269.53	2519.0		17.2	1650 CONC	1.6764	0.013	0.15	3682.6	1.67	0.17	68.4%	
	2143	2144	-							0.00			0.00	23.30	18.72	54.19		1262.43	2504.9		20.1	1800 CONC	1.8288	0.013	0.10	3792.1	1.44	0.23	66.1%	
	2144	HW	-							0.00			0.00	23.30	18.95	53.78		1252.99	2486.0		17.2	1800 CONC	1.8288	0.013	0.10	3792.1	1.44	0.20	65.6%	
TO TRUNK STORM SEWER																														

DEMAND EQUATION
 $Q = 2.78 \text{ AIR}$
 Where : Q = Peak flow in litres per second (L/s)
 A = Area in hectares (ha)
 R = Weighted runoff coefficient (increased by 25% for 100-year)
 I = Rainfall intensity in millimeters per hour (mm/hr)
 Rainfall Intensity (I) is based on City of Ottawa IDF data presented in the City of Ottawa Sewer Design Guidelines (Oct. 2012)

CAPACITY EQUATION
 $Q_{full} = (1/n) A R^{2/3} S_0^{1/2}$
 Where : Q_{full} = Capacity (L/s)
 n = Manning coefficient of roughness (0.013)
 A = Flow area (m²)
 R = Wetted perimeter (m)
 S₀ = Pipe Slope/gradient



FRONTYARD AREA = 5095.452m²
 AREA OF IMPERVIOUSNESS = 3636.917m²
 TOTAL IMPERVIOUSNESS = 71.38%
 C-VALUE = 0.70



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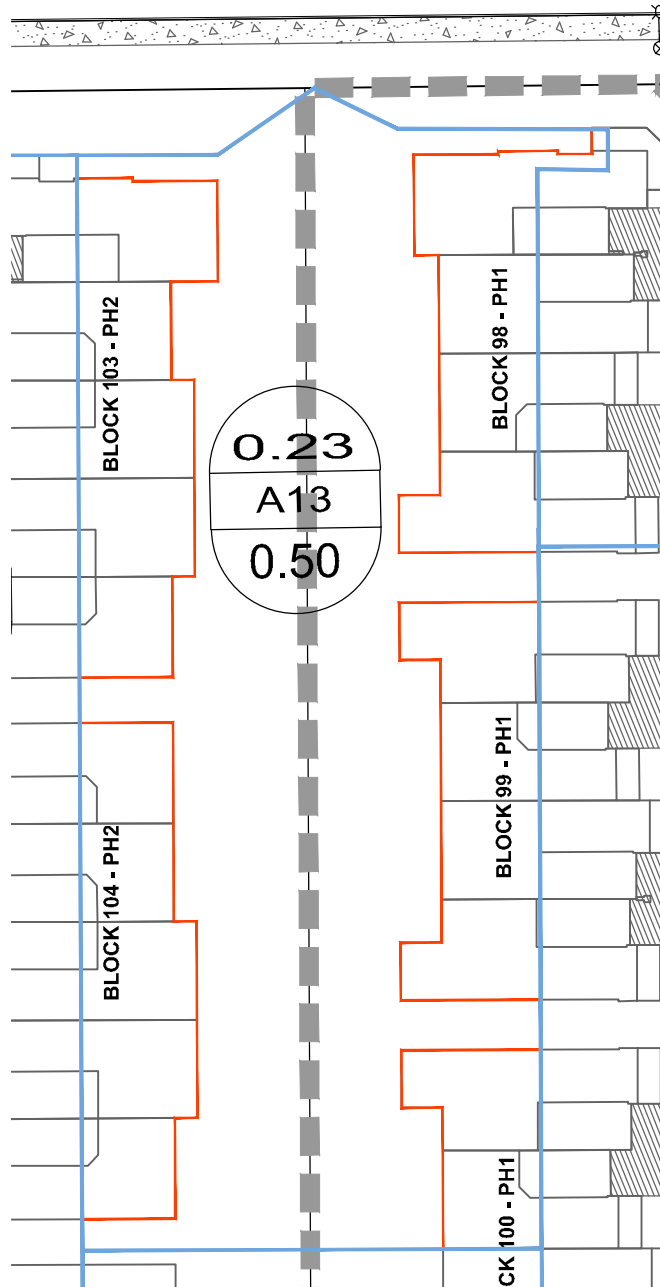
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THE COMMONS

STORM DRAINAGE AREA

SCALE 1 : 750
 0 10 20 30

DATE FEB 2022 JOB 118224 FIGURE 1



A13

AREA = 2259.340m²

AREA OF IMPERVIOUSNESS = 953.445m²

TOTAL IMPERVIOUSNESS = 42.20%

C-VALUE = 0.50

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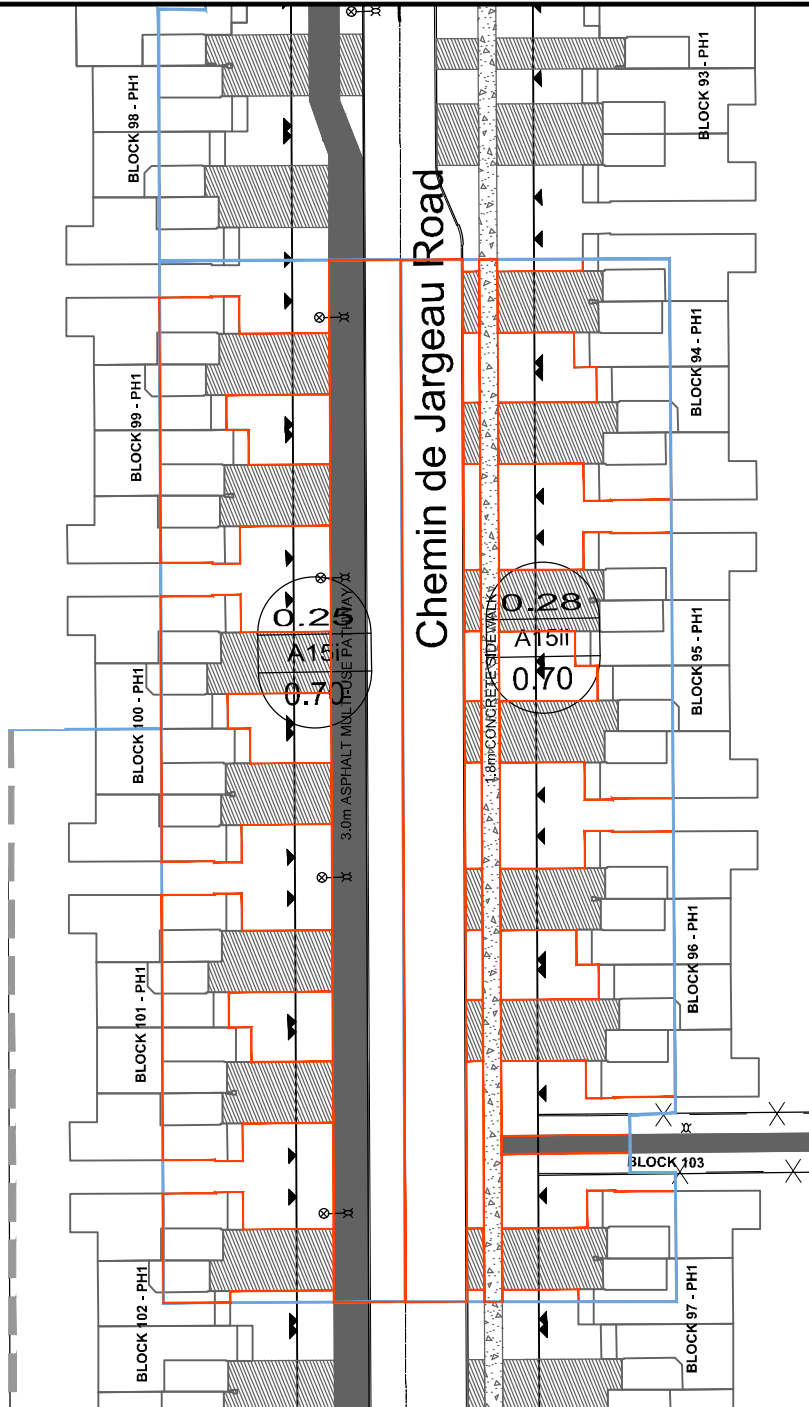
THE COMMONS

STORM DRAINAGE AREA

SCALE 1 : 500

DATE FEB 2022	JOB 118224	FIGURE 2
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A15

FRONTYARD AREA = 5217.667m²

AREA OF IMPERVIOUSNESS = 3858.626m²

TOTAL IMPERVIOUSNESS = 73.95%

C-VALUE = 0.72



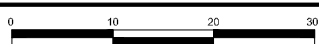
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STORM DRAINAGE AREA

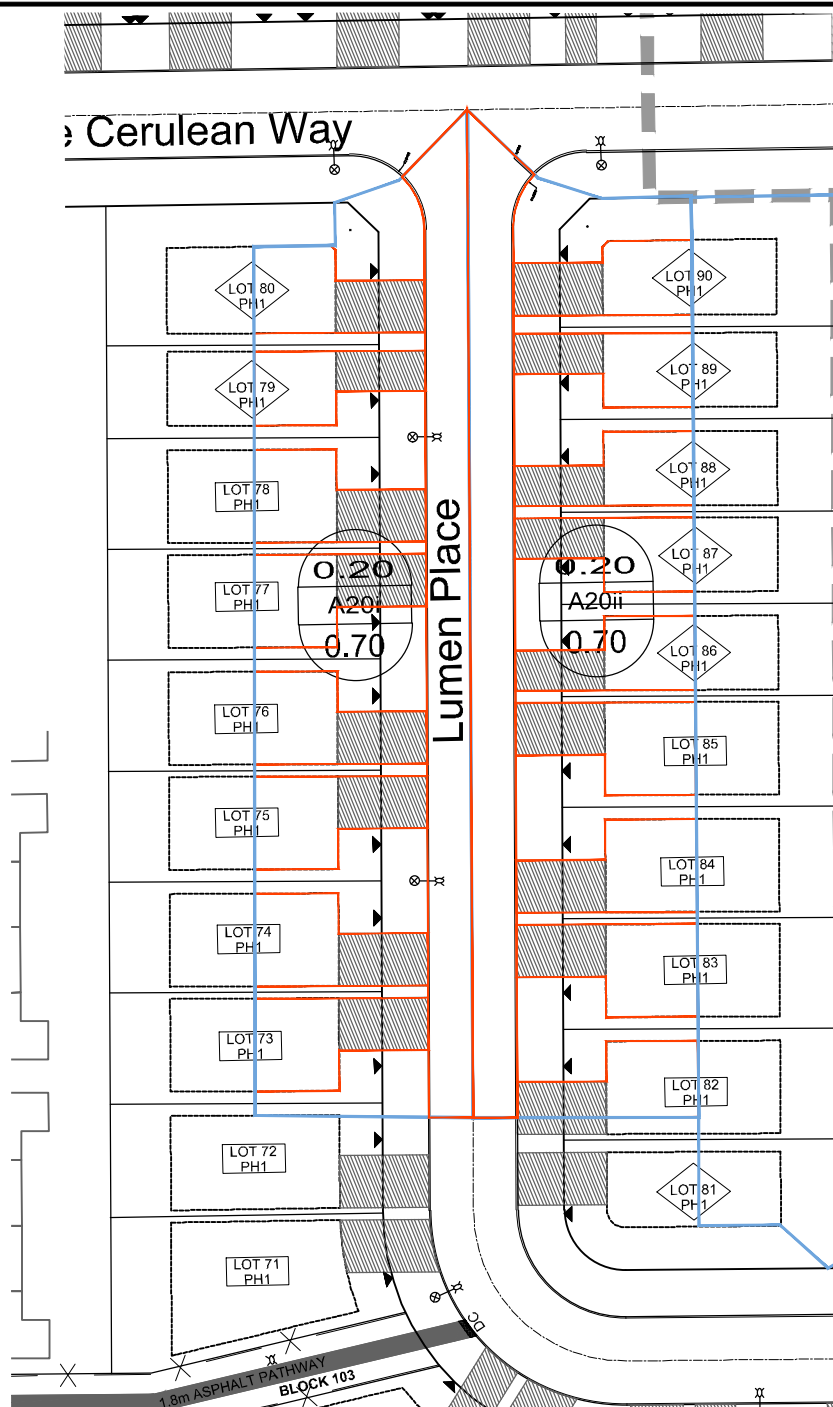
SCALE 1 : 750



DATE FEB 2022

JOB 118224

FIGURE 3



A20

FRONTYARD AREA = 4028.217m²

AREA OF IMPERVIOUSNESS = 2779.381m²

TOTAL IMPERVIOUSNESS = 69.00%

C-VALUE = 0.68



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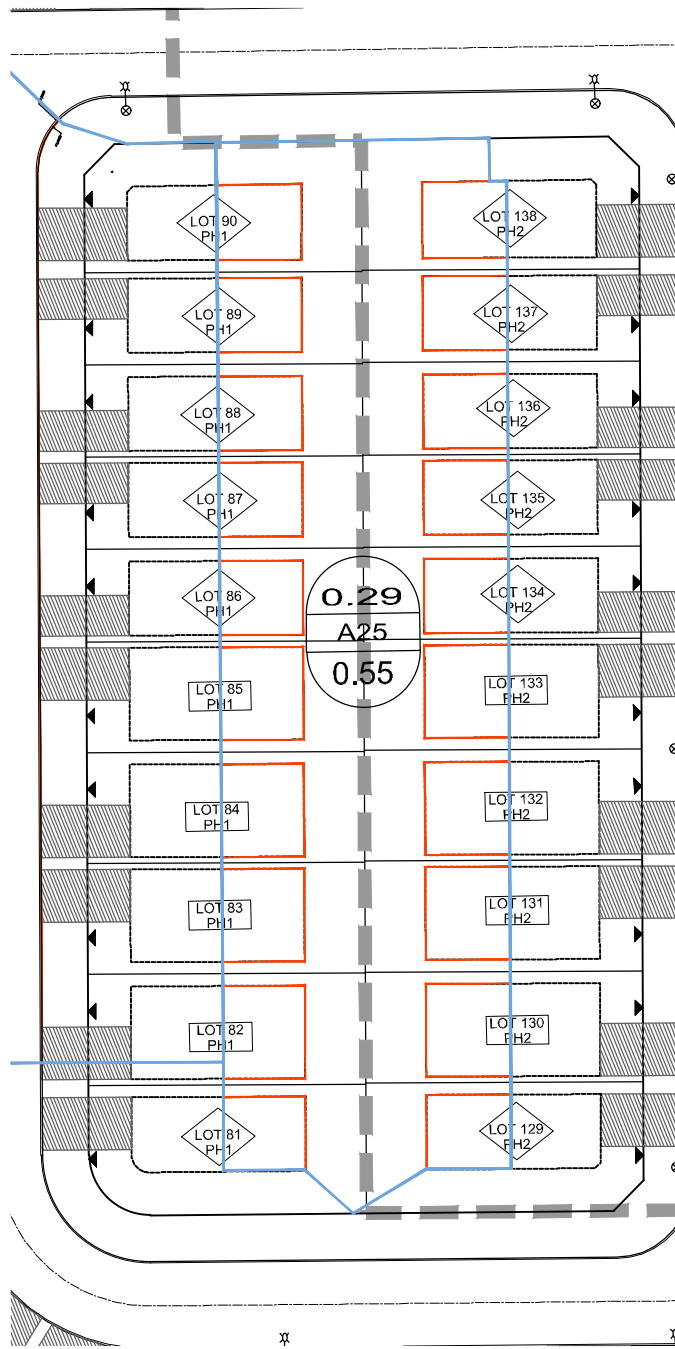
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STORM DRAINAGE AREA

SCALE 1 : 750

DATE FEB 2022	JOB 118224	FIGURE 4
------------------	---------------	-------------



A25

FRONTYARD AREA = 2937.971m²

AREA OF IMPERVIOUSNESS = 1346.687m²

TOTAL IMPERVIOUSNESS = 45.84%

C-VALUE = 0.52



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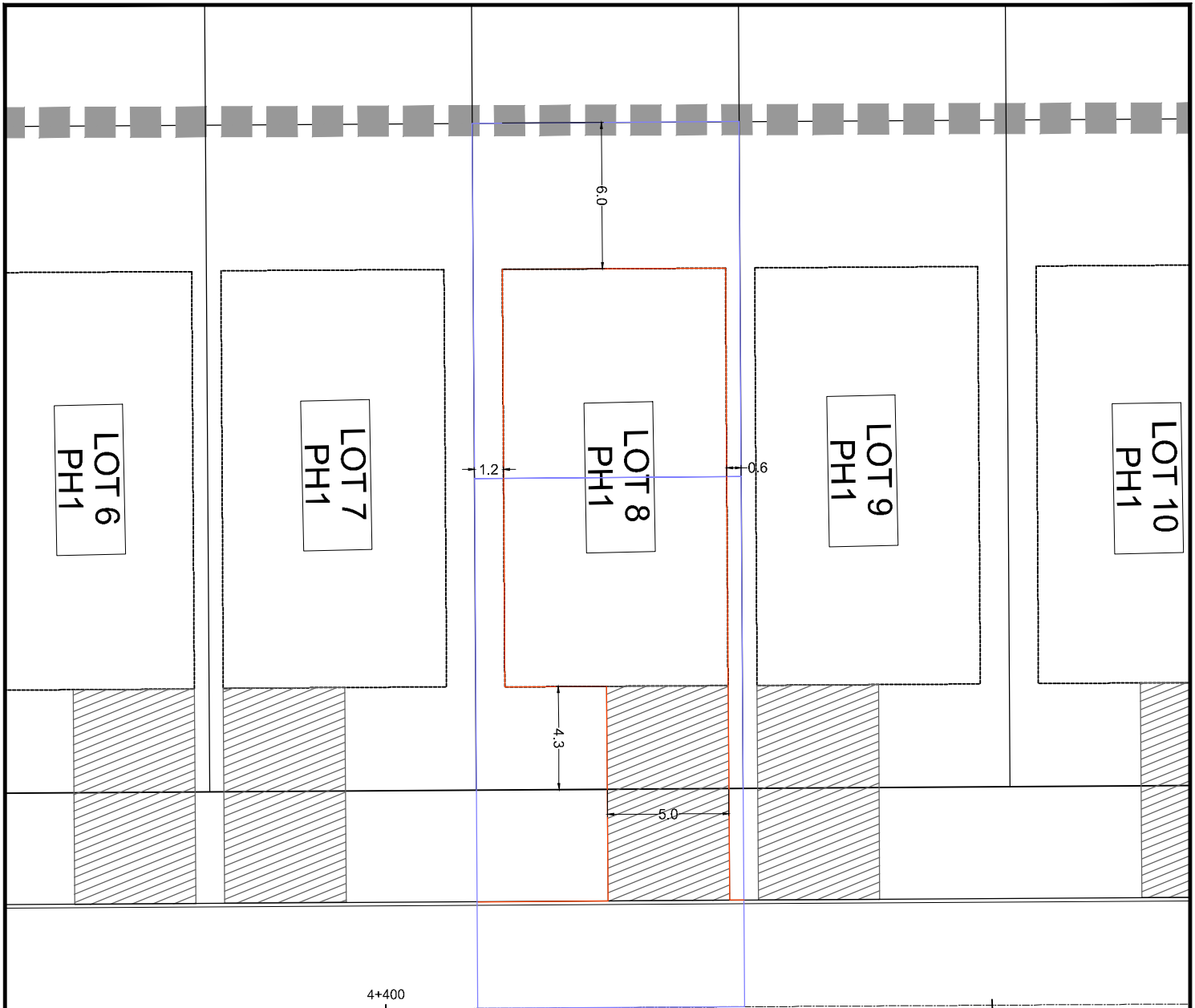
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STORM DRAINAGE AREA

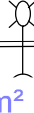
SCALE 1 : 750

DATE	JOB	FIGURE
FEB 2022	118224	5

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REARYARD AREA = 161.01m²
 AREA OF IMPERVIOUSNESS = 79.11m²
 TOTAL IMPERVIOUSNESS = 49.13%
 C-VALUE=0.54



FRONTYARD AREA = 240.49m²
 AREA OF IMPERVIOUSNESS = 171.96m²
 TOTAL IMPERVIOUSNESS = 71.50%
 C-VALUE = 0.70



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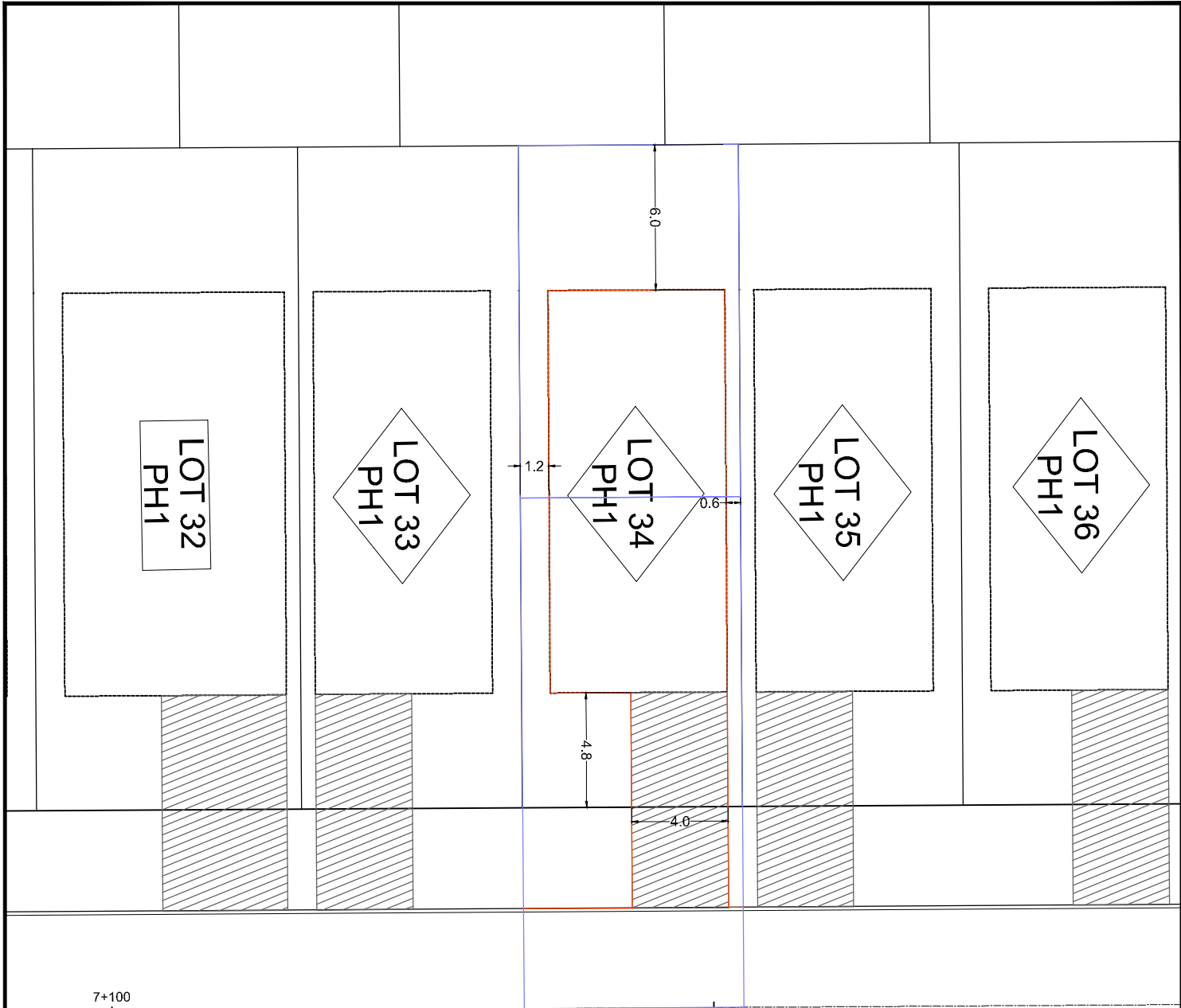
THE COMMONS

EXAMPLE LOT 6
 36' SINGLE

DATE FEB 2022

JOB 118224

FIGURE SINGLE1



RUE DE BEAUGENCY STREET

REARYARD AREA = 133.94m²
 AREA OF IMPERVIOUSNESS = 63.26m²
 TOTAL IMPERVIOUSNESS = 47.23%
 C-VALUE = 0.53

FRONTYARD AREA = 190.73m²
 AREA OF IMPERVIOUSNESS = 133.31m²
 TOTAL IMPERVIOUSNESS = 69.89%
 C-VALUE = 0.69



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EXAMPLE LOT 7
 30' SINGLE

DATE FEB 2022

JOB 118224

FIGURE SINGLE2

BLOCK 100 - PH1

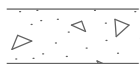
BLOCK 99 - PH1

3.0m MULTI-USE PATHWAY

RUE DE JARGEAU ROAD

1+100

REARYARD AREA = 121.63m²
 AREA OF IMPERVIOUSNESS = 49.36m²
 TOTAL IMPERVIOUSNESS = 40.58%
 C-VALUE = 0.48



FRONTYARD AREA = 204.32m²
 AREA OF IMPERVIOUSNESS = 143.30m²
 TOTAL IMPERVIOUSNESS = 70.13%
 C-VALUE = 0.69



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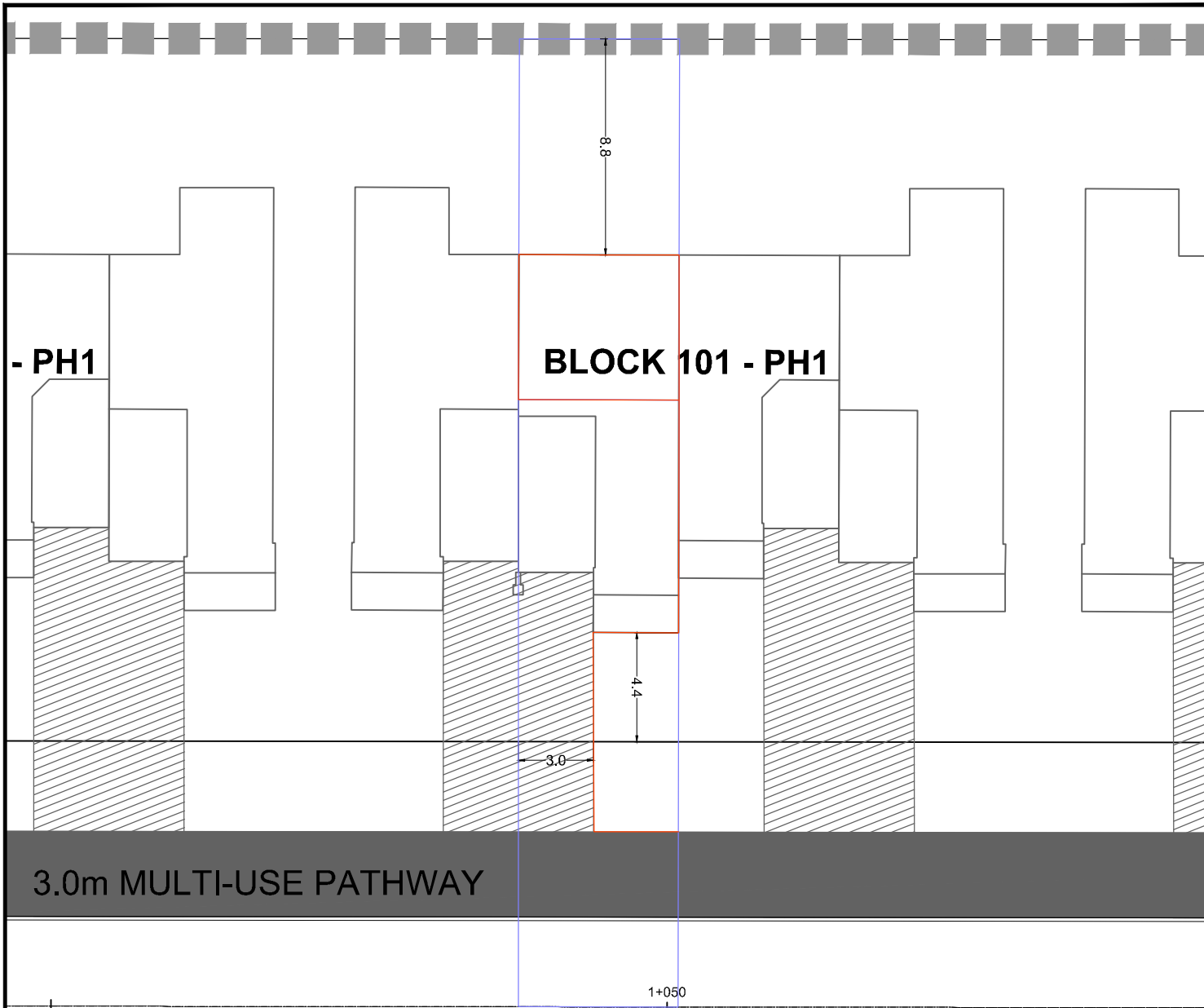
**EXAMPLE LOT 1
EXTERNAL TOWN**

DATE FEB 2022

JOB 118224

FIGURE TOWN1

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RUE DE JARGEAU ROAD

REARYARD AREA = 95.09m²
 AREA OF IMPERVIOUSNESS = 38.22m²
 TOTAL IMPERVIOUSNESS = 40.20%
 C-VALUE = 0.48

FRONTYARD AREA = 159.85m²
 AREA OF IMPERVIOUSNESS = 132.01m²
 TOTAL IMPERVIOUSNESS = 82.58%
 C-VALUE = 0.78



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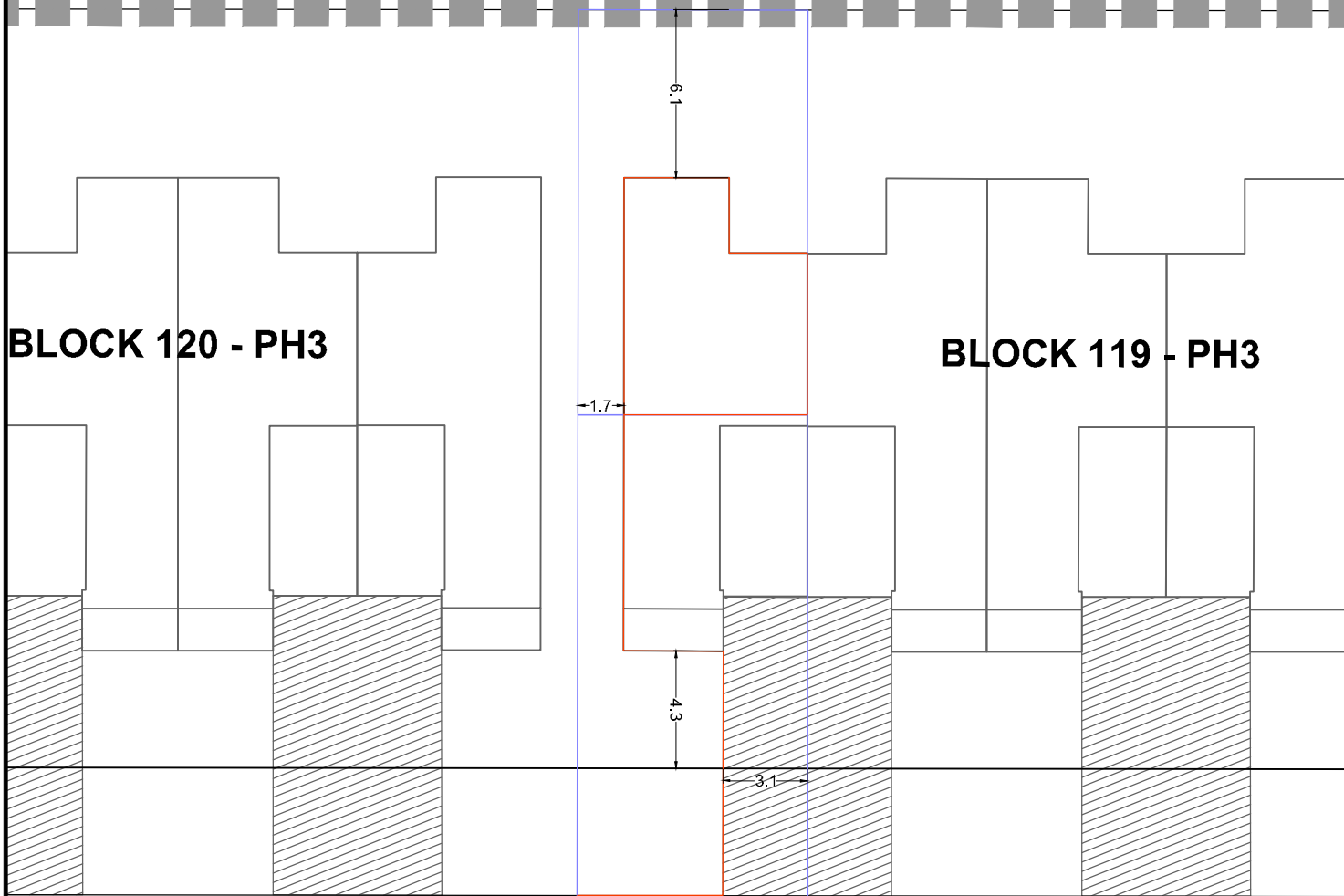
**EXAMPLE LOT 2
 INTERNAL TOWN**

DATE FEB 2022	JOB 118224	FIGURE TOWN2
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BLOCK 120 - PH3

BLOCK 119 - PH3



2+050

STREET 2

REARYARD AREA = 121.12m²
AREA OF IMPERVIOUSNESS = 49.38m²
TOTAL IMPERVIOUSNESS = 40.77%
C-VALUE = 0.49

FRONTYARD AREA = 182.00m²
AREA OF IMPERVIOUSNESS = 120.90m²
TOTAL IMPERVIOUSNESS = 66.43%
C-VALUE = 0.66



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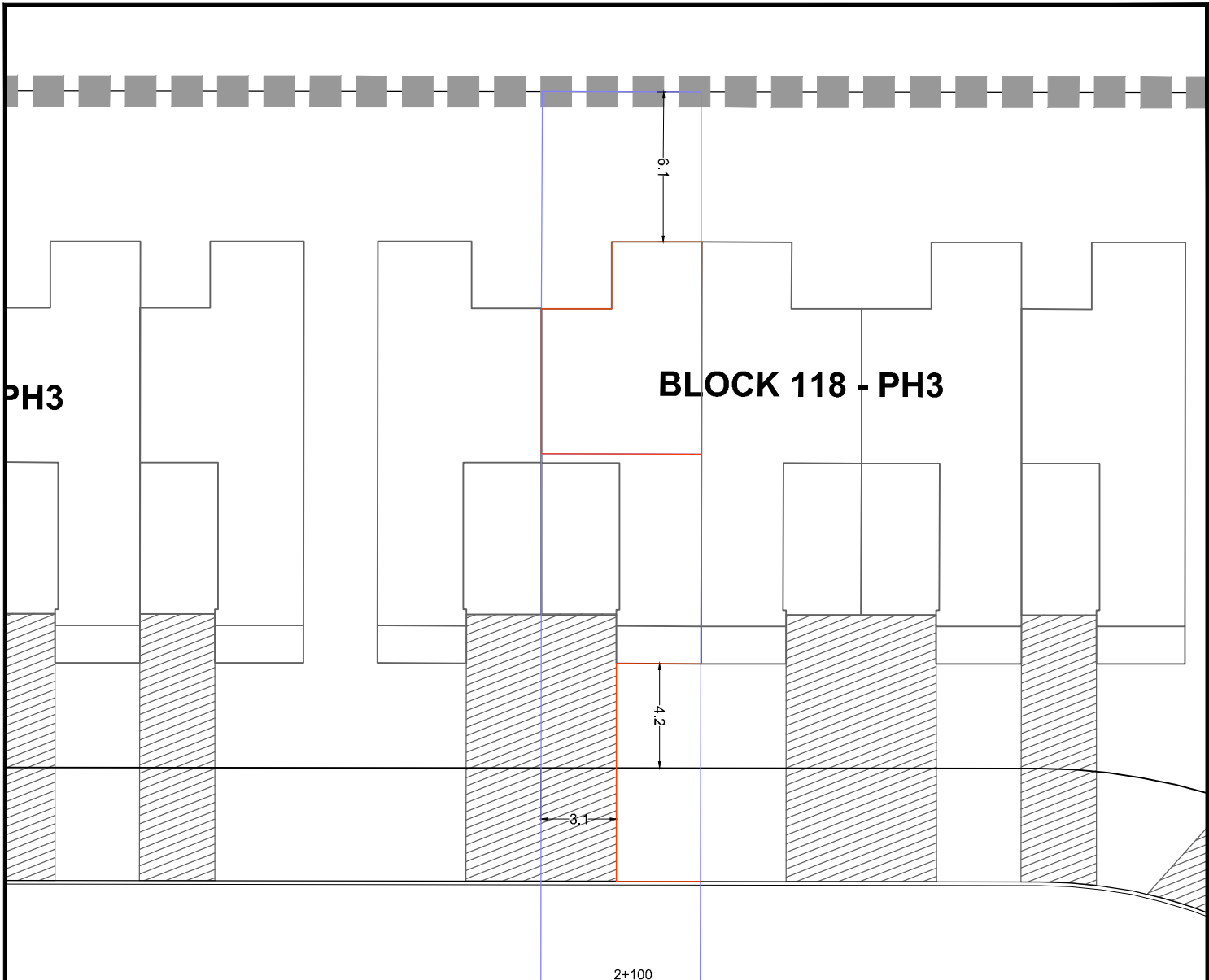
**EXAMPLE LOT 3
EXTERNAL TOWN**

DATE
FEB 2022

JOB
118224

FIGURE
TOWN3

M:\2018\118224\CAD\Design\Figures\STM118224-IMPDetail.dwg, TOWN3, Jan 25, 2022 - 1:44pm, mghauri



STREET 2

REARYARD AREA = 95.48m²
 AREA OF IMPERVIOUSNESS = 48.28m²
 TOTAL IMPERVIOUSNESS = 50.56%
 C-VALUE = 0.55

FRONTYARD AREA = 141.41m²
 AREA OF IMPERVIOUSNESS = 111.16m²
 TOTAL IMPERVIOUSNESS = 78.61%
 C-VALUE = 0.75



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THE COMMONS

EXAMPLE LOT 4
 INTERNAL TOWN

DATE FEB 2022

JOB 118224

FIGURE TOWN4

M:\2018\118224\CAD\Design\Figures\STM118224-IMPDetail.dwg, TOWN4, Jan 25, 2022 - 1:44pm, mghauri

BLOCK 104 - PH2

1.8m CONCRETE SIDEWALK

9+500

STREET NINE

REARYARD AREA = 86.46m²
 AREA OF IMPERVIOUSNESS = 38.22m²
 TOTAL IMPERVIOUSNESS = 44.20%
 C-VALUE = 0.51

FRONTYARD AREA = 155.24m²
 AREA OF IMPERVIOUSNESS = 125.54m²
 TOTAL IMPERVIOUSNESS = 80.87%
 C-VALUE = 0.77



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**EXAMPLE LOT 5
 INTERNAL TOWN**

DATE FEB 2022	JOB 118224	FIGURE TOWN5
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APPENDIX

B

Inlet Control Devices

PCSWMM Input Files

JFSA

Water Resources and
Environmental Consultants



Products – StormTech Orifice Plate

Our StormTech Orifice Plate uses a calibrated orifice to control the outflow at a specific rate at a specific head in the catch basin. This is our simplest and most economical Inlet Control Device (ICD), and can be sometimes used by municipalities as a starting point for storm water management until more information is gathered. As with all our products, it can be swapped out with another StormTech ICD once more is known about the system.

Orifice Plate units can have any shape or size of orifice customized to meet your needs. Standard designs include Round, Diamond, Keyhole and Diamond Keyhole shaped orifices. Keyholes help create a torsional flow pattern through the orifice that can help unblock some debris.

Orifice plate ICD's do not form water traps to prevent odours and are also prone to blockage by floatables like leaves, twigs, bottles and cans, especially during higher rainfall periods. Monitoring of these types of installs is recommended and sometimes leads to recommendations to upgrade to water trap devices, such as Odour Traps and Sumps, to prevent blockage and odours. But in locations where they work properly they are an economical alternative solution.

Primary Function(s): Flow Control for Medium to High Flow Rates (15 to 100 l/s | 237 to 1585 GPM).

Other Functions(s): None.

Outflow Pipe Diameter: 150 mm to 300 mm | 6 inch to 12 inch. Special orders can be made for larger sizes.

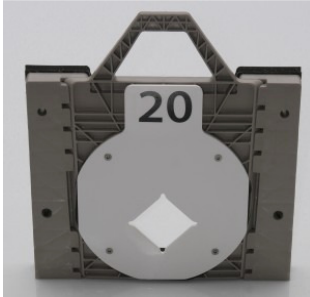
Catch Basin Types: All – with or without sumps.
Rectangular or Round Catch Basins (Round requires built-in adapter that can be provided).
Standard Round is 600 mm, but larger sizes available (900 mm, 1200 mm, 1600 mm ...etc.).
Fits through even small Catch Basin openings (300 mm x 450 mm).

Specifications:

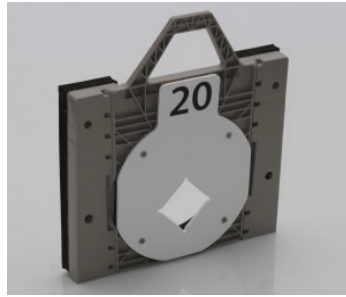
- Orifice Plate:** HDPE Thermoplastic with UV resistant additives.
- Handle Plate (common):** HDPE Thermoplastic.
- Handle Plate (common):** HDPE Thermoplastic.
- Mounting Plate (common):** HDPE Thermoplastic.
- Hardware (common):** Stainless Steel Wedge Bolts with Nut and Washer (4).
- Welds:** None.
- Inner Ring Seal:** Rubber Bulb Seal EPDM. Held in place and reusable. No need to replace.
- Wall Seal:** 3/8 or 5/8 inch Neoprene closed cell sponge gasket attached to Mounting Plate.
- Identifier:** 50 mm high numeric's on top of unit. Peel and stick. Note: Not visible from street surface.
- Special Tools:** None required.
- Weight:** Removable Unit: 0.5 kg / 1 lb. Maximum Total Assembly: 2.3 kg / 5 lb.

Products – StormTech Orifice Plate (continued)

Orifice Plate – Square Adapter (with Diamond Orifice pictured)



Front

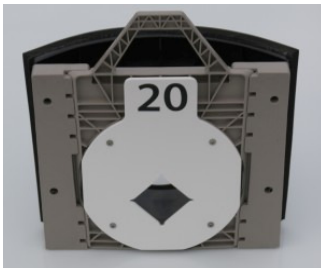


Left Angle



Back – View from Wall

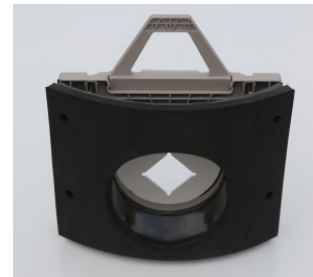
Orifice Plate – Round Adapter



Front



Left Angle



Back – View from Wall

Installation:

1. If necessary, cut protruding out-flowing pipe back flush to Catch Basin wall.
2. Use Mounting Plate as template to mark four hole pattern on Catch Basin wall.
3. Install four Stainless Steel Wedge Bolts (provided) perpendicular to Mounting Plate.
4. Install Mounting Plate and hand secure with four washers and nuts (provided).
5. Torque nuts to 40 N·m or 30 lbf·ft. Do not over-tighten.
6. Snap unit into place by pushing Handle Plate into dove-tail slot of Mounting Plate.
7. Record Unit Identifier along with Catch Basin Location according to municipal requirements.
8. Note – Unit Identifier with this model is NOT easily seen from street level.

Table B-1: Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD) Capacities ⁽¹⁾

ICD Diameter (mm)	Capture (L/s)							
	CB (1.38 m lead pipe invert depth)				CBMH (1.74 m lead pipe invert depth)			
<i>Water Depth:</i>	<i>0 cm</i>	<i>Average</i>	<i>30 cm</i>	<i>35 cm</i>	<i>0 cm</i>	<i>Average</i>	<i>30 cm</i>	<i>35 cm</i>
<i>Head:</i>	<i>1.28 m</i>	<i>1.4 m</i>	<i>1.58 m</i>	<i>1.63 m</i>	<i>1.64 m</i>	<i>1.76 m</i>	<i>1.94 m</i>	<i>1.99 m</i>
83	17.6	18.4	19.6	19.9	19.9	20.7	21.7	22.0
94	22.6	23.6	25.1	25.5	25.6	26.5	27.8	28.2
102	26.6	27.8	29.6	30.0	30.1	31.2	32.8	33.2
108	29.8	31.2	33.2	33.7	33.8	35.0	36.7	37.2
127	41.3	43.2	45.8	46.6	46.7	48.4	50.8	51.5
152	59.1	61.8	65.7	66.7	66.9	69.3	72.8	73.7
178	81.1	84.8	90.1	91.5	91.8	95.0	99.8	101.1

⁽¹⁾ For circular orifices plate type with diameters as specified by City of Ottawa standards.

[BMR The Commons Ultimate Conditions Input File]
 ;;Project Title/Notes
 Base_Model_v1.5 from the Model Build (GIS) folder.
 20220413 - Additional CB added, minor changes to drainage
 areas

[OPTIONS]

```

;;Option      Value
FLOW_UNITS    CMS
INFILTRATION  HORTON
FLOW_ROUTING  DYNWAVE
LINK_OFFSETS  ELEVATION
MIN_SLOPE     0
ALLOW_PONDING YES
SKIP_STEADY_STATE NO

START_DATE    01/01/2019
START_TIME    00:00:00
REPORT_START_DATE 01/01/2019
REPORT_START_TIME 00:00:00
END_DATE      01/02/2019
END_TIME      00:00:00
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  0.5
RULE_STEP     00:00:00
  
```

```

INERTIAL_DAMPING PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP    0.75
LENGTHENING_STEP 0
MIN_SURFAREA     1.167
MAX_TRIALS       21
HEAD_TOLERANCE   0.0001
SYS_FLOW_TOL     5
LAT_FLOW_TOL     5
MINIMUM_STEP     0.5
THREADS          6
  
```

[EVAPORATION]

```

;;Data Source Parameters
;;-----
CONSTANT 0.0
DRY_ONLY NO
  
```

[RAINGAGES]

```

;;Name      Format  Interval SCF  Source
;;-----
002yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
002yrChicago3hr
002YrSCS24      INTENSITY 0:10  1.0  TIMESERIES
002YrSCS24
005yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
005yrChicago3hr
005YrSCS24      INTENSITY 0:10  1.0  TIMESERIES
005YrSCS24
010yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
010yrChicago3hr
010YrSCS24      INTENSITY 0:10  1.0  TIMESERIES
010YrSCS24
025yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
025yrChicago3hr
025YrSCS24      INTENSITY 0:10  1.0  TIMESERIES
025YrSCS24
  
```

```

050yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
050yrChicago3hr
050YrSCS24      INTENSITY 0:10  1.0  TIMESERIES
050YrSCS24
100yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
100yrChicago3hr
100yrChicago3hr+20% INTENSITY 0:10  1.0
TIMESERIES 100yrChicago3hr+20%
100YrSCS12hr    INTENSITY 0:15  1.0  TIMESERIES
100YrSCS12hr
100YrSCS24      INTENSITY 0:10  1.0  TIMESERIES
100YrSCS24
100YrSCS24+20% INTENSITY 0:10  1.0
TIMESERIES 100YrSCS24+20%
1979July01      INTENSITY 0:05  1.0  TIMESERIES
1979July01
1988Aug04        INTENSITY 0:05  1.0  TIMESERIES
1988Aug04
1996Aug08        INTENSITY 0:05  1.0  TIMESERIES
1996Aug08
25mmChicago4Hr  INTENSITY 0:10  1.0  TIMESERIES
25mmChicago4Hr
2YrSCS12hr      INTENSITY 0:15  1.0  TIMESERIES
2YrSCS12hr
5YrSCS12hr      INTENSITY 0:15  1.0  TIMESERIES
5YrSCS12hr
No_Rain          INTENSITY 0:01  1.0  TIMESERIES
No_Rain
  
```

[SUBCATCHMENTS]

```

;;Name      Rain Gage  Outlet  Area  %Imperv
Width  %Slope  CurbLen  SnowPack
;;-----
;RYCB_14_(RYCB)
A10        1996Aug08  RYCB_14_(RYCB) 0.202
42.9  105.001  0.5  0
;RYCB_12_(RYCB)
A11        1996Aug08  RYCB_12_(RYCB) 0.287
42.9  105.001  0.5  0
;30_(CB)
A12i       1996Aug08  Slope1         0.194  71.4
76.001  0.5  0
;31_(CB)
A12ii      1996Aug08  Slope1         0.09  71.4
76.001  0.5  0
;RYCB_11_(RYCB)
A13        1996Aug08  RYCB_11_(RYCB) 0.226
42.9  76  0.5  0
;ELB_13_(RYCB)
A14        1996Aug08  TEE_23_(RYCB) 0.319
42.9  75.001  0.5  0
;28_(CB)
A15i       1996Aug08  Maj-20         0.248  71.4
103  0.5  0
;27_(CB)
A15ii      1996Aug08  Maj-20         0.274  71.4
103  0.5  0
;26_(CB)
A16i       1996Aug08  Maj-19_2       0.06  71.4
24  0.5  0
;25_(CB)
A16ii      1996Aug08  Maj-19_2       0.067  71.4
25  0.5  0
;TEE_39_(RYCB)
A17        1996Aug08  TEE_39_(RYCB) 0.091
42.9  68.002  0.5  0
;24_(CB)
A17ii      1996Aug08  Maj-24         0.093  71.4
77  0.5  0
  
```

;23_(CB)					A31	1996Aug08	TEE_5_(RYCB)	0.187	50
A18i	1996Aug08	Maj-24	0.189	71.4	128.806	0.5	0		
77.001	0.5				;17_(CB)				
;RYCB_9_(RYCB)					A32i	1996Aug08	Maj-35	0.155	71.4
A19	1996Aug08	RYCB_9_(RYCB)	0.19		73.089	1	0		
42.9	127.998				;16_(CB)				
;42_(CB)					A32ii	1996Aug08	Maj-35	0.082	71.4
A1i	1996Aug08	Maj-03	0.157	71.4	72.689	1	0		
148.985	0.5				;14_(CB)				
;43_(CB)					A33i	1996Aug08	Maj-37	0.11	71.4
A1ii	1996Aug08	Maj-03	0.202	71.4	163.52	1	0		
148.979	0.5				;15_(CB)				
;21_(CB)					A33ii	1996Aug08	Maj-37	0.157	71.4
A20i	1996Aug08	Maj-26	0.195	71.4	75.739	1	0		
99.8	0.9				;13_(CB)				
;20_(CB)					A34i	1996Aug08	Maj-41	0.212	71.4
A20ii	1996Aug08	Maj-26	0.206	71.4	124.53	0.5	0		
99.801	0.9				;12_(CB)				
;RYCB_7_(RYCB)					A34ii	1996Aug08	Maj-41	0.276	71.4
A21	1996Aug08	RYCB_7_(RYCB)	0.325	50	133.747	0.5	0		
111.999	0.5				;51_(CB)				
;RYCB_7_(RYCB)					A35i	1996Aug08	Maj-42	0.228	71.4
A22	1996Aug08	TEE_14_(RYCB)	0.028		116.149	0.5	0		
42.9	47.7				;50_(CB)				
;RYCB_7_(RYCB)					A35ii	1996Aug08	Maj-42	0.203	71.4
A23	1996Aug08	TEE_14_(RYCB)	0.169	50	117.199	0.5	0		
72.001	0.5				;TEE_32_(RYCB)				
;18_(CB)					A36	1996Aug08	TEE_32_(RYCB)	0.294	50
A24i	1996Aug08	Maj-28	0.11	71.4	98.91	0.5	0		
90.002	0.9				;RYCB_18_(RYCB)				
;19_(CB)					A37	1996Aug08	RYCB_18_(RYCB)	0.029	
A24ii	1996Aug08	Maj-28	0.237	71.4	42.9	47.339	0.5	0	
129.998	0.9				;TEE_34_(RYCB)				
;RYCB_8_(RYCB)					A38	1996Aug08	TEE_34_(RYCB)	0.239	50
A25	1996Aug08	RYCB_8_(RYCB)	0.294	50	95	0.5	0		
101.998	0.5				;10_(CB)				
;45_(CB)					A39i	1996Aug08	Maj-44	0.214	71.4
A26i	1996Aug08	Maj-33	0.06	71.4	113.588	1	0		
73.002	0.5				;11_(CB)				
;44_(CB)					A39ii	1996Aug08	Maj-44	0.074	71.4
A26ii	1996Aug08	Maj-33	0.172	71.4	74.537	1	0		
72.999	0.5				;52_(CB)				
;47_(CB)					A4	1996Aug08	Maj-09	0.092	71.4
A27i	1996Aug08	Maj-32	0.088	71.4	60.001	0.5	0		
47.779	0.5				;RYCB_5_(RYCB)				
;46_(CB)					A40	1996Aug08	RYCB_5_(RYCB)	0.219	50
A27ii	1996Aug08	Maj-32	0.181	71.4	80.064	0.5	0		
84.801	0.5				;TEE_7_(RYCB)				
;49_(CB)					A41	1996Aug08	TEE_7_(RYCB)	0.075	50
A28i	1996Aug08	Maj-30	0.143	71.4	54.989	0.5	0		
63.179	1				;08_(CB)				
;48_(CB)					A42i	1996Aug08	Maj-46	0.1456	71.4
A28ii	1996Aug08	Maj-30	0.142	71.4	72.329	0.5	0		
65.081	1				;09_(CB)				
;TEE_11_(RYCB)					A42ii	1996Aug08	Maj-46	0.083	71.4
A29	1996Aug08	TEE_11_(RYCB)	0.116	50	72.438	0.5	0		
78.569	0.5				A42iii	1996Aug08	Maj-48_3	0.0254	71.4
;40_(CB)					30	0.5	0		
A2i	1996Aug08	Maj-06_2	0.12	71.4	;RYCB_2_(RYCB)				
119.737	0.5				A43	1996Aug08	RYCB_2_(RYCB)	0.236	50
;41_(CB)					80.93	0.5	0		
A2ii	1996Aug08	Maj-06_2	0.118	71.4	;RYCB_3_(RYCB)				
119.736	0.5				A44	1996Aug08	RYCB_3_(RYCB)	0.199	50
;ELB_23_(RYCB)					72.054	0.5	0		
A3	1996Aug08	ELB_23_(RYCB)	0.154	42.9	;03_(CB)				
110.553	0.5				A45i	1996Aug08	Maj-50	0.168	71.4
;RYCB_6_(RYCB)					77.609	0.5	0		
A30	1996Aug08	RYCB_6_(RYCB)	0.014		;02_(CB)				
42.9	17.981				A45ii	1996Aug08	Maj-50	0.075	71.4
;TEE_5_(RYCB)					77.672	0.5	0		

;05_(CB)				
A46i	1996Aug08	Maj-52	0.157	71.4
73.067	0.5	0		
;04_(CB)				
A46ii	1996Aug08	Maj-52	0.136	71.4
87.029	0.5	0		
;RYCB_4_(RYCB)				
A47	1996Aug08	RYCB_4_(RYCB)	0.136	50
92.998	0.5	0		
;55_(CB)				
A48	1996Aug08	Maj-54	0.205	71.4
57.13	0.5	0		
;RYCB_1_(RYCB)				
A49	1996Aug08	RYCB_1_(RYCB)	0.074	50
57.989	0.5	0		
;06_(CB)				
A50	1996Aug08	Maj-55	0.066	71.4
32.22	0.5	0		
;57_(CB)				
A51	1996Aug08	Maj-58	0.186	71.4
72.719	0.5	0		
;Maj-58				
A52	1996Aug08	Maj-58	0.021	42.9
23.67	1.2	0		
;ELB_25_(RYCB)				
A53	1996Aug08	ELB_25_(RYCB)	0.182	50
121.358	0.5	0		
;TEE_43_(RYCB)				
A54	1996Aug08	TEE_43_(RYCB)	0.165	50
80.066	0.5	0		
;36_(CB)				
A5i	1996Aug08	Maj-10	0.102	71.4
65.001	0.5	0		
;37_(CB)				
A5ii	1996Aug08	Maj-10	0.26	71.4
121.968	0.5	0		
;38_(RYCB)				
A6	1996Aug08	RYCB_13_(RYCB)	0.131	
42.9	112.311	0.5	0	
;35_(CB)				
A7i	1996Aug08	Maj-16	0.228	71.4
120	0.7	0		
;34_(CB)				
A7ii	1996Aug08	Maj-16	0.282	71.4
130.002	0.7	0		
;53_(CB)				
A8i	1996Aug08	Maj-12	0.22	71.4
105.002	0.5	0		
;54_(CB)				
A8ii	1996Aug08	Maj-12	0.19	71.4
0.5	0			87
;32_(CB)				
A9i	1996Aug08	Maj-14	0.188	71.4
84.999	0.7	0		
;33_(CB)				
A9ii	1996Aug08	Maj-14	0.067	71.4
71.997	0.7	0		
;B1_Stor				
B1	1996Aug08	B1_Stor	0.883	85.7
200	0.5	0		
;41_(CB)				
B1ii	1996Aug08	Maj-06_2	0.123	85.7
200	0.5	0		
;B2_Stor				
B2	1996Aug08	B2_Stor	3.432	100
226.894	1	0		
;B3_Stor				
B3i	1996Aug08	B3_Stor	0.965	85.7
86.65	0.5	0		
;40_(CB)				

B3ii				
70.005	0.5	0		
;58_(CB)				
B4i	1996Aug08	58_(CB)	0.947	28.6
148.991	0.5	0		
;02_(CB)				
B4ii	1996Aug08	Maj-50	0.047	28.6
77.571	0.5	0		
;04_(CB)				
B4iii	1996Aug08	Maj-51	0.008	28.6
14.24	0.5	0		
;Maj-01				
C1	1996Aug08	Maj-01	0.114	71.4
54.684	0.5	0		
;Maj-22				
C2	1996Aug08	Maj-21	0.087	71.4
0.5	0			60

[SUBAREAS]

Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv
PctZero	RouteTo	PctRouted		

A10	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A11	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A12i	0.013	0.25	1.57	4.67
OUTLET				0
A12ii	0.013	0.25	1.57	4.67
OUTLET				0
A13	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A14	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A15i	0.013	0.25	1.57	4.67
OUTLET				0
A15ii	0.013	0.25	1.57	4.67
OUTLET				0
A16i	0.013	0.25	1.57	4.67
OUTLET				0
A16ii	0.013	0.25	1.57	4.67
OUTLET				0
A17	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A17ii	0.013	0.25	1.57	4.67
OUTLET				0
A18i	0.013	0.25	1.57	4.67
OUTLET				0
A19	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A1i	0.013	0.25	1.57	4.67
OUTLET				0
A1ii	0.013	0.25	1.57	4.67
OUTLET				0
A20i	0.013	0.25	1.57	4.67
OUTLET				0
A20ii	0.013	0.25	1.57	4.67
OUTLET				0
A21	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A22	0.013	0.25	1.57	4.67
OUTLET				0
A23	0.013	0.25	1.57	4.67
PERVIOUS	100			0
A24i	0.013	0.25	1.57	4.67
OUTLET				0
A24ii	0.013	0.25	1.57	4.67
OUTLET				0

A25	0.013	0.25	1.57	4.67	0	A45ii	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A26i	0.013	0.25	1.57	4.67	0	A46i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A26ii	0.013	0.25	1.57	4.67	0	A46ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A27i	0.013	0.25	1.57	4.67	0	A47	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A27ii	0.013	0.25	1.57	4.67	0	A48	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A28i	0.013	0.25	1.57	4.67	0	A49	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A28ii	0.013	0.25	1.57	4.67	0	A50	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A29	0.013	0.25	1.57	4.67	0	A51	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A2i	0.013	0.25	1.57	4.67	0	A52	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A2ii	0.013	0.25	1.57	4.67	0	A53	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A3	0.013	0.25	1.57	4.67	0	A54	0.013	0.25	1.57	4.67	0
PERVIOUS	100					PERVIOUS	100				
A30	0.013	0.25	1.57	4.67	0	A5i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A31	0.013	0.25	1.57	4.67	0	A5ii	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A32i	0.013	0.25	1.57	4.67	0	A6	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A32ii	0.013	0.25	1.57	4.67	0	A7i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A33i	0.013	0.25	1.57	4.67	0	A7ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A33ii	0.013	0.25	1.57	4.67	0	A8i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A34i	0.013	0.25	1.57	4.67	0	A8ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A34ii	0.013	0.25	1.57	4.67	0	A9i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A35i	0.013	0.25	1.57	4.67	0	A9ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A35ii	0.013	0.25	1.57	4.67	0	B1	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A36	0.013	0.25	1.57	4.67	0	B1ii	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A37	0.013	0.25	1.57	4.67	0	B2	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A38	0.013	0.25	1.57	4.67	0	B3i	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A39i	0.013	0.25	1.57	4.67	0	B3ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A39ii	0.013	0.25	1.57	4.67	0	B4i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A4	0.013	0.25	1.57	4.67	0	B4ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A40	0.013	0.25	1.57	4.67	0	B4iii	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A41	0.013	0.25	1.57	4.67	0	C1	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A42i	0.013	0.25	1.57	4.67	0	C2	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A42ii	0.013	0.25	1.57	4.67	0						
OUTLET											
A42iii	0.013	0.25	1.57	4.67	0						
OUTLET											
A43	0.013	0.25	1.57	4.67	0						
PERVIOUS	100										
A44	0.013	0.25	1.57	4.67	0						
PERVIOUS	100										
A45i	0.013	0.25	1.57	4.67	0						
OUTLET											

[INFILTRATION]					
::Subcatchment	Param1	Param2	Param3	Param4	Param5

A10	76.2	13.2	4.14	7	0
A11	76.2	13.2	4.14	7	0
A12i	76.2	13.2	4.14	7	0
A12ii	76.2	13.2	4.14	7	0
A13	76.2	13.2	4.14	7	0

A14	76.2	13.2	4.14	7	0
A15i	76.2	13.2	4.14	7	0
A15ii	76.2	13.2	4.14	7	0
A16i	76.2	13.2	4.14	7	0
A16ii	76.2	13.2	4.14	7	0
A17	76.2	13.2	4.14	7	0
A17ii	76.2	13.2	4.14	7	0
A18i	76.2	13.2	4.14	7	0
A19	76.2	13.2	4.14	7	0
A1i	76.2	13.2	4.14	7	0
A1ii	76.2	13.2	4.14	7	0
A20i	76.2	13.2	4.14	7	0
A20ii	76.2	13.2	4.14	7	0
A21	76.2	13.2	4.14	7	0
A22	76.2	13.2	4.14	7	0
A23	76.2	13.2	4.14	7	0
A24i	76.2	13.2	4.14	7	0
A24ii	76.2	13.2	4.14	7	0
A25	76.2	13.2	4.14	7	0
A26i	76.2	13.2	4.14	7	0
A26ii	76.2	13.2	4.14	7	0
A27i	76.2	13.2	4.14	7	0
A27ii	76.2	13.2	4.14	7	0
A28i	76.2	13.2	4.14	7	0
A28ii	76.2	13.2	4.14	7	0
A29	76.2	13.2	4.14	7	0
A2i	76.2	13.2	4.14	7	0
A2ii	76.2	13.2	4.14	7	0
A3	76.2	13.2	4.14	7	0
A30	76.2	13.2	4.14	7	0
A31	76.2	13.2	4.14	7	0
A32i	76.2	13.2	4.14	7	0
A32ii	76.2	13.2	4.14	7	0
A33i	76.2	13.2	4.14	7	0
A33ii	76.2	13.2	4.14	7	0
A34i	76.2	13.2	4.14	7	0
A34ii	76.2	13.2	4.14	7	0
A35i	76.2	13.2	4.14	7	0
A35ii	76.2	13.2	4.14	7	0
A36	76.2	13.2	4.14	7	0
A37	76.2	13.2	4.14	7	0
A38	76.2	13.2	4.14	7	0
A39i	76.2	13.2	4.14	7	0
A39ii	76.2	13.2	4.14	7	0
A4	76.2	13.2	4.14	7	0
A40	76.2	13.2	4.14	7	0
A41	76.2	13.2	4.14	7	0
A42i	76.2	13.2	4.14	7	0
A42ii	76.2	13.2	4.14	7	0
A42iii	76.2	13.2	4.14	7	0
A43	76.2	13.2	4.14	7	0
A44	76.2	13.2	4.14	7	0
A45i	76.2	13.2	4.14	7	0
A45ii	76.2	13.2	4.14	7	0
A46i	76.2	13.2	4.14	7	0
A46ii	76.2	13.2	4.14	7	0
A47	76.2	13.2	4.14	7	0
A48	76.2	13.2	4.14	7	0
A49	76.2	13.2	4.14	7	0
A50	76.2	13.2	4.14	7	0
A51	76.2	13.2	4.14	7	0
A52	76.2	13.2	4.14	7	0
A53	76.2	13.2	4.14	7	0
A54	76.2	13.2	4.14	7	0
A5i	76.2	13.2	4.14	7	0
A5ii	76.2	13.2	4.14	7	0
A6	76.2	13.2	4.14	7	0
A7i	76.2	13.2	4.14	7	0
A7ii	76.2	13.2	4.14	7	0
A8i	76.2	13.2	4.14	7	0

A8ii	76.2	13.2	4.14	7	0
A9i	76.2	13.2	4.14	7	0
A9ii	76.2	13.2	4.14	7	0
B1	76.2	13.2	4.14	7	0
B1ii	76.2	13.2	4.14	7	0
B2	76.2	13.2	4.14	7	0
B3i	76.2	13.2	4.14	7	0
B3ii	76.2	13.2	4.14	7	0
B4i	76.2	13.2	4.14	7	0
B4ii	76.2	13.2	4.14	7	0
B4iii	76.2	13.2	4.14	7	0
C1	76.2	13.2	4.14	7	0
C2	76.2	13.2	4.14	7	0

[JUNCTIONS]

;;Name	Elevation	MaxDepth	InitDepth	SurDepth
;;Aponded				
;;-----				
;;T/G 87.6 m				
02_(CB)	85.6	2.6	0	0
;;T/G 87.6 m				
03_(CB)	85.6	2.6	0	0
;;T/G 87.53 m				
04_(CB)	85.53	2.6	0	0
;;T/G 87.531 m				
05_(CB)	85.531	2.6	0	0
;;T/G 87.39 m				
06_(CB)	85.39	2.6	0	0
;;T/G 87.436 m				
08_(CB)	85.436	2.6	0	0
;;T/G 87.425 m				
09_(CB)	85.425	2.6	0	0
;;Mcon-CBMH				
1_(RYCB)	85.42	2.993	0	0
;;T/G 87.565 m				
10_(CB)	86.17	1.995	0	0
;;Mcon MH - Concentric				
100_(STM)	81.27	6.31	0	0
;;Mcon MH - Concentric				
102_(STM)	81.341	6.229	0	0
;;Mcon MH - Concentric				
104_(STM)	81.383	6.234	0	0
;;Mcon MH - Concentric				
106_(STM)	83.539	4.124	0	0
;;Mcon MH - Concentric				
108_(STM)	83.616	3.887	0	0
;;T/G 87.555 m				
11_(CB)	86.021	2.134	0	0
;;Mcon MH - Concentric				
110_(STM)	83.936	3.813	0	0
;;Mcon MH - Concentric				
112_(STM)	81.904	6.011	0	0
;;Mcon MH - Concentric				
114_(STM)	83.366	4.634	0	0
;;Mcon MH - Concentric				
116_(STM)	83.501	4.673	0	0
;;Mcon MH - Concentric				
118_(STM)	83.88	4.482	0	0
;;T/G 87.643 m				
12_(CB)	85.643	2.6	0	0
;;Mcon MH - Concentric				
120_(STM)	82.664	5.412	0	0
;;Mcon MH - Concentric				
122_(STM)	82.736	5.495	0	0
;;Mcon MH - Concentric				
124_(STM)	82.834	5.361	0	0
;;Mcon MH - Concentric				
126_(STM)	82.974	5.491	0	0
;;Mcon MH - Concentric				
128_(STM)	83.17	5.461	0	0

;T/G 87.63 m							22_(RYCB)	87.076	2.824	0	0	1
13_(CB)	85.793	2.437	0	0	0		;T/G 88.923 m					
;Mcon MH - Concentric							23_(CB)	86.923	2.6	0	0	0
130_(STM)	84.268	4.777	0	0	0		;T/G 88.923 m					
;Mcon MH - Concentric							24_(CB)	86.923	2.6	0	0	0
132_(STM)	84.484	4.697	0	0	0		;T/G 89.381 m					
;Mcon MH - Concentric							25_(CB)	86.775	3.206	0	0	0
134_(STM)	84.804	4.516	0	0	1		;T/G 89.5 m					
;Mcon MH - Concentric							26_(CB)	86.775	3.325	0	0	0
136_(STM)	83.336	5.31	0	0	0		;T/G 88.56 m					
;Mcon MH - Concentric							27_(CB)	86.775	2.385	0	0	0
138_(STM)	83.424	5.349	0	0	0		;T/G 88.64 m					
;T/G 88.012 m							28_(CB)	86.775	2.465	0	0	0
14_(CB)	86.012	2.6	0	0	0		;Mcon-CBMH					
;Mcon MH - Concentric							29_(RYCB)	85.31	5.13	0	0	1
140_(STM)	83.713	5.538	0	0	0		;T/G 89.073 m					
;Mcon MH - Concentric							30_(CB)	86.93	2.743	0	0	0
142_(STM)	84.907	4.253	0	0	0		;T/G 89.07 m					
;Mcon MH - Concentric							31_(CB)	86.9	2.77	0	0	0
144_(STM)	84.131	5.323	0	0	0		;T/G 89.47 m					
;Mcon MH - Concentric							32_(CB)	88.283	1.917	0	0	0
146_(STM)	85	4.123	0	0	0		;T/G 89.473 m					
;Mcon MH - Concentric							33_(CB)	87.473	2.6	0	0	0
148_(STM)	85.14	4.07	0	0	1		;T/G 89.507 m					
;T/G 88.016 m							34_(CB)	87.507	2.6	0	0	0
15_(CB)	86.016	2.6	0	0	0		;T/G 89.507 m					
15_RYCB	86.595	2.178	0	0	1		35_(CB)	87.507	2.6	0	0	0
;Mcon MH - Concentric							;T/G 89.79 m					
150_(STM)	84.379	5.419	0	0	0		36_(CB)	87.79	2.6	0	0	0
;Mcon MH - Concentric							;T/G 89.792 m					
152_(STM)	85.262	4.738	0	0	0		37_(CB)	87.792	2.6	0	0	0
;Mcon MH - Concentric							;Mcon-CB					
154_(STM)	85.353	4.738	0	0	0		38_(RYCB)	87.378	3.081	0	0	1
;Mcon MH - Concentric							;Mcon-CB					
156_(STM)	85.728	4.211	0	0	0		39_(RYCB)	88.671	2.279	0	0	1
;Mcon MH - Concentric							;T/G 90.13 m					
158_(STM)	84.907	5.159	0	0	0		40_(CB)	88.226	2.504	0	0	0
;T/G 88.173 m							;T/G 90.125 m					
16_(CB)	86.173	2.6	0	0	0		41_(CB)	88.125	2.6	0	0	0
;Mcon MH - Concentric							;T/G 90.299 m					
160_(STM)	84.989	5.173	0	0	0		42_(CB)	88.299	2.6	0	0	0
;Mcon MH - Concentric							;T/G 90.294 m					
162_(STM)	85.348	4.955	0	0	0		43_(CB)	88.294	2.6	0	0	0
;Mcon MH - Concentric							;T/G 88.921 m					
164_(STM)	85.603	4.674	0	0	0		44_(CB)	86.921	2.6	0	0	0
;Mcon MH - Concentric							;T/G 88.921 m					
166_(STM)	86.165	4.259	0	0	0		45_(CB)	86.921	2.6	0	0	0
;Mcon MH - Concentric							;T/G 88.884 m					
168_(STM)	86.504	3.886	0	0	1		46_(CB)	86.884	2.6	0	0	0
;T/G 88.176 m							;T/G 88.88 m					
17_(CB)	86.176	2.6	0	0	0		47_(CB)	87.034	2.446	0	0	0
;Mcon MH - Concentric							;T/G 88.373 m					
170_(STM)	87.058	3.997	0	0	0		48_(CB)	86.373	2.6	0	0	0
;T/G 88.277 m							;T/G 88.37 m					
18_(CB)	86.97	1.907	0	0	0		49_(CB)	86.523	2.447	0	0	0
;T/G 88.281 m							;T/G 87.874 m					
19_(CB)	86.281	2.6	0	0	0		50_(CB)	86.03	2.444	0	0	0
;T/G 88.623 m							;T/G 87.87 m					
20_(CB)	86.623	2.6	0	0	0		51_(CB)	86.06	2.41	0	0	0
;T/G 88.62 m							;T/G 89.807 m					
21_(CB)	86.773	2.447	0	0	0		52_(CB)	85.21	5.197	0	0	0
;Mcon MH - Concentric							;T/G 89.662 m					
2121_(STM)	80.231	7.259	0	0	0		53_(CB)	87.662	2.6	0	0	0
;Mcon MH - Concentric							;T/G 89.66 m					
2142_(STM)	80.104	7.267	0	0	0		54_(CB)	87.708	2.552	0	0	0
;Mcon MH - Concentric							;T/G 87.27 m					
2143_(STM)	79.93	6.39	0	0	0		55_(CB)	85.27	2.6	0	0	0
;Mcon MH - Concentric							;T/G 87.4 m					
2144_(STM)	79.854	6.146	0	0	0		57_(CB)	85.21	2.79	0	0	0
;Mcon-CB							;T/G 86.71					

;LP							;T/G 89.08
Maj-44	87.539	0.611	0	0	0		RYCB_9_(RYCB) 87.54 1.54 0 0 0 1
;HP							Slope1 89.066 1.098 0 0 0 0
Maj-45	87.812	0.688	0	0	0		;Dummy Null Structure for LandXML purposes
;LP							StartNullStruct2 86.62 1.4 0 0 0 1
Maj-46	87.407	0.613	0	0	0		;Dummy Null Structure for LandXML purposes
Maj-48_2	87.744	0.636	0	0	0		StartNullStruct3 84.091 3.709 0 0 0 0
Maj-48_3	87.647	0.621	0	0	0		;Null Structure
;LP							STM-251_(STM) 85.31 4.327 0 0 0 0
Maj-50	87.425	0.615	0	0	0		;Mcon-CBMH
;HP							Structure_-_ (18)_(RYCB) 85.579 3.211 0 0 0 1
Maj-51	87.71	0.63	0	0	0		;Mcon-CBMH
;LP							TEE_1_(RYCB) 86.21 1.444 0 0 0 1
Maj-52	87.472	0.498	0	0	0		;Mcon-CBMH
Maj-53	87.588	0.612	0	0	0		TEE_10_(RYCB) 86.8 1.01 0 0 0 1
;LP							;CB-LANDSCAPE
Maj-54	87.251	0.609	0	0	0		TEE_11_(RYCB) 86.59 1.457 0 0 0 1
;HP							;Mcon-CBMH
Maj-55	87.494	0.626	0	0	0		TEE_12_(RYCB) 86.85 1.334 0 0 0 1
;Overland Major Spill Point							;CB-LANDSCAPE
Maj-56	88.8	0.6	0	0	0		TEE_13_(RYCB) 87 1.291 0 0 0 1
;LP							;CB-LANDSCAPE
Maj-58	87.162	0.608	0	0	0		TEE_14_(RYCB) 86.861 2.639 0 0 0 1
Maj-59	87.53	0.72	0	0	0		;CB-LANDSCAPE
;Spill Point							TEE_15_(RYCB) 87.38 1.98 0 0 0 1
Maj-60	88.618	0.679	0	0	0		;Mcon-CBMH
;Overland Major Spill Point							TEE_16_(RYCB) 87.27 1.61 0 0 0 1
Maj-61	88.7	0.6	0	0	0		;Mcon-CBMH
;Major System Spill Point							TEE_17_(RYCB) 87.39 1.45 0 0 0 1
Maj-62	89.85	0.6	0	0	0		;Mcon-CBMH
;Major System Spill Point							TEE_18_(RYCB) 87.54 1.41 0 0 0 1
Maj-63	87.72	1.091	0	0	0		;Mcon-CBMH
;Major System Spill Point							TEE_19_(RYCB) 87.44 1.34 0 0 0 1
Maj-64	88.8	0.6	0	0	0		;Mcon-CBMH
;Major System Spill Point							TEE_2_(RYCB) 86.35 1.365 0 0 0 1
Maj-65	87.8	1.182	0	0	0		;Mcon-CBMH
;Major System Spill Point							TEE_20_(RYCB) 87.29 1.331 0 0 0 1
Maj-66	87.65	0.6	0	0	0		;Mcon-CBMH
Maj-67	87.95	0.6	0	0	0		TEE_21_(RYCB) 87.17 1.438 0 0 0 1
Maj-Park	86.5	0.6	0	0	0		;Mcon-CBMH
;Mcon-CBMH (T/G 87.31 m)							TEE_22_(RYCB) 87.78 1.42 0 0 0 1
RYCB_1_(RYCB)	86	2.1	0	0	1		;Mcon-CBMH
;Mcon-CBMH (T/G 88.55 m)							TEE_23_(RYCB) 87.4 1.38 0 0 0 1
RYCB_10_(RYCB)	87.02	2.38	0	0	1		;Mcon-CBMH
;Mcon-CBMH (T/G 89.3 m)							TEE_24_(RYCB) 87.69 1.32 0 0 0 1
RYCB_11_(RYCB)	87.35	2.55	0	0	1		;Mcon-CBMH
;Mcon-CBMH (T/G 89.68 m)							TEE_25_(RYCB) 87.53 1.546 0 0 0 1
RYCB_12_(RYCB)	88	2.28	0	0	1		;Mcon-CBMH
;CB-LANDSCAPE							TEE_26_(RYCB) 88.39 1.319 0 0 0 1
RYCB_13_(RYCB)	87.54	2.11	0	0	1		;Mcon-CBMH
;Mcon-CBMH							TEE_27_(RYCB) 88.23 1.399 0 0 0 1
RYCB_14_(RYCB)	88.14	2.31	0	0	1		;Mcon-CBMH
;CB-LANDSCAPE							TEE_28_(RYCB) 87.47 1.318 0 0 0 1
RYCB_15_(RYCB)	88.7	2.15	0	0	1		;Mcon-CBMH
;Mcon-CBMH							TEE_29_(RYCB) 86.87 1.442 0 0 0 1
RYCB_18_(RYCB)	85.764	2.339	0	0	1		;Mcon-CBMH
;TEE (T/G 87.55 m)							TEE_3_(RYCB) 86.25 1.37 0 0 0 1
RYCB_2_(RYCB)	86.01	3.14	0	0	1		;Mcon-CBMH
;Mcon-CBMH							TEE_30_(RYCB) 86.75 1.477 0 0 0 1
RYCB_3_(RYCB)	86.18	2.27	0	0	1		;Mcon-CBMH
;Mcon-CBMH (T/G 87.63 m)							TEE_31_(RYCB) 86.62 1.531 0 0 0 1
RYCB_4_(RYCB)	86.12	3.11	0	0	1		;CB-LANDSCAPE
;Mcon-CBMH							TEE_32_(RYCB) 86.78 1.447 0 0 0 1
RYCB_5_(RYCB)	86.044	2.295	0	0	1		;CB-LANDSCAPE
;Mcon-CBMH							TEE_33_(RYCB) 86.134 2.093 0 0 0 1
RYCB_6_(RYCB)	85.72	3.209	0	0	1		;Mcon-CBMH
;T/G 88.79m							TEE_34_(RYCB) 85.98 2.077 0 0 0 1
RYCB_7_(RYCB)	86.49	2.9	0	0	1		;Mcon-CBMH
;Mcon-CBMH (T/G 88.45 m)							TEE_35_(RYCB) 86.044 2.101 0 0 0 1
RYCB_8_(RYCB)	86.97	2.23	0	0	1		;Mcon-CBMH

TEE_36_(RYCB)	88.3	1.519	0	0	1	10_(STM)	124_(STM)	122_(STM)	16.861
;Mcon-CBMH						0.013	83.134	83.05	0
TEE_37_(RYCB)	88.65	1.301	0	0	1	;Mcon Circular Conc. Pipe			
;Mcon-CBMH						11_(STM)	122_(STM)	120_(STM)	24.629
TEE_38_(RYCB)	88.52	1.302	0	0	1	0.013	83.036	82.974	0
;Mcon-CBMH						;Mcon Circular Conc. Pipe			
TEE_39_(RYCB)	88.28	1.384	0	0	1	12_(STM)	120_(STM)	112_(STM)	91.574
;Mcon-CBMH						0.013	82.964	82.735	0
TEE_4_(RYCB)	86.02	1.86	0	0	1	;Mcon Circular Conc. Pipe			
;Mcon-CBMH						13_(STM)	112_(STM)	104_(STM)	73.804
TEE_40_(RYCB)	88.83	1.486	0	0	1	0.013	82.204	81.983	0
;Mcon-CBMH						;Mcon Circular Conc. Pipe			
TEE_41_(RYCB)	88.64	1.665	0	0	1	14_(STM)	104_(STM)	102_(STM)	41.856
;CB-LANDSCAPE						0.013	81.683	81.641	0
TEE_42_(RYCB)	86.35	1.4	0	0	1	;Mcon Circular Conc. Pipe			
;CB-LANDSCAPE						15_(10)_ (STM)	138_(STM)	136_(STM)	14.785
TEE_43_(RYCB)	86.11	1.64	0	0	1	0.013	83.724	83.65	0
;CB-LANDSCAPE						;Mcon Circular Conc. Pipe			
TEE_44_(RYCB)	86.04	1.71	0	0	1	15_(11)_ (STM)	136_(STM)	128_(STM)	62.501
;CB-LANDSCAPE						0.013	83.636	83.48	0
TEE_5_(RYCB)	86.09	1.934	0	0	1	;Mcon Circular Conc. Pipe			
;Mcon-CBMH						15_(12)_ (STM)	148_(STM)	146_(STM)	78.542
TEE_6_(RYCB)	86.35	1.525	0	0	1	0.013	85.33	85.21	0
;Mcon-CBMH						;Mcon Circular Conc. Pipe			
TEE_7_(RYCB)	86.46	1.427	0	0	1	15_(13)_ (STM)	146_(STM)	144_(STM)	78.665
;Mcon-CBMH						0.013	85.15	85.03	0
TEE_8_(RYCB)	86.34	1.523	0	0	1	;Mcon Circular Conc. Pipe			
;Mcon-CBMH						15_(14)_ (STM)	162_(STM)	160_(STM)	106.278
TEE_9_(RYCB)	86.22	1.66	0	0	1	0.013	85.648	85.299	0

[OUTFALLS]

;;Name	Elevation	Type	Stage Data	Gated	15_(15)_ (STM)	160_(STM)	158_(STM)	14.296	
Route To									

Maj-01	91.06	FREE	NO		0.013	85.289	85.217	0	
;HP						;Mcon Circular Conc. Pipe			
Maj-18	89.547	FREE	NO		15_(16)_ (STM)	158_(STM)	150_(STM)	108.023	
Maj-22	88.834	FREE	NO		0.013	85.207	84.829	0	
;HP						;Mcon Circular Conc. Pipe			
Maj-48	87.75	FREE	NO		15_(19)_ (STM)	170_(STM)	168_(STM)	93.892	
;HP						0.013	87.358	87.029	0
Maj-49	87.673	FREE	NO		;Mcon Circular Conc. Pipe				
Maj-57	89.055	FREE	NO		15_(20)_ (STM)	168_(STM)	166_(STM)	101.148	
OF1	85	FREE	NO		0.013	86.804	86.475	0	
;Rectangular Headwall Variable Height SI						;Mcon Circular Conc. Pipe			
STM-111_(STM)	80.137	TIMESERIES	MH-111-		15_(21)_ (STM)	166_(STM)	164_(STM)	29.241	
August_8_1996	NO				0.013	86.465	86.353	0	
;Mcon Circular Conc. Pipe						;Mcon Circular Conc. Pipe			

[STORAGE]

;;Name	Elev.	MaxDepth	InitDepth	Shape	Curve	15_(3)_ (STM)	118_(STM)	116_(STM)	99.63
Name/Params	N/A	Fevap	Psi	Ksat	IMD				

B1_Stor	90.5	1.5	0	FUNCTIONAL	383	0.013	84.18	83.873	0
0_0_0	0	0				;Mcon Circular Conc. Pipe			
B2_Stor	90.5	1.5	0	TABULAR		15_(4)_ (STM)	116_(STM)	114_(STM)	11.937
UHAL_Onsite		0	0			0.013	83.801	83.741	0
B3_Stor	90.5	1.5	0	FUNCTIONAL	368	;Mcon Circular Conc. Pipe			
0_0_0	0	0				15_(5)_ (STM)	114_(STM)	112_(STM)	64.641
;Mcon Circular Conc. Pipe						0.013	83.666	83.44	0
;Mcon Circular Conc. Pipe						;Mcon Circular Conc. Pipe			
;Mcon Circular Conc. Pipe						15_(9)_ (STM)	140_(STM)	138_(STM)	113.118
;Mcon Circular Conc. Pipe						0.013	84.013	83.73	0

[CONDUITS]

;;Name	From Node	To Node	Length	2_(STM)	154_(STM)	152_(STM)	12.573		
Roughness	InOffset	OutOffset	InitFlow	MaxFlow					

;Mcon Circular Conc. Pipe									
1_(STM)	156_(STM)	154_(STM)	100.708	0.013	85.653	85.59	0		
0.013	86.028	85.68	0	;Mcon Circular Conc. Pipe					
;Mcon Circular Conc. Pipe						3_(STM)	152_(STM)	150_(STM)	59.352
;Mcon Circular Conc. Pipe						0.013	85.562	85.354	0
;Mcon Circular Conc. Pipe						;Mcon Circular Conc. Pipe			
;Mcon Circular Conc. Pipe						4_(STM)	150_(STM)	144_(STM)	76.294
;Mcon Circular Conc. Pipe						0.013	84.679	84.49	0

5_(STM)	144_(STM)	140_(STM)	77.327		C22	Maj-22	Maj-21	13.47	0.013
0.013	84.36	84.13	0	0	88.834	88.595	0	0	
;lpex PVC DR 35									
6_(STM)	142_(STM)	132_(STM)	53.44		C23	Maj-23	Maj-24	31.267	0.013
0.013	85.197	84.85	0	0	89.24	88.904	0	0	
;Mcon Circular Conc. Pipe									
7_(1)_STM)	130_(STM)	128_(STM)	88.337		C24	Maj-25	Maj-24	35.922	0.013
0.013	84.55	84.37	0	0	89.152	88.904	0	0	
;Mcon Circular Conc. Pipe									
7_(STM)	132_(STM)	130_(STM)	37.406		C25	Maj-25	Maj-26	59.92	0.013
0.013	84.72	84.642	0	0	89.152	88.605	0	0	
;Mcon Circular Conc. Pipe									
8_(STM)	128_(STM)	126_(STM)	75.98		C26	Maj-27	Maj-26	40.459	0.013
0.013	83.47	83.28	0	0	88.848	88.605	0	0	
;Mcon Circular Conc. Pipe									
9_(STM)	126_(STM)	124_(STM)	53.402		;Maj RY Spill Point				
0.013	83.274	83.14	0	0	C27	22_(RYCB)	Maj-25	17.828	0.035
C1	Maj-55	Maj-58	15.736	0.013	89.3	89.152	0	0	
87.494	87.162	0	0		C27_1	Maj-27	Maj-60	20.292	0.013
C1_1	Maj-01	Maj-01_2	15.296	0.013	88.848	88.618	0	0	
91.06	90.899	0	0		C27_2	Maj-60	Maj-28	39.649	0.013
C1_2	Maj-01_2	Maj-02	24.816	0.013	88.618	88.251	0	0	
90.899	90.668	0	0		C28	Maj-29	Maj-28	31.279	0.013
C10	Maj-17	Maj-10	54.682	0.013	88.595	88.251	0	0	
90.064	89.777	0	0		C29	Maj-25	Maj-33	47.188	0.013
C11	Maj-17	Maj-16	86.734	0.013	89.152	88.918	0	0	
90.064	89.419	0	0		C3	Maj-04	Maj-03	70.051	0.013
C12	Maj-11	Maj-09	10.987	0.013	90.61	90.272	0	0	
89.819	89.846	0	0		C30	Maj-34	Maj-33	24.584	0.013
C13	Maj-11	Maj-12	60.306	0.013	89.067	88.918	0	0	
89.819	89.664	0	0		C31	Maj-Park	OF1	47.652	0.035
C14	Maj-13	Maj-12	46.489	0.013	86.5	85	0	0	
89.973	89.664	0	0		;Maj RY Spill Point				
C15	Maj-15	Maj-16	38.838	0.013	C31_1	RYCB_8_(RYCB)	Maj-61	1.758	
89.666	89.419	0	0		0.035	88.6	88.7	0	0
C16	Maj-13	Maj-14	44.234	0.013	;Maj RY Spill Point				
89.973	89.484	0	0		C31_2	Maj-61	Maj-28	17.384	0.035
C17	Maj-15	Maj-14	29.277	0.013	88.7	88.251	0	0	
89.666	89.484	0	0		C32	Maj-34	Maj-32	25.871	0.013
;Maj RY Spill Point									
C18	29_(RYCB)	Maj-18_2	4.776	0.035	89.067	88.874	0	0	
89.84	89.55	0	0		C33	Maj-31	Maj-32	22.994	0.013
C18_2	Maj-34_2	Maj-57	7.803	0.013	89.025	88.874	0	0	
89.16	89.055	0	0		C34	Maj-31	Maj-30	47.52	0.013
C18_3	Maj-15	Slope1	36.415	0.013	89.025	88.398	0	0	
89.666	89.066	0	0		C35	Maj-29	Maj-30	27.889	0.013
C18_4	Slope1	Maj-15_2	37.347	0.013	88.595	88.398	0	0	
89.066	89.36	0	0		C36	Maj-29	Maj-35	35.198	0.013
C18_5	Maj-19_2	Maj-15_2	13.813	0.013	88.595	88.149	0	0	
89.527	89.36	0	0		C37	Maj-36	Maj-35	37.341	0.013
C18_6	Maj-19_2	Maj-19	27.25	0.013	88.408	88.149	0	0	
89.527	89.388	0	0		C38	Maj-36	Maj-42	75.802	0.013
C18_7	Maj-34_2	Maj-34	28.133	0.013	88.408	87.881	0	0	
89.16	89.067	0	0		C39	Maj-43	Maj-42	39.792	0.013
C18_8	Maj-18	Maj-18_2	5	0.013	88.074	87.881	0	0	
89.547	89.51	0	0		C4	Maj-59	Maj-Park	148.118	0.035
C18_9	Maj-18_2	Maj-15_2	31.942	0.013	87.53	86.5	0	0	
89.51	89.36	0	0		C4_1	Maj-04	Maj-04_2	15.06	0.013
C19	Maj-15_2	Maj-23	11.274	0.013	90.61	90.507	0	0	
89.36	89.24	0	0		C4_2	Maj-04_2	Maj-05	20.639	0.013
C2	Maj-59	Maj-58	9.133	0.013	90.507	90.398	0	0	
87.5	87.162	0	0		;Maj RY Spill Point				
C2_1	Maj-02	Maj-02_2	25.364	0.013	C4_3	RYCB_12_(RYCB)	Maj-62	9.605	
90.668	90.416	0	0		0.035	89.581	89.85	0	0
C2_2	Maj-02_2	Maj-03	14.602	0.013	;Maj RY Spill Point				
90.416	90.272	0	0		C4_4	Maj-62	Maj-14	10.914	0.035
C20	Maj-19	Maj-20	24.9	0.013	89.85	89.484	0	0	
89.388	89.169	0	0		C40	Maj-43	Maj-44	41.644	0.013
C21	Maj-20	Maj-21	64.337	0.013	88.074	87.539	0	0	
89.169	88.595	0	0		C41	Maj-45	Maj-44	34.02	0.013
					87.812	87.539	0	0	
					C42	Maj-45	Maj-41	33.014	0.013
					87.812	87.62	0	0	
					C43	Maj-40	Maj-41	55.256	0.013
					87.97	87.62	0	0	

C44	Maj-40	Maj-39	14.403	0.013	C62	1_(RYCB)	Maj-50	27.046	0.035	
87.97	88.071	0			87.813	87.425	0	0		
C45	Maj-38	Maj-39	19.588	0.013	C63_1	RYCB_5_(RYCB)	Maj-67	3.561		
88.19	88.071	0			0.035	87.739	87.95	0	0	
C46	Maj-36	Maj-37	37.582	0.013	C63_2	Maj-67	Maj-44	7.188	0.035	
88.408	87.993	0			87.95	87.539	0	0		
C47	Maj-38	Maj-37	23.672	0.013	C64	Structure_-(18)_(RYCB)	Maj-43	5		
88.19	87.993	0			0.035	88.19	88.074	0	0	
C48	Maj-45	Maj-46	39.529	0.013	C65_1	RYCB_6_(RYCB)	J1	22.199		
87.812	87.407	0			0.035	88.329	88.48	0	0	
C49	Maj-53	Maj-46	33.614	0.013	C65_2	J1	Maj-35	15.658	0.035	
87.588	87.407	0			88.48	88.149	0	0		
C5	58_(CB)	Maj-Park	30	0.035	C66_1	RYCB_10_(RYCB)	Maj-64	14.534		
86.71	86.5	0			0.035	88.729	88.8	0	0	
C5_1	Maj-05	Maj-05_2	4.665	0.013	C66_2	Maj-64	Maj-21	36.889	0.035	
90.398	90.369	0			88.8	88.595	0	0		
C5_2	Maj-05_2	Maj-06	24.629	0.013	C67	RYCB_11_(RYCB)	Slope1	10.418		
90.369	90.227	0			0.035	89.123	89.066	0	0	
;RY Maj System Spill Point					C68	38_(RYCB)	Maj-09	5	0.035	
C50	ELB_20_(RYCB)	ELB_6_(RYCB)	31.256		89.859	89.846	0	0		
0.013	87.694	87.862	0	0	C69	32_(CB)	Maj-14	5	0.035	
C50_1	Maj-48	Maj-48_2	5	0.013	89.6	89.484	0	0		
87.75	87.744	0			C7	Maj-07	Maj-08	17.171	0.013	
C50_3	Maj-48_2	Maj-48_3	19.501	0.013	90.275	90.15	0	0		
87.744	87.647	0			C8	Maj-08	Maj-09	40.633	0.013	
C50_4	Maj-48_3	Maj-53	11.933	0.013	90.15	89.846	0	0		
87.647	87.588	0			C9	Maj-09	Maj-10	8.974	0.013	
C51	Maj-53	Maj-52	33.988	0.013	89.846	89.777	0	0		
87.588	87.472	0			;HDPE Pipe SI					
C52	Maj-51	Maj-52	53.407	0.013	Pipe_-(1)_(RYCB)_1 TEE_43_(RYCB) 98_(STM) 40.7					
87.71	87.472	0			0.013	86.11	85.703	0	0	
C53	Maj-51	Maj-50	33.561	0.013	;HDPE Pipe SI					
87.71	87.425	0			Pipe_-(10)_(RYCB) TEE_32_(RYCB) RYCB_18_(RYCB)					
C54	Maj-49	Maj-50	43.76	0.013	4.029	0.013	86.78	86.76	0	0
87.673	87.425	0			;HDPE Pipe SI					
C55	Maj-53	Maj-54	22.82	0.013	Pipe_-(100)_(RYCB) TEE_6_(RYCB) RYCB_4_(RYCB)					
87.588	87.251	0			43.106	0.013	86.65	86.434	0	0
C56	Maj-21	Maj-56	22.042	0.035	;HDPE Pipe SI					
88.595	88.8	0			Pipe_-(101)_(RYCB) ELB_20_(RYCB) TEE_35_(RYCB)					
C57	Maj-55	Maj-54	42.124	0.013	58.134	0.013	86.684	86.393	0	0
87.494	87.251	0			;HDPE Pipe SI					
;Major System Spill Point					Pipe_-(103)_(1)_(RYCB) TEE_33_(RYCB)					
C58	TEE_14_(RYCB)	Maj-60	42.957		RYCB_18_(RYCB) 3.988 0.013 86.134 86.114 0					
0.035	88.9	88.618	0	0	0					
;Maj RY Spill Point					;HDPE Pipe SI					
C58_1	RYCB_2_(RYCB)	Maj-63	5.09		Pipe_-(103)_(RYCB) TEE_34_(RYCB) TEE_33_(RYCB)					
0.035	87.58	87.72	0	0	29.299 0.013 86.28 86.134 0 0					
;Maj RY Spill Point					;HDPE Pipe SI					
C58_2	Maj-63	Maj-46	12.116	0.035	Pipe_-(109)_(RYCB) ELB_21_(RYCB) RYCB_9_(RYCB)					
87.72	87.407	0			42.607	0.013	88.36	88.147	0	0
;Maj RY Spill Point					;HDPE Pipe SI					
C59_1	RYCB_4_(RYCB)	Maj-65	3.487		Pipe_-(11)_(RYCB) RYCB_18_(RYCB) Structure_-(18)_(RYCB) 37.013 0.013 86.064 85.879 0 0					
0.035	87.79	87.8	0	0	;HDPE Pipe SI					
;Maj RY Spill Point					Pipe_-(110)_(RYCB) ELB_12_(RYCB) TEE_22_(RYCB)					
C59_2	Maj-65	Maj-48_2	8.163	0.035	42.796	0.013	88.3	88.086	0	0
87.8	87.744	0			;HDPE Pipe SI					
;Maj RY Spill Point					Pipe_-(111)_(RYCB) TEE_22_(RYCB) RYCB_9_(RYCB)					
C6	39_(RYCB)	Maj-08	6.432	0.035	36.137	0.013	88.08	87.899	0	0
90.35	90.15	0			;HDPE Pipe SI					
C6_1	Maj-07	Maj-06_2	34.136	0.013	Pipe_-(114)_(RYCB) ELB_10_(RYCB) TEE_18_(RYCB)					
90.275	90.095	0			20.158	0.013	87.95	87.849	0	0
C6_2	Maj-06	Maj-06_2	20.238	0.013	;HDPE Pipe SI					
90.227	90.095	0			Pipe_-(117)_(RYCB) ELB_14_(RYCB) TEE_24_(RYCB)					
;Major System Overland Spillway					14.18	0.013	88.08	88.009	0	0
C60	Maj-56	TEE_14_(RYCB)	23.631		;HDPE Pipe SI					
0.035	88.8	88.9	0	0	Pipe_-(118)_(RYCB) TEE_24_(RYCB) TEE_25_(RYCB)					
C61_1	RYCB_1_(RYCB)	Maj-66	2.392		29.666	0.013	87.99	87.842	0	0
0.035	87.5	87.65	0	0	;HDPE Pipe SI					
C61_2	Maj-66	Maj-55	19.877	0.035						
87.65	87.494	0								

Pipe -(119)(RYCB) ELB_13 (RYCB) TEE_23 (RYCB)
29.54 0.013 87.86 87.712 0 0
;HDPE Pipe SI
Pipe -(120)(RYCB) ELB_17 (RYCB) TEE_28 (RYCB)
13.487 0.013 87.85 87.783 0 0
;HDPE Pipe SI
Pipe -(121)(RYCB) TEE_28 (RYCB) RYCB_13 (RYCB)
35.693 0.013 87.77 87.592 0 0
;HDPE Pipe SI
Pipe -(122)(RYCB) ELB_18 (RYCB) RYCB_13 (RYCB)
34.873 0.013 87.88 87.706 0 0
;HDPE Pipe SI
Pipe -(123)(RYCB) ELB_16 (RYCB) TEE_26 (RYCB)
27.685 0.013 88.98 88.703 0 0
;HDPE Pipe SI
Pipe -(124)(RYCB) TEE_26 (RYCB) TEE_27 (RYCB)
29.406 0.013 88.69 88.543 0 0
;HDPE Pipe SI
Pipe -(125)(RYCB) TEE_27 (RYCB) RYCB_12 (RYCB)
39.4 0.013 88.53 88.333 0 0
;HDPE Pipe SI
Pipe -(126)(RYCB) ELB_23 (RYCB) TEE_40 (RYCB)
30.531 0.013 89.29 89.137 0 0
;HDPE Pipe SI
Pipe -(127)(RYCB) TEE_40 (RYCB) TEE_41 (RYCB)
35.765 0.013 89.13 88.951 0 0
;HDPE Pipe SI
Pipe -(128)(RYCB) TEE_41 (RYCB) RYCB_15 (RYCB)
32.603 0.013 88.94 88.777 0 0
;HDPE Pipe SI
Pipe -(129)(RYCB) ELB_22 (RYCB) TEE_36 (RYCB)
47.076 0.013 88.84 88.605 0 0
;HDPE Pipe SI
Pipe -(130)(RYCB) TEE_36 (RYCB) RYCB_14 (RYCB)
21.116 0.013 88.6 88.494 0 0
;HDPE Pipe SI
Pipe -(131)(RYCB) TEE_37 (RYCB) RYCB_14 (RYCB)
21.231 0.013 88.95 88.844 0 0
;HDPE Pipe SI
Pipe -(132)(RYCB) TEE_37 (RYCB) TEE_38 (RYCB)
21.029 0.013 88.95 88.845 0 0
;HDPE Pipe SI
Pipe -(133)(RYCB) TEE_38 (RYCB) TEE_39 (RYCB)
46.6 0.013 88.82 88.587 0 0
;HDPE Pipe SI
Pipe -(134)(RYCB) TEE_10 (RYCB) TEE_11 (RYCB)
40.369 0.013 86.81 86.6 0 0
;HDPE Pipe SI
Pipe -(137)(RYCB) TEE_7 (RYCB) TEE_8 (RYCB)
22.479 0.013 86.76 86.648 0 0
;HDPE Pipe SI
Pipe -(138)(RYCB) TEE_8 (RYCB) TEE_9 (RYCB)
21.988 0.013 86.64 86.53 0 0
;HDPE Pipe SI
Pipe -(139)(RYCB) ELB_3 (RYCB) TEE_2 (RYCB)
20.228 0.013 86.78 86.681 0 0
;HDPE Pipe SI
Pipe -(14)(RYCB) TEE_15 (RYCB) RYCB_7 (RYCB)
4.757 0.013 87.38 87.356 0 0
;HDPE Pipe SI
Pipe -(140)(RYCB) TEE_2 (RYCB) RYCB_3 (RYCB)
20.776 0.013 86.65 86.544 0 0
;HDPE Pipe SI
Pipe -(141)(RYCB) ELB_11 (RYCB) TEE_19 (RYCB)
18.513 0.013 87.9 87.752 0 0
;HDPE Pipe SI
Pipe -(142)(RYCB) TEE_19 (RYCB) TEE_20 (RYCB)
27.38 0.013 87.74 87.603 0 0
;HDPE Pipe SI

Pipe -(143)(RYCB) TEE_20 (RYCB) TEE_21 (RYCB)
22.082 0.013 87.59 87.48 0 0
;HDPE Pipe SI
Pipe -(144)(RYCB) TEE_21 (RYCB) RYCB_8 (RYCB)
33.251 0.013 87.47 87.304 0 0
;HDPE Pipe SI
Pipe -(145)(RYCB) ELB_19 (RYCB) TEE_29 (RYCB)
18.496 0.013 87.27 87.178 0 0
;HDPE Pipe SI
Pipe -(146)(RYCB) TEE_29 (RYCB) TEE_30 (RYCB)
21.926 0.013 87.17 87.06 0 0
;HDPE Pipe SI
Pipe -(147)(RYCB) TEE_30 (RYCB) TEE_31 (RYCB)
23.15 0.013 87.05 86.934 0 0
;HDPE Pipe SI
Pipe -(148)(RYCB) TEE_31 (RYCB) TEE_32 (RYCB)
26.341 0.013 86.92 86.788 0 0
;HDPE Pipe SI
Pipe -(149)(RYCB) TEE_35 (RYCB) TEE_34 (RYCB)
12.115 0.013 86.344 86.284 0 0
;HDPE Pipe SI
Pipe -(15)(RYCB) RYCB_7 (RYCB) 15_RYCB
39.009 0.013 86.79 86.595 0 0
;HDPE Pipe SI
Pipe -(150)(RYCB) TEE_18 (RYCB) TEE_17 (RYCB)
21.983 0.013 87.84 87.73 0 0
;HDPE Pipe SI
Pipe -(151)(RYCB) TEE_17 (RYCB) TEE_16 (RYCB)
22.116 0.013 87.69 87.579 0 0
;HDPE Pipe SI
Pipe -(152)(RYCB) TEE_16 (RYCB) TEE_15 (RYCB)
36.027 0.013 87.57 87.39 0 0
;HDPE Pipe SI
Pipe -(153)(RYCB) ELB_8 (RYCB) TEE_10 (RYCB)
17.189 0.013 86.93 86.8 0 0
;HDPE Pipe SI
Pipe -(154)(RYCB) ELB_9 (RYCB) TEE_12 (RYCB)
38.096 0.013 87.35 87.16 0 0
;HDPE Pipe SI
Pipe -(155)(RYCB) TEE_12 (RYCB) TEE_13 (RYCB)
17.927 0.013 87.15 87.06 0 0
;HDPE Pipe SI
Pipe -(156)(1)(RYCB) TEE_14 (RYCB)
RYCB_7 (RYCB) 3.241 0.013 86.861 86.845 0
0
;HDPE Pipe SI
Pipe -(156)(RYCB) TEE_13 (RYCB) TEE_14 (RYCB)
27.79 0.013 87 86.861 0 0
;HDPE Pipe SI
Pipe -(157)(RYCB) ELB_25 (RYCB) TEE_44 (RYCB)
64.5 0.013 86.43 86.108 0 0
;HDPE Pipe SI
Pipe -(159)(RYCB) ELB_24 (RYCB) TEE_42 (RYCB)
38.3 0.013 86.55 86.359 0 0
;HDPE Pipe SI
Pipe -(16)(RYCB) TEE_5 (RYCB) RYCB_6 (RYCB)
3.09 0.013 86.09 86.075 0 0
;HDPE Pipe SI
Pipe -(160)(RYCB) TEE_42 (RYCB) TEE_43 (RYCB)
36.9 0.013 86.35 86.165 0 0
;HDPE Pipe SI
Pipe -(161)(RYCB) ELB_1 (RYCB) RYCB_1 (RYCB)
36.543 0.013 86.51 86.327 0 0
;HDPE Pipe SI
Pipe -(162)(RYCB) ELB_15 (RYCB) RYCB_10 (RYCB)
33.014 0.013 87.5 87.33 0 0
;HDPE Pipe SI
Pipe -(164)(RYCB) TEE_23 (RYCB) RYCB_10 (RYCB)
28.561 0.013 87.7 87.557 0 0
;HDPE Pipe SI

Pipe - (165)_(RYCB) TEE_25_(RYCB) RYCB_11_(RYCB)
30.956 0.013 87.83 87.675 0 0
;HDPE Pipe SI
Pipe - (17)_(RYCB) TEE_11_(RYCB) RYCB_6_(RYCB)
5.41 0.013 86.59 86.56 0 0
;HDPE Pipe SI
Pipe - (19)_(RYCB) RYCB_9_(RYCB) 22_(RYCB)
31.338 0.013 87.84 87.683 0 0
;HDPE Pipe SI
Pipe - (2)_(RYCB) TEE_44_(RYCB) 98_(STM) 58.2
0.013 86.04 85.458 0 0
;HDPE Pipe SI
Pipe - (22)_(RYCB) RYCB_14_(RYCB) 32_(CB)
31.316 0.013 88.44 88.283 0 0
;HDPE Pipe SI
Pipe - (23)_(RYCB) RYCB_12_(RYCB) 33_(CB)
11.395 0.013 88.3 88.243 0 0
;HDPE Pipe SI
Pipe - (24)_(RYCB) TEE_39_(RYCB) 29_(RYCB)
8.187 0.013 88.58 88.539 0 0
;HDPE Pipe SI
Pipe - (25)_(RYCB) RYCB_11_(RYCB) 31_(CB) 6.05
0.013 87.65 87.62 0 0
;HDPE Pipe SI
Pipe - (27)_(RYCB) RYCB_3_(RYCB) 1_(RYCB) 30.6
0.013 86.48 86.327 0 0
;HDPE Pipe SI
Pipe - (73)_(RYCB) RYCB_8_(RYCB) 18_(CB) 9.658
0.013 87.27 87.222 0 0
;HDPE Pipe SI
Pipe - (74)_(RYCB) RYCB_15_(RYCB) 39_(RYCB)
5.744 0.013 88.7 88.671 0 0
;HDPE Pipe SI
Pipe - (77)_(RYCB) RYCB_13_(RYCB) 38_(RYCB)
32.433 0.013 87.54 87.378 0 0
;HDPE Pipe SI
Pipe - (87)_(RYCB) StartNullStruct2 TEE_1_(RYCB)
21.137 0.013 86.62 86.515 0 0
;HDPE Pipe SI
Pipe - (88)_(RYCB) TEE_1_(RYCB) RYCB_2_(RYCB)
36.065 0.013 86.51 86.33 0 0
;HDPE Pipe SI
Pipe - (89)_(RYCB) ELB_4_(RYCB) RYCB_3_(RYCB)
30.528 0.013 86.75 86.6 0 0
;HDPE Pipe SI
Pipe - (9)_(RYCB) RYCB_5_(RYCB) 11_(CB) 5.75
0.013 86.35 86.321 0 0
;HDPE Pipe SI
Pipe - (90)_(RYCB) StartNullStruct2 ELB_2_(RYCB)
11.016 0.013 86.62 86.565 0 0
;HDPE Pipe SI
Pipe - (93)_(RYCB) ELB_5_(RYCB) TEE_3_(RYCB)
39.684 0.013 86.75 86.56 0 0
;HDPE Pipe SI
Pipe - (94)_(RYCB) TEE_3_(RYCB) TEE_4_(RYCB)
43.993 0.013 86.55 86.33 0 0
;HDPE Pipe SI
Pipe - (95)_(RYCB) TEE_4_(RYCB) TEE_5_(RYCB)
43.248 0.013 86.32 86.104 0 0
;HDPE Pipe SI
Pipe - (96)_(RYCB) ELB_7_(RYCB) TEE_7_(RYCB)
25.116 0.013 87.1 86.82 0 0
;HDPE Pipe SI
Pipe - (98)_(RYCB) TEE_9_(RYCB) RYCB_5_(RYCB)
35.118 0.013 86.52 86.344 0 0
;HDPE Pipe SI
Pipe - (99)_(RYCB) ELB_6_(RYCB) TEE_6_(RYCB)
38.969 0.013 86.85 86.655 0 0
;Mcon Circular Conc. Pipe

STM-23_(STM) 106_(STM) 104_(STM) 97.6
0.013 83.839 83.595 0 0
;Mcon Circular Conc. Pipe
STM-24_(STM) 108_(STM) 106_(STM) 26.241
0.013 83.916 83.85 0 0
;lpex PVC DR 35
STM-27_(STM) 134_(STM) 132_(STM) 36.012
0.013 85.14 84.906 0 0
;lpex PVC DR 35
STM-28_(STM) 110_(STM) 108_(STM) 29.106
0.013 84.236 84.114 0 0
;Mcon Circular Conc. Pipe
STM-34_(1)_(1)_(STM) 98_(STM) 2121_(STM) 40.5
0.013 81.46 81.42 0 0
;Mcon Circular Conc. Pipe
STM-34_(1)_(STM) 100_(STM) 98_(STM) 39.5
0.013 81.56 81.52 0 0
;Mcon Circular Conc. Pipe
STM-34_(STM) 102_(STM) 100_(STM) 12.1
0.013 81.61 81.598 0 0
;Mcon Circular Conc. Pipe
STM-35_(STM) 2121_(STM) 2142_(STM) 83.9
0.013 80.72 80.59 0 0
;Mcon Circular Conc. Pipe
STM-36_(STM) 2142_(STM) 2143_(STM) 17.7
0.013 80.43 80.4 0 0
;Mcon Circular Conc. Pipe
STM-37_(STM) 2143_(STM) 2144_(STM) 20.119
0.013 80.23 80.21 0 0
;Mcon Circular Conc. Pipe
STM-38_(STM) 2144_(STM) STM-111_(STM)
17.179 0.013 80.154 80.137 0 0
;HDPE Pipe SI
STM-81_(STM) 142_(STM) 140_(STM) 20.687
0.013 85.244 85.11 0 0
;HDPE Pipe SI
STM-82_(STM) StartNullStruct3 104_(STM) 37.594
0.013 84.091 83.903 0 0
;HDPE Pipe SI
STM-83_(STM) STM-251_(STM) 144_(STM) 37.8
0.013 85.609 85.225 0 0

[ORIFICES]
;:Name From Node To Node Type
Offset Qcoeff Gated CloseTime
;:-----

CB-02 02_(CB) 106_(STM) SIDE 85.6
0.62 NO 0
CB-03 03_(CB) 106_(STM) SIDE 85.6
0.62 NO 0
CB-04 04_(CB) 104_(STM) SIDE
85.53 0.62 NO 0
CB-05 05_(CB) 104_(STM) SIDE
85.531 0.62 NO 0
CB-06 06_(CB) 104_(STM) SIDE
86.19 0.62 NO 0
CB-08 08_(CB) 112_(STM) SIDE
85.436 0.62 NO 0
CB-09 09_(CB) 112_(STM) SIDE
85.425 0.62 NO 0
CB-10 10_(CB) 114_(STM) SIDE
86.17 0.62 NO 0
CB-11 11_(CB) 114_(STM) SIDE
86.321 0.62 NO 0
CB-12 12_(CB) 120_(STM) SIDE
85.643 0.62 NO 0
CB-13 13_(CB) 120_(STM) SIDE
85.793 0.62 NO 0

CB-14	14_(CB)	126_(STM)	SIDE	CB-52	52_(CB)	162_(STM)	SIDE	
86.012	0.62 NO	0		85.348	0.62 NO	0		
CB-15	15_(CB)	126_(STM)	SIDE	CB-53	53_(CB)	156_(STM)	SIDE	
86.016	0.62 NO	0		87.662	0.62 NO	0		
CB-16	16_(CB)	128_(STM)	SIDE	CB-54	54_(CB)	156_(STM)	SIDE	
86.173	0.62 NO	0		87.708	0.62 NO	0		
CB-17	17_(CB)	128_(STM)	SIDE	CB-55	55_(CB)	104_(STM)	SIDE	
86.176	0.62 NO	0		85.27	0.62 NO	0		
CB-18	18_(CB)	136_(STM)	SIDE	CB-57	57_(CB)	100_(STM)	SIDE	
87.222	0.62 NO	0		85.21	0.62 NO	0		
CB-19	19_(CB)	136_(STM)	SIDE	;CICB				
86.281	0.62 NO	0		OR-02	Maj-50	02_(CB)	SIDE	87.425
CB-20	20_(CB)	140_(STM)	SIDE	0.62	NO 0			
86.623	0.62 NO	0		;CICB				
CB-21	21_(CB)	140_(STM)	SIDE	OR-03	Maj-50	03_(CB)	SIDE	87.425
86.773	0.62 NO	0		0.62	NO 0			
CB-23	23_(CB)	144_(STM)	SIDE	;CICB				
86.923	0.62 NO	0		OR-04	Maj-52	04_(CB)	SIDE	87.472
CB-24	24_(CB)	144_(STM)	SIDE	0.62	NO 0			
86.923	0.62 NO	0		;CICB				
CB-25	25_(CB)	146_(STM)	SIDE	OR-05	Maj-52	05_(CB)	SIDE	87.472
86.775	0.82 NO	0		0.62	NO 0			
CB-26	26_(CB)	146_(STM)	SIDE	;CICB				
86.775	0.82 NO	0		OR-06	Maj-55	06_(CB)	SIDE	87.494
CB-27	27_(CB)	148_(STM)	SIDE	0.62	NO 0			
86.775	0.62 NO	0		OR-08	Maj-46	08_(CB)	BOTTOM	
CB-28	28_(CB)	148_(STM)	SIDE	87.407	0.62 NO	0		
86.775	0.62 NO	0		OR-09	Maj-46	09_(CB)	BOTTOM	
;On Slope				87.407	0.62 NO	0		
CB-30	30_(CB)	150_(STM)	SIDE	OR1	59_(CB)	112_(STM)	SIDE	
86.93	0.82 NO	0		85.85	0.62 NO	0		
;On Slope				OR-10	Maj-44	10_(CB)	BOTTOM	
CB-31	31_(CB)	150_(STM)	SIDE	87.539	0.62 NO	0		
87.62	0.82 NO	0		OR-11	Maj-44	11_(CB)	BOTTOM	
CB-32	32_(CB)	152_(STM)	SIDE	87.539	0.62 NO	0		
88.283	0.62 NO	0		OR-12	Maj-41	12_(CB)	BOTTOM	
CB-33	33_(CB)	152_(STM)	SIDE	87.62	0.62 NO	0		
88.243	0.62 NO	0		OR-13	Maj-41	13_(CB)	BOTTOM	
CB-34	34_(CB)	158_(STM)	SIDE	87.62	0.62 NO	0		
87.507	0.62 NO	0		OR-14	Maj-37	14_(CB)	BOTTOM	
CB-35	35_(CB)	158_(STM)	SIDE	87.993	0.62 NO	0		
87.507	0.62 NO	0		OR-15	Maj-37	15_(CB)	BOTTOM	
CB-36	36_(CB)	162_(STM)	SIDE	87.993	0.62 NO	0		
87.79	0.62 NO	0		OR-16	Maj-35	16_(CB)	BOTTOM	
CB-37	37_(CB)	162_(STM)	SIDE	88.149	0.62 NO	0		
87.792	0.62 NO	0		OR-17	Maj-35	17_(CB)	BOTTOM	
CB-40	40_(CB)	164_(STM)	SIDE	88.149	0.62 NO	0		
88.226	0.62 NO	0		OR-18	Maj-28	18_(CB)	BOTTOM	
CB-41	41_(CB)	164_(STM)	SIDE	88.251	0.62 NO	0		
88.125	0.62 NO	0		OR-19	Maj-28	19_(CB)	BOTTOM	
CB-42	42_(CB)	170_(STM)	SIDE	88.251	0.62 NO	0		
88.299	0.62 NO	0		;CICB				
CB-43	43_(CB)	170_(STM)	SIDE	OR2	Maj-48_3	59_(CB)	SIDE	
88.294	0.62 NO	0		87.647	0.62 NO	0		
CB-44	44_(CB)	142_(STM)	SIDE	OR-20	Maj-26	20_(CB)	BOTTOM	
86.921	0.62 NO	0		88.605	0.62 NO	0		
CB-45	45_(CB)	142_(STM)	SIDE	OR-21	Maj-26	21_(CB)	BOTTOM	
86.921	0.62 NO	0		88.605	0.62 NO	0		
CB-46	46_(CB)	132_(STM)	SIDE	OR-23	Maj-24	23_(CB)	BOTTOM	
86.884	0.62 NO	0		88.904	0.62 NO	0		
CB-47	47_(CB)	132_(STM)	SIDE	OR-24	Maj-24	24_(CB)	BOTTOM	
87.034	0.62 NO	0		88.904	0.62 NO	0		
CB-48	48_(CB)	130_(STM)	SIDE	OR-25	Maj-19	25_(CB)	BOTTOM	
86.373	0.62 NO	0		89.388	0.62 NO	0		
CB-49	49_(CB)	130_(STM)	SIDE	;CICB				
86.523	0.62 NO	0		OR-26	Maj-19	26_(CB)	SIDE	89.388
CB-50	50_(CB)	118_(STM)	SIDE	0.62	NO 0			
86.03	0.62 NO	0		;Double CB				
CB-51	51_(CB)	118_(STM)	SIDE	OR-27	Maj-21	27_(CB)	BOTTOM	
86.06	0.62 NO	0		88.595	0.62 NO	0		

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;Double CB
OR-28      Maj-21      28_(CB)      BOTTOM
88.595    0.62    NO    0
OR-30      Slope1      30_(CB)      BOTTOM
89.066    0.62    NO    0
;CICB
OR-31      Slope1      31_(CB)      SIDE      89.066
0.62    NO    0
OR-32      Maj-14      32_(CB)      BOTTOM
89.484    0.62    NO    0
OR-33      Maj-14      33_(CB)      BOTTOM
89.484    0.62    NO    0
OR-34      Maj-16      34_(CB)      BOTTOM
89.419    0.62    NO    0
OR-35      Maj-16      35_(CB)      BOTTOM
89.419    0.62    NO    0
OR-36      Maj-10      36_(CB)      BOTTOM
89.777    0.62    NO    0
OR-37      Maj-10      37_(CB)      BOTTOM
89.777    0.62    NO    0
OR-40      Maj-06_2     40_(CB)      BOTTOM
90.095    0.62    NO    0
OR-41      Maj-06_2     41_(CB)      BOTTOM
90.095    0.62    NO    0
OR-42      Maj-03      42_(CB)      BOTTOM
90.272    0.62    NO    0
OR-43      Maj-03      43_(CB)      BOTTOM
90.272    0.62    NO    0
OR-44      Maj-33      44_(CB)      BOTTOM
88.918    0.62    NO    0
OR-45      Maj-33      45_(CB)      BOTTOM
88.918    0.62    NO    0
OR-46      Maj-32      46_(CB)      BOTTOM
88.874    0.62    NO    0
OR-47      Maj-32      47_(CB)      BOTTOM
88.874    0.62    NO    0
OR-48      Maj-30      48_(CB)      BOTTOM
88.398    0.62    NO    0
OR-49      Maj-30      49_(CB)      BOTTOM
88.398    0.62    NO    0
OR-50      Maj-42      50_(CB)      BOTTOM
87.881    0.62    NO    0
OR-51      Maj-42      51_(CB)      BOTTOM
87.881    0.62    NO    0
OR-52      Maj-09      52_(CB)      BOTTOM
89.819    0.62    NO    0
OR-53      Maj-12      53_(CB)      BOTTOM
89.664    0.62    NO    0
OR-54      Maj-12      54_(CB)      BOTTOM
89.664    0.62    NO    0
OR-55      Maj-54      55_(CB)      BOTTOM
87.251    0.62    NO    0
;Double CB Grate
OR-57      Maj-58      57_(CB)      BOTTOM
87.162    0.62    NO    0
RYCB-01    RYCB_1_(RYCB) 06_(CB)      SIDE
86.3      0.62    NO    0
RYCB-02    RYCB_2_(RYCB) 112_(STM)     SIDE
86.01     0.62    NO    0
RYCB-03    1_(RYCB)      110_(STM)     SIDE
86.327    0.62    NO    0
RYCB-04    RYCB_4_(RYCB) StartNullStruct3 SIDE
86.42     0.62    NO    0
RYCB-06    RYCB_6_(RYCB) 128_(STM)     SIDE
86.075    0.82    NO    0
;Direct Connection
RYCB-07    15_RYCB      138_(STM)     SIDE
86.595    0.82    NO    0
RYCB-10    RYCB_10_(RYCB) 148_(STM)     SIDE
87.33     0.62    NO    0

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RYCB-18    Structure_-(18)_ (RYCB) 116_(STM) SIDE
85.879    0.82    NO    0
RYCB-22    22_(RYCB)      142_(STM)     SIDE
87.683    0.62    NO    0
RYCB-29    29_(RYCB)      STM-251_(STM) SIDE
88.539    0.62    NO    0
RYCB-38    38_(RYCB)      162_(STM)     SIDE
87.378    0.62    NO    0
RYCB-39    39_(RYCB)      162_(STM)     SIDE
88.671    0.62    NO    0

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[OUTLETS]
;Name      From Node      To Node      Offset  Type
QTable/Qcoeff Qexpon      Gated
;-----
B1-Out     B1_Stor      164_(STM)    90.5
TABULAR/HEAD B1-Out      NO
B2-Out     B2_Stor      164_(STM)    90.5
TABULAR/HEAD B2-Out      NO
B3-Out     B3_Stor      164_(STM)    90.5
TABULAR/HEAD B3-Out      NO
B4-Out     58_(CB)      2142_(STM)   85.4
TABULAR/HEAD B4-Out      NO

```

```

[XSECTIONS]
;Link      Shape      Geom1      Geom2      Geom3
Geom4      Barrels    Culvert
;-----
1_(STM)    CIRCULAR    0.375      0          0          0
1
10_(STM)   CIRCULAR    1.35       0          0          0
1
11_(STM)   CIRCULAR    1.35       0          0          0
1
12_(STM)   CIRCULAR    1.35       0          0          0
1
13_(STM)   CIRCULAR    1.35       0          0          0
1
14_(STM)   CIRCULAR    1.65       0          0          0
1
15_(10)_(STM) CIRCULAR    1.35       0          0
0 1
15_(11)_(STM) CIRCULAR    1.35       0          0
0 1
15_(12)_(STM) CIRCULAR    0.75       0          0
0 1
15_(13)_(STM) CIRCULAR    0.75       0          0
0 1
15_(14)_(STM) CIRCULAR    1.05       0          0
0 1
15_(15)_(STM) CIRCULAR    1.05       0          0
0 1
15_(16)_(STM) CIRCULAR    1.05       0          0
0 1
15_(19)_(STM) CIRCULAR    0.375     0          0
0 1
15_(20)_(STM) CIRCULAR    0.6        0          0          0
1
15_(21)_(STM) CIRCULAR    0.6        0          0          0
1
15_(22)_(STM) CIRCULAR    1.05       0          0
0 1
15_(3)_(STM)  CIRCULAR    0.375     0          0
0 1
15_(4)_(STM)  CIRCULAR    0.45       0          0          0
1
15_(5)_(STM)  CIRCULAR    0.525     0          0
0 1

```

15_(9)_(STM) 1	CIRCULAR	1.35	0	0	0	C21	IRREGULAR	24mROW-Dbl-Sidewalk	0	0
2_(STM) 1	CIRCULAR	0.375	0	0	0	C22	IRREGULAR	24mROW-Dbl-Sidewalk	0	0
3_(STM) 1	CIRCULAR	0.525	0	0	0	C23	IRREGULAR	18mROW-No-Sidewalk	0	0
4_(STM) 1	CIRCULAR	1.2	0	0	0	C24	IRREGULAR	18mROW-No-Sidewalk	0	0
5_(STM) 1	CIRCULAR	1.35	0	0	0	C25	IRREGULAR	18mROW-No-Sidewalk	0	0
6_(STM) 1	CIRCULAR	0.25	0	0	0	C26	IRREGULAR	18mROW-No-Sidewalk	0	0
7_(1)_(STM) 1	CIRCULAR	0.45	0	0	0	C27	TRIANGULAR	0.6 3.6 0 0		
7_(STM) 1	CIRCULAR	0.375	0	0	0	C27_1	IRREGULAR	18mROW-No-Sidewalk	0	0
8_(STM) 1	CIRCULAR	1.35	0	0	0	C27_2	IRREGULAR	18mROW-No-Sidewalk	0	0
9_(STM) 1	CIRCULAR	1.35	0	0	0	C28	IRREGULAR	18mROW-No-Sidewalk	0	0
C1 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C29	IRREGULAR	18mROW-No-Sidewalk	0	0
C1_1 0 1	IRREGULAR	18mROW-Dbl-Sidewalk	0	0		C3	IRREGULAR	18mROW-Dbl-Sidewalk	0	0
C1_2 0 1	IRREGULAR	18mROW-Dbl-Sidewalk	0	0		C30	IRREGULAR	18mROW-No-Sidewalk	0	0
C10 0 1	IRREGULAR	18mROWwSidewalk	0	0		C31	TRIANGULAR	0.6 3.6 0 0		
C11 0 1	IRREGULAR	18mROWwSidewalk	0	0		C31_1	TRIANGULAR	0.6 3.6 0 0		
C12 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C31_2	TRIANGULAR	0.6 3.6 0 0		
C13 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C32	IRREGULAR	18mROW-No-Sidewalk	0	0
C14 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C33	IRREGULAR	18mROW-No-Sidewalk	0	0
C15 0 1	IRREGULAR	18mROWwSidewalk	0	0		C34	IRREGULAR	18mROW-No-Sidewalk	0	0
C16 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C35	IRREGULAR	18mROW-No-Sidewalk	0	0
C17 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C36	IRREGULAR	18mROW-No-Sidewalk	0	0
C18 1	TRIANGULAR	0.6 3.6 0 0				C37	IRREGULAR	18mROW-No-Sidewalk	0	0
C18_2 0 0	IRREGULAR	18mROW-No-Sidewalk	0	0		C38	IRREGULAR	18mROW-No-Sidewalk	0	0
C18_3 0 1	IRREGULAR	18mROWwSidewalk	0	0		C39	IRREGULAR	18mROW-No-Sidewalk	0	0
C18_4 0 1	IRREGULAR	18mROWwSidewalk	0	0		C4	TRIANGULAR	0.6 3.6 0 0		
C18_5 0 0	IRREGULAR	24mROW-Dbl-Sidewalk	0	0		C4_1	IRREGULAR	18mROW-Dbl-Sidewalk	0	0
C18_6 0 0	IRREGULAR	24mROW-Dbl-Sidewalk	0	0		C4_2	IRREGULAR	18mROW-Dbl-Sidewalk	0	0
C18_7 0 0	IRREGULAR	18mROW-No-Sidewalk	0	0		C4_3	TRIANGULAR	0.6 3.6 0 0		
C18_8 0 0	IRREGULAR	24mROW-Dbl-Sidewalk	0	0		C4_4	TRIANGULAR	0.6 3.6 0 0		
C18_9 0 0	IRREGULAR	24mROW-Dbl-Sidewalk	0	0		C40	IRREGULAR	18mROW-No-Sidewalk	0	0
C19 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C41	IRREGULAR	18mROW-No-Sidewalk	0	0
C2 0 1	IRREGULAR	18mROW-No-Sidewalk	0	0		C42	IRREGULAR	18mROW-No-Sidewalk	0	0
C2_1 0 1	IRREGULAR	18mROW-Dbl-Sidewalk	0	0		C43	IRREGULAR	18mROW-No-Sidewalk	0	0
C2_2 0 1	IRREGULAR	18mROW-Dbl-Sidewalk	0	0		C44	IRREGULAR	18mROW-No-Sidewalk	0	0
C20 0 1	IRREGULAR	24mROW-Dbl-Sidewalk	0	0		C45	IRREGULAR	18mROW-No-Sidewalk	0	0

C46	IRREGULAR	18mROW-No-Sidewalk	0	0	C66_1	TRIANGULAR	0.6	3.6	0	0	
0	1				1						
C47	IRREGULAR	18mROW-No-Sidewalk	0	0	C66_2	TRIANGULAR	0.6	3.6	0	0	
0	1				1						
C48	IRREGULAR	18mROW-No-Sidewalk	0	0	C67	TRIANGULAR	0.6	3.6	0	0	
0	1				1						
C49	IRREGULAR	18mROW-No-Sidewalk	0	0	C68	TRIANGULAR	0.6	3.6	0	0	
0	1				1						
C5	TRIANGULAR	0.6	3.6	0	0	C69	TRIANGULAR	0.6	3.6	0	0
1					1						
C5_1	IRREGULAR	18mROW-DbI-Sidewalk	0	0	C7	IRREGULAR	18mROW-DbI-Sidewalk	0	0		
0	1				0	1					
C5_2	IRREGULAR	18mROW-DbI-Sidewalk	0	0	C8	IRREGULAR	18mROW-DbI-Sidewalk	0	0		
0	1				0	1					
C50	TRIANGULAR	0.6	3.6	0	0	C9	IRREGULAR	18mROWwSidewalk	0	0	
1					0	1					
C50_1	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(1)_ (RYCB)_1	CIRCULAR	0.25	0	0		
0	1				0	1					
C50_3	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(10)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C50_4	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(100)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C51	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(101)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C52	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(103)_ (1)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C53	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(103)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C54	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(109)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C55	IRREGULAR	18mROW-No-Sidewalk	0	0	Pipe_-(11)_ (RYCB)	CIRCULAR	0.3	0	0		
0	1				0	1					
C56	TRIANGULAR	0.6	3.6	0	0	Pipe_-(110)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C57	IRREGULAR	18mROW-No-Sidewalk	0	0	Pipe_-(111)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C58	TRIANGULAR	0.6	3.6	0	0	Pipe_-(114)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C58_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(117)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C58_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(118)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C59_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(119)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C59_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(120)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C6	TRIANGULAR	0.6	3.6	0	0	Pipe_-(121)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C6_1	IRREGULAR	18mROW-DbI-Sidewalk	0	0	Pipe_-(122)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C6_2	IRREGULAR	18mROW-DbI-Sidewalk	0	0	Pipe_-(123)_ (RYCB)	CIRCULAR	0.25	0	0		
0	1				0	1					
C60	TRIANGULAR	0.6	3.6	0	0	Pipe_-(124)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C61_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(125)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C61_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(126)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C62	TRIANGULAR	0.6	3.6	0	0	Pipe_-(127)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C63_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(128)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C63_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(129)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C64	TRIANGULAR	0.6	3.6	0	0	Pipe_-(130)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C65_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(131)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					
C65_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(132)_ (RYCB)	CIRCULAR	0.25	0	0	
1					0	1					

Pipe_-(133)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(2)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(134)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(22)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(137)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(23)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(138)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(24)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(139)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(25)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(14)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(27)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(140)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(73)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(141)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(74)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(142)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(77)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(143)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(87)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(144)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(88)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(145)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(89)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(146)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(9)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(147)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(90)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(148)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(93)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(149)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(94)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(15)_ (RYCB) CIRCULAR 0.3	0	0	Pipe_-(95)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(150)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(96)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(151)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(98)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(152)_ (RYCB) CIRCULAR 0.25	0	0	Pipe_-(99)_ (RYCB) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(153)_ (RYCB) CIRCULAR 0.25	0	0	STM-23_ (STM) CIRCULAR 0.45	0	0
0_1			0_1		
Pipe_-(154)_ (RYCB) CIRCULAR 0.25	0	0	STM-24_ (STM) CIRCULAR 0.45	0	0
0_1			0_1		
Pipe_-(155)_ (RYCB) CIRCULAR 0.25	0	0	STM-27_ (STM) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(156)_ (1)_ (RYCB) CIRCULAR 0.25	0	0	STM-28_ (STM) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(156)_ (RYCB) CIRCULAR 0.25	0	0	STM-34_ (1)_ (1)_ (STM) CIRCULAR 1.65	0	0
0_1			0_1		
Pipe_-(157)_ (RYCB) CIRCULAR 0.25	0	0	STM-34_ (1)_ (STM) CIRCULAR 1.65	0	0
0_1			0_1		
Pipe_-(159)_ (RYCB) CIRCULAR 0.25	0	0	STM-34_ (STM) CIRCULAR 1.65	0	0
0_1			0_1		
Pipe_-(16)_ (RYCB) CIRCULAR 0.25	0	0	STM-35_ (STM) CIRCULAR 1.65	0	0
0_1			0_1		
Pipe_-(160)_ (RYCB) CIRCULAR 0.25	0	0	STM-36_ (STM) CIRCULAR 1.65	0	0
0_1			0_1		
Pipe_-(161)_ (RYCB) CIRCULAR 0.25	0	0	STM-37_ (STM) CIRCULAR 1.8	0	0
0_1			0_1		
Pipe_-(162)_ (RYCB) CIRCULAR 0.25	0	0	STM-38_ (STM) CIRCULAR 1.8	0	0
0_1			0_1		
Pipe_-(164)_ (RYCB) CIRCULAR 0.25	0	0	STM-81_ (STM) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(165)_ (RYCB) CIRCULAR 0.25	0	0	STM-82_ (STM) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(17)_ (RYCB) CIRCULAR 0.25	0	0	STM-83_ (STM) CIRCULAR 0.25	0	0
0_1			0_1		
Pipe_-(19)_ (RYCB) CIRCULAR 0.25	0	0	CB-02 CIRCULAR 0.094	0	0
0_1			CB-03 CIRCULAR 0.102	0	0

CB-04	CIRCULAR	0.094	0	0	0	OR-13	RECT_CLOSED	0.35	0.35	0
CB-05	CIRCULAR	0.094	0	0	0	0				
CB-06	CIRCULAR	0.127	0	0	0	OR-14	RECT_CLOSED	0.35	0.35	0
CB-08	CIRCULAR	0.102	0	0	0	0				
CB-09	CIRCULAR	0.094	0	0	0	OR-15	RECT_CLOSED	0.35	0.35	0
CB-10	CIRCULAR	0.108	0	0	0	0				
CB-11	CIRCULAR	0.127	0	0	0	OR-16	RECT_CLOSED	0.35	0.35	0
CB-12	CIRCULAR	0.127	0	0	0	0				
CB-13	CIRCULAR	0.127	0	0	0	OR-17	RECT_CLOSED	0.35	0.35	0
CB-14	CIRCULAR	0.094	0	0	0	0				
CB-15	CIRCULAR	0.094	0	0	0	OR-18	RECT_CLOSED	0.35	0.35	0
CB-16	CIRCULAR	0.083	0	0	0	0				
CB-17	CIRCULAR	0.094	0	0	0	OR-19	RECT_CLOSED	0.35	0.35	0
CB-18	CIRCULAR	0.152	0	0	0	0				
CB-19	CIRCULAR	0.152	0	0	0	OR2	RECT_CLOSED	0.13	0.65	0
CB-20	CIRCULAR	0.108	0	0	0	0				
CB-21	CIRCULAR	0.108	0	0	0	OR-20	RECT_CLOSED	0.35	0.35	0
CB-23	CIRCULAR	0.127	0	0	0	0				
CB-24	CIRCULAR	0.127	0	0	0	OR-21	RECT_CLOSED	0.35	0.35	0
CB-25	CIRCULAR	0.25	0	0	0	0				
CB-26	CIRCULAR	0.25	0	0	0	OR-23	RECT_CLOSED	0.35	0.35	0
CB-27	CIRCULAR	0.152	0	0	0	0				
CB-28	CIRCULAR	0.152	0	0	0	OR-24	RECT_CLOSED	0.35	0.35	0
CB-30	CIRCULAR	0.2	0	0	0	0				
CB-31	CIRCULAR	0.2	0	0	0	OR-25	RECT_CLOSED	0.35	0.35	0
CB-32	CIRCULAR	0.127	0	0	0	0				
CB-33	CIRCULAR	0.152	0	0	0	OR-26	RECT_CLOSED	0.13	0.65	0
CB-34	CIRCULAR	0.127	0	0	0	0				
CB-35	CIRCULAR	0.127	0	0	0	OR-27	RECT_CLOSED	0.35	0.7	0
CB-36	CIRCULAR	0.108	0	0	0	0				
CB-37	CIRCULAR	0.127	0	0	0	OR-28	RECT_CLOSED	0.35	0.7	0
CB-40	CIRCULAR	0.127	0	0	0	0				
CB-41	CIRCULAR	0.127	0	0	0	OR-30	RECT_CLOSED	0.35	0.35	0
CB-42	CIRCULAR	0.102	0	0	0	0				
CB-43	CIRCULAR	0.108	0	0	0	OR-31	RECT_CLOSED	0.13	0.65	0
CB-44	CIRCULAR	0.102	0	0	0	0				
CB-45	CIRCULAR	0.083	0	0	0	OR-32	RECT_CLOSED	0.35	0.35	0
CB-46	CIRCULAR	0.102	0	0	0	0				
CB-47	CIRCULAR	0.094	0	0	0	OR-33	RECT_CLOSED	0.35	0.35	0
CB-48	CIRCULAR	0.094	0	0	0	0				
CB-49	CIRCULAR	0.094	0	0	0	OR-34	RECT_CLOSED	0.35	0.35	0
CB-50	CIRCULAR	0.127	0	0	0	0				
CB-51	CIRCULAR	0.127	0	0	0	OR-35	RECT_CLOSED	0.35	0.35	0
CB-52	CIRCULAR	0.178	0	0	0	0				
CB-53	CIRCULAR	0.127	0	0	0	OR-36	RECT_CLOSED	0.35	0.35	0
CB-54	CIRCULAR	0.127	0	0	0	0				
CB-55	CIRCULAR	0.127	0	0	0	OR-37	RECT_CLOSED	0.35	0.35	0
CB-57	CIRCULAR	0.127	0	0	0	0				
OR-02	RECT_CLOSED	0.13	0.65	0		OR-40	RECT_CLOSED	0.35	0.35	0
0						0				
OR-03	RECT_CLOSED	0.13	0.65	0		OR-41	RECT_CLOSED	0.35	0.35	0
0						0				
OR-04	RECT_CLOSED	0.13	0.65	0		OR-42	RECT_CLOSED	0.35	0.35	0
0						0				
OR-05	RECT_CLOSED	0.13	0.65	0		OR-43	RECT_CLOSED	0.35	0.35	0
0						0				
OR-06	RECT_CLOSED	0.13	0.65	0		OR-44	RECT_CLOSED	0.35	0.35	0
0						0				
OR-08	RECT_CLOSED	0.35	0.35	0		OR-45	RECT_CLOSED	0.35	0.35	0
0						0				
OR-09	RECT_CLOSED	0.35	0.35	0		OR-46	RECT_CLOSED	0.35	0.35	0
0						0				
OR1	CIRCULAR	0.083	0	0	0	OR-47	RECT_CLOSED	0.35	0.35	0
OR-10	RECT_CLOSED	0.35	0.35	0		0				
0						OR-48	RECT_CLOSED	0.35	0.35	0
OR-11	RECT_CLOSED	0.35	0.35	0		0				
0						OR-49	RECT_CLOSED	0.35	0.35	0
OR-12	RECT_CLOSED	0.35	0.35	0		0				
0						OR-50	RECT_CLOSED	0.35	0.35	0
						0				

OR-51 RECT_CLOSED 0.35 0.35 0
0
OR-52 RECT_CLOSED 0.35 0.35 0
0
OR-53 RECT_CLOSED 0.35 0.35 0
0
OR-54 RECT_CLOSED 0.35 0.35 0
0
OR-55 RECT_CLOSED 0.35 0.35 0
0
OR-57 RECT_CLOSED 0.7 0.35 0
0
RYCB-01 CIRCULAR 0.127 0 0 0
RYCB-02 CIRCULAR 0.127 0 0 0
RYCB-03 CIRCULAR 0.152 0 0 0
RYCB-04 CIRCULAR 0.152 0 0 0
RYCB-06 CIRCULAR 0.2 0 0 0
RYCB-07 CIRCULAR 0.25 0 0 0
RYCB-10 CIRCULAR 0.178 0 0 0
RYCB-18 CIRCULAR 0.2 0 0 0
RYCB-22 CIRCULAR 0.152 0 0 0
RYCB-29 CIRCULAR 0.152 0 0 0
RYCB-38 CIRCULAR 0.152 0 0 0
RYCB-39 CIRCULAR 0.152 0 0 0

[TRANSECTS]

;;Transect Data in HEC-2 format

NC 0.035 0.035 0.013
X1 16.5mROW-Dbl-Sidewalk 9 2 14.5 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10.9 0.15 2 0.15 4 0 4.01
0.13 8.25
GR 0 12.49 0.15 12.5 0.15 14.5 0.6 25.6

NC 0.035 0.035 0.013
X1 16.5mROW-No-Sidewalk 9 3.8 12.7 0.0 0.0
0.0 0.0 0.0
GR 0.6 -9.1 0.15 3.8 0.15 4 0 4.01
0.13 8.25
GR 0 12.49 0.15 12.5 0.15 12.7 0.6 25.6

NC 0.035 0.035 0.013
X1 16.5mROWwSidewalk 9 2 12.7 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10.9 0.15 2 0.15 4 0 4.01
0.13 8.25
GR 0 12.49 0.15 12.5 0.15 12.7 0.6 25.6

NC 0.035 0.035 0.013
X1 18mROW-Dbl-Sidewalk 9 5.5 18 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10 0.09 5.5 0.08 7.5 0 7.5
0.13 11.75
GR 0 16 0.08 16 0.09 18 0.6 29.25

NC 0.035 0.035 0.013
X1 18mROW-No-Sidewalk 7 7.5 16 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10 0.08 7.5 0 7.5 0.13 11.75
0 16
GR 0.08 16 0.6 29.25

NC 0.035 0.035 0.013
X1 18mROWwSidewalk 8 2.75 16 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10 0.09 2.75 0.08 7.5 0 7.5
0.13 11.75
GR 0 16 0.08 16 0.6 29.25

NC 0.035 0.035 0.013
X1 18mROWwSidewalk-Half 5 2.75 16 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10 0.09 2.75 0.08 7.5 0 7.5
0.13 11.75
;
NC 0.035 0.035 0.013
X1 24mROW-Dbl-Sidewalk 9 3.6 20.4 0.0 0.0
0.0 0.0 0.0
GR 0.6 -9.3 0.15 3.6 0.15 7.5 0 7.51
0.13 12
GR 0 16.49 0.15 16.5 0.15 20.4 0.6 33.3

[LOSSES]

;;Link Kentry Kexit Kavg Flap Gate Seepage

Link	Kentry	Kexit	Kavg	Flap	Gate	Seepage
1_(STM)	0	0.47	0	NO		0
10_(STM)	0	0.26	0	NO		0
11_(STM)	0	0.11	0	NO		0
12_(STM)	0	1.33	0	NO		0
13_(STM)	0	0.02	0	NO		0
14_(STM)	0	0.47	0	NO		0
15_(10)_(STM)	0	0.39	0	NO		0
15_(11)_(STM)	0	0.035	0	NO		0
15_(12)_(STM)	0	0.035	0	NO		0
15_(13)_(STM)	0	1.33	0	NO		0
15_(14)_(STM)	0	0.47	0	NO		0
15_(15)_(STM)	0	0.39	0	NO		0
15_(16)_(STM)	0	1.33	0	NO		0
15_(19)_(STM)	0	0.02	0	NO		0
15_(20)_(STM)	0	0.055	0	NO		0
15_(21)_(STM)	0	0.08	0	NO		0
15_(22)_(STM)	0	0.16	0	NO		0
15_(3)_(STM)	0	0.39	0	NO		0
15_(4)_(STM)	0	0.39	0	NO		0
15_(5)_(STM)	0	0.02	0	NO		0
15_(9)_(STM)	0	0.47	0	NO		0
2_(STM)	0	0.47	0	NO		0
3_(STM)	0	0.035	0	NO		0
4_(STM)	0	0.035	0	NO		0
5_(STM)	0	1.33	0	NO		0
6_(STM)	0	1.33	0	NO		0
7_(1)_(STM)	0	1.33	0	NO		0
7_(STM)	0	0.02	0	NO		0
8_(STM)	0	0.035	0	NO		0
9_(STM)	0	0.32	0	NO		0
Pipe -(1)_(RYCB)	1	0.02	0	NO		0
Pipe -(10)_(RYCB)	0	1.33	0	NO		0
Pipe -(101)_(RYCB)	0	1.33	0	NO		0
Pipe -(103)_(1)_(RYCB)	0	1.33	0	NO		0
Pipe -(103)_(RYCB)	0	0.02	0	NO		0
Pipe -(109)_(RYCB)	0	1.33	0	NO		0
Pipe -(110)_(RYCB)	0	0.02	0	NO		0
Pipe -(111)_(RYCB)	0	1.33	0	NO		0
Pipe -(114)_(RYCB)	0	0.035	0	NO		0
Pipe -(117)_(RYCB)	0	0.035	0	NO		0
Pipe -(118)_(RYCB)	0	0.035	0	NO		0
Pipe -(119)_(RYCB)	0	0.035	0	NO		0
Pipe -(120)_(RYCB)	0	0.035	0	NO		0
Pipe -(121)_(RYCB)	0	1.33	0	NO		0
Pipe -(122)_(RYCB)	0	1.33	0	NO		0
Pipe -(123)_(RYCB)	0	0.035	0	NO		0
Pipe -(124)_(RYCB)	0	0.02	0	NO		0
Pipe -(125)_(RYCB)	0	0.635	0	NO		0
Pipe -(126)_(RYCB)	0	0.035	0	NO		0
Pipe -(127)_(RYCB)	0	0.035	0	NO		0
Pipe -(128)_(RYCB)	0	0.035	0	NO		0
Pipe -(129)_(RYCB)	0	0.035	0	NO		0
Pipe -(130)_(RYCB)	0	1.33	0	NO		0
Pipe -(131)_(RYCB)	0	1.33	0	NO		0

Pipe _ (132)_ (RYCB) 0	0.02	0	NO	0	102mm-ICD	0.35	0.03
Pipe _ (133)_ (RYCB) 0	0.02	0	NO	0			
Pipe _ (134)_ (RYCB) 0	0.035	0	NO	0	102mm-ICD-RLCB Rating	0	0
Pipe _ (137)_ (RYCB) 0	0.035	0	NO	0	102mm-ICD-RLCB	0.01	0.0301
Pipe _ (138)_ (RYCB) 0	0.02	0	NO	0	102mm-ICD-RLCB	0.15	0.0312
Pipe _ (139)_ (RYCB) 0	0.08	0	NO	0	102mm-ICD-RLCB	0.3	0.0328
Pipe _ (14)_ (RYCB) 0	1.33	0	NO	0	102mm-ICD-RLCB	0.35	0.0332
Pipe _ (140)_ (RYCB) 0	1.33	0	NO	0			
Pipe _ (141)_ (RYCB) 0	0.035	0	NO	0	;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).		
Pipe _ (142)_ (RYCB) 0	0.035	0	NO	0	;Depth from top of CB		
Pipe _ (143)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD Rating	0	0
Pipe _ (144)_ (RYCB) 0	0.54	0	NO	0	108mm-ICD	0.01	0.0298
Pipe _ (145)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD	0.15	0.0312
Pipe _ (146)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD	0.3	0.0332
Pipe _ (147)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD	0.35	0.0337
Pipe _ (148)_ (RYCB) 0	0.02	0	NO	0			
Pipe _ (149)_ (RYCB) 0	0.035	0	NO	0			
Pipe _ (15)_ (RYCB) 0	0.84	0	NO	0	108mm-ICD-RLCB Rating	0	0
Pipe _ (150)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD-RLCB	0.01	0.0338
Pipe _ (151)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD-RLCB	0.15	0.035
Pipe _ (152)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD-RLCB	0.3	0.0367
Pipe _ (153)_ (RYCB) 0	0.035	0	NO	0	108mm-ICD-RLCB	0.35	0.0372
Pipe _ (154)_ (RYCB) 0	0.02	0	NO	0			
Pipe _ (155)_ (RYCB) 0	1.33	0	NO	0	;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).		
Pipe _ (156)_ (1)_ (RYCB) 0	0.84	0	NO	0	;Depth from top of CB		
Pipe _ (156)_ (RYCB) 0	0.02	0	NO	0	127mm-ICD Rating	0	0
Pipe _ (157)_ (RYCB) 0	1.33	0	NO	0	127mm-ICD	0.01	0.0413
Pipe _ (159)_ (RYCB) 0	0.02	0	NO	0	127mm-ICD	0.15	0.0432
Pipe _ (160)_ (RYCB) 0	1.33	0	NO	0	127mm-ICD	0.3	0.0458
Pipe _ (161)_ (RYCB) 0	0.035	0	NO	0	127mm-ICD	0.35	0.0466
Pipe _ (165)_ (RYCB) 0	0.035	0	NO	0			
Pipe _ (2)_ (RYCB) 0	0.02	0	NO	0			
Pipe _ (87)_ (RYCB) 0	0.02	0	NO	0	127mm-ICD-RLCB Rating	0	0
Pipe _ (89)_ (RYCB) 0	1.33	0	NO	0	127mm-ICD-RLCB	0.01	0.047
Pipe _ (93)_ (RYCB) 0	0.02	0	NO	0	127mm-ICD-RLCB	0.15	0.048
Pipe _ (94)_ (RYCB) 0	0.02	0	NO	0	127mm-ICD-RLCB	0.3	0.051
Pipe _ (95)_ (RYCB) 0	0.035	0	NO	0	127mm-ICD-RLCB	0.35	0.052
Pipe _ (96)_ (RYCB) 0	1.33	0	NO	0			
Pipe _ (98)_ (RYCB) 0	0.035	0	NO	0	;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).		
Pipe _ (99)_ (RYCB) 0	0.035	0	NO	0	;Depth from top of CB		
STM-23_ (STM) 0	1.33	0	NO	0	152mm-ICD Rating	0	0
STM-24_ (STM) 0	0.08	0	NO	0	152mm-ICD	0.01	0.0591
STM-27_ (STM) 0	0.035	0	NO	0	152mm-ICD	0.15	0.0618
STM-28_ (STM) 0	0.055	0	NO	0	152mm-ICD	0.3	0.0657
STM-34_ (1)_ (1)_ (STM) 0	1.07	0	NO	0	152mm-ICD	0.35	0.0667
STM-34_ (1)_ (STM) 0	0.08	0	NO	0			
STM-34_ (STM) 0	0.54	0	NO	0			
STM-35_ (STM) 0	0.32	0	NO	0	152mm-ICD-RLCB Rating	0	0
STM-36_ (STM) 0	0.39	0	NO	0	152mm-ICD-RLCB	0.01	0.067
STM-37_ (STM) 0	0.73	0	NO	0	152mm-ICD-RLCB	0.15	0.069
STM-81_ (STM) 0	1.33	0	NO	0	152mm-ICD-RLCB	0.3	0.073
STM-82_ (STM) 0	1.33	0	NO	0	152mm-ICD-RLCB	0.35	0.074
STM-83_ (STM) 0	1.33	0	NO	0			
[CURVES]					;Sx0.03		
;;Name Type X-Value Y-Value					16ROW_1CB_So0.005 Rating	0	0
;;-----					16ROW_1CB_So0.005	0.01	0.0003
;100% capture of flow to this CB					16ROW_1CB_So0.005	0.02	0.0011
100%_Capture	Rating	0	0	16ROW_1CB_So0.005	0.03	0.0037	
100%_Capture	0.01	0.001		16ROW_1CB_So0.005	0.04	0.0072	
100%_Capture	0.1	1		16ROW_1CB_So0.005	0.05	0.0132	
100%_Capture	0.3	5		16ROW_1CB_So0.005	0.06	0.0168	
				16ROW_1CB_So0.005	0.07	0.0214	
				16ROW_1CB_So0.005	0.08	0.0253	
;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).					16ROW_1CB_So0.005	0.09	0.0286
;Depth from top of CB					16ROW_1CB_So0.005	0.1	0.0331
102mm-ICD	Rating	0	0	16ROW_1CB_So0.005	0.11	0.0367	
102mm-ICD	0.01	0.0266		16ROW_1CB_So0.005	0.12	0.0409	
102mm-ICD	0.15	0.0278		16ROW_1CB_So0.005	0.13	0.0446	
102mm-ICD	0.3	0.0296		16ROW_1CB_So0.005	0.14	0.048	
				16ROW_1CB_So0.005	0.15	0.049	

16ROW_1CB_So0.005	0.16	0.049
16ROW_1CB_So0.005	0.17	0.049
16ROW_1CB_So0.005	0.18	0.049
16ROW_1CB_So0.005	0.19	0.049
16ROW_1CB_So0.005	0.2	0.049
16ROW_1CB_So0.005	0.21	0.049
16ROW_1CB_So0.005	0.22	0.049
16ROW_1CB_So0.005	0.23	0.049
16ROW_1CB_So0.005	0.24	0.049
16ROW_1CB_So0.005	0.25	0.049
16ROW_1CB_So0.005	0.26	0.049
16ROW_1CB_So0.005	0.27	0.049
16ROW_1CB_So0.005	0.28	0.049
16ROW_1CB_So0.005	0.29	0.049
16ROW_1CB_So0.005	0.3	0.049
16ROW_1CB_So0.005	0.31	0.049
16ROW_1CB_So0.005	0.32	0.049
16ROW_1CB_So0.005	0.33	0.049
16ROW_1CB_So0.005	0.34	0.049
16ROW_1CB_So0.005	0.35	0.049
16ROW_1CB_So0.005	0.36	0.049
16ROW_1CB_So0.005	0.37	0.049
16ROW_1CB_So0.005	0.38	0.049
16ROW_1CB_So0.005	0.39	0.049
16ROW_1CB_So0.005	0.4	0.049

;Sx0.03

16ROW_1CB_So0.01	Rating	0	0
16ROW_1CB_So0.01		0.01	0.0005
16ROW_1CB_So0.01		0.02	0.0016
16ROW_1CB_So0.01		0.03	0.0052
16ROW_1CB_So0.01		0.04	0.0101
16ROW_1CB_So0.01		0.05	0.0158
16ROW_1CB_So0.01		0.06	0.0206
16ROW_1CB_So0.01		0.07	0.0254
16ROW_1CB_So0.01		0.08	0.029
16ROW_1CB_So0.01		0.09	0.0343
16ROW_1CB_So0.01		0.1	0.0382
16ROW_1CB_So0.01		0.11	0.043
16ROW_1CB_So0.01		0.12	0.0463
16ROW_1CB_So0.01		0.13	0.049
16ROW_1CB_So0.01		0.14	0.049
16ROW_1CB_So0.01		0.15	0.049
16ROW_1CB_So0.01		0.16	0.049
16ROW_1CB_So0.01		0.17	0.049
16ROW_1CB_So0.01		0.18	0.049
16ROW_1CB_So0.01		0.19	0.049
16ROW_1CB_So0.01		0.2	0.049
16ROW_1CB_So0.01		0.21	0.049
16ROW_1CB_So0.01		0.22	0.049
16ROW_1CB_So0.01		0.23	0.049
16ROW_1CB_So0.01		0.24	0.049
16ROW_1CB_So0.01		0.25	0.049
16ROW_1CB_So0.01		0.26	0.049
16ROW_1CB_So0.01		0.27	0.049
16ROW_1CB_So0.01		0.28	0.049
16ROW_1CB_So0.01		0.29	0.049
16ROW_1CB_So0.01		0.3	0.049
16ROW_1CB_So0.01		0.31	0.049
16ROW_1CB_So0.01		0.32	0.049
16ROW_1CB_So0.01		0.33	0.049
16ROW_1CB_So0.01		0.34	0.049
16ROW_1CB_So0.01		0.35	0.049
16ROW_1CB_So0.01		0.36	0.049
16ROW_1CB_So0.01		0.37	0.049

;Sx0.03

16ROW_1CB_So0.02	Rating	0	0
16ROW_1CB_So0.02		0.01	0.0006
16ROW_1CB_So0.02		0.02	0.0019

16ROW_1CB_So0.02	0.03	0.0062
16ROW_1CB_So0.02	0.04	0.012
16ROW_1CB_So0.02	0.05	0.0154
16ROW_1CB_So0.02	0.06	0.0192
16ROW_1CB_So0.02	0.07	0.0236
16ROW_1CB_So0.02	0.08	0.0275
16ROW_1CB_So0.02	0.09	0.0316
16ROW_1CB_So0.02	0.1	0.0363
16ROW_1CB_So0.02	0.11	0.041
16ROW_1CB_So0.02	0.12	0.045
16ROW_1CB_So0.02	0.13	0.045
16ROW_1CB_So0.02	0.14	0.045
16ROW_1CB_So0.02	0.15	0.045
16ROW_1CB_So0.02	0.16	0.045
16ROW_1CB_So0.02	0.17	0.045
16ROW_1CB_So0.02	0.18	0.045
16ROW_1CB_So0.02	0.19	0.045
16ROW_1CB_So0.02	0.2	0.045
16ROW_1CB_So0.02	0.21	0.045
16ROW_1CB_So0.02	0.22	0.045
16ROW_1CB_So0.02	0.23	0.045
16ROW_1CB_So0.02	0.24	0.045
16ROW_1CB_So0.02	0.25	0.045
16ROW_1CB_So0.02	0.26	0.045
16ROW_1CB_So0.02	0.27	0.045
16ROW_1CB_So0.02	0.28	0.045
16ROW_1CB_So0.02	0.29	0.045
16ROW_1CB_So0.02	0.3	0.045
16ROW_1CB_So0.02	0.31	0.045
16ROW_1CB_So0.02	0.32	0.045

;Sx0.03

16ROW_1CB_So0.03	Rating	0	0
16ROW_1CB_So0.03		0.01	0.0005
16ROW_1CB_So0.03		0.02	0.0017
16ROW_1CB_So0.03		0.03	0.0057
16ROW_1CB_So0.03		0.04	0.011
16ROW_1CB_So0.03		0.05	0.0146
16ROW_1CB_So0.03		0.06	0.0179
16ROW_1CB_So0.03		0.07	0.0216
16ROW_1CB_So0.03		0.08	0.0256
16ROW_1CB_So0.03		0.09	0.0298
16ROW_1CB_So0.03		0.1	0.0335
16ROW_1CB_So0.03		0.11	0.038
16ROW_1CB_So0.03		0.12	0.039
16ROW_1CB_So0.03		0.13	0.039
16ROW_1CB_So0.03		0.14	0.039
16ROW_1CB_So0.03		0.15	0.039
16ROW_1CB_So0.03		0.16	0.039
16ROW_1CB_So0.03		0.17	0.039
16ROW_1CB_So0.03		0.18	0.039
16ROW_1CB_So0.03		0.19	0.039
16ROW_1CB_So0.03		0.2	0.039
16ROW_1CB_So0.03		0.21	0.039
16ROW_1CB_So0.03		0.22	0.039
16ROW_1CB_So0.03		0.23	0.039
16ROW_1CB_So0.03		0.24	0.039
16ROW_1CB_So0.03		0.25	0.039
16ROW_1CB_So0.03		0.26	0.039
16ROW_1CB_So0.03		0.27	0.039
16ROW_1CB_So0.03		0.28	0.039
16ROW_1CB_So0.03		0.29	0.039
16ROW_1CB_So0.03		0.3	0.039

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

178mm-ICD	Rating	0	0
178mm-ICD		0.01	0.0811
178mm-ICD		0.15	0.0848

178mm-ICD	0.3	0.0901
178mm-ICD	0.35	0.0915
178mm-ICD-RLCB Rating	0	0
178mm-ICD-RLCB	0.01	0.092
178mm-ICD-RLCB	0.15	0.095
178mm-ICD-RLCB	0.3	0.1
178mm-ICD-RLCB	0.35	0.101

;1 Single CB on single lead pipe. Single CB is limited by 250mm Lead pipe at 1.2m head. Q=195.3 L/s

1-CB	Rating	0	0
1-CB		0.05	0.1953
1-CB		1	0.1954

;1 DCB on single lead pipe. DCB is limited by 300mm Lead pipe at 1.2m head. Q=281.2 L/s

1-DCB	Rating	0	0
1-DCB		0.05	0.2812
1-DCB		1	0.2813

;Sx0.03

24ROW_1CB_So0.005 Rating	0	0
24ROW_1CB_So0.005	0.01	0.0004
24ROW_1CB_So0.005	0.02	0.0012
24ROW_1CB_So0.005	0.03	0.0039
24ROW_1CB_So0.005	0.04	0.0076
24ROW_1CB_So0.005	0.05	0.0136
24ROW_1CB_So0.005	0.06	0.0174
24ROW_1CB_So0.005	0.07	0.022
24ROW_1CB_So0.005	0.08	0.0258
24ROW_1CB_So0.005	0.09	0.0296
24ROW_1CB_So0.005	0.1	0.034
24ROW_1CB_So0.005	0.11	0.0378
24ROW_1CB_So0.005	0.12	0.0418
24ROW_1CB_So0.005	0.13	0.0453
24ROW_1CB_So0.005	0.14	0.0486
24ROW_1CB_So0.005	0.15	0.049
24ROW_1CB_So0.005	0.16	0.049
24ROW_1CB_So0.005	0.17	0.049
24ROW_1CB_So0.005	0.18	0.049
24ROW_1CB_So0.005	0.19	0.049
24ROW_1CB_So0.005	0.2	0.049
24ROW_1CB_So0.005	0.21	0.049
24ROW_1CB_So0.005	0.22	0.049
24ROW_1CB_So0.005	0.23	0.049
24ROW_1CB_So0.005	0.24	0.049
24ROW_1CB_So0.005	0.25	0.049
24ROW_1CB_So0.005	0.26	0.049
24ROW_1CB_So0.005	0.27	0.049
24ROW_1CB_So0.005	0.28	0.049
24ROW_1CB_So0.005	0.29	0.049
24ROW_1CB_So0.005	0.3	0.049
24ROW_1CB_So0.005	0.31	0.049
24ROW_1CB_So0.005	0.32	0.049
24ROW_1CB_So0.005	0.33	0.049
24ROW_1CB_So0.005	0.34	0.049
24ROW_1CB_So0.005	0.35	0.049
24ROW_1CB_So0.005	0.36	0.049
24ROW_1CB_So0.005	0.37	0.049
24ROW_1CB_So0.005	0.38	0.049
24ROW_1CB_So0.005	0.39	0.049
24ROW_1CB_So0.005	0.4	0.049

;Sx0.03

24ROW_1CB_So0.01 Rating	0	0
24ROW_1CB_So0.01	0.01	0.0005
24ROW_1CB_So0.01	0.02	0.0017
24ROW_1CB_So0.01	0.03	0.0055
24ROW_1CB_So0.01	0.04	0.0107

24ROW_1CB_So0.01	0.05	0.0164
24ROW_1CB_So0.01	0.06	0.0212
24ROW_1CB_So0.01	0.07	0.0259
24ROW_1CB_So0.01	0.08	0.03
24ROW_1CB_So0.01	0.09	0.0351
24ROW_1CB_So0.01	0.1	0.0396
24ROW_1CB_So0.01	0.11	0.044
24ROW_1CB_So0.01	0.12	0.0473
24ROW_1CB_So0.01	0.13	0.049
24ROW_1CB_So0.01	0.14	0.049
24ROW_1CB_So0.01	0.15	0.049
24ROW_1CB_So0.01	0.16	0.049
24ROW_1CB_So0.01	0.17	0.049
24ROW_1CB_So0.01	0.18	0.049
24ROW_1CB_So0.01	0.19	0.049
24ROW_1CB_So0.01	0.2	0.049
24ROW_1CB_So0.01	0.21	0.049
24ROW_1CB_So0.01	0.22	0.049
24ROW_1CB_So0.01	0.23	0.049
24ROW_1CB_So0.01	0.24	0.049
24ROW_1CB_So0.01	0.25	0.049
24ROW_1CB_So0.01	0.26	0.049
24ROW_1CB_So0.01	0.27	0.049
24ROW_1CB_So0.01	0.28	0.049
24ROW_1CB_So0.01	0.29	0.049
24ROW_1CB_So0.01	0.3	0.049
24ROW_1CB_So0.01	0.31	0.049
24ROW_1CB_So0.01	0.32	0.049
24ROW_1CB_So0.01	0.33	0.049
24ROW_1CB_So0.01	0.34	0.049
24ROW_1CB_So0.01	0.35	0.049
24ROW_1CB_So0.01	0.36	0.049
24ROW_1CB_So0.01	0.37	0.049

;Sx0.03

24ROW_1CB_So0.02 Rating	0	0
24ROW_1CB_So0.02	0.01	0.0006
24ROW_1CB_So0.02	0.02	0.002
24ROW_1CB_So0.02	0.03	0.0066
24ROW_1CB_So0.02	0.04	0.0123
24ROW_1CB_So0.02	0.05	0.0158
24ROW_1CB_So0.02	0.06	0.0198
24ROW_1CB_So0.02	0.07	0.0243
24ROW_1CB_So0.02	0.08	0.0281
24ROW_1CB_So0.02	0.09	0.0325
24ROW_1CB_So0.02	0.1	0.0373
24ROW_1CB_So0.02	0.11	0.0418
24ROW_1CB_So0.02	0.12	0.045
24ROW_1CB_So0.02	0.13	0.045
24ROW_1CB_So0.02	0.14	0.045
24ROW_1CB_So0.02	0.15	0.045
24ROW_1CB_So0.02	0.16	0.045
24ROW_1CB_So0.02	0.17	0.045
24ROW_1CB_So0.02	0.18	0.045
24ROW_1CB_So0.02	0.19	0.045
24ROW_1CB_So0.02	0.2	0.045
24ROW_1CB_So0.02	0.21	0.045
24ROW_1CB_So0.02	0.22	0.045
24ROW_1CB_So0.02	0.23	0.045
24ROW_1CB_So0.02	0.24	0.045
24ROW_1CB_So0.02	0.25	0.045
24ROW_1CB_So0.02	0.26	0.045
24ROW_1CB_So0.02	0.27	0.045
24ROW_1CB_So0.02	0.28	0.045
24ROW_1CB_So0.02	0.29	0.045
24ROW_1CB_So0.02	0.3	0.045
24ROW_1CB_So0.02	0.31	0.045
24ROW_1CB_So0.02	0.32	0.045

;Sx0.03

24ROW_1CB_So0.03	Rating	0	0
24ROW_1CB_So0.03		0.01	0.0006
24ROW_1CB_So0.03		0.02	0.0018
24ROW_1CB_So0.03		0.03	0.006
24ROW_1CB_So0.03		0.04	0.0113
24ROW_1CB_So0.03		0.05	0.015
24ROW_1CB_So0.03		0.06	0.0183
24ROW_1CB_So0.03		0.07	0.0225
24ROW_1CB_So0.03		0.08	0.0264
24ROW_1CB_So0.03		0.09	0.0306
24ROW_1CB_So0.03		0.1	0.0343
24ROW_1CB_So0.03		0.11	0.0388
24ROW_1CB_So0.03		0.12	0.039
24ROW_1CB_So0.03		0.13	0.039
24ROW_1CB_So0.03		0.14	0.039
24ROW_1CB_So0.03		0.15	0.039
24ROW_1CB_So0.03		0.16	0.039
24ROW_1CB_So0.03		0.17	0.039
24ROW_1CB_So0.03		0.18	0.039
24ROW_1CB_So0.03		0.19	0.039
24ROW_1CB_So0.03		0.2	0.039
24ROW_1CB_So0.03		0.21	0.039
24ROW_1CB_So0.03		0.22	0.039
24ROW_1CB_So0.03		0.23	0.039
24ROW_1CB_So0.03		0.24	0.039
24ROW_1CB_So0.03		0.25	0.039
24ROW_1CB_So0.03		0.26	0.039
24ROW_1CB_So0.03		0.27	0.039
24ROW_1CB_So0.03		0.28	0.039
24ROW_1CB_So0.03		0.29	0.039
24ROW_1CB_So0.03		0.3	0.039

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

;Assumes 2 CB's with individual ICD's

2x102mm-ICD	Rating	0	0
2x102mm-ICD		0.005	0.0532
2x102mm-ICD		0.15	0.0556
2x102mm-ICD		0.3	0.0592
2x102mm-ICD		0.35	0.06

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

;Assumes 2 CB's with individual ICD's

2x152mm-ICD	Rating	0	0
2x152mm-ICD		0.005	0.1182
2x152mm-ICD		0.15	0.1236
2x152mm-ICD		0.3	0.1314
2x152mm-ICD		0.35	0.1334

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

83mm-ICD	Rating	0	0
83mm-ICD		0.01	0.0176
83mm-ICD		0.15	0.0184
83mm-ICD		0.3	0.0196
83mm-ICD		0.35	0.0199

83mm-ICD-RLCB	Rating	0	0
83mm-ICD-RLCB		0.01	0.0199
83mm-ICD-RLCB		0.15	0.0207
83mm-ICD-RLCB		0.3	0.0217
83mm-ICD-RLCB		0.35	0.022

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

94mm-ICD	Rating	0	0
94mm-ICD		0.01	0.0226
94mm-ICD		0.15	0.0236
94mm-ICD		0.3	0.0251
94mm-ICD		0.35	0.0255

94mm-ICD-RLCB	Rating	0	0
94mm-ICD-RLCB		0.01	0.0256
94mm-ICD-RLCB		0.15	0.0265
94mm-ICD-RLCB		0.3	0.0278
94mm-ICD-RLCB		0.35	0.0282

;Block 160 - Medium Density Residential

;0.883 ha C=0.80 tc= 10 min

;5 Year Rational = 205 L/s

B1-Out	Rating	0	0
B1-Out		0.01	0.205
B1-Out		0.3	0.234

;Existing UHAUL site

;3.43 ha R=0.90 tc= 12 min

;5 Year Rational (via Novatech)= 786.6 L/s

B2-Out	Rating	0	0
B2-Out		0.01	0.787
B2-Out		0.3	0.897

;Block 161 - Medium Density Residential

;0.965 ha C=0.80 tc= 10 min

;5 Year Rational = 224 L/s

B3-Out	Rating	0	0
B3-Out		0.01	0.224
B3-Out		0.3	0.255

;Park Lands

;1.00 ha R=0.25 tc= 10 min

;5 Year Rational (via Novatech) = 129 L/s

B4-Out	Rating	0	0
B4-Out		0.01	0.1297
B4-Out		0.3	0.1479

;540 m³ of storage assumed for site based on MArch 2020

UHAUL site Design Brief

UHAL_Onsite	Storage	0	1800
UHAL_Onsite		0.3	1800
UHAL_Onsite		0.31	1
UHAL_Onsite		2	1

[TIMESERIES]

::Name	Date	Time	Value
::-----			

;Rainfall (mm/hr)

002yrChicago3hr	01-01-2019	00:00:00	0
002yrChicago3hr	01-01-2019	00:10:00	2.81459
002yrChicago3hr	01-01-2019	00:20:00	3.49824
002yrChicago3hr	01-01-2019	00:30:00	4.68718
002yrChicago3hr	01-01-2019	00:40:00	7.30485
002yrChicago3hr	01-01-2019	00:50:00	18.20881
002yrChicago3hr	01-01-2019	01:00:00	76.805
002yrChicago3hr	01-01-2019	01:10:00	24.07906
002yrChicago3hr	01-01-2019	01:20:00	12.36376
002yrChicago3hr	01-01-2019	01:30:00	8.32403
002yrChicago3hr	01-01-2019	01:40:00	6.30341
002yrChicago3hr	01-01-2019	01:50:00	5.09498
002yrChicago3hr	01-01-2019	02:00:00	4.29133
002yrChicago3hr	01-01-2019	02:10:00	3.71786
002yrChicago3hr	01-01-2019	02:20:00	3.28762
002yrChicago3hr	01-01-2019	02:30:00	2.95254
002yrChicago3hr	01-01-2019	02:40:00	2.68388
002yrChicago3hr	01-01-2019	02:50:00	2.46348
002yrChicago3hr	01-01-2019	03:00:00	2.27921

002YrSCS24 01-01-2019 23:00:00 0.58
002YrSCS24 01-01-2019 23:10:00 0.58
002YrSCS24 01-01-2019 23:20:00 0.58
002YrSCS24 01-01-2019 23:30:00 0.58
002YrSCS24 01-01-2019 23:40:00 0.58
002YrSCS24 01-01-2019 23:50:00 0.58

;Rainfall (mm/hr)

005yrChicago3hr 01-01-2019 00:00:00 0
005yrChicago3hr 01-01-2019 00:10:00 3.68223
005yrChicago3hr 01-01-2019 00:20:00 4.58232
005yrChicago3hr 01-01-2019 00:30:00 6.15055
005yrChicago3hr 01-01-2019 00:40:00 9.6141
005yrChicago3hr 01-01-2019 00:50:00 24.17035
005yrChicago3hr 01-01-2019 01:00:00 104.193
005yrChicago3hr 01-01-2019 01:10:00 32.03692
005yrChicago3hr 01-01-2019 01:20:00 16.3375
005yrChicago3hr 01-01-2019 01:30:00 10.96479
005yrChicago3hr 01-01-2019 01:40:00 8.28693
005yrChicago3hr 01-01-2019 01:50:00 6.68897
005yrChicago3hr 01-01-2019 02:00:00 5.6279
005yrChicago3hr 01-01-2019 02:10:00 4.87167
005yrChicago3hr 01-01-2019 02:20:00 4.30483
005yrChicago3hr 01-01-2019 02:30:00 3.8637
005yrChicago3hr 01-01-2019 02:40:00 3.51028
005yrChicago3hr 01-01-2019 02:50:00 3.22046
005yrChicago3hr 01-01-2019 03:00:00 2.97831

;Rainfall (mm/hr)

005YrSCS24 01-01-2019 00:00:00 0.71
005YrSCS24 01-01-2019 00:10:00 0.71
005YrSCS24 01-01-2019 00:20:00 0.71
005YrSCS24 01-01-2019 00:30:00 0.71
005YrSCS24 01-01-2019 00:40:00 0.71
005YrSCS24 01-01-2019 00:50:00 0.71
005YrSCS24 01-01-2019 01:00:00 0.71
005YrSCS24 01-01-2019 01:10:00 0.71
005YrSCS24 01-01-2019 01:20:00 0.71
005YrSCS24 01-01-2019 01:30:00 0.71
005YrSCS24 01-01-2019 01:40:00 0.71
005YrSCS24 01-01-2019 01:50:00 0.71
005YrSCS24 01-01-2019 02:00:00 0.83
005YrSCS24 01-01-2019 02:10:00 0.83
005YrSCS24 01-01-2019 02:20:00 0.83
005YrSCS24 01-01-2019 02:30:00 0.83
005YrSCS24 01-01-2019 02:40:00 0.83
005YrSCS24 01-01-2019 02:50:00 0.83
005YrSCS24 01-01-2019 03:00:00 0.83
005YrSCS24 01-01-2019 03:10:00 0.83
005YrSCS24 01-01-2019 03:20:00 0.83
005YrSCS24 01-01-2019 03:30:00 0.83
005YrSCS24 01-01-2019 03:40:00 0.83
005YrSCS24 01-01-2019 03:50:00 0.83
005YrSCS24 01-01-2019 04:00:00 1.03
005YrSCS24 01-01-2019 04:10:00 1.03
005YrSCS24 01-01-2019 04:20:00 1.03
005YrSCS24 01-01-2019 04:30:00 1.03
005YrSCS24 01-01-2019 04:40:00 1.03
005YrSCS24 01-01-2019 04:50:00 1.03
005YrSCS24 01-01-2019 05:00:00 1.03
005YrSCS24 01-01-2019 05:10:00 1.03
005YrSCS24 01-01-2019 05:20:00 1.03
005YrSCS24 01-01-2019 05:30:00 1.03
005YrSCS24 01-01-2019 05:40:00 1.03
005YrSCS24 01-01-2019 05:50:00 1.03
005YrSCS24 01-01-2019 06:00:00 1.15
005YrSCS24 01-01-2019 06:10:00 1.15
005YrSCS24 01-01-2019 06:20:00 1.15
005YrSCS24 01-01-2019 06:30:00 1.15
005YrSCS24 01-01-2019 06:40:00 1.15

005YrSCS24 01-01-2019 06:50:00 1.15
005YrSCS24 01-01-2019 07:00:00 1.41
005YrSCS24 01-01-2019 07:10:00 1.41
005YrSCS24 01-01-2019 07:20:00 1.41
005YrSCS24 01-01-2019 07:30:00 1.41
005YrSCS24 01-01-2019 07:40:00 1.41
005YrSCS24 01-01-2019 07:50:00 1.41
005YrSCS24 01-01-2019 08:00:00 1.67
005YrSCS24 01-01-2019 08:10:00 1.67
005YrSCS24 01-01-2019 08:20:00 1.67
005YrSCS24 01-01-2019 08:30:00 1.8
005YrSCS24 01-01-2019 08:40:00 1.8
005YrSCS24 01-01-2019 08:50:00 1.8
005YrSCS24 01-01-2019 09:00:00 2.05
005YrSCS24 01-01-2019 09:10:00 2.05
005YrSCS24 01-01-2019 09:20:00 2.05
005YrSCS24 01-01-2019 09:30:00 2.31
005YrSCS24 01-01-2019 09:40:00 2.31
005YrSCS24 01-01-2019 09:50:00 2.31
005YrSCS24 01-01-2019 10:00:00 2.95
005YrSCS24 01-01-2019 10:10:00 2.95
005YrSCS24 01-01-2019 10:20:00 2.95
005YrSCS24 01-01-2019 10:30:00 3.98
005YrSCS24 01-01-2019 10:40:00 3.98
005YrSCS24 01-01-2019 10:50:00 3.98
005YrSCS24 01-01-2019 11:00:00 6.16
005YrSCS24 01-01-2019 11:10:00 6.16
005YrSCS24 01-01-2019 11:20:00 6.16
005YrSCS24 01-01-2019 11:30:00 18.98
005YrSCS24 01-01-2019 11:40:00 48.73
005YrSCS24 01-01-2019 11:50:00 78.48
005YrSCS24 01-01-2019 12:00:00 9.23
005YrSCS24 01-01-2019 12:10:00 9.23
005YrSCS24 01-01-2019 12:20:00 9.23
005YrSCS24 01-01-2019 12:30:00 4.74
005YrSCS24 01-01-2019 12:40:00 4.74
005YrSCS24 01-01-2019 12:50:00 4.74
005YrSCS24 01-01-2019 13:00:00 3.46
005YrSCS24 01-01-2019 13:10:00 3.46
005YrSCS24 01-01-2019 13:20:00 3.46
005YrSCS24 01-01-2019 13:30:00 2.69
005YrSCS24 01-01-2019 13:40:00 2.69
005YrSCS24 01-01-2019 13:50:00 2.69
005YrSCS24 01-01-2019 14:00:00 1.92
005YrSCS24 01-01-2019 14:10:00 1.92
005YrSCS24 01-01-2019 14:20:00 1.92
005YrSCS24 01-01-2019 14:30:00 1.92
005YrSCS24 01-01-2019 14:40:00 1.92
005YrSCS24 01-01-2019 14:50:00 1.92
005YrSCS24 01-01-2019 15:00:00 1.92
005YrSCS24 01-01-2019 15:10:00 1.92
005YrSCS24 01-01-2019 15:20:00 1.92
005YrSCS24 01-01-2019 15:30:00 1.92
005YrSCS24 01-01-2019 15:40:00 1.92
005YrSCS24 01-01-2019 15:50:00 1.92
005YrSCS24 01-01-2019 16:00:00 1.15
005YrSCS24 01-01-2019 16:10:00 1.15
005YrSCS24 01-01-2019 16:20:00 1.15
005YrSCS24 01-01-2019 16:30:00 1.15
005YrSCS24 01-01-2019 16:40:00 1.15
005YrSCS24 01-01-2019 16:50:00 1.15
005YrSCS24 01-01-2019 17:00:00 1.15
005YrSCS24 01-01-2019 17:10:00 1.15
005YrSCS24 01-01-2019 17:20:00 1.15
005YrSCS24 01-01-2019 17:30:00 1.15
005YrSCS24 01-01-2019 17:40:00 1.15
005YrSCS24 01-01-2019 17:50:00 1.15
005YrSCS24 01-01-2019 18:00:00 1.15
005YrSCS24 01-01-2019 18:10:00 1.15
005YrSCS24 01-01-2019 18:20:00 1.15

050YrSCS24	01-01-2019 05:00:00	1.54
050YrSCS24	01-01-2019 05:10:00	1.54
050YrSCS24	01-01-2019 05:20:00	1.54
050YrSCS24	01-01-2019 05:30:00	1.54
050YrSCS24	01-01-2019 05:40:00	1.54
050YrSCS24	01-01-2019 05:50:00	1.54
050YrSCS24	01-01-2019 06:00:00	1.74
050YrSCS24	01-01-2019 06:10:00	1.74
050YrSCS24	01-01-2019 06:20:00	1.74
050YrSCS24	01-01-2019 06:30:00	1.74
050YrSCS24	01-01-2019 06:40:00	1.74
050YrSCS24	01-01-2019 06:50:00	1.74
050YrSCS24	01-01-2019 07:00:00	2.12
050YrSCS24	01-01-2019 07:10:00	2.12
050YrSCS24	01-01-2019 07:20:00	2.12
050YrSCS24	01-01-2019 07:30:00	2.12
050YrSCS24	01-01-2019 07:40:00	2.12
050YrSCS24	01-01-2019 07:50:00	2.12
050YrSCS24	01-01-2019 08:00:00	2.51
050YrSCS24	01-01-2019 08:10:00	2.51
050YrSCS24	01-01-2019 08:20:00	2.51
050YrSCS24	01-01-2019 08:30:00	2.7
050YrSCS24	01-01-2019 08:40:00	2.7
050YrSCS24	01-01-2019 08:50:00	2.7
050YrSCS24	01-01-2019 09:00:00	3.09
050YrSCS24	01-01-2019 09:10:00	3.09
050YrSCS24	01-01-2019 09:20:00	3.09
050YrSCS24	01-01-2019 09:30:00	3.48
050YrSCS24	01-01-2019 09:40:00	3.48
050YrSCS24	01-01-2019 09:50:00	3.48
050YrSCS24	01-01-2019 10:00:00	4.44
050YrSCS24	01-01-2019 10:10:00	4.44
050YrSCS24	01-01-2019 10:20:00	4.44
050YrSCS24	01-01-2019 10:30:00	5.98
050YrSCS24	01-01-2019 10:40:00	5.98
050YrSCS24	01-01-2019 10:50:00	5.98
050YrSCS24	01-01-2019 11:00:00	9.27
050YrSCS24	01-01-2019 11:10:00	9.27
050YrSCS24	01-01-2019 11:20:00	9.27
050YrSCS24	01-01-2019 11:30:00	28.57
050YrSCS24	01-01-2019 11:40:00	73.36
050YrSCS24	01-01-2019 11:50:00	118.15
050YrSCS24	01-01-2019 12:00:00	13.9
050YrSCS24	01-01-2019 12:10:00	13.9
050YrSCS24	01-01-2019 12:20:00	13.9
050YrSCS24	01-01-2019 12:30:00	7.14
050YrSCS24	01-01-2019 12:40:00	7.14
050YrSCS24	01-01-2019 12:50:00	7.14
050YrSCS24	01-01-2019 13:00:00	5.21
050YrSCS24	01-01-2019 13:10:00	5.21
050YrSCS24	01-01-2019 13:20:00	5.21
050YrSCS24	01-01-2019 13:30:00	4.05
050YrSCS24	01-01-2019 13:40:00	4.05
050YrSCS24	01-01-2019 13:50:00	4.05
050YrSCS24	01-01-2019 14:00:00	2.9
050YrSCS24	01-01-2019 14:10:00	2.9
050YrSCS24	01-01-2019 14:20:00	2.9
050YrSCS24	01-01-2019 14:30:00	2.9
050YrSCS24	01-01-2019 14:40:00	2.9
050YrSCS24	01-01-2019 14:50:00	2.9
050YrSCS24	01-01-2019 15:00:00	2.9
050YrSCS24	01-01-2019 15:10:00	2.9
050YrSCS24	01-01-2019 15:20:00	2.9
050YrSCS24	01-01-2019 15:30:00	2.9
050YrSCS24	01-01-2019 15:40:00	2.9
050YrSCS24	01-01-2019 15:50:00	2.9
050YrSCS24	01-01-2019 16:00:00	1.74
050YrSCS24	01-01-2019 16:10:00	1.74
050YrSCS24	01-01-2019 16:20:00	1.74
050YrSCS24	01-01-2019 16:30:00	1.74

050YrSCS24	01-01-2019 16:40:00	1.74
050YrSCS24	01-01-2019 16:50:00	1.74
050YrSCS24	01-01-2019 17:00:00	1.74
050YrSCS24	01-01-2019 17:10:00	1.74
050YrSCS24	01-01-2019 17:20:00	1.74
050YrSCS24	01-01-2019 17:30:00	1.74
050YrSCS24	01-01-2019 17:40:00	1.74
050YrSCS24	01-01-2019 17:50:00	1.74
050YrSCS24	01-01-2019 18:00:00	1.74
050YrSCS24	01-01-2019 18:10:00	1.74
050YrSCS24	01-01-2019 18:20:00	1.74
050YrSCS24	01-01-2019 18:30:00	1.74
050YrSCS24	01-01-2019 18:40:00	1.74
050YrSCS24	01-01-2019 18:50:00	1.74
050YrSCS24	01-01-2019 19:00:00	1.74
050YrSCS24	01-01-2019 19:10:00	1.74
050YrSCS24	01-01-2019 19:20:00	1.74
050YrSCS24	01-01-2019 19:30:00	1.74
050YrSCS24	01-01-2019 19:40:00	1.74
050YrSCS24	01-01-2019 19:50:00	1.74
050YrSCS24	01-01-2019 20:00:00	1.16
050YrSCS24	01-01-2019 20:10:00	1.16
050YrSCS24	01-01-2019 20:20:00	1.16
050YrSCS24	01-01-2019 20:30:00	1.16
050YrSCS24	01-01-2019 20:40:00	1.16
050YrSCS24	01-01-2019 20:50:00	1.16
050YrSCS24	01-01-2019 21:00:00	1.16
050YrSCS24	01-01-2019 21:10:00	1.16
050YrSCS24	01-01-2019 21:20:00	1.16
050YrSCS24	01-01-2019 21:30:00	1.16
050YrSCS24	01-01-2019 21:40:00	1.16
050YrSCS24	01-01-2019 21:50:00	1.16
050YrSCS24	01-01-2019 22:00:00	1.16
050YrSCS24	01-01-2019 22:10:00	1.16
050YrSCS24	01-01-2019 22:20:00	1.16
050YrSCS24	01-01-2019 22:30:00	1.16
050YrSCS24	01-01-2019 22:40:00	1.16
050YrSCS24	01-01-2019 22:50:00	1.16
050YrSCS24	01-01-2019 23:00:00	1.16
050YrSCS24	01-01-2019 23:10:00	1.16
050YrSCS24	01-01-2019 23:20:00	1.16
050YrSCS24	01-01-2019 23:30:00	1.16
050YrSCS24	01-01-2019 23:40:00	1.16
050YrSCS24	01-01-2019 23:50:00	1.16

```

;Rainfall (mm/hr)
100yrChicago3hr 01-01-2019 00:00:00 0
100yrChicago3hr 01-01-2019 00:10:00 6.04573
100yrChicago3hr 01-01-2019 00:20:00 7.54219
100yrChicago3hr 01-01-2019 00:30:00 10.1588
100yrChicago3hr 01-01-2019 00:40:00 15.96889
100yrChicago3hr 01-01-2019 00:50:00 40.65497
100yrChicago3hr 01-01-2019 01:00:00 178.559
100yrChicago3hr 01-01-2019 01:10:00 54.04853
100yrChicago3hr 01-01-2019 01:20:00 27.3187
100yrChicago3hr 01-01-2019 01:30:00 18.24039
100yrChicago3hr 01-01-2019 01:40:00 13.73692
100yrChicago3hr 01-01-2019 01:50:00 11.05876
100yrChicago3hr 01-01-2019 02:00:00 9.28521
100yrChicago3hr 01-01-2019 02:10:00 8.02389
100yrChicago3hr 01-01-2019 02:20:00 7.08022
100yrChicago3hr 01-01-2019 02:30:00 6.34698
100yrChicago3hr 01-01-2019 02:40:00 5.76029
100yrChicago3hr 01-01-2019 02:50:00 5.27978
100yrChicago3hr 01-01-2019 03:00:00 4.87871

```

```

;Rainfall (mm/hr)
100yrChicago3hr+20% 01-01-2019 00:00:00 0
100yrChicago3hr+20% 01-01-2019 00:10:00 7.25488
100yrChicago3hr+20% 01-01-2019 00:20:00 9.05063

```

100yrChicago3hr+20% 01-01-2019 00:30:00 12.19056
 100yrChicago3hr+20% 01-01-2019 00:40:00 19.16267
 100yrChicago3hr+20% 01-01-2019 00:50:00 48.78596
 100yrChicago3hr+20% 01-01-2019 01:00:00 214.2708
 100yrChicago3hr+20% 01-01-2019 01:10:00 64.85824
 100yrChicago3hr+20% 01-01-2019 01:20:00 32.78244
 100yrChicago3hr+20% 01-01-2019 01:30:00 21.88847
 100yrChicago3hr+20% 01-01-2019 01:40:00 16.4843
 100yrChicago3hr+20% 01-01-2019 01:50:00 13.27051
 100yrChicago3hr+20% 01-01-2019 02:00:00 11.14225
 100yrChicago3hr+20% 01-01-2019 02:10:00 9.62867
 100yrChicago3hr+20% 01-01-2019 02:20:00 8.49626
 100yrChicago3hr+20% 01-01-2019 02:30:00 7.61638
 100yrChicago3hr+20% 01-01-2019 02:40:00 6.91235
 100yrChicago3hr+20% 01-01-2019 02:50:00 6.33574
 100yrChicago3hr+20% 01-01-2019 03:00:00 5.85445

;Rainfall (mm/hr)

100YrSCS12hr 01-01-2019 0:00:00 2.4
 100YrSCS12hr 01-01-2019 0:15:00 2.4
 100YrSCS12hr 01-01-2019 0:30:00 2.4
 100YrSCS12hr 01-01-2019 0:45:00 2.4
 100YrSCS12hr 01-01-2019 1:00:00 2.4
 100YrSCS12hr 01-01-2019 1:15:00 2.4
 100YrSCS12hr 01-01-2019 1:30:00 2.4
 100YrSCS12hr 01-01-2019 1:45:00 2.4
 100YrSCS12hr 01-01-2019 2:00:00 2.88
 100YrSCS12hr 01-01-2019 2:15:00 2.88
 100YrSCS12hr 01-01-2019 2:30:00 2.88
 100YrSCS12hr 01-01-2019 2:45:00 2.88
 100YrSCS12hr 01-01-2019 3:00:00 3.84
 100YrSCS12hr 01-01-2019 3:15:00 3.84
 100YrSCS12hr 01-01-2019 3:30:00 3.84
 100YrSCS12hr 01-01-2019 3:45:00 3.84
 100YrSCS12hr 01-01-2019 4:00:00 5.76
 100YrSCS12hr 01-01-2019 4:15:00 5.76
 100YrSCS12hr 01-01-2019 4:30:00 7.68
 100YrSCS12hr 01-01-2019 4:45:00 7.68
 100YrSCS12hr 01-01-2019 5:00:00 11.52
 100YrSCS12hr 01-01-2019 5:15:00 11.52
 100YrSCS12hr 01-01-2019 5:30:00 46.08
 100YrSCS12hr 01-01-2019 5:45:00 126.72
 100YrSCS12hr 01-01-2019 6:00:00 17.28
 100YrSCS12hr 01-01-2019 6:15:00 17.28
 100YrSCS12hr 01-01-2019 6:30:00 7.68
 100YrSCS12hr 01-01-2019 6:45:00 7.68
 100YrSCS12hr 01-01-2019 7:00:00 5.76
 100YrSCS12hr 01-01-2019 7:15:00 5.76
 100YrSCS12hr 01-01-2019 7:30:00 5.76
 100YrSCS12hr 01-01-2019 7:45:00 5.76
 100YrSCS12hr 01-01-2019 8:00:00 3.36
 100YrSCS12hr 01-01-2019 8:15:00 3.36
 100YrSCS12hr 01-01-2019 8:30:00 3.36
 100YrSCS12hr 01-01-2019 8:45:00 3.36
 100YrSCS12hr 01-01-2019 9:00:00 3.36
 100YrSCS12hr 01-01-2019 9:15:00 3.36
 100YrSCS12hr 01-01-2019 9:30:00 3.36
 100YrSCS12hr 01-01-2019 9:45:00 3.36
 100YrSCS12hr 01-01-2019 10:00:00 1.92
 100YrSCS12hr 01-01-2019 10:15:00 1.92
 100YrSCS12hr 01-01-2019 10:30:00 1.92
 100YrSCS12hr 01-01-2019 10:45:00 1.92
 100YrSCS12hr 01-01-2019 11:00:00 1.92
 100YrSCS12hr 01-01-2019 11:15:00 1.92
 100YrSCS12hr 01-01-2019 11:30:00 1.92
 100YrSCS12hr 01-01-2019 11:45:00 1.92
 100YrSCS12hr 01-01-2019 12:00:00 0

;Rainfall (mm/hr)

100YrSCS24 01/01/2019 00:00:00 1.17

100YrSCS24 01/01/2019 00:10:00 1.17
 100YrSCS24 01/01/2019 00:20:00 1.17
 100YrSCS24 01/01/2019 00:30:00 1.17
 100YrSCS24 01/01/2019 00:40:00 1.17
 100YrSCS24 01/01/2019 00:50:00 1.17
 100YrSCS24 01/01/2019 01:00:00 1.17
 100YrSCS24 01/01/2019 01:10:00 1.17
 100YrSCS24 01/01/2019 01:20:00 1.17
 100YrSCS24 01/01/2019 01:30:00 1.17
 100YrSCS24 01/01/2019 01:40:00 1.17
 100YrSCS24 01/01/2019 01:50:00 1.17
 100YrSCS24 01/01/2019 02:00:00 1.39
 100YrSCS24 01/01/2019 02:10:00 1.39
 100YrSCS24 01/01/2019 02:20:00 1.39
 100YrSCS24 01/01/2019 02:30:00 1.39
 100YrSCS24 01/01/2019 02:40:00 1.39
 100YrSCS24 01/01/2019 02:50:00 1.39
 100YrSCS24 01/01/2019 03:00:00 1.39
 100YrSCS24 01/01/2019 03:10:00 1.39
 100YrSCS24 01/01/2019 03:20:00 1.39
 100YrSCS24 01/01/2019 03:30:00 1.39
 100YrSCS24 01/01/2019 03:40:00 1.39
 100YrSCS24 01/01/2019 03:50:00 1.39
 100YrSCS24 01/01/2019 04:00:00 1.71
 100YrSCS24 01/01/2019 04:10:00 1.71
 100YrSCS24 01/01/2019 04:20:00 1.71
 100YrSCS24 01/01/2019 04:30:00 1.71
 100YrSCS24 01/01/2019 04:40:00 1.71
 100YrSCS24 01/01/2019 04:50:00 1.71
 100YrSCS24 01/01/2019 05:00:00 1.71
 100YrSCS24 01/01/2019 05:10:00 1.71
 100YrSCS24 01/01/2019 05:20:00 1.71
 100YrSCS24 01/01/2019 05:30:00 1.71
 100YrSCS24 01/01/2019 05:40:00 1.71
 100YrSCS24 01/01/2019 05:50:00 1.71
 100YrSCS24 01/01/2019 06:00:00 1.92
 100YrSCS24 01/01/2019 06:10:00 1.92
 100YrSCS24 01/01/2019 06:20:00 1.92
 100YrSCS24 01/01/2019 06:30:00 1.92
 100YrSCS24 01/01/2019 06:40:00 1.92
 100YrSCS24 01/01/2019 06:50:00 1.92
 100YrSCS24 01/01/2019 07:00:00 2.35
 100YrSCS24 01/01/2019 07:10:00 2.35
 100YrSCS24 01/01/2019 07:20:00 2.35
 100YrSCS24 01/01/2019 07:30:00 2.35
 100YrSCS24 01/01/2019 07:40:00 2.35
 100YrSCS24 01/01/2019 07:50:00 2.35
 100YrSCS24 01/01/2019 08:00:00 2.78
 100YrSCS24 01/01/2019 08:10:00 2.78
 100YrSCS24 01/01/2019 08:20:00 2.78
 100YrSCS24 01/01/2019 08:30:00 2.99
 100YrSCS24 01/01/2019 08:40:00 2.99
 100YrSCS24 01/01/2019 08:50:00 2.99
 100YrSCS24 01/01/2019 09:00:00 3.42
 100YrSCS24 01/01/2019 09:10:00 3.42
 100YrSCS24 01/01/2019 09:20:00 3.42
 100YrSCS24 01/01/2019 09:30:00 3.84
 100YrSCS24 01/01/2019 09:40:00 3.84
 100YrSCS24 01/01/2019 09:50:00 3.84
 100YrSCS24 01/01/2019 10:00:00 4.91
 100YrSCS24 01/01/2019 10:10:00 4.91
 100YrSCS24 01/01/2019 10:20:00 4.91
 100YrSCS24 01/01/2019 10:30:00 6.62
 100YrSCS24 01/01/2019 10:40:00 6.62
 100YrSCS24 01/01/2019 10:50:00 6.62
 100YrSCS24 01/01/2019 11:00:00 10.25
 100YrSCS24 01/01/2019 11:10:00 10.25
 100YrSCS24 01/01/2019 11:20:00 10.25
 100YrSCS24 01/01/2019 11:30:00 31.6
 100YrSCS24 01/01/2019 11:40:00 81.12

100YrSCS24+20%	01-01-2019	10:50:00	7.944
100YrSCS24+20%	01-01-2019	11:00:00	12.3
100YrSCS24+20%	01-01-2019	11:10:00	12.3
100YrSCS24+20%	01-01-2019	11:20:00	12.3
100YrSCS24+20%	01-01-2019	11:30:00	37.92
100YrSCS24+20%	01-01-2019	11:40:00	97.344
100YrSCS24+20%	01-01-2019	11:50:00	156.78
100YrSCS24+20%	01-01-2019	12:00:00	18.444
100YrSCS24+20%	01-01-2019	12:10:00	18.444
100YrSCS24+20%	01-01-2019	12:20:00	18.444
100YrSCS24+20%	01-01-2019	12:30:00	9.48
100YrSCS24+20%	01-01-2019	12:40:00	9.48
100YrSCS24+20%	01-01-2019	12:50:00	9.48
100YrSCS24+20%	01-01-2019	13:00:00	6.912
100YrSCS24+20%	01-01-2019	13:10:00	6.912
100YrSCS24+20%	01-01-2019	13:20:00	6.912
100YrSCS24+20%	01-01-2019	13:30:00	5.376
100YrSCS24+20%	01-01-2019	13:40:00	5.376
100YrSCS24+20%	01-01-2019	13:50:00	5.376
100YrSCS24+20%	01-01-2019	14:00:00	3.84
100YrSCS24+20%	01-01-2019	14:10:00	3.84
100YrSCS24+20%	01-01-2019	14:20:00	3.84
100YrSCS24+20%	01-01-2019	14:30:00	3.84
100YrSCS24+20%	01-01-2019	14:40:00	3.84
100YrSCS24+20%	01-01-2019	14:50:00	3.84
100YrSCS24+20%	01-01-2019	15:00:00	3.84
100YrSCS24+20%	01-01-2019	15:10:00	3.84
100YrSCS24+20%	01-01-2019	15:20:00	3.84
100YrSCS24+20%	01-01-2019	15:30:00	3.84
100YrSCS24+20%	01-01-2019	15:40:00	3.84
100YrSCS24+20%	01-01-2019	15:50:00	3.84
100YrSCS24+20%	01-01-2019	16:00:00	2.304
100YrSCS24+20%	01-01-2019	16:10:00	2.304
100YrSCS24+20%	01-01-2019	16:20:00	2.304
100YrSCS24+20%	01-01-2019	16:30:00	2.304
100YrSCS24+20%	01-01-2019	16:40:00	2.304
100YrSCS24+20%	01-01-2019	16:50:00	2.304
100YrSCS24+20%	01-01-2019	17:00:00	2.304
100YrSCS24+20%	01-01-2019	17:10:00	2.304
100YrSCS24+20%	01-01-2019	17:20:00	2.304
100YrSCS24+20%	01-01-2019	17:30:00	2.304
100YrSCS24+20%	01-01-2019	17:40:00	2.304
100YrSCS24+20%	01-01-2019	17:50:00	2.304
100YrSCS24+20%	01-01-2019	18:00:00	2.304
100YrSCS24+20%	01-01-2019	18:10:00	2.304
100YrSCS24+20%	01-01-2019	18:20:00	2.304
100YrSCS24+20%	01-01-2019	18:30:00	2.304
100YrSCS24+20%	01-01-2019	18:40:00	2.304
100YrSCS24+20%	01-01-2019	18:50:00	2.304
100YrSCS24+20%	01-01-2019	19:00:00	2.304
100YrSCS24+20%	01-01-2019	19:10:00	2.304
100YrSCS24+20%	01-01-2019	19:20:00	2.304
100YrSCS24+20%	01-01-2019	19:30:00	2.304
100YrSCS24+20%	01-01-2019	19:40:00	2.304
100YrSCS24+20%	01-01-2019	19:50:00	2.304
100YrSCS24+20%	01-01-2019	20:00:00	1.536
100YrSCS24+20%	01-01-2019	20:10:00	1.536
100YrSCS24+20%	01-01-2019	20:20:00	1.536
100YrSCS24+20%	01-01-2019	20:30:00	1.536
100YrSCS24+20%	01-01-2019	20:40:00	1.536
100YrSCS24+20%	01-01-2019	20:50:00	1.536
100YrSCS24+20%	01-01-2019	21:00:00	1.536
100YrSCS24+20%	01-01-2019	21:10:00	1.536
100YrSCS24+20%	01-01-2019	21:20:00	1.536
100YrSCS24+20%	01-01-2019	21:30:00	1.536
100YrSCS24+20%	01-01-2019	21:40:00	1.536
100YrSCS24+20%	01-01-2019	21:50:00	1.536
100YrSCS24+20%	01-01-2019	22:00:00	1.536
100YrSCS24+20%	01-01-2019	22:10:00	1.536
100YrSCS24+20%	01-01-2019	22:20:00	1.536

100YrSCS24+20%	01-01-2019	22:30:00	1.536
100YrSCS24+20%	01-01-2019	22:40:00	1.536
100YrSCS24+20%	01-01-2019	22:50:00	1.536
100YrSCS24+20%	01-01-2019	23:00:00	1.536
100YrSCS24+20%	01-01-2019	23:10:00	1.536
100YrSCS24+20%	01-01-2019	23:20:00	1.536
100YrSCS24+20%	01-01-2019	23:30:00	1.536
100YrSCS24+20%	01-01-2019	23:40:00	1.536
100YrSCS24+20%	01-01-2019	23:50:00	1.536

;Rainfall (mm/hr)

1979July01	01-01-2019	00:00:00	2.3
1979July01	01-01-2019	00:05:00	2.3
1979July01	01-01-2019	00:10:00	8.89
1979July01	01-01-2019	00:15:00	8.89
1979July01	01-01-2019	00:20:00	8.89
1979July01	01-01-2019	00:25:00	8.89
1979July01	01-01-2019	00:30:00	38.1
1979July01	01-01-2019	00:35:00	38.1
1979July01	01-01-2019	00:40:00	38.1
1979July01	01-01-2019	00:45:00	38.1
1979July01	01-01-2019	00:50:00	38.1
1979July01	01-01-2019	00:55:00	38.1
1979July01	01-01-2019	01:00:00	38.1
1979July01	01-01-2019	01:05:00	50.8
1979July01	01-01-2019	01:10:00	50.8
1979July01	01-01-2019	01:15:00	76.2
1979July01	01-01-2019	01:20:00	106.7
1979July01	01-01-2019	01:25:00	106.7
1979July01	01-01-2019	01:30:00	71.1
1979July01	01-01-2019	01:35:00	71.1
1979July01	01-01-2019	01:40:00	30.5
1979July01	01-01-2019	01:45:00	30.5
1979July01	01-01-2019	01:50:00	30.5
1979July01	01-01-2019	01:55:00	30.5
1979July01	01-01-2019	02:00:00	3.8
1979July01	01-01-2019	02:05:00	3.8
1979July01	01-01-2019	02:10:00	3.8
1979July01	01-01-2019	02:15:00	3.8
1979July01	01-01-2019	02:20:00	3.8
1979July01	01-01-2019	02:25:00	3.8
1979July01	01-01-2019	02:30:00	3.8
1979July01	01-01-2019	02:35:00	3.8
1979July01	01-01-2019	02:40:00	3.8
1979July01	01-01-2019	02:45:00	3.8
1979July01	01-01-2019	02:50:00	3.8
1979July01	01-01-2019	02:55:00	3.8

;Rainfall (mm/hr)

1988Aug04	01-01-2019	00:00:00	0.1
1988Aug04	01-01-2019	00:05:00	0.1
1988Aug04	01-01-2019	00:10:00	0
1988Aug04	01-01-2019	00:15:00	3.7
1988Aug04	01-01-2019	00:20:00	6.2
1988Aug04	01-01-2019	00:25:00	101.5
1988Aug04	01-01-2019	00:30:00	15.5
1988Aug04	01-01-2019	00:35:00	29.3
1988Aug04	01-01-2019	00:40:00	19.8
1988Aug04	01-01-2019	00:45:00	1.5
1988Aug04	01-01-2019	00:50:00	1.7
1988Aug04	01-01-2019	00:55:00	5.4
1988Aug04	01-01-2019	01:00:00	24.6
1988Aug04	01-01-2019	01:05:00	26.5
1988Aug04	01-01-2019	01:10:00	34.9
1988Aug04	01-01-2019	01:15:00	10.2
1988Aug04	01-01-2019	01:20:00	27.1
1988Aug04	01-01-2019	01:25:00	104.4
1988Aug04	01-01-2019	01:30:00	27.5
1988Aug04	01-01-2019	01:35:00	62.5
1988Aug04	01-01-2019	01:40:00	31.8

1988Aug04	01-01-2019 01:45:00	79.8
1988Aug04	01-01-2019 01:50:00	67.5
1988Aug04	01-01-2019 01:55:00	156.2
1988Aug04	01-01-2019 02:00:00	5.1
1988Aug04	01-01-2019 02:05:00	0.2
1988Aug04	01-01-2019 02:10:00	0.2
1988Aug04	01-01-2019 02:15:00	0.2
1988Aug04	01-01-2019 02:20:00	0.2
1988Aug04	01-01-2019 02:25:00	0.2
1988Aug04	01-01-2019 02:30:00	0.2
1988Aug04	01-01-2019 02:35:00	0.2
1988Aug04	01-01-2019 02:40:00	0.2
1988Aug04	01-01-2019 02:45:00	0.2
1988Aug04	01-01-2019 02:50:00	0.2
1988Aug04	01-01-2019 02:55:00	12.8
1988Aug04	01-01-2019 03:00:00	14
1988Aug04	01-01-2019 03:05:00	22.2
1988Aug04	01-01-2019 03:10:00	21.8
1988Aug04	01-01-2019 03:15:00	1.4
1988Aug04	01-01-2019 03:20:00	0.2
1988Aug04	01-01-2019 03:25:00	0.2
1988Aug04	01-01-2019 03:30:00	0.2
1988Aug04	01-01-2019 03:35:00	0.2
1988Aug04	01-01-2019 03:40:00	0.2
1988Aug04	01-01-2019 03:45:00	0.2
1988Aug04	01-01-2019 03:50:00	0.2
1988Aug04	01-01-2019 03:55:00	0.2
1988Aug04	01-01-2019 04:00:00	0.2
1988Aug04	01-01-2019 04:05:00	0.2
1988Aug04	01-01-2019 04:10:00	0.2
1988Aug04	01-01-2019 04:15:00	0.2
1988Aug04	01-01-2019 04:20:00	0.2
1988Aug04	01-01-2019 04:25:00	0.2
1988Aug04	01-01-2019 04:30:00	0.2
1988Aug04	01-01-2019 04:35:00	0.2
1988Aug04	01-01-2019 04:40:00	0.2
1988Aug04	01-01-2019 04:45:00	0.2
1988Aug04	01-01-2019 04:50:00	0.2
1988Aug04	01-01-2019 04:55:00	2.9
1988Aug04	01-01-2019 05:00:00	7.8
1988Aug04	01-01-2019 05:05:00	10
1988Aug04	01-01-2019 05:10:00	6.3
1988Aug04	01-01-2019 05:15:00	5.1
1988Aug04	01-01-2019 05:20:00	9.8
1988Aug04	01-01-2019 05:25:00	2.6
1988Aug04	01-01-2019 05:30:00	1.7

1996Aug08	01-01-2019 01:50:00	2.7
1996Aug08	01-01-2019 01:55:00	0
1996Aug08	01-01-2019 02:00:00	0
1996Aug08	01-01-2019 02:05:00	0
1996Aug08	01-01-2019 02:10:00	5.3
1996Aug08	01-01-2019 02:15:00	0
1996Aug08	01-01-2019 02:20:00	0
1996Aug08	01-01-2019 02:25:00	0
1996Aug08	01-01-2019 02:30:00	0
1996Aug08	01-01-2019 02:35:00	0
1996Aug08	01-01-2019 02:40:00	0
1996Aug08	01-01-2019 02:45:00	4
1996Aug08	01-01-2019 02:50:00	53.1
1996Aug08	01-01-2019 02:55:00	69
1996Aug08	01-01-2019 03:00:00	63.7
1996Aug08	01-01-2019 03:05:00	58.4
1996Aug08	01-01-2019 03:10:00	47.8
1996Aug08	01-01-2019 03:15:00	15.9
1996Aug08	01-01-2019 03:20:00	13.3
1996Aug08	01-01-2019 03:25:00	8
1996Aug08	01-01-2019 03:30:00	5.3
1996Aug08	01-01-2019 03:35:00	6.6
1996Aug08	01-01-2019 03:40:00	2.7
1996Aug08	01-01-2019 03:45:00	4
1996Aug08	01-01-2019 03:50:00	2.7
1996Aug08	01-01-2019 03:55:00	4
1996Aug08	01-01-2019 04:00:00	2.7
1996Aug08	01-01-2019 04:05:00	5.3
1996Aug08	01-01-2019 04:10:00	4
1996Aug08	01-01-2019 04:15:00	2.7
1996Aug08	01-01-2019 04:20:00	4
1996Aug08	01-01-2019 04:25:00	2.7
1996Aug08	01-01-2019 04:30:00	1.3
1996Aug08	01-01-2019 04:35:00	1.3
1996Aug08	01-01-2019 04:40:00	0
1996Aug08	01-01-2019 04:45:00	0
1996Aug08	01-01-2019 04:50:00	0
1996Aug08	01-01-2019 04:55:00	0
1996Aug08	01-01-2019 05:00:00	2.7
1996Aug08	01-01-2019 05:05:00	0
1996Aug08	01-01-2019 05:10:00	0
1996Aug08	01-01-2019 05:15:00	0
1996Aug08	01-01-2019 05:20:00	0
1996Aug08	01-01-2019 05:25:00	0
1996Aug08	01-01-2019 05:30:00	0
1996Aug08	01-01-2019 05:35:00	0
1996Aug08	01-01-2019 05:40:00	1.3

;Rainfall (mm/hr)

1996Aug08	01-01-2019 00:00:00	4
1996Aug08	01-01-2019 00:05:00	11.9
1996Aug08	01-01-2019 00:10:00	26.5
1996Aug08	01-01-2019 00:15:00	13.3
1996Aug08	01-01-2019 00:20:00	0
1996Aug08	01-01-2019 00:25:00	2.7
1996Aug08	01-01-2019 00:30:00	0
1996Aug08	01-01-2019 00:35:00	8
1996Aug08	01-01-2019 00:40:00	18.6
1996Aug08	01-01-2019 00:45:00	10.6
1996Aug08	01-01-2019 00:50:00	21.2
1996Aug08	01-01-2019 00:55:00	2.7
1996Aug08	01-01-2019 01:00:00	2.7
1996Aug08	01-01-2019 01:05:00	15.9
1996Aug08	01-01-2019 01:10:00	66.3
1996Aug08	01-01-2019 01:15:00	55.7
1996Aug08	01-01-2019 01:20:00	122
1996Aug08	01-01-2019 01:25:00	88.9
1996Aug08	01-01-2019 01:30:00	9.3
1996Aug08	01-01-2019 01:35:00	8
1996Aug08	01-01-2019 01:40:00	4
1996Aug08	01-01-2019 01:45:00	0

;Rainfall (mm/hr)

25mmChicago4Hr	01-01-2019 00:00:00	0
25mmChicago4Hr	01-01-2019 00:10:00	1.5122
25mmChicago4Hr	01-01-2019 00:20:00	1.7483
25mmChicago4Hr	01-01-2019 00:30:00	2.0803
25mmChicago4Hr	01-01-2019 00:40:00	2.5819
25mmChicago4Hr	01-01-2019 00:50:00	3.4597
25mmChicago4Hr	01-01-2019 01:00:00	5.3924
25mmChicago4Hr	01-01-2019 01:10:00	13.4405
25mmChicago4Hr	01-01-2019 01:20:00	56.6613
25mmChicago4Hr	01-01-2019 01:30:00	17.7634
25mmChicago4Hr	01-01-2019 01:40:00	9.1177
25mmChicago4Hr	01-01-2019 01:50:00	6.1375
25mmChicago4Hr	01-01-2019 02:00:00	4.6474
25mmChicago4Hr	01-01-2019 02:10:00	3.7548
25mmChicago4Hr	01-01-2019 02:20:00	3.1647
25mmChicago4Hr	01-01-2019 02:30:00	2.7442
25mmChicago4Hr	01-01-2019 02:40:00	2.427
25mmChicago4Hr	01-01-2019 02:50:00	2.1762
25mmChicago4Hr	01-01-2019 03:00:00	1.977
25mmChicago4Hr	01-01-2019 03:10:00	1.8147
25mmChicago4Hr	01-01-2019 03:20:00	1.6819

25mmChicago4Hr	01-01-2019 03:30:00	1.5639
25mmChicago4Hr	01-01-2019 03:40:00	1.468
25mmChicago4Hr	01-01-2019 03:50:00	1.3795
25mmChicago4Hr	01-01-2019 04:00:00	1.3057

5YrSCS12hr	01-01-2019 3:30:00	2.304
5YrSCS12hr	01-01-2019 3:45:00	2.304
5YrSCS12hr	01-01-2019 4:00:00	3.456
5YrSCS12hr	01-01-2019 4:15:00	3.456
5YrSCS12hr	01-01-2019 4:30:00	4.608
5YrSCS12hr	01-01-2019 4:45:00	4.608
5YrSCS12hr	01-01-2019 5:00:00	6.912
5YrSCS12hr	01-01-2019 5:15:00	6.912
5YrSCS12hr	01-01-2019 5:30:00	27.648
5YrSCS12hr	01-01-2019 5:45:00	76.032
5YrSCS12hr	01-01-2019 6:00:00	10.368
5YrSCS12hr	01-01-2019 6:15:00	10.368
5YrSCS12hr	01-01-2019 6:30:00	4.608
5YrSCS12hr	01-01-2019 6:45:00	4.608
5YrSCS12hr	01-01-2019 7:00:00	3.456
5YrSCS12hr	01-01-2019 7:15:00	3.456
5YrSCS12hr	01-01-2019 7:30:00	3.456
5YrSCS12hr	01-01-2019 7:45:00	3.456
5YrSCS12hr	01-01-2019 8:00:00	2.016
5YrSCS12hr	01-01-2019 8:15:00	2.016
5YrSCS12hr	01-01-2019 8:30:00	2.016
5YrSCS12hr	01-01-2019 8:45:00	2.016
5YrSCS12hr	01-01-2019 9:00:00	2.016
5YrSCS12hr	01-01-2019 9:15:00	2.016
5YrSCS12hr	01-01-2019 9:30:00	2.016
5YrSCS12hr	01-01-2019 9:45:00	2.016
5YrSCS12hr	01-01-2019 10:00:00	1.152
5YrSCS12hr	01-01-2019 10:15:00	1.152
5YrSCS12hr	01-01-2019 10:30:00	1.152
5YrSCS12hr	01-01-2019 10:45:00	1.152
5YrSCS12hr	01-01-2019 11:00:00	1.152
5YrSCS12hr	01-01-2019 11:15:00	1.152
5YrSCS12hr	01-01-2019 11:30:00	1.152
5YrSCS12hr	01-01-2019 11:45:00	1.152
5YrSCS12hr	01-01-2019 12:00:00	0

;Rainfall (mm/hr)

2YrSCS12hr	01-01-2019 0:00:00	1.08
2YrSCS12hr	01-01-2019 0:15:00	1.08
2YrSCS12hr	01-01-2019 0:30:00	1.08
2YrSCS12hr	01-01-2019 0:45:00	1.08
2YrSCS12hr	01-01-2019 1:00:00	1.08
2YrSCS12hr	01-01-2019 1:15:00	1.08
2YrSCS12hr	01-01-2019 1:30:00	1.08
2YrSCS12hr	01-01-2019 1:45:00	1.08
2YrSCS12hr	01-01-2019 2:00:00	1.296
2YrSCS12hr	01-01-2019 2:15:00	1.296
2YrSCS12hr	01-01-2019 2:30:00	1.296
2YrSCS12hr	01-01-2019 2:45:00	1.296
2YrSCS12hr	01-01-2019 3:00:00	1.728
2YrSCS12hr	01-01-2019 3:15:00	1.728
2YrSCS12hr	01-01-2019 3:30:00	1.728
2YrSCS12hr	01-01-2019 3:45:00	1.728
2YrSCS12hr	01-01-2019 4:00:00	2.592
2YrSCS12hr	01-01-2019 4:15:00	2.592
2YrSCS12hr	01-01-2019 4:30:00	3.456
2YrSCS12hr	01-01-2019 4:45:00	3.456
2YrSCS12hr	01-01-2019 5:00:00	5.184
2YrSCS12hr	01-01-2019 5:15:00	5.184
2YrSCS12hr	01-01-2019 5:30:00	20.736
2YrSCS12hr	01-01-2019 5:45:00	57.024
2YrSCS12hr	01-01-2019 6:00:00	7.776
2YrSCS12hr	01-01-2019 6:15:00	7.776
2YrSCS12hr	01-01-2019 6:30:00	3.456
2YrSCS12hr	01-01-2019 6:45:00	3.456
2YrSCS12hr	01-01-2019 7:00:00	2.592
2YrSCS12hr	01-01-2019 7:15:00	2.592
2YrSCS12hr	01-01-2019 7:30:00	2.592
2YrSCS12hr	01-01-2019 7:45:00	2.592
2YrSCS12hr	01-01-2019 8:00:00	1.512
2YrSCS12hr	01-01-2019 8:15:00	1.512
2YrSCS12hr	01-01-2019 8:30:00	1.512
2YrSCS12hr	01-01-2019 8:45:00	1.512
2YrSCS12hr	01-01-2019 9:00:00	1.512
2YrSCS12hr	01-01-2019 9:15:00	1.512
2YrSCS12hr	01-01-2019 9:30:00	1.512
2YrSCS12hr	01-01-2019 9:45:00	1.512
2YrSCS12hr	01-01-2019 10:00:00	0.864
2YrSCS12hr	01-01-2019 10:15:00	0.864
2YrSCS12hr	01-01-2019 10:30:00	0.864
2YrSCS12hr	01-01-2019 10:45:00	0.864
2YrSCS12hr	01-01-2019 11:00:00	0.864
2YrSCS12hr	01-01-2019 11:15:00	0.864
2YrSCS12hr	01-01-2019 11:30:00	0.864
2YrSCS12hr	01-01-2019 12:00:00	0

;Depth (m)

MH-111-100YrCHI3Hr	01/01/2019 00:00:00	80.571
MH-111-100YrCHI3Hr	01/01/2019 00:05:00	80.571
MH-111-100YrCHI3Hr	01/01/2019 00:10:00	80.572
MH-111-100YrCHI3Hr	01/01/2019 00:15:00	80.573
MH-111-100YrCHI3Hr	01/01/2019 00:20:00	80.598
MH-111-100YrCHI3Hr	01/01/2019 00:25:00	80.659
MH-111-100YrCHI3Hr	01/01/2019 00:30:00	80.721
MH-111-100YrCHI3Hr	01/01/2019 00:35:00	80.794
MH-111-100YrCHI3Hr	01/01/2019 00:40:00	80.872
MH-111-100YrCHI3Hr	01/01/2019 00:45:00	80.963
MH-111-100YrCHI3Hr	01/01/2019 00:50:00	81.068
MH-111-100YrCHI3Hr	01/01/2019 00:55:00	81.22
MH-111-100YrCHI3Hr	01/01/2019 01:00:00	81.386
MH-111-100YrCHI3Hr	01/01/2019 01:05:00	81.505
MH-111-100YrCHI3Hr	01/01/2019 01:10:00	81.555
MH-111-100YrCHI3Hr	01/01/2019 01:15:00	81.604
MH-111-100YrCHI3Hr	01/01/2019 01:20:00	81.721
MH-111-100YrCHI3Hr	01/01/2019 01:25:00	81.907
MH-111-100YrCHI3Hr	01/01/2019 01:30:00	82.122
MH-111-100YrCHI3Hr	01/01/2019 01:35:00	82.313
MH-111-100YrCHI3Hr	01/01/2019 01:40:00	82.438
MH-111-100YrCHI3Hr	01/01/2019 01:45:00	82.497
MH-111-100YrCHI3Hr	01/01/2019 01:50:00	82.568
MH-111-100YrCHI3Hr	01/01/2019 01:55:00	82.632
MH-111-100YrCHI3Hr	01/01/2019 02:00:00	82.69
MH-111-100YrCHI3Hr	01/01/2019 02:05:00	82.713
MH-111-100YrCHI3Hr	01/01/2019 02:10:00	82.737
MH-111-100YrCHI3Hr	01/01/2019 02:15:00	82.761
MH-111-100YrCHI3Hr	01/01/2019 02:20:00	82.781
MH-111-100YrCHI3Hr	01/01/2019 02:25:00	82.787
MH-111-100YrCHI3Hr	01/01/2019 02:30:00	82.797
MH-111-100YrCHI3Hr	01/01/2019 02:35:00	82.804
MH-111-100YrCHI3Hr	01/01/2019 02:40:00	82.811

;Rainfall (mm/hr)

5YrSCS12hr	01-01-2019 0:00:00	1.44
5YrSCS12hr	01-01-2019 0:15:00	1.44
5YrSCS12hr	01-01-2019 0:30:00	1.44
5YrSCS12hr	01-01-2019 0:45:00	1.44
5YrSCS12hr	01-01-2019 1:00:00	1.44
5YrSCS12hr	01-01-2019 1:15:00	1.44
5YrSCS12hr	01-01-2019 1:30:00	1.44
5YrSCS12hr	01-01-2019 1:45:00	1.44
5YrSCS12hr	01-01-2019 2:00:00	1.728
5YrSCS12hr	01-01-2019 2:15:00	1.728
5YrSCS12hr	01-01-2019 2:30:00	1.728
5YrSCS12hr	01-01-2019 2:45:00	1.728
5YrSCS12hr	01-01-2019 3:00:00	2.304
5YrSCS12hr	01-01-2019 3:15:00	2.304

MH-111-July_1_1979 01/01/2019 18:45:00 82.169
 MH-111-July_1_1979 01/01/2019 18:50:00 82.167
 MH-111-July_1_1979 01/01/2019 18:55:00 82.164
 MH-111-July_1_1979 01/01/2019 19:00:00 82.163
 MH-111-July_1_1979 01/01/2019 19:05:00 82.16
 MH-111-July_1_1979 01/01/2019 19:10:00 82.159
 MH-111-July_1_1979 01/01/2019 19:15:00 82.156
 MH-111-July_1_1979 01/01/2019 19:20:00 82.154
 MH-111-July_1_1979 01/01/2019 19:25:00 82.152
 MH-111-July_1_1979 01/01/2019 19:30:00 82.151
 MH-111-July_1_1979 01/01/2019 19:35:00 82.148
 MH-111-July_1_1979 01/01/2019 19:40:00 82.147
 MH-111-July_1_1979 01/01/2019 19:45:00 82.144
 MH-111-July_1_1979 01/01/2019 19:50:00 82.143
 MH-111-July_1_1979 01/01/2019 19:55:00 82.141
 MH-111-July_1_1979 01/01/2019 20:00:00 82.139
 MH-111-July_1_1979 01/01/2019 20:05:00 82.137
 MH-111-July_1_1979 01/01/2019 20:10:00 82.135
 MH-111-July_1_1979 01/01/2019 20:15:00 82.133
 MH-111-July_1_1979 01/01/2019 20:20:00 82.131
 MH-111-July_1_1979 01/01/2019 20:25:00 82.129
 MH-111-July_1_1979 01/01/2019 20:30:00 82.127
 MH-111-July_1_1979 01/01/2019 20:35:00 82.125
 MH-111-July_1_1979 01/01/2019 20:40:00 82.123
 MH-111-July_1_1979 01/01/2019 20:45:00 82.121
 MH-111-July_1_1979 01/01/2019 20:50:00 82.12
 MH-111-July_1_1979 01/01/2019 20:55:00 82.118
 MH-111-July_1_1979 01/01/2019 21:00:00 82.116
 MH-111-July_1_1979 01/01/2019 21:05:00 82.114
 MH-111-July_1_1979 01/01/2019 21:10:00 82.112
 MH-111-July_1_1979 01/01/2019 21:15:00 82.11
 MH-111-July_1_1979 01/01/2019 21:20:00 82.108
 MH-111-July_1_1979 01/01/2019 21:25:00 82.106
 MH-111-July_1_1979 01/01/2019 21:30:00 82.105
 MH-111-July_1_1979 01/01/2019 21:35:00 82.103
 MH-111-July_1_1979 01/01/2019 21:40:00 82.101
 MH-111-July_1_1979 01/01/2019 21:45:00 82.099
 MH-111-July_1_1979 01/01/2019 21:50:00 82.097
 MH-111-July_1_1979 01/01/2019 21:55:00 82.095
 MH-111-July_1_1979 01/01/2019 22:00:00 82.094
 MH-111-July_1_1979 01/01/2019 22:05:00 82.092
 MH-111-July_1_1979 01/01/2019 22:10:00 82.09
 MH-111-July_1_1979 01/01/2019 22:15:00 82.088
 MH-111-July_1_1979 01/01/2019 22:20:00 82.087
 MH-111-July_1_1979 01/01/2019 22:25:00 82.084
 MH-111-July_1_1979 01/01/2019 22:30:00 82.083
 MH-111-July_1_1979 01/01/2019 22:35:00 82.081
 MH-111-July_1_1979 01/01/2019 22:40:00 82.08
 MH-111-July_1_1979 01/01/2019 22:45:00 82.077
 MH-111-July_1_1979 01/01/2019 22:50:00 82.076
 MH-111-July_1_1979 01/01/2019 22:55:00 82.074
 MH-111-July_1_1979 01/01/2019 23:00:00 82.072
 MH-111-July_1_1979 01/01/2019 23:05:00 82.07
 MH-111-July_1_1979 01/01/2019 23:10:00 82.069
 MH-111-July_1_1979 01/01/2019 23:15:00 82.067
 MH-111-July_1_1979 01/01/2019 23:20:00 82.066
 MH-111-July_1_1979 01/01/2019 23:25:00 82.064
 MH-111-July_1_1979 01/01/2019 23:30:00 82.062
 MH-111-July_1_1979 01/01/2019 23:35:00 82.06
 MH-111-July_1_1979 01/01/2019 23:40:00 82.059
 MH-111-July_1_1979 01/01/2019 23:45:00 82.057
 MH-111-July_1_1979 01/01/2019 23:50:00 82.055
 MH-111-July_1_1979 01/01/2019 23:55:00 82.053
 MH-111-July_1_1979 01/02/2019 00:00:00 82.052

No_Rain 01/01/2019 00:00 0
 No_Rain 12/31/2019 0:00 0

[REPORT]
 ;;Reporting Options

INPUT YES
 CONTROLS NO
 SUBCATCHMENTS ALL
 NODES ALL
 LINKS ALL

[TAGS]
 Node 02_(CB) CB
 Node 03_(CB) CB
 Node 04_(CB) CB
 Node 05_(CB) CB
 Node 06_(CB) CB
 Node 08_(CB) CB
 Node 09_(CB) CB
 Node 1_(RYCB) RY
 Node 10_(CB) CB
 Node 100_(STM) STM
 Node 102_(STM) STM
 Node 104_(STM) STM
 Node 106_(STM) STM
 Node 108_(STM) STM
 Node 11_(CB) CB
 Node 110_(STM) STM
 Node 112_(STM) STM
 Node 114_(STM) STM
 Node 116_(STM) STM
 Node 118_(STM) STM
 Node 12_(CB) CB
 Node 120_(STM) STM
 Node 122_(STM) STM
 Node 124_(STM) STM
 Node 126_(STM) STM
 Node 128_(STM) STM
 Node 13_(CB) CB
 Node 130_(STM) STM
 Node 132_(STM) STM
 Node 134_(STM) STM
 Node 136_(STM) STM
 Node 138_(STM) STM
 Node 14_(CB) CB
 Node 140_(STM) STM
 Node 142_(STM) STM
 Node 144_(STM) STM
 Node 146_(STM) STM
 Node 148_(STM) STM
 Node 15_(CB) CB
 Node 15_RYCB RY
 Node 150_(STM) STM
 Node 152_(STM) STM
 Node 154_(STM) STM
 Node 156_(STM) STM
 Node 158_(STM) STM
 Node 16_(CB) CB
 Node 160_(STM) STM
 Node 162_(STM) STM
 Node 164_(STM) STM
 Node 166_(STM) STM
 Node 168_(STM) STM
 Node 17_(CB) CB
 Node 170_(STM) STM
 Node 18_(CB) CB
 Node 19_(CB) CB
 Node 20_(CB) CB
 Node 21_(CB) CB
 Node 2121_(STM) STM
 Node 2142_(STM) STM
 Node 2143_(STM) STM
 Node 2144_(STM) STM
 Node 22_(RYCB) RY
 Node 23_(CB) CB

Node	24_(CB)	CB	Node	Maj-06	Maj
Node	25_(CB)	CB	Node	Maj-06_2	Maj
Node	26_(CB)	CB	Node	Maj-07	Maj
Node	27_(CB)	CB	Node	Maj-08	Maj
Node	28_(CB)	CB	Node	Maj-09	Maj
Node	29_(RYCB)	RY	Node	Maj-10	Maj
Node	30_(CB)	CB	Node	Maj-11	Maj
Node	31_(CB)	CB	Node	Maj-12	Maj
Node	32_(CB)	CB	Node	Maj-13	Maj
Node	33_(CB)	CB	Node	Maj-14	Maj
Node	34_(CB)	CB	Node	Maj-15	Maj
Node	35_(CB)	CB	Node	Maj-15_2	Maj
Node	36_(CB)	CB	Node	Maj-16	Maj
Node	37_(CB)	CB	Node	Maj-17	Maj
Node	38_(RYCB)	RY	Node	Maj-18_2	Maj
Node	39_(RYCB)	RY	Node	Maj-19	Maj
Node	40_(CB)	CB	Node	Maj-19_2	Maj
Node	41_(CB)	CB	Node	Maj-20	Maj
Node	42_(CB)	CB	Node	Maj-21	Maj
Node	43_(CB)	CB	Node	Maj-23	Maj
Node	44_(CB)	CB	Node	Maj-24	Maj
Node	45_(CB)	CB	Node	Maj-25	Maj
Node	46_(CB)	CB	Node	Maj-26	Maj
Node	47_(CB)	CB	Node	Maj-27	Maj
Node	48_(CB)	CB	Node	Maj-28	Maj
Node	49_(CB)	CB	Node	Maj-29	Maj
Node	50_(CB)	CB	Node	Maj-30	Maj
Node	51_(CB)	CB	Node	Maj-31	Maj
Node	52_(CB)	CB	Node	Maj-32	Maj
Node	53_(CB)	CB	Node	Maj-33	Maj
Node	54_(CB)	CB	Node	Maj-34	Maj
Node	55_(CB)	CB	Node	Maj-34_2	Maj
Node	57_(CB)	CB	Node	Maj-35	Maj
Node	58_(CB)	CB	Node	Maj-36	Maj
Node	59_(CB)	CB	Node	Maj-37	Maj
Node	98_(STM)	STM	Node	Maj-38	Maj
Node	ELB_1_(RYCB)	RY	Node	Maj-39	Maj
Node	ELB_10_(RYCB)	RY	Node	Maj-40	Maj
Node	ELB_11_(RYCB)	RY	Node	Maj-41	Maj
Node	ELB_12_(RYCB)	RY	Node	Maj-42	Maj
Node	ELB_13_(RYCB)	RY	Node	Maj-43	Maj
Node	ELB_14_(RYCB)	RY	Node	Maj-44	Maj
Node	ELB_15_(RYCB)	RY	Node	Maj-45	Maj
Node	ELB_16_(RYCB)	RY	Node	Maj-46	Maj
Node	ELB_17_(RYCB)	RY	Node	Maj-48_2	Maj
Node	ELB_18_(RYCB)	RY	Node	Maj-48_3	Maj
Node	ELB_19_(RYCB)	RY	Node	Maj-50	Maj
Node	ELB_2_(RYCB)	RY	Node	Maj-51	Maj
Node	ELB_20_(RYCB)	RY	Node	Maj-52	Maj
Node	ELB_21_(RYCB)	RY	Node	Maj-53	Maj
Node	ELB_22_(RYCB)	RY	Node	Maj-54	Maj
Node	ELB_23_(RYCB)	RY	Node	Maj-55	Maj
Node	ELB_24_(RYCB)	RY	Node	Maj-56	Maj
Node	ELB_25_(RYCB)	RY	Node	Maj-58	Maj
Node	ELB_3_(RYCB)	RY	Node	Maj-59	Maj
Node	ELB_4_(RYCB)	RY	Node	Maj-60	Maj
Node	ELB_5_(RYCB)	RY	Node	Maj-61	Maj
Node	ELB_6_(RYCB)	RY	Node	Maj-62	Maj
Node	ELB_7_(RYCB)	RY	Node	Maj-63	Maj
Node	ELB_8_(RYCB)	RY	Node	Maj-64	Maj
Node	ELB_9_(RYCB)	RY	Node	Maj-65	Maj
Node	J1	Maj	Node	Maj-66	Maj
Node	Maj-01_2	Maj	Node	Maj-67	Maj
Node	Maj-02	Maj	Node	Maj-Park	Maj
Node	Maj-02_2	Maj	Node	RYCB_1_(RYCB)	RY
Node	Maj-03	Maj	Node	RYCB_10_(RYCB)	RY
Node	Maj-04	Maj	Node	RYCB_11_(RYCB)	RY
Node	Maj-04_2	Maj	Node	RYCB_12_(RYCB)	RY
Node	Maj-05	Maj	Node	RYCB_13_(RYCB)	RY
Node	Maj-05_2	Maj	Node	RYCB_14_(RYCB)	RY

Node	RYCB_15_(RYCB)	RY	Link	13_(STM)	STM
Node	RYCB_18_(RYCB)	RY	Link	14_(STM)	STM
Node	RYCB_2_(RYCB)	RY	Link	15_(10)_(STM)	STM
Node	RYCB_3_(RYCB)	RY	Link	15_(11)_(STM)	STM
Node	RYCB_4_(RYCB)	RY	Link	15_(12)_(STM)	STM
Node	RYCB_5_(RYCB)	RY	Link	15_(13)_(STM)	STM
Node	RYCB_6_(RYCB)	RY	Link	15_(14)_(STM)	STM
Node	RYCB_7_(RYCB)	RY	Link	15_(15)_(STM)	STM
Node	RYCB_8_(RYCB)	RY	Link	15_(16)_(STM)	STM
Node	RYCB_9_(RYCB)	RY	Link	15_(19)_(STM)	STM
Node	Slope1	Maj	Link	15_(20)_(STM)	STM
Node	StartNullStruct2	RY	Link	15_(21)_(STM)	STM
Node	StartNullStruct3	STM	Link	15_(22)_(STM)	STM
Node	STM-251_(STM)	STM	Link	15_(3)_(STM)	STM
Node	Structure_-(18)_(RYCB)	RY	Link	15_(4)_(STM)	STM
Node	TEE_1_(RYCB)	RY	Link	15_(5)_(STM)	STM
Node	TEE_10_(RYCB)	RY	Link	15_(9)_(STM)	STM
Node	TEE_11_(RYCB)	RY	Link	2_(STM)	STM
Node	TEE_12_(RYCB)	RY	Link	3_(STM)	STM
Node	TEE_13_(RYCB)	RY	Link	4_(STM)	STM
Node	TEE_14_(RYCB)	RY	Link	5_(STM)	STM
Node	TEE_15_(RYCB)	RY	Link	6_(STM)	STM
Node	TEE_16_(RYCB)	RY	Link	7_(1)_(STM)	STM
Node	TEE_17_(RYCB)	RY	Link	7_(STM)	STM
Node	TEE_18_(RYCB)	RY	Link	8_(STM)	STM
Node	TEE_19_(RYCB)	RY	Link	9_(STM)	STM
Node	TEE_2_(RYCB)	RY	Link	C1	Maj
Node	TEE_20_(RYCB)	RY	Link	C1_1	Maj
Node	TEE_21_(RYCB)	RY	Link	C1_2	Maj
Node	TEE_22_(RYCB)	RY	Link	C10	Maj
Node	TEE_23_(RYCB)	RY	Link	C11	Maj
Node	TEE_24_(RYCB)	RY	Link	C12	Maj
Node	TEE_25_(RYCB)	RY	Link	C13	Maj
Node	TEE_26_(RYCB)	RY	Link	C14	Maj
Node	TEE_27_(RYCB)	RY	Link	C15	Maj
Node	TEE_28_(RYCB)	RY	Link	C16	Maj
Node	TEE_29_(RYCB)	RY	Link	C17	Maj
Node	TEE_3_(RYCB)	RY	Link	C18	Maj
Node	TEE_30_(RYCB)	RY	Link	C18_2	Maj
Node	TEE_31_(RYCB)	RY	Link	C18_3	Maj
Node	TEE_32_(RYCB)	RY	Link	C18_4	Maj
Node	TEE_33_(RYCB)	RY	Link	C18_5	Maj
Node	TEE_34_(RYCB)	RY	Link	C18_6	Maj
Node	TEE_35_(RYCB)	RY	Link	C18_7	Maj
Node	TEE_36_(RYCB)	RY	Link	C18_8	Maj
Node	TEE_37_(RYCB)	RY	Link	C18_9	Maj
Node	TEE_38_(RYCB)	RY	Link	C19	Maj
Node	TEE_39_(RYCB)	RY	Link	C2	Maj
Node	TEE_4_(RYCB)	RY	Link	C2_1	Maj
Node	TEE_40_(RYCB)	RY	Link	C2_2	Maj
Node	TEE_41_(RYCB)	RY	Link	C20	Maj
Node	TEE_42_(RYCB)	RY	Link	C21	Maj
Node	TEE_43_(RYCB)	RY	Link	C22	Maj
Node	TEE_44_(RYCB)	RY	Link	C23	Maj
Node	TEE_5_(RYCB)	RY	Link	C24	Maj
Node	TEE_6_(RYCB)	RY	Link	C25	Maj
Node	TEE_7_(RYCB)	RY	Link	C26	Maj
Node	TEE_8_(RYCB)	RY	Link	C27	Maj
Node	TEE_9_(RYCB)	RY	Link	C27_1	Maj
Node	Maj-01	Maj	Link	C27_2	Maj
Node	Maj-18	Maj	Link	C28	Maj
Node	Maj-22	Maj	Link	C29	Maj
Node	Maj-48	Maj	Link	C3	Maj
Node	Maj-49	Maj	Link	C30	Maj
Node	Maj-57	Maj	Link	C31	Maj
Node	STM-111_(STM)	STM	Link	C31_1	Maj
Link	1_(STM)	STM	Link	C31_2	Maj
Link	10_(STM)	STM	Link	C32	Maj
Link	11_(STM)	STM	Link	C33	Maj
Link	12_(STM)	STM	Link	C34	Maj

Link	C35	Maj	Link	Pipe_-_ (117)_ (RYCB) RY
Link	C36	Maj	Link	Pipe_-_ (118)_ (RYCB) RY
Link	C37	Maj	Link	Pipe_-_ (119)_ (RYCB) RY
Link	C38	Maj	Link	Pipe_-_ (120)_ (RYCB) RY
Link	C39	Maj	Link	Pipe_-_ (121)_ (RYCB) RY
Link	C4	Maj	Link	Pipe_-_ (122)_ (RYCB) RY
Link	C4_1	Maj	Link	Pipe_-_ (123)_ (RYCB) RY
Link	C4_2	Maj	Link	Pipe_-_ (124)_ (RYCB) RY
Link	C4_3	Maj	Link	Pipe_-_ (125)_ (RYCB) RY
Link	C4_4	Maj	Link	Pipe_-_ (126)_ (RYCB) RY
Link	C40	Maj	Link	Pipe_-_ (127)_ (RYCB) RY
Link	C41	Maj	Link	Pipe_-_ (128)_ (RYCB) RY
Link	C42	Maj	Link	Pipe_-_ (129)_ (RYCB) RY
Link	C43	Maj	Link	Pipe_-_ (130)_ (RYCB) RY
Link	C44	Maj	Link	Pipe_-_ (131)_ (RYCB) RY
Link	C45	Maj	Link	Pipe_-_ (132)_ (RYCB) RY
Link	C46	Maj	Link	Pipe_-_ (133)_ (RYCB) RY
Link	C47	Maj	Link	Pipe_-_ (134)_ (RYCB) RY
Link	C48	Maj	Link	Pipe_-_ (137)_ (RYCB) RY
Link	C49	Maj	Link	Pipe_-_ (138)_ (RYCB) RY
Link	C5	Maj	Link	Pipe_-_ (139)_ (RYCB) RY
Link	C5_1	Maj	Link	Pipe_-_ (14)_ (RYCB) RY
Link	C5_2	Maj	Link	Pipe_-_ (140)_ (RYCB) RY
Link	C50	Maj	Link	Pipe_-_ (141)_ (RYCB) RY
Link	C50_1	Maj	Link	Pipe_-_ (142)_ (RYCB) RY
Link	C50_3	Maj	Link	Pipe_-_ (143)_ (RYCB) RY
Link	C50_4	Maj	Link	Pipe_-_ (144)_ (RYCB) RY
Link	C51	Maj	Link	Pipe_-_ (145)_ (RYCB) RY
Link	C52	Maj	Link	Pipe_-_ (146)_ (RYCB) RY
Link	C53	Maj	Link	Pipe_-_ (147)_ (RYCB) RY
Link	C54	Maj	Link	Pipe_-_ (148)_ (RYCB) RY
Link	C55	Maj	Link	Pipe_-_ (149)_ (RYCB) RY
Link	C56	Maj	Link	Pipe_-_ (15)_ (RYCB) RY
Link	C57	Maj	Link	Pipe_-_ (150)_ (RYCB) RY
Link	C58	Maj	Link	Pipe_-_ (151)_ (RYCB) RY
Link	C58_1	Maj	Link	Pipe_-_ (152)_ (RYCB) RY
Link	C58_2	Maj	Link	Pipe_-_ (153)_ (RYCB) RY
Link	C59_1	Maj	Link	Pipe_-_ (154)_ (RYCB) RY
Link	C59_2	Maj	Link	Pipe_-_ (155)_ (RYCB) RY
Link	C6	Maj	Link	Pipe_-_ (156)_ (1)_ (RYCB) RY
Link	C6_1	Maj	Link	Pipe_-_ (156)_ (RYCB) RY
Link	C6_2	Maj	Link	Pipe_-_ (157)_ (RYCB) RY
Link	C60	Maj	Link	Pipe_-_ (159)_ (RYCB) RY
Link	C61_1	Maj	Link	Pipe_-_ (16)_ (RYCB) RY
Link	C61_2	Maj	Link	Pipe_-_ (160)_ (RYCB) RY
Link	C62	Maj	Link	Pipe_-_ (161)_ (RYCB) RY
Link	C63_1	Maj	Link	Pipe_-_ (162)_ (RYCB) RY
Link	C63_2	Maj	Link	Pipe_-_ (164)_ (RYCB) RY
Link	C64	Maj	Link	Pipe_-_ (165)_ (RYCB) RY
Link	C65_1	Maj	Link	Pipe_-_ (17)_ (RYCB) RY
Link	C65_2	Maj	Link	Pipe_-_ (19)_ (RYCB) RY
Link	C66_1	Maj	Link	Pipe_-_ (2)_ (RYCB) RY
Link	C66_2	Maj	Link	Pipe_-_ (22)_ (RYCB) RY
Link	C67	Maj	Link	Pipe_-_ (23)_ (RYCB) RY
Link	C68	Maj	Link	Pipe_-_ (24)_ (RYCB) RY
Link	C69	Maj	Link	Pipe_-_ (25)_ (RYCB) RY
Link	C7	Maj	Link	Pipe_-_ (27)_ (RYCB) RY
Link	C8	Maj	Link	Pipe_-_ (73)_ (RYCB) RY
Link	C9	Maj	Link	Pipe_-_ (74)_ (RYCB) RY
Link	Pipe_-_ (1)_ (RYCB) 1 RY		Link	Pipe_-_ (77)_ (RYCB) RY
Link	Pipe_-_ (10)_ (RYCB) RY		Link	Pipe_-_ (87)_ (RYCB) RY
Link	Pipe_-_ (100)_ (RYCB) RY		Link	Pipe_-_ (88)_ (RYCB) RY
Link	Pipe_-_ (101)_ (RYCB) RY		Link	Pipe_-_ (89)_ (RYCB) RY
Link	Pipe_-_ (103)_ (1)_ (RYCB) RY		Link	Pipe_-_ (9)_ (RYCB) RY
Link	Pipe_-_ (103)_ (RYCB) RY		Link	Pipe_-_ (90)_ (RYCB) RY
Link	Pipe_-_ (109)_ (RYCB) RY		Link	Pipe_-_ (93)_ (RYCB) RY
Link	Pipe_-_ (11)_ (RYCB) RY		Link	Pipe_-_ (94)_ (RYCB) RY
Link	Pipe_-_ (110)_ (RYCB) RY		Link	Pipe_-_ (95)_ (RYCB) RY
Link	Pipe_-_ (111)_ (RYCB) RY		Link	Pipe_-_ (96)_ (RYCB) RY
Link	Pipe_-_ (114)_ (RYCB) RY		Link	Pipe_-_ (98)_ (RYCB) RY

Link Pipe - (99) (RYCB) RY
 Link STM-23 (STM) STM
 Link STM-24 (STM) STM
 Link STM-27 (STM) STM
 Link STM-28 (STM) STM
 Link STM-34 (1) (1) (STM) STM
 Link STM-34 (1) (STM) STM
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 Link OR-04 Grate
 Link OR-05 Grate
 Link OR-06 Grate

Link OR-08 Grate
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 Link RYCB-06 Lead
 Link RYCB-07 Lead
 Link RYCB-10 ICD
 Link RYCB-18 Lead
 Link RYCB-22 ICD
 Link RYCB-29 ICD
 Link RYCB-38 ICD
 Link RYCB-39 ICD

[MAP]
 DIMENSIONS 381264.26565 5033747.0677
 381848.96735 5034901.1063
 UNITS Meters

[COORDINATES]
 ;;Node X-Coord Y-Coord
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 02_(CB) 381640.363 5033940.449
 03_(CB) 381639.319 5033948.683

04_(CB)	381707.362	5033964.513	33_(CB)	381559.242	5034416.94
05_(CB)	381704.042	5033972.256	34_(CB)	381537.986	5034376.241
06_(CB)	381744.277	5033945.622	35_(CB)	381534.823	5034383.637
08_(CB)	381742.356	5034021.942	36_(CB)	381439.974	5034407.723
09_(CB)	381735.199	5034018.381	37_(CB)	381431.96	5034404.589
1_(RYCB)	381613.893	5033947.165	38_(RYCB)	381428.516	5034412.648
10_(CB)	381712.816	5034088.875	39_(RYCB)	381422.234	5034448.442
100_(STM)	381764.117	5033934.567	40_(CB)	381417.006	5034502.802
102_(STM)	381768.733	5033945.462	41_(CB)	381408.506	5034502.869
104_(STM)	381751.832	5033983.755	42_(CB)	381362.704	5034648.887
106_(STM)	381661.746	5033946.201	43_(CB)	381354.995	5034645.351
108_(STM)	381636.072	5033940.78	44_(CB)	381657.847	5034213.423
11_(CB)	381705.04	5034085.441	45_(CB)	381650.071	5034209.99
110_(STM)	381606.992	5033939.535	46_(CB)	381640.714	5034173.395
112_(STM)	381722.061	5034051.287	47_(CB)	381637.365	5034181.208
114_(STM)	381695.933	5034110.412	48_(CB)	381580.475	5034147.57
116_(STM)	381684.826	5034114.785	49_(CB)	381577.127	5034155.38
118_(STM)	381593.257	5034075.528	50_(CB)	381646.323	5034096.374
12_(CB)	381693.043	5034036.978	51_(CB)	381642.974	5034104.186
120_(STM)	381637.884	5034015.234	52_(CB)	381437.977	5034421.78
122_(STM)	381613.388	5034012.674	53_(CB)	381495.276	5034445.607
124_(STM)	381598.561	5034020.702	54_(CB)	381498.626	5034437.794
126_(STM)	381577.374	5034069.721	55_(CB)	381765.154	5033970.288
128_(STM)	381546.966	5034139.351	57_(CB)	381763.267	5033922.607
13_(CB)	381689.694	5034044.79	58_(CB)	381708.111	5033853.995
130_(STM)	381628.129	5034174.222	59_(CB)	381762.072	5033997.514
132_(STM)	381662.497	5034188.987	98_(STM)	381785.194	5033899.178
134_(STM)	381695.108	5034204.263	ELB_1_(RYCB)	381700.573	5033926.894
136_(STM)	381522.723	5034196.958	ELB_10_(RYCB)	381599.13	5034277.804
138_(STM)	381527.988	5034210.775	ELB_11_(RYCB)	381637.075	5034217.32
14_(CB)	381597.707	5034039.587	ELB_12_(RYCB)	381642.665	5034324.923
140_(STM)	381631.534	5034256.315	ELB_13_(RYCB)	381495.849	5034321.044
142_(STM)	381640.84	5034237.84	ELB_14_(RYCB)	381510.037	5034327.133
144_(STM)	381600.199	5034327.009	ELB_15_(RYCB)	381429.255	5034328.779
146_(STM)	381528.36	5034294.959	ELB_16_(RYCB)	381461.331	5034385.698
148_(STM)	381456.173	5034264.012	ELB_17_(RYCB)	381418.154	5034354.74
15_(CB)	381589.912	5034036.197	ELB_18_(RYCB)	381384.507	5034431.762
15_RYCB	381522.627	5034214.255	ELB_19_(RYCB)	381584.211	5034112.987
150_(STM)	381569.837	5034397.001	ELB_2_(RYCB)	381662.86	5033987.854
152_(STM)	381547.042	5034451.801	ELB_20_(RYCB)	381735.662	5034114.708
154_(STM)	381535.402	5034456.553	ELB_21_(RYCB)	381691.942	5034213.823
156_(STM)	381442.843	5034416.871	ELB_22_(RYCB)	381568.311	5034495.286
158_(STM)	381470.942	5034353.543	ELB_23_(RYCB)	381518.443	5034489.592
16_(CB)	381567.802	5034108.366	ELB_24_(RYCB)	381791.285	5033989.638
160_(STM)	381457.588	5034358.648	ELB_25_(RYCB)	381708.31	5033927.869
162_(STM)	381416.076	5034456.483	ELB_3_(RYCB)	381652.666	5033983.757
164_(STM)	381413.768	5034516.578	ELB_4_(RYCB)	381581.795	5033976.053
166_(STM)	381406.574	5034544.92	ELB_5_(RYCB)	381580.949	5033978.006
168_(STM)	381365.805	5034637.487	ELB_6_(RYCB)	381748.325	5034086.133
17_(CB)	381560.007	5034104.977	ELB_7_(RYCB)	381616.382	5034075.058
170_(STM)	381327.98	5034723.422	ELB_8_(RYCB)	381504.046	5034155.002
18_(CB)	381541.884	5034167.976	ELB_9_(RYCB)	381496.419	5034172.819
19_(CB)	381534.089	5034164.586	J1	381549.496	5034106.162
20_(CB)	381581.406	5034227.395	Maj-01_2	381331.798	5034706.095
21_(CB)	381578.057	5034235.207	Maj-02	381342.288	5034683.606
2121_(STM)	381797.506	5033862.116	Maj-02_2	381353.136	5034660.68
2142_(STM)	381733.715	5033824.051	Maj-03	381359.381	5034647.481
2143_(STM)	381710.028	5033827.852	Maj-04	381387.564	5034583.352
2144_(STM)	381693.076	5033817.017	Maj-04_2	381393.958	5034569.717
22_(RYCB)	381646.054	5034240.141	Maj-05	381401.951	5034550.69
23_(CB)	381624.155	5034289.758	Maj-05_2	381402.995	5034546.144
24_(CB)	381616.38	5034286.326	Maj-06	381411.465	5034523.018
25_(CB)	381569.18	5034305.469	Maj-06_2	381411.962	5034502.787
26_(CB)	381565.878	5034313.223	Maj-07	381413.465	5034468.686
27_(CB)	381486.175	5034268.55	Maj-08	381416.91	5034452.058
28_(CB)	381482.272	5034277.449	Maj-09	381432.186	5034414.406
29_(RYCB)	381634.571	5034343.916	Maj-10	381435.592	5034406.105
30_(CB)	381592.282	5034362.433	Maj-11	381442.75	5034417.427
31_(CB)	381584.351	5034358.98	Maj-12	381497.775	5034442.101
32_(CB)	381567.034	5034420.338	Maj-13	381540.5	5034456.444

Maj-14	381562.795	5034420.84
Maj-15	381573.401	5034393.553
Maj-15_2	381603.958	5034326.421
Maj-16	381536.878	5034380.349
Maj-17	381457.696	5034356.091
Maj-18_2	381633.162	5034339.357
Maj-19	381566.414	5034309.792
Maj-19_2	381591.329	5034320.826
Maj-20	381543.507	5034300.033
Maj-21	381484.13	5034275.269
Maj-23	381608.541	5034316.121
Maj-24	381621.369	5034287.607
Maj-25	381635.742	5034254.688
Maj-26	381580.14	5034232.359
Maj-27	381542.959	5034216.408
Maj-28	381537.056	5034166.524
Maj-29	381551.053	5034138.553
Maj-30	381575.916	5034151.186
Maj-31	381619.905	5034169.158
Maj-32	381640.736	5034178.892
Maj-33	381654.551	5034211.412
Maj-34	381664.566	5034188.961
Maj-34_2	381690.114	5034200.739
Maj-35	381565.153	5034106.303
Maj-36	381580.163	5034072.113
Maj-37	381594.925	5034037.553
Maj-38	381607.643	5034017.588
Maj-39	381627.215	5034016.837
Maj-40	381641.204	5034020.262
Maj-41	381691.979	5034042.056
Maj-42	381649.35	5034103.078
Maj-43	381686.268	5034117.921
Maj-44	381709.885	5034086.785
Maj-45	381722.3	5034055.112
Maj-46	381739.691	5034019.616
Maj-48_2	381781.911	5034001.189
Maj-48_3	381763.999	5033993.482
Maj-50	381640.747	5033943.96
Maj-51	381672.455	5033954.954
Maj-52	381721.553	5033975.967
Maj-53	381753.038	5033988.766
Maj-54	381762.396	5033967.954
Maj-55	381756.035	5033936.811
Maj-56	381494.997	5034256.092
Maj-58	381766.255	5033924.846
Maj-59	381770.697	5033916.865
Maj-60	381528.438	5034203.663
Maj-61	381544.191	5034175.631
Maj-62	381554.75	5034415.29
Maj-63	381730.205	5034016.811
Maj-64	381448.655	5034285.38
Maj-65	381778.382	5034008.55
Maj-66	381736.548	5033940.72
Maj-67	381703.616	5034083.059
Maj-Park	381713.84	5033832.09
RYCB_1_(RYCB)	381734.202	5033941.191
RYCB_10_(RYCB)	381442.319	5034298.46
RYCB_11_(RYCB)	381578.806	5034356.559
RYCB_12_(RYCB)	381550.039	5034423.66
RYCB_13_(RYCB)	381398.692	5034399.905
RYCB_14_(RYCB)	381595.739	5034432.854
RYCB_15_(RYCB)	381427.566	5034450.578
RYCB_18_(RYCB)	381670.55	5034150.009
RYCB_2_(RYCB)	381725.556	5034014.74
RYCB_3_(RYCB)	381612.277	5033977.722
RYCB_4_(RYCB)	381781.005	5034010.848
RYCB_5_(RYCB)	381699.781	5034083.118
RYCB_6_(RYCB)	381529.161	5034097.261
RYCB_7_(RYCB)	381502.626	5034236.326
RYCB_8_(RYCB)	381544.063	5034177.384

RYCB_9_(RYCB)	381674.723	5034252.795
Slope1	381588.486	5034360.411
StartNullStruct2	381672.996	5033992.169
StartNullStruct3	381785.825	5033999.81
STM-251_(STM)	381634.726	5034343.823
Structure_-(18)_(RYCB)	381684.258	5034115.629
TEE_1_(RYCB)	381692.419	5034000.507
TEE_10_(RYCB)	381510.902	5034139.24
TEE_11_(RYCB)	381526.967	5034102.206
TEE_12_(RYCB)	381481.223	5034207.753
TEE_13_(RYCB)	381474.067	5034224.19
TEE_14_(RYCB)	381499.643	5034235.058
TEE_15_(RYCB)	381507.237	5034238.213
TEE_16_(RYCB)	381540.082	5034252.461
TEE_17_(RYCB)	381560.408	5034261.179
TEE_18_(RYCB)	381580.624	5034269.812
TEE_19_(RYCB)	381620.112	5034209.907
TEE_2_(RYCB)	381633.017	5033978.954
TEE_20_(RYCB)	381594.914	5034199.197
TEE_21_(RYCB)	381574.635	5034190.459
TEE_22_(RYCB)	381660.032	5034285.809
TEE_23_(RYCB)	381468.715	5034309.368
TEE_24_(RYCB)	381523.065	5034332.731
TEE_25_(RYCB)	381550.359	5034344.355
TEE_26_(RYCB)	381486.817	5034396.509
TEE_27_(RYCB)	381513.832	5034408.124
TEE_28_(RYCB)	381412.802	5034367.12
TEE_29_(RYCB)	381601.179	5034120.349
TEE_3_(RYCB)	381565.175	5034014.419
TEE_30_(RYCB)	381621.361	5034128.918
TEE_31_(RYCB)	381642.632	5034138.054
TEE_32_(RYCB)	381666.847	5034148.422
TEE_33_(RYCB)	381674.215	5034151.582
TEE_34_(RYCB)	381701.138	5034163.137
TEE_35_(RYCB)	381712.266	5034167.926
TEE_36_(RYCB)	381587.21	5034452.17
TEE_37_(RYCB)	381604.181	5034413.374
TEE_38_(RYCB)	381612.601	5034394.104
TEE_39_(RYCB)	381631.287	5034351.415
TEE_4_(RYCB)	381547.662	5034054.776
TEE_40_(RYCB)	381490.353	5034477.632
TEE_41_(RYCB)	381457.485	5034463.531
TEE_42_(RYCB)	381806.618	5033954.387
TEE_43_(RYCB)	381821.326	5033920.619
TEE_44_(RYCB)	381733.757	5033868.705
TEE_5_(RYCB)	381530.407	5034094.432
TEE_6_(RYCB)	381764.108	5034050.504
TEE_7_(RYCB)	381626.502	5034052.072
TEE_8_(RYCB)	381647.239	5034060.747
TEE_9_(RYCB)	381667.469	5034069.361
Maj-01	381325.332	5034719.952
Maj-18	381637.356	5034341.21
Maj-22	381471.715	5034270.038
Maj-48	381786.497	5034003.157
Maj-49	381597.176	5033939.913
Maj-57	381697.2	5034204
OF1	381690.918	5033799.524
STM-111_(STM)	381695.19	5033799.968
B1_Stor	381381.8	5034524.754
B2_Stor	381428.703	5034532.135
B3_Stor	381440.972	5034513.72

[VERTICES]

::Link	X-Coord	Y-Coord
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C11	381471.189	5034350.534
C14	381535.443	5034458.427
C16	381548.571	5034453.532
C27_1	381530.457	5034209.127
C27_2	381525.808	5034196.544

C31	381709.448	5033831.75
C31	381689.146	5033818.376
C31_2	381544.884	5034166.116
C4	381782.464	5033897.925
C4	381793.719	5033864.62
C4	381733.618	5033827.883
C4_4	381559.663	5034415.746
C40	381698.314	5034112.953
C57	381771.794	5033946.005
C58	381517.209	5034212.082
C58_2	381736.37	5034014.996
C60	381502.529	5034238.486
C63_2	381705.821	5034083.025
C67	381582.176	5034355.673
C69	381565.796	5034418.085
C7	381415.014	5034455.824
RYCB-18	381686.563	5034115.935
RYCB-29	381634.762	5034344

[POLYGONS]

::Subcatchment	X-Coord	Y-Coord
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A10	381563.233	5034509.833
A10	381605.188	5034413.776
A10	381592.341	5034408.174
A10	381570.154	5034459.096
A10	381567.314	5034471.541
A10	381536.247	5034482.099
A10	381531.292	5034480.532
A11	381550.593	5034424.99
A11	381554.875	5034415.041
A11	381550.639	5034413.231
A11	381552.014	5034410.123
A11	381543.267	5034404.984
A11	381478.565	5034378.543
A11	381464.501	5034373.697
A11	381461.563	5034380.465
A11	381454.288	5034383.802
A11	381456.724	5034391.402
A11	381453.346	5034399.308
A11	381522.435	5034428.826
A11	381539.434	5034435.2
A11	381540.743	5034435.76
A11	381543.807	5034428.59
A11	381550.593	5034424.99
A12i	381603.575	5034325.904
A12i	381573.156	5034395.733
A12i	381589.032	5034403.102
A12i	381587.702	5034406.152
A12i	381592.446	5034408.22
A12i	381618.261	5034349.82
A12i	381624.954	5034352.71
A12i	381626.891	5034348.374
A12i	381632.397	5034351
A12i	381636.88	5034340.972
A12i	381603.575	5034325.904
A12ii	381573.156	5034395.733
A12ii	381603.575	5034325.904
A12ii	381590.101	5034319.808
A12ii	381582.52	5034337.492
A12ii	381585.089	5034338.593
A12ii	381579.688	5034351.312
A12ii	381579.992	5034357.472
A12ii	381573.409	5034361.654
A12ii	381568.251	5034373.511
A12ii	381566.784	5034377.24
A12ii	381567.964	5034381.301
A12ii	381569.546	5034386.864

A12ii	381573.156	5034395.733
A13	381530.192	5034320.178
A13	381515.153	5034313.748
A13	381509.139	5034327.791
A13	381503.199	5034341.647
A13	381569.774	5034370.189
A13	381573.409	5034361.654
A13	381579.992	5034357.472
A13	381579.648	5034351.406
A13	381585.024	5034338.57
A13	381582.52	5034337.492
A13	381580.785	5034341.808
A13	381558.955	5034332.475
A13	381530.192	5034320.178
A14	381447.103	5034284.654
A14	381417.289	5034354.315
A14	381424.587	5034357.425
A14	381431.404	5034360.379
A14	381437.223	5034347.192
A14	381439.373	5034337.785
A14	381464.724	5034330.505
A14	381472.2	5034328.358
A14	381503.199	5034341.647
A14	381509.139	5034327.791
A14	381512.599	5034319.721
A14	381515.151	5034313.747
A14	381493.903	5034304.663
A14	381466.674	5034293.021
A14	381447.103	5034284.654
A15i	381567.244	5034310.002
A15i	381567.244	5034310.002
A15i	381472.296	5034269.296
A15i	381462.819	5034291.373
A15i	381493.903	5034304.663
A15i	381515.153	5034313.748
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A15ii	381472.296	5034269.296
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A15ii	381567.244	5034310.002
A15ii	381577.731	5034285.474
A15ii	381499.928	5034251.954
A15ii	381498.003	5034256.002
A15ii	381492.764	5034253.757
A15ii	381494.517	5034249.639
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A16i	381568.321	5034310.464
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A16i	381557.84	5034331.998
A16i	381580.785	5034341.808
A16i	381590.176	5034319.842
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A16ii	381568.321	5034310.464
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A16ii	381590.176	5034319.842
A16ii	381600.673	5034295.291
A16ii	381577.792	5034285.449
A16ii	381569.597	5034304.499
A16ii	381567.244	5034310.002
A17	381605.188	5034413.776
A17	381632.595	5034350.922
A17	381626.871	5034348.366
A17	381624.954	5034352.71
A17	381618.261	5034349.82
A17	381592.434	5034408.246

A17	381605.188	5034413.776	A20i	381634.488	5034254.988
A17ii	381603.575	5034325.904	A20i	381543.015	5034215.565
A17ii	381634.735	5034255.086	A20i	381534.487	5034235.449
A17ii	381634.856	5034255.039	A20i	381614.086	5034269.236
A17ii	381625.735	5034258.586	A20i	381617.343	5034261.859
A17ii	381621.236	5034263.563	A20i	381621.236	5034263.563
A17ii	381617.344	5034261.852	A20i	381625.735	5034258.586
A17ii	381610.829	5034276.619	A20i	381634.488	5034254.988
A17ii	381611.967	5034284.565	A20ii	381543.081	5034215.412
A17ii	381606.225	5034288.349	A20ii	381634.809	5034254.918
A17ii	381602.709	5034296.167	A20ii	381631.345	5034245.978
A17ii	381600.627	5034295.272	A20ii	381631.936	5034239.319
A17ii	381590.101	5034319.808	A20ii	381635.518	5034231.203
A17ii	381603.575	5034325.904	A20ii	381551.831	5034194.996
A18i	381634.856	5034255.039	A20ii	381543.081	5034215.412
A18i	381634.735	5034255.086	A21	381611.967	5034284.565
A18i	381603.575	5034325.904	A21	381610.829	5034276.619
A18i	381636.881	5034340.972	A21	381614.086	5034269.236
A18i	381642.191	5034328.913	A21	381570.95	5034251.169
A18i	381628.738	5034322.599	A21	381525.154	5034231.426
A18i	381638.99	5034299.797	A21	381514.208	5034225.655
A18i	381644.221	5034287.878	A21	381507.271	5034235.078
A18i	381654.793	5034263.788	A21	381499.928	5034251.954
A18i	381634.856	5034255.039	A21	381602.709	5034296.167
A19	381642.191	5034328.913	A21	381606.078	5034288.284
A19	381694.037	5034211.811	A21	381611.967	5034284.565
A19	381685.879	5034207.767	A22	381498.141	5034256.061
A19	381680.622	5034205.162	A22	381507.271	5034235.078
A19	381676.575	5034214.333	A22	381520.172	5034217.553
A19	381662.063	5034247.212	A22	381516.384	5034212.577
A19	381656.121	5034260.762	A22	381502.03	5034232.083
A19	381643.608	5034289.274	A22	381492.764	5034253.757
A19	381633.156	5034313.091	A22	381498.141	5034256.061
A19	381628.751	5034322.572	A23	381509.221	5034177.744
A19	381642.191	5034328.913	A23	381495.8	5034171.963
A1i	381386.831	5034583.572	A23	381472.748	5034224.61
A1i	381357.656	5034649.855	A23	381467.289	5034237.916
A1i	381324.99	5034719.106	A23	381482.787	5034244.56
A1i	381335.973	5034723.941	A23	381494.55	5034249.652
A1i	381395.985	5034587.599	A23	381502.03	5034232.083
A1i	381386.831	5034583.572	A23	381509.754	5034221.839
A1ii	381324.99	5034719.106	A23	381508.667	5034221.039
A1ii	381357.656	5034649.855	A23	381500.297	5034204.233
A1ii	381386.831	5034583.572	A23	381504.385	5034189.257
A1ii	381377.678	5034579.544	A23	381509.221	5034177.744
A1ii	381351.366	5034639.322	A24i	381549.322	5034138.762
A1ii	381348.253	5034637.952	A24i	381526.351	5034193.134
A1ii	381345.965	5034636.945	A24i	381526.04	5034194.114
A1ii	381331.724	5034634.567	A24i	381525.797	5034195.112
A1ii	381331.943	5034634.725	A24i	381525.623	5034196.125
A1ii	381332.151	5034634.897	A24i	381525.518	5034197.147
A1ii	381332.347	5034635.083	A24i	381525.484	5034198.174
A1ii	381332.529	5034635.281	A24i	381525.52	5034199.201
A1ii	381332.698	5034635.492	A24i	381525.627	5034200.223
A1ii	381332.853	5034635.713	A24i	381525.803	5034201.235
A1ii	381332.991	5034635.944	A24i	381526.048	5034202.233
A1ii	381333.114	5034636.185	A24i	381526.361	5034203.212
A1ii	381333.22	5034636.433	A24i	381526.74	5034204.167
A1ii	381333.31	5034636.687	A24i	381527.183	5034205.094
A1ii	381333.381	5034636.947	A24i	381527.689	5034205.989
A1ii	381333.435	5034637.212	A24i	381528.255	5034206.846
A1ii	381333.471	5034637.479	A24i	381528.879	5034207.663
A1ii	381333.489	5034637.748	A24i	381529.557	5034208.435
A1ii	381333.488	5034638.018	A24i	381530.286	5034209.159
A1ii	381331.194	5034646.567	A24i	381531.063	5034209.832
A1ii	381323.214	5034649.432	A24i	381531.884	5034210.449
A1ii	381332.596	5034655.255	A24i	381532.746	5034211.009
A1ii	381338.741	5034658.094	A24i	381533.644	5034211.509
A1ii	381314.008	5034714.27	A24i	381534.574	5034211.946
A1ii	381324.99	5034719.106	A24i	381543.015	5034215.565

A24i	381543.081	5034215.412	A26i	381631.936	5034239.319
A24i	381546.561	5034207.293	A26i	381631.345	5034245.978
A24i	381551.831	5034194.996	A26i	381634.809	5034254.919
A24i	381543.421	5034191.366	A26ii	381664.016	5034188.923
A24i	381541.924	5034190.72	A26ii	381634.809	5034254.919
A24i	381545.113	5034183.28	A26ii	381634.856	5034255.039
A24i	381543.011	5034177.3	A26ii	381654.793	5034263.788
A24i	381549.92	5034172.284	A26ii	381670.667	5034227.717
A24i	381556.16	5034157.729	A26ii	381680.688	5034205.013
A24i	381552.823	5034154.734	A26ii	381694.039	5034211.806
A24i	381558.434	5034147.596	A26ii	381697.738	5034203.163
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A24i	381549.922	5034138.762	A26ii	381664.016	5034188.923
A24ii	381543.015	5034215.565	A27i	381664.852	5034188.487
A24ii	381534.574	5034211.946	A27i	381620.034	5034169.224
A24ii	381533.644	5034211.509	A27i	381611.297	5034189.483
A24ii	381532.746	5034211.009	A27i	381643.332	5034203.207
A24ii	381531.884	5034210.449	A27i	381646.742	5034195.247
A24ii	381531.063	5034209.832	A27i	381650.63	5034196.963
A24ii	381530.286	5034209.159	A27i	381651.238	5034195.586
A24ii	381529.557	5034208.435	A27i	381664.852	5034188.487
A24ii	381528.879	5034207.663	A27ii	381620.034	5034169.224
A24ii	381528.255	5034206.846	A27ii	381664.852	5034188.487
A24ii	381527.689	5034205.989	A27ii	381697.738	5034203.163
A24ii	381527.183	5034205.094	A27ii	381699.512	5034199.142
A24ii	381526.74	5034204.167	A27ii	381703.079	5034191.06
A24ii	381526.361	5034203.212	A27ii	381706.635	5034183.003
A24ii	381526.048	5034202.233	A27ii	381667.371	5034165.673
A24ii	381525.803	5034201.235	A27ii	381664.02	5034173.466
A24ii	381525.627	5034200.223	A27ii	381658.59	5034171.287
A24ii	381525.52	5034199.201	A27ii	381661.861	5034163.285
A24ii	381525.484	5034198.174	A27ii	381628.695	5034149.041
A24ii	381525.518	5034197.147	A27ii	381625.277	5034156.999
A24ii	381525.623	5034196.125	A27ii	381620.398	5034168.379
A24ii	381525.797	5034195.112	A27ii	381620.034	5034169.224
A24ii	381526.04	5034194.114	A28i	381620.03	5034169.222
A24ii	381526.351	5034193.134	A28i	381560.238	5034143.523
A24ii	381549.922	5034138.762	A28i	381558.434	5034147.596
A24ii	381529.865	5034130.075	A28i	381552.823	5034154.734
A24ii	381504.385	5034189.257	A28i	381556.16	5034157.729
A24ii	381500.297	5034204.233	A28i	381553.216	5034164.599
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A24ii	381516.384	5034212.577	A28i	381611.19	5034189.437
A24ii	381520.078	5034217.429	A28i	381620.03	5034169.222
A24ii	381514.208	5034225.655	A28ii	381560.238	5034143.523
A24ii	381525.154	5034231.426	A28ii	381620.03	5034169.222
A24ii	381534.487	5034235.449	A28ii	381620.398	5034168.379
A24ii	381539.469	5034223.837	A28ii	381628.702	5034149.044
A24ii	381543.015	5034215.565	A28ii	381570.953	5034124.316
A25	381635.518	5034231.203	A28ii	381567.791	5034132.197
A25	381646.455	5034206.422	A28ii	381563.39	5034130.431
A25	381642.567	5034204.706	A28ii	381562.044	5034139.444
A25	381643.209	5034203.155	A28ii	381560.238	5034143.523
A25	381553.216	5034164.599	A29	381495.658	5034171.847
A25	381549.92	5034172.284	A29	381509.292	5034177.575
A25	381543.011	5034177.3	A29	381520.124	5034152.567
A25	381545.108	5034183.386	A29	381540.518	5034105.476
A25	381541.921	5034190.773	A29	381532.563	5034102.017
A25	381551.831	5034194.996	A29	381526.506	5034100.783
A25	381631.649	5034229.445	A29	381495.658	5034171.847
A25	381635.518	5034231.203	A2i	381412.794	5034468.768
A26i	381634.809	5034254.919	A2i	381412.624	5034470.116
A26i	381664.016	5034188.923	A2i	381412.041	5034475.937
A26i	381651.238	5034195.586	A2i	381411.783	5034481.782
A26i	381650.63	5034196.963	A2i	381411.85	5034487.633
A26i	381646.508	5034195.185	A2i	381412.242	5034493.471
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A2i	381411.539	5034519.203	A31	381534.283	5034083.013
A2i	381410.329	5034525.544	A31	381528.997	5034095.171
A2i	381408.711	5034531.794	A31	381534.376	5034096.263
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A2i	381404.285	5034543.917	A31	381577.987	5034019.272
A2i	381386.832	5034583.57	A31	381583.698	5034007.256
A2i	381395.985	5034587.599	A31	381591.935	5033995.041
A2i	381415.298	5034543.454	A31	381592.957	5033994.457
A2i	381417.7	5034536.541	A32i	381549.922	5034138.762
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A2i	381422.162	5034515.077	A32i	381542.909	5034099.979
A2i	381422.713	5034507.78	A32i	381550.866	5034103.433
A2i	381422.791	5034500.463	A32i	381548.472	5034108.939
A2i	381422.395	5034493.155	A32i	381540.517	5034105.478
A2i	381421.526	5034485.889	A32i	381529.865	5034130.075
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A2i	381421.825	5034469.744	A32ii	381549.948	5034138.774
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A2ii	381412.722	5034506.359	A32ii	381585.829	5034089.482
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A2ii	381411.85	5034487.633	A32ii	381579.085	5034071.762
A2ii	381411.783	5034481.782	A33i	381607.69	5034016.517
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A2ii	381412.794	5034468.768	A33i	381605.552	5034017.605
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A2ii	381402.139	5034473.849	A33i	381603.908	5034018.781
A2ii	381401.777	5034480.035	A33i	381603.15	5034019.45
A2ii	381401.765	5034486.231	A33i	381602.438	5034020.168
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A3	381425.905	5034450.972	A33i	381611.043	5034024.972
A3	381531.128	5034496.071	A33i	381609.318	5034020.435
A3	381531.292	5034480.532	A33i	381607.69	5034016.517
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A30	381526.565	5034100.795	A33ii	381603.15	5034019.45
A30	381532.563	5034102.017	A33ii	381603.908	5034018.781
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A30	381550.866	5034103.433	A33ii	381605.552	5034017.605
A30	381534.376	5034096.263	A33ii	381606.429	5034017.102
A30	381528.997	5034095.171	A33ii	381607.338	5034016.66
A30	381526.565	5034100.795	A33ii	381607.69	5034016.517
A31	381592.957	5033994.457	A33ii	381605.999	5034012.447
A31	381583.104	5033977.186	A33ii	381593.066	5033994.395
A31	381580.359	5033977.041	A33ii	381591.935	5033995.041

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A34i	381723.329	5034054.572	A35i	381582.579	5034096.956
A34i	381639.998	5034018.866	A35i	381647.532	5034125.182
A34i	381638.115	5034018.123	A35i	381671.763	5034135.619
A34i	381636.191	5034017.492	A35i	381673.014	5034136.12
A34i	381634.233	5034016.975	A35i	381676.106	5034128.004
A34i	381632.249	5034016.573	A35i	381682.089	5034129.703
A34i	381630.244	5034016.289	A35i	381684.95	5034121.102
A34i	381628.226	5034016.123	A35i	381685.722	5034117.779
A34i	381614.234	5034015.383	A35i	381686.171	5034116.734
A34i	381613.223	5034015.364	A35ii	381579.281	5034072.261
A34i	381612.213	5034015.412	A35ii	381582.839	5034073.787
A34i	381611.209	5034015.529	A35ii	381680.19	5034115.522
A34i	381610.215	5034015.713	A35ii	381681.138	5034115.891
A34i	381609.235	5034015.964	A35ii	381682.109	5034116.195
A34i	381608.275	5034016.28	A35ii	381683.098	5034116.432
A34i	381607.69	5034016.517	A35ii	381684.101	5034116.602
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A34i	381630.507	5034029.725	A35ii	381686.1	5034103.486
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A34i	381633.576	5034026.109	A35ii	381690.743	5034095.549
A34i	381635.08	5034026.593	A35ii	381621.386	5034066.026
A34i	381636.556	5034027.159	A35ii	381616.071	5034078.235
A34i	381637.998	5034027.804	A35ii	381594.759	5034069.099
A34i	381632.965	5034039.378	A35ii	381588.029	5034068.502
A34i	381702.128	5034069.506	A35ii	381579.101	5034071.768
A34i	381705.586	5034061.921	A35ii	381579.281	5034072.261
A34i	381709.474	5034063.637	A36	381578.962	5034105.309
A34i	381714.153	5034058.186	A36	381572.521	5034109.076
A34i	381723.329	5034054.572	A36	381574.164	5034116.309
A34ii	381607.69	5034016.517	A36	381570.953	5034124.316
A34ii	381608.275	5034016.28	A36	381628.695	5034149.041
A34ii	381609.235	5034015.964	A36	381661.833	5034163.273
A34ii	381610.215	5034015.713	A36	381667.39	5034149.76
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A34ii	381613.223	5034015.364	A36	381655.941	5034128.836
A34ii	381614.234	5034015.383	A36	381582.582	5034096.957
A34ii	381628.226	5034016.123	A36	381578.962	5034105.309
A34ii	381630.244	5034016.289	A37	381664.069	5034173.742
A34ii	381632.249	5034016.573	A37	381682.089	5034129.703
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A34ii	381636.191	5034017.492	A37	381658.59	5034171.287
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A35i	381686.171	5034116.734	A39i	381699.381	5034108.709
A35i	381685.113	5034116.703	A39i	381698.878	5034109.593
A35i	381684.101	5034116.602	A39i	381698.316	5034110.441
A35i	381683.098	5034116.432	A39i	381697.698	5034111.249
A35i	381682.109	5034116.195	A39i	381697.026	5034112.013
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A35i	381680.19	5034115.522	A39i	381695.536	5034113.396
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A39i	381690.149	5034116.179	A40	381693.968	5034088.244
A39i	381689.161	5034116.42	A40	381700.697	5034083.527
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A39i	381685.83	5034117.825	A40	381621.386	5034066.026
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A39i	381722.915	5034109.719	A41	381621.758	5034029.049
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A39ii	381691.119	5034115.871	A42i	381767.382	5034009.019
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A39ii	381723.308	5034054.581	A42ii	381720.368	5034038.953
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A39ii	381709.474	5034063.637	A42ii	381723.329	5034054.572
A39ii	381705.477	5034061.918	A42iii	381760.423	5034000.68
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A39ii	381686.1	5034103.486	A43	381658.29	5033971.559
A39ii	381690.744	5034105.535	A43	381652.974	5033984.733
A39ii	381686.267	5034116.731	A43	381650.434	5033983.765
A4	381412.811	5034468.77	A43	381645.443	5033997.642
A4	381421.825	5034469.744	A43	381655.556	5034001.733
A4	381421.666	5034471.785	A43	381719.905	5034029.352
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A4	381422.467	5034464.976	A43	381730.257	5034016.76
A4	381422.944	5034462.427	A43	381728.308	5034010.436
A4	381423.363	5034460.249	A43	381731.729	5034002.815
A4	381424.283	5034456.664	A43	381668.635	5033975.791
A4	381424.51	5034455.577	A43	381658.29	5033971.559
A4	381425.905	5034450.972	A44	381587.259	5033961.173
A4	381428.166	5034445.311	A44	381580.359	5033977.041
A4	381433.819	5034447.569	A44	381583.104	5033977.186
A4	381436.998	5034440.722	A44	381593.066	5033994.395
A4	381447.236	5034444.398	A44	381608.729	5033993.33
A4	381455.754	5034424.132	A44	381632.243	5033994.489
A4	381432.252	5034414.084	A44	381644.337	5033997.195
A4	381419.416	5034444.108	A44	381645.441	5033997.641
A4	381417.189	5034450.155	A44	381650.431	5033983.764
A4	381415.336	5034456.328	A44	381652.974	5033984.733
A4	381413.864	5034462.602	A44	381658.352	5033971.585

A44	381647.327	5033967.806	A46ii	381694.461	5033938.716
A44	381635.91	5033965.77	A46ii	381689.214	5033950.742
A44	381588.359	5033961.652	A46ii	381676.204	5033945.164
A44	381587.259	5033961.173	A46ii	381672.844	5033954.229
A45i	381587.259	5033961.173	A47	381745.243	5034095.526
A45i	381588.359	5033961.652	A47	381782.791	5034010.45
A45i	381588.217	5033961.59	A47	381769.257	5034004.647
A45i	381588.359	5033961.652	A47	381767.382	5034009.019
A45i	381635.985	5033965.776	A47	381763.615	5034017.555
A45i	381647.327	5033967.806	A47	381735.495	5034081.222
A45i	381658.352	5033971.585	A47	381731.8	5034089.593
A45i	381664.49	5033974.096	A47	381745.243	5034095.526
A45i	381672.844	5033954.229	A48	381786.259	5034002.846
A45i	381662.673	5033950.069	A48	381790.062	5033993.977
A45i	381656.714	5033948.114	A48	381776.62	5033988.214
A45i	381650.651	5033946.512	A48	381793.627	5033949.261
A45i	381644.505	5033945.268	A48	381755.829	5033934.716
A45i	381638.296	5033944.386	A48	381753.569	5033951.672
A45i	381632.047	5033943.869	A48	381746.309	5033957.612
A45i	381607.333	5033942.562	A48	381743.579	5033956.274
A45i	381605.976	5033942.469	A48	381741.476	5033959.954
A45i	381604.627	5033942.296	A48	381738.326	5033966.562
A45i	381603.29	5033942.044	A48	381746.161	5033969.986
A45i	381601.971	5033941.712	A48	381744.291	5033974.348
A45i	381600.673	5033941.303	A48	381752.566	5033988.289
A45i	381599.403	5033940.817	A48	381786.259	5034002.846
A45i	381596.633	5033939.613	A49	381707.071	5033928.476
A45i	381587.259	5033961.173	A49	381700.017	5033925.509
A45ii	381596.633	5033939.613	A49	381694.461	5033938.716
A45ii	381599.403	5033940.817	A49	381728.024	5033953.086
A45ii	381600.673	5033941.303	A49	381724.769	5033960.689
A45ii	381601.971	5033941.712	A49	381730.49	5033963.138
A45ii	381603.29	5033942.044	A49	381738.326	5033966.562
A45ii	381604.627	5033942.296	A49	381741.476	5033959.954
A45ii	381605.976	5033942.469	A49	381743.579	5033956.274
A45ii	381607.333	5033942.562	A49	381742.194	5033955.418
A45ii	381632.047	5033943.869	A49	381740.869	5033954.471
A45ii	381638.296	5033944.386	A49	381739.612	5033953.436
A45ii	381644.505	5033945.268	A49	381738.428	5033952.318
A45ii	381650.651	5033946.512	A49	381737.323	5033951.122
A45ii	381656.714	5033948.114	A49	381736.301	5033949.854
A45ii	381662.673	5033950.069	A49	381735.368	5033948.52
A45ii	381672.844	5033954.229	A49	381734.527	5033947.126
A45ii	381676.204	5033945.164	A49	381733.782	5033945.677
A45ii	381662.718	5033939.873	A49	381733.138	5033944.182
A45ii	381652.843	5033937.109	A49	381732.038	5033943.711
A45ii	381646.586	5033935.831	A49	381733.678	5033939.884
A45ii	381639.597	5033934.819	A49	381707.071	5033928.476
A45ii	381632.558	5033934.232	A50	381746.309	5033957.612
A45ii	381607.711	5033932.918	A50	381753.569	5033951.672
A45ii	381602.883	5033931.977	A50	381755.829	5033934.716
A45ii	381600.42	5033930.904	A50	381726.439	5033921.508
A45ii	381596.633	5033939.613	A50	381725.162	5033923.592
A46i	381740.213	5033983.122	A50	381722.078	5033934.91
A46i	381740.056	5033982.939	A50	381733.678	5033939.884
A46i	381672.844	5033954.229	A50	381732.038	5033943.711
A46i	381672.521	5033955.1	A50	381733.138	5033944.182
A46i	381664.49	5033974.096	A50	381733.537	5033945.108
A46i	381668.606	5033975.86	A50	381733.847	5033945.804
A46i	381678.748	5033980.123	A50	381734.238	5033946.564
A46i	381731.69	5034002.773	A50	381734.592	5033947.234
A46i	381740.213	5033983.122	A50	381735.037	5033947.971
A46ii	381672.844	5033954.229	A50	381735.431	5033948.611
A46ii	381740.056	5033982.939	A50	381735.929	5033949.323
A46ii	381740.213	5033983.122	A50	381736.36	5033949.928
A46ii	381752.566	5033988.289	A50	381736.913	5033950.614
A46ii	381744.291	5033974.348	A50	381737.376	5033951.18
A46ii	381746.161	5033969.986	A50	381737.985	5033951.839
A46ii	381724.771	5033960.685	A50	381738.474	5033952.361
A46ii	381728.024	5033953.086	A50	381739.145	5033952.994

A50	381739.649	5033953.466	A5ii	381412.794	5034468.768
A50	381740.396	5033954.081	A5ii	381413.864	5034462.602
A50	381740.895	5033954.489	A5ii	381415.336	5034456.328
A50	381741.769	5033955.115	A5ii	381417.189	5034450.155
A50	381742.207	5033955.427	A5ii	381419.416	5034444.108
A50	381743.579	5033956.274	A5ii	381432.252	5034414.084
A50	381746.309	5033957.612	A5ii	381455.098	5034360.649
A51	381726.418	5033921.499	A5ii	381455.483	5034359.818
A51	381755.829	5033934.716	A5ii	381455.921	5034359.013
A51	381785.386	5033946.409	A5ii	381456.41	5034358.239
A51	381793.627	5033949.261	A5ii	381456.947	5034357.497
A51	381797.388	5033937.885	A5ii	381457.532	5034356.791
A51	381795.808	5033924.099	A5ii	381458.027	5034356.243
A51	381781.903	5033913.459	A5ii	381457.889	5034356.028
A51	381777.427	5033920.956	A5ii	381455.23	5034353.398
A51	381769.864	5033916.069	A5ii	381447.444	5034340.784
A51	381770.494	5033915.014	A5ii	381446.034	5034335.872
A51	381774.311	5033908.62	A5ii	381439.373	5034337.785
A51	381761.475	5033902.013	A5ii	381437.223	5034347.192
A51	381757.54	5033901.457	A5ii	381431.404	5034360.379
A51	381745.005	5033899.685	A5ii	381397.323	5034438.703
A51	381733.121	5033910.597	A5ii	381409.135	5034443.769
A51	381726.418	5033921.499	A5ii	381406.699	5034450.733
A52	381789.561	5033900.633	A5ii	381404.738	5034457.846
A52	381781.834	5033896.02	A5ii	381403.261	5034465.075
A52	381769.864	5033916.069	A5ii	381402.907	5034467.7
A52	381777.427	5033920.956	A5ii	381412.794	5034468.768
A52	381789.561	5033900.633	A6	381417.244	5034354.295
A53	381722.078	5033934.91	A6	381398.694	5034397.404
A53	381725.162	5033923.592	A6	381382.967	5034432.55
A53	381732.761	5033910.927	A6	381397.323	5034438.703
A53	381745.005	5033899.685	A6	381431.404	5034360.379
A53	381761.475	5033902.013	A6	381417.244	5034354.295
A53	381773.281	5033908.005	A7i	381573.115	5034395.633
A53	381774.44	5033908.697	A7i	381473.864	5034353.167
A53	381781.834	5033896.02	A7i	381472.982	5034352.817
A53	381733.358	5033867.077	A7i	381472.077	5034352.526
A53	381707.071	5033928.476	A7i	381471.156	5034352.297
A53	381722.078	5033934.91	A7i	381470.221	5034352.13
A54	381789.558	5033900.625	A7i	381469.277	5034352.026
A54	381781.903	5033913.459	A7i	381468.328	5034351.985
A54	381782.932	5033914.073	A7i	381467.378	5034352.008
A54	381795.808	5033924.099	A7i	381466.433	5034352.095
A54	381797.388	5033937.885	A7i	381465.495	5034352.245
A54	381793.252	5033950.395	A7i	381464.569	5034352.457
A54	381778.504	5033983.819	A7i	381463.66	5034352.731
A54	381776.62	5033988.214	A7i	381462.771	5034353.066
A54	381790.062	5033993.975	A7i	381461.906	5034353.459
A54	381822.39	5033920.729	A7i	381461.07	5034353.909
A54	381789.558	5033900.625	A7i	381460.266	5034354.414
A5i	381432.252	5034414.084	A7i	381459.497	5034354.972
A5i	381455.786	5034424.057	A7i	381458.768	5034355.581
A5i	381464.369	5034404.032	A7i	381458.081	5034356.236
A5i	381522.435	5034428.826	A7i	381460.265	5034359.751
A5i	381453.346	5034399.308	A7i	381461.663	5034366.527
A5i	381456.724	5034391.402	A7i	381466.593	5034368.637
A5i	381454.288	5034383.802	A7i	381464.501	5034373.697
A5i	381461.563	5034380.465	A7i	381478.565	5034378.543
A5i	381464.501	5034373.697	A7i	381543.267	5034404.984
A5i	381466.593	5034368.637	A7i	381552.014	5034410.123
A5i	381461.678	5034366.533	A7i	381553.865	5034405.938
A5i	381460.265	5034359.751	A7i	381558.052	5034407.79
A5i	381458.035	5034356.257	A7i	381560.351	5034402.517
A5i	381457.532	5034356.791	A7i	381565.33	5034399.258
A5i	381456.947	5034357.497	A7i	381573.156	5034395.733
A5i	381456.41	5034358.239	A7i	381573.115	5034395.633
A5i	381455.921	5034359.013	A7ii	381458.027	5034356.243
A5i	381455.483	5034359.818	A7ii	381458.768	5034355.581
A5i	381455.098	5034360.649	A7ii	381459.497	5034354.972
A5i	381432.252	5034414.084	A7ii	381460.266	5034354.414

A7ii	381461.07	5034353.909	A9i	381548.807	5034450.878
A7ii	381461.906	5034353.459	A9i	381548.22	5034451.663
A7ii	381462.771	5034353.066	A9i	381547.582	5034452.407
A7ii	381463.66	5034352.731	A9i	381546.896	5034453.107
A7ii	381464.569	5034352.457	A9i	381546.165	5034453.761
A7ii	381465.495	5034352.245	A9i	381545.392	5034454.364
A7ii	381466.433	5034352.095	A9i	381544.581	5034454.915
A7ii	381467.378	5034352.008	A9i	381543.735	5034455.41
A7ii	381468.328	5034351.985	A9i	381542.858	5034455.848
A7ii	381469.277	5034352.026	A9i	381541.954	5034456.227
A7ii	381470.221	5034352.13	A9i	381541.027	5034456.546
A7ii	381471.156	5034352.297	A9i	381540.08	5034456.801
A7ii	381472.077	5034352.526	A9i	381539.119	5034456.994
A7ii	381472.982	5034352.817	A9i	381539.895	5034461.259
A7ii	381473.864	5034353.167	A9i	381545.867	5034478.83
A7ii	381573.115	5034395.633	A9i	381567.314	5034471.541
A7ii	381569.546	5034386.864	A9i	381570.363	5034458.178
A7ii	381567.964	5034381.301	A9i	381592.341	5034408.174
A7ii	381566.784	5034377.24	A9i	381587.702	5034406.152
A7ii	381569.708	5034370.161	A9i	381589.032	5034403.102
A7ii	381472.2	5034328.358	A9i	381585.165	5034401.277
A7ii	381464.724	5034330.505	A9i	381573.156	5034395.733
A7ii	381446.034	5034335.872	A9ii	381539.119	5034456.994
A7ii	381447.444	5034340.784	A9ii	381540.08	5034456.801
A7ii	381455.23	5034353.398	A9ii	381541.027	5034456.546
A7ii	381457.889	5034356.028	A9ii	381541.954	5034456.227
A7ii	381458.027	5034356.243	A9ii	381542.858	5034455.848
A8i	381539.134	5034457.074	A9ii	381543.735	5034455.41
A8i	381538.17	5034457.216	A9ii	381544.581	5034454.915
A8i	381537.199	5034457.296	A9ii	381545.392	5034454.364
A8i	381536.224	5034457.313	A9ii	381546.165	5034453.761
A8i	381535.251	5034457.267	A9ii	381546.896	5034453.107
A8i	381534.283	5034457.158	A9ii	381547.582	5034452.407
A8i	381533.323	5034456.986	A9ii	381548.22	5034451.663
A8i	381532.377	5034456.753	A9ii	381548.807	5034450.878
A8i	381531.448	5034456.459	A9ii	381549.341	5034450.055
A8i	381530.54	5034456.106	A9ii	381549.818	5034449.199
A8i	381455.755	5034424.132	A9ii	381550.238	5034448.313
A8i	381447.235	5034444.4	A9ii	381550.598	5034447.402
A8i	381451.065	5034445.777	A9ii	381573.156	5034395.733
A8i	381510.203	5034471.898	A9ii	381565.33	5034399.258
A8i	381527.053	5034479.191	A9ii	381560.351	5034402.517
A8i	381536.247	5034482.099	A9ii	381558.087	5034407.805
A8i	381545.867	5034478.83	A9ii	381553.865	5034405.938
A8i	381539.895	5034461.259	A9ii	381550.663	5034413.177
A8i	381539.134	5034457.074	A9ii	381554.942	5034415.069
A8ii	381539.134	5034457.074	A9ii	381550.593	5034424.99
A8ii	381538.374	5034452.896	A9ii	381543.767	5034428.681
A8ii	381542.855	5034442.499	A9ii	381538.648	5034440.663
A8ii	381538.657	5034440.641	A9ii	381542.828	5034442.487
A8ii	381540.745	5034435.761	A9ii	381538.374	5034452.896
A8ii	381539.404	5034435.27	A9ii	381539.119	5034456.994
A8ii	381522.435	5034428.826	B1	381382.967	5034432.55
A8ii	381464.369	5034404.032	B1	381300.46	5034616.904
A8ii	381455.786	5034424.057	B1	381306.314	5034623.312
A8ii	381530.54	5034456.106	B1	381331.724	5034634.567
A8ii	381531.448	5034456.459	B1	381345.964	5034636.945
A8ii	381532.377	5034456.753	B1	381389.639	5034537.477
A8ii	381533.323	5034456.986	B1	381391.747	5034532.199
A8ii	381534.283	5034457.158	B1	381393.497	5034526.791
A8ii	381535.251	5034457.267	B1	381394.88	5034521.278
A8ii	381536.224	5034457.313	B1	381395.89	5034515.685
A8ii	381537.199	5034457.296	B1	381396.522	5034510.037
A8ii	381538.17	5034457.216	B1	381396.774	5034504.359
A8ii	381539.134	5034457.074	B1	381396.644	5034498.677
A9i	381573.156	5034395.733	B1	381396.133	5034493.016
A9i	381550.598	5034447.402	B1	381395.726	5034485.529
A9i	381550.238	5034448.313	B1	381395.824	5034478.032
A9i	381549.818	5034449.199	B1	381396.426	5034470.558
A9i	381549.341	5034450.055	B1	381397.528	5034463.141

B1	381399.127	5034455.815	B3ii	381427.326	5034481.699
B1	381401.214	5034448.613	B3ii	381427.295	5034476.908
B1	381403.781	5034441.568	B3ii	381427.577	5034472.125
B1	381382.967	5034432.55	B3ii	381428.17	5034467.371
B1ii	381345.964	5034636.944	B3ii	381429.073	5034462.666
B1ii	381351.366	5034639.322	B3ii	381430.281	5034458.029
B1ii	381395.133	5034539.889	B3ii	381431.785	5034453.492
B1ii	381397.3	5034534.499	B3ii	381426.008	5034451.003
B1ii	381399.115	5034528.981	B3ii	381425.905	5034450.972
B1ii	381400.571	5034523.358	B3ii	381424.51	5034455.577
B1ii	381401.66	5034517.652	B3ii	381424.283	5034456.664
B1ii	381402.379	5034511.888	B3ii	381423.363	5034460.249
B1ii	381402.725	5034506.09	B3ii	381422.944	5034462.427
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B1ii	381402.293	5034494.487	B3ii	381421.996	5034468.268
B1ii	381401.79	5034487.126	B3ii	381421.444	5034474.16
B1ii	381401.784	5034479.748	B3ii	381421.289	5034480.075
B1ii	381402.275	5034472.386	B3ii	381421.533	5034485.988
B1ii	381403.261	5034465.075	B3ii	381422.397	5034493.242
B1ii	381404.738	5034457.846	B3ii	381422.789	5034500.537
B1ii	381406.699	5034450.733	B3ii	381422.709	5034507.842
B1ii	381409.135	5034443.769	B3ii	381422.157	5034515.127
B1ii	381403.814	5034441.488	B3ii	381421.134	5034522.36
B1ii	381401.522	5034447.684	B3ii	381419.645	5034529.512
B1ii	381399.602	5034454.006	B3ii	381417.697	5034536.553
B1ii	381398.06	5034460.429	B3ii	381415.298	5034543.454
B1ii	381396.901	5034466.933	B3ii	381424.704	5034522.34
B1ii	381396.154	5034473.427	B3ii	381426.926	5034523.496
B1ii	381395.777	5034479.953	B3ii	381427.177	5034522.719
B1ii	381395.77	5034486.49	B4i	381691.588	5033945.198
B1ii	381396.133	5034493.016	B4i	381699.904	5033925.461
B1ii	381396.644	5034498.677	B4i	381707.071	5033928.476
B1ii	381396.774	5034504.359	B4i	381733.358	5033867.077
B1ii	381396.522	5034510.037	B4i	381726.731	5033863.113
B1ii	381395.89	5034515.685	B4i	381649.852	5033817.212
B1ii	381394.88	5034521.278	B4i	381602.985	5033925.012
B1ii	381393.497	5034526.791	B4i	381605.53	5033926.1
B1ii	381391.747	5034532.199	B4i	381608.677	5033926.961
B1ii	381389.639	5034537.477	B4i	381632.876	5033928.241
B1ii	381345.964	5034636.944	B4i	381640.276	5033928.858
B2	381530.741	5034583.975	B4i	381647.625	5033929.921
B2	381424.704	5034522.35	B4i	381654.461	5033931.331
B2	381316.325	5034768.58	B4i	381664.627	5033934.177
B2	381315.387	5034770.71	B4i	381686.036	5033942.851
B2	381447.869	5034848.65	B4i	381691.588	5033945.198
B2	381463.21	5034813.696	B4ii	381600.42	5033930.904
B2	381436.808	5034798.092	B4ii	381602.883	5033931.977
B2	381530.741	5034583.975	B4ii	381607.711	5033932.918
B3i	381431.785	5034453.492	B4ii	381632.558	5033934.232
B3i	381430.333	5034457.869	B4ii	381639.597	5033934.819
B3i	381429.155	5034462.326	B4ii	381646.586	5033935.831
B3i	381428.255	5034466.848	B4ii	381652.843	5033937.109
B3i	381427.638	5034471.418	B4ii	381662.718	5033939.873
B3i	381427.305	5034476.016	B4ii	381676.204	5033945.164
B3i	381427.257	5034480.627	B4ii	381678.395	5033939.755
B3i	381427.326	5034481.699	B4ii	381691.563	5033945.188
B3i	381428.245	5034489.879	B4ii	381690.549	5033944.759
B3i	381428.351	5034492.892	B4ii	381686.036	5033942.851
B3i	381428.717	5034500.592	B4ii	381664.627	5033934.177
B3i	381428.593	5034508.299	B4ii	381654.461	5033931.331
B3i	381427.978	5034515.982	B4ii	381647.625	5033929.921
B3i	381426.875	5034523.611	B4ii	381640.276	5033928.858
B3i	381530.743	5034583.97	B4ii	381632.876	5033928.241
B3i	381563.223	5034509.829	B4ii	381608.677	5033926.961
B3i	381431.785	5034453.492	B4ii	381605.53	5033926.1
B3ii	381427.177	5034522.719	B4ii	381602.985	5033925.012
B3ii	381428.155	5034514.546	B4ii	381600.42	5033930.904
B3ii	381428.66	5034506.33	B4iii	381676.204	5033945.164
B3ii	381428.69	5034498.098	B4iii	381689.214	5033950.742
B3ii	381428.245	5034489.879	B4iii	381691.563	5033945.188

B4iii	381678.395	5033939.755
B4iii	381676.204	5033945.164
C1	381295.775	5034755.874
C1	381316.325	5034768.58
C1	381335.973	5034723.941
C1	381314.105	5034714.313
C1	381298.068	5034750.52
C1	381290.843	5034752.831
C1	381295.775	5034755.874
C2	381447.104	5034284.654
C2	381462.819	5034291.373
C2	381482.826	5034244.577
C2	381467.309	5034237.869
C2	381447.104	5034284.654

[SYMBOLS]

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

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;;Name      Links
;;-----
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"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" Pipe_-(141)_(RYCB) Pipe_-(142)_(RYCB) Pipe_-(143)_(RYCB) Pipe_-(144)_(RYCB) C31_1

"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" C31_2 OR19 CB-21 15_(11)_(STM) 8_(STM)

"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" 9_(STM) 10_(STM) 11_(STM) 12_(STM) 13_(STM)

"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" STM-23_(STM) STM-24_(STM)

"Profile 002. Outfall Maj-01 to Junction STM-251_(STM)" C1_1 C1_2 C2_1 C2_2 CB-06

"Profile 002. Outfall Maj-01 to Junction STM-251_(STM)" CB-43 15_(19)_(STM) 15_(20)_(STM) 15_(21)_(STM) 15_(22)_(STM)

"Profile 002. Outfall Maj-01 to Junction STM-251_(STM)" 15_(14)_(STM) 15_(15)_(STM) 15_(16)_(STM) 4_(STM) STM-83_(STM)

"Profile 003. Junction RYCB_6_(1)_(9)_(RYCB) to Junction 112_(STM)" Pipe_-(145)_(RYCB) Pipe_-(146)_(RYCB) Pipe_-(147)_(RYCB) Pipe_-(148)_(RYCB) Pipe_-(10)_(RYCB)

"Profile 003. Junction RYCB_6_(1)_(9)_(RYCB) to Junction 112_(STM)" Pipe_-(11)_(RYCB) RYCB-18 15_(4)_(STM) 15_(5)_(STM)

"Profile 004. Junction RYCB_6_(1)_(13)_(RYCB) to Junction 104_(STM)" C50 Pipe_-(99)_(RYCB) Pipe_-(100)_(RYCB) C59_1 C59_2

"Profile 004. Junction RYCB_6_(1)_(13)_(RYCB) to Junction 104_(STM)" C50_3 C50_4 C55 OR44 CB-56

"Profile 005. Junction RYCB_6_(1)_(21)_(RYCB) to Junction 144_(STM)" Pipe_-(110)_(RYCB) Pipe_-(111)_(RYCB) Pipe_-(19)_(RYCB) C27 C24

"Profile 005. Junction RYCB_6_(1)_(21)_(RYCB) to Junction 144_(STM)" OR-15 CB-26

"Profile 006. Junction Maj-04 to Junction 164_(STM)" C4_1 C4_2 C5_1 C5_2 C6_2

"Profile 006. Junction Maj-04 to Junction 164_(STM)" OR4 CB-41

"Profile 007. Junction RYCB_6_(1)_(24)_(RYCB) to Junction 136_(STM)" Pipe_-(114)_(RYCB) Pipe_-(150)_(RYCB) Pipe_-(151)_(RYCB) Pipe_-(152)_(RYCB) Pipe_-(14)_(RYCB)

"Profile 007. Junction RYCB_6_(1)_(24)_(RYCB) to Junction 136_(STM)" Pipe_-(15)_(RYCB) 15_(10)_(STM)_2

"Profile 008. Junction RYCB_6_(1)_(31)_(RYCB) to Junction 150_(STM)" Pipe_-(123)_(RYCB) Pipe_-(124)_(RYCB) Pipe_-(125)_(RYCB) Pipe_-(23)_(RYCB) CB-35

"Profile 008. Junction RYCB_6_(1)_(31)_(RYCB) to Junction 150_(STM)" 3_(STM)

"Profile 009. Junction RYCB_6_(1)_(6)_(RYCB) to Junction 114_(STM)" Pipe_-(96)_(RYCB) Pipe_-(137)_(RYCB) Pipe_-(138)_(RYCB) Pipe_-(98)_(RYCB) Pipe_-(9)_(RYCB)

"Profile 009. Junction RYCB_6_(1)_(6)_(RYCB) to Junction 114_(STM)" CB-11

"Profile 010. Junction Maj-34_2 to Junction 128_(STM)" C18_7 C32 OR23 CB-47 7_(STM)

"Profile 010. Junction Maj-34_2 to Junction 128_(STM)" 7_(1)_(STM)

"Profile 011. Junction Maj-19 to Junction 144_(STM)" C20 C21 OR46 CB-30 15_(12)_(STM)

"Profile 011. Junction Maj-19 to Junction 144_(STM)" 15_(13)_(STM)

"Profile 012. Junction RYCB_6_(1)_(26)_(RYCB) to Junction 150_(STM)" Pipe_-(117)_(RYCB) Pipe_-(118)_(RYCB) Pipe_-(165)_(RYCB) Pipe_-(25)_(RYCB) CB-33

"Profile 013. Junction Maj-11 to Junction 152_(STM)" C13 OR8 CB-54 1_(STM) 2_(STM)

"Profile 014. Junction RYCB_6_(1)_(36)_(RYCB) to Junction 162_(STM)" Pipe_-(126)_(RYCB) Pipe_-(127)_(RYCB) Pipe_-(128)_(RYCB) Pipe_-(74)_(RYCB) RYCB-52

"Profile 015. Junction Maj-07 to Junction 162_(STM)" C7 C8 C9 OR5 CB-39

"Profile 016. Junction RYCB_6_(1)_(2)_(1)_(RYCB) to Junction 108_(STM)" Pipe_-(139)_(RYCB) Pipe_-(140)_(RYCB) Pipe_-(27)_(RYCB) RYCB-03 STM-28_(STM)

"Profile 017. Junction TEE_2_(2)_(RYCB) to Outfall 2121_(STM)" Pipe_-(159)_(RYCB) Pipe_-(160)_(RYCB) Pipe_-(1)_(RYCB)_1 Pipe_-(1)_(RYCB)_2 Pipe_-(4)_(RYCB)

"Profile 017. Junction TEE_2_(2)_(RYCB) to Outfall 2121_(STM)" STM-34_(1)_(STM) 2

"Profile 018. Junction RYCB_6_(1)_(3)_(RYCB) to Junction 128_(STM)" Pipe_-(93)_(RYCB) Pipe_-(94)_(RYCB) Pipe_-(95)_(RYCB) Pipe_-(16)_(RYCB) RYCB-26

"Profile 019. Junction Maj-25 to Junction STM-Split" C25 OR-16 CB-23 15_(9)_(STM) 15_(10)_(STM)_1

"Profile 020. Junction Maj-15 to Junction Maj-24" C18_3 C18_4 C19 C23

"Profile 021. Junction RYCB_6_(1)_(37)_(RYCB) to Junction 152_(STM)" Pipe_-(129)_(RYCB) Pipe_-(130)_(RYCB) Pipe_-(22)_(RYCB) CB-31a

"Profile 022. Junction RYCB_6_(1)_(28)_(RYCB) to Junction 162_(STM)" Pipe_-(120)_(RYCB) Pipe_-(121)_(RYCB) Pipe_-(77)_(RYCB) RYCB-34

"Profile 023. Junction RYCB_6_(1)_(2)_(RYCB) to Junction 112_(STM)" Pipe_-(87)_(RYCB) Pipe_-(88)_(RYCB) Pipe_-(7)_(RYCB) CB-9

"Profile 024. Junction Maj-36 to Junction 116_(STM)" C38 OR28 CB-51 15_(3)_(STM)

"Profile 025. Junction TEE_1_(1)_(RYCB) to Junction STM-Split3" Pipe_-(157)_(RYCB) Pipe_-(158)_(RYCB) Pipe_-(2)_(RYCB) Pipe_-(3)_(RYCB)

"Profile 026. Junction RYCB_6_(1)_(40)_(RYCB) to Junction STM-251_(STM)" Pipe_-(132)_(RYCB) Pipe_-(133)_(RYCB) Pipe_-(24)_(RYCB) CB-31

"Profile 027. Junction Maj-25 to Junction 132_(STM)" C29 OR25 CB-45 6_(STM)

"Profile 028. Junction Maj-55 to Junction STM-Split3" C1 OR-51 CB-57 STM-34_(1)_(STM) 1

"Profile 029. Junction Maj-17 to Junction 158_(STM)" C11 OR-10 CB-37

"Profile 030. Junction RYCB_6_(1)_(25)_(RYCB) to Junction 148_(STM)" Pipe_-(119)_(RYCB) Pipe_-(164)_(RYCB) RYCB-10

"Profile 031. Junction Maj-51 to Junction 106_(STM)" C53 OR42 CB-3

"Profile 032. Junction TEE_1_(1)_(1)_(RYCB) to Junction 104_(STM)" Pipe_-(161)_(RYCB) RYCB-01 CB-06

"Profile 033. Junction Maj-40 to Junction 120_(STM)" C43 OR32 CB-13-C

"Profile 034. Junction Maj-38 to Junction 122_(STM)" C45 OR34 CB-15

"Profile 035. Junction RYCB_6_(1)_(16)_(1)_(RYCB) to Junction Structure_-(26)_(RYCB)" Pipe_-(153)_(RYCB) Pipe_-(134)_(RYCB) Pipe_-(17)_(RYCB)

"Profile 036. Junction Maj-29 to Junction 128_(STM)" C36 OR27 CB-19

"Profile 037. Junction Maj-31 to Junction 130_(STM)" C34 OR21 CB-49

"Profile 038. Junction RYCB_6_(1)_(16)_(2)_(RYCB) to Junction Structure_-(7)_(RYCB)" Pipe_-(154)_(RYCB) Pipe_-(155)_(RYCB) Pipe_-(156)_(RYCB)

"Profile 039. Junction Maj-19_2 to Junction 146_(STM)" C18_6 OR-13 CB-28

"Profile 040. Junction Maj-53 to Junction 104_(STM)" C51 OR40 CB-5

"Profile 041. Junction TEE_4_(RYCB) to Junction 104_(STM)" RYCB-04 RYCB-04 STM-82_(STM)

"Profile 042. Junction RYCB_6_(1)_(13)_(RYCB) to Junction Structure_-(17)_(RYCB)" Pipe_-(101)_(RYCB) Pipe_-(149)_(RYCB) Pipe_-(103)_(RYCB)

"Profile 043. Junction Maj-36 to Junction 126_(STM)" C46 OR37 CB-17

"Profile 044. Junction Maj-21 to Junction Maj-28" C56 C60 C27_2

"Profile 045. Junction Maj-13 to Junction 35_(CB)" C16 OR-50

"Profile 046. Junction Maj-45 to Junction 9_(1)_(RYCB)" C48 OR39

"Profile 047. Junction Maj-43 to Junction 11_(2)_(RYCB)" C40 OR31

"Profile 048. Outfall Maj-18 to Junction Maj-15_2" C18_8 C18_9

"Profile 049. Junction Maj-24 to Junction 144_(STM)" OR-14 CB-25

"Profile 050. Junction Slope1 to Junction 150_(STM)" OR-11 CB-32

"Profile 051. Junction Maj-12 to Junction 156_(STM)" OR7 CB-53

"Profile 052. Junction Maj-16 to Junction 158_(STM)" OR9 CB-36

"Profile 053. Junction Maj-10 to Junction 162_(STM)" OR6 CB-38

"Profile 054. Junction Maj-06_2 to Junction 164_(STM)" OR-03 CB-40

"Profile 055. Junction Maj-03 to Junction 170_(STM)" OR-02 CB-42

"Profile 056. Junction Maj-19 to Junction 146_(STM)" OR-12 CB-27(1)

"Profile 057. Junction Maj-21 to Junction 148_(STM)" OR47 CB-29

"Profile 058. Junction Maj-50 to Junction 106_(STM)" OR43 CB-2

"Profile 059. Junction Maj-54 to Junction 104_(STM)" OR45 CB-55

"Profile 060. Junction Maj-52 to Junction 104_(STM)" OR41 CB-4

"Profile 061. Junction Maj-46 to Junction 112_(STM)" OR38 CB-8

"Profile 062. Junction Maj-44 to Junction 114_(STM)" OR30 CB-10

"Profile 063. Junction Maj-42 to Junction 118_(STM)" OR29 CB-50

"Profile 064. Junction Maj-41 to Junction 120_(STM)" OR33 CB-12-C

"Profile 065. Junction Maj-39 to Junction 122_(STM)" OR35 CB-14

"Profile 066. Junction Maj-37 to Junction 126_(STM)" OR36 CB-16

"Profile 067. Junction Maj-35 to Junction 128_(STM)" OR26 CB-18

"Profile 068. Junction Maj-30 to Junction 130_(STM)" OR20 CB-48

"Profile 069. Junction Maj-32 to Junction 132_(STM)" OR22 CB-46

"Profile 070. Junction Maj-33 to Junction 142_(STM)" OR24 CB-44

"Profile 071. Junction Maj-28 to Junction 136_(STM)" OR18 CB-20

"Profile 072. Junction Maj-26 to Junction 140_(STM)" OR-17 CB-22

"Profile 073. Junction 104_(STM) to Junction 100_(STM)" 14_(STM) STM-34_(STM)

"Profile 074. Junction RYCB_6_(1)_(20)_(RYCB) to Junction Structure_-(29)_(RYCB)" Pipe_-(109)_(RYCB)

"Profile 075. Junction Maj-19_2 to Junction Maj-15_2" C18_5

"Profile 076. Junction RYCB_6_(1)_(40)_(RYCB) to Junction Structure_-(35)_(RYCB)" Pipe_-(131)_(RYCB)

"Profile 077. Junction RYCB_6_(1)_(30)_(RYCB) to Junction Structure_-(132)_(RYCB)" Pipe_-(122)_(RYCB)

"Profile 078. Storage B3_Stor to Junction 164_(STM)" B3-Out

"Profile 079. Storage B2_Stor to Junction 164_(STM)" B2-Out

"Profile 080. Storage B1_Stor to Junction 164_(STM)" B1-Out

"Profile 081. Junction RYCB_6_(1)_(25)_(2)_(RYCB) to Junction RYCB_10" Pipe_-(162)_(RYCB)

"Profile 082. Junction RYCB_6_(1)_(3)_(RYCB) to Junction TEE_3_(RYCB)" Pipe_-(89)_(RYCB)

"Profile 083. Storage B4_Stor to Junction 106_(STM)" B4-Out

"Profile 084. Junction Maj-55 to Junction Maj-54" C57

"Profile 085. Junction 134_(STM) to Junction 132_(STM)" STM-27_(STM)

"Profile 086. Junction Maj-27 to Junction Maj-60" C27_1

"Profile 087. Junction 31_(RYCB) to Junction Maj-18_2" C18

"Profile 088. Junction Slope1 to Junction 33_(RYCB)" OR48

"Profile 089. Junction Maj-15 to Junction Maj-14" C17

"Profile 090. Junction Structure_-(12)_(RYCB) to Junction Maj-14" C4_3 C4_4

"Profile 091. Junction Maj-14 to Junction 31a_(RYCB)" OR49

"Profile 092. Junction Maj-13 to Junction Maj-12" C14

"Profile 093. Junction Maj-15 to Junction Maj-16" C15

"Profile 094. Junction Maj-17 to Junction Maj-10" C10

"Profile 095. Junction Maj-11 to Junction Maj-09" C12

"Profile 096. Junction 52_(RYCB) to Junction Maj-08" C6

"Profile 097. Junction Maj-07 to Junction Maj-06_2" C6_1

"Profile 098. Storage B2_Stor to Junction Maj-06" B2-Outflow

"Profile 099. Junction Maj-04 to Junction Maj-03" C3

"Profile 100. Outfall Maj-22 to Junction Maj-21" C22

"Profile 101. Outfall Maj-49 to Junction Maj-50" C54

"Profile 102. Outfall Maj-48 to Junction Maj-48_2" C50_1

"Profile 103. Junction Maj-51 to Junction Maj-52" C52

"Profile 104. Junction Maj-53 to Junction Maj-46" C49

"Profile 105. Junction TEE_6_(RYCB) to Junction Maj-46" C58_1 C58_2

"Profile 106. Junction Maj-45 to Junction Maj-44" C41

"Profile 107. Junction Maj-43 to Junction Maj-42" C39

"Profile 108. Junction Maj-45 to Junction Maj-41" C42

"Profile 109. Junction Maj-40 to Junction Maj-39" C44
"Profile 110. Junction Maj-38 to Junction Maj-37" C47
"Profile 111. Junction Maj-36 to Junction Maj-35" C37
"Profile 112. Junction Maj-29 to Junction Maj-30" C35
"Profile 113. Junction Maj-31 to Junction Maj-32" C33
"Profile 114. Junction 24_(RYCB) to Junction 142_(STM)"
RYCB-24
"Profile 115. Junction Maj-34 to Junction Maj-33" C30
"Profile 116. Junction Maj-29 to Junction Maj-28" C28
"Profile 117. Junction STM-Split to Junction Maj-60" C5
"Profile 118. Junction Structure_-_ (115)_(RYCB) to Junction
20_(CB)" Pipe_-_ (73)_(RYCB)
"Profile 119. Junction 144_(STM) to Junction 140_(STM)"
5_(STM)
"Profile 120. Junction 142_(STM) to Junction 140_(STM)"
STM-81_(STM)
"Profile 121. Junction Maj-27 to Junction Maj-26" C26
"Profile 122. Junction Maj-34_2 to Outfall Maj-57" C18_2
"Profile 123. Outfall Maj-59 to Junction Maj-58" C2

[BMR The Commons Interim Model Input File]
 ;;Project Title/Notes
 Submission 3 SWM Model for BMR The Commons - Interim
 Conditions including Phase 1 only

[OPTIONS]

```

;;Option      Value
FLOW_UNITS    CMS
INFILTRATION  HORTON
FLOW_ROUTING  DYNWAVE
LINK_OFFSETS  ELEVATION
MIN_SLOPE     0
ALLOW_PONDING YES
SKIP_STEADY_STATE NO

START_DATE    01/01/2019
START_TIME    00:00:00
REPORT_START_DATE 01/01/2019
REPORT_START_TIME 00:00:00
END_DATE      01/02/2019
END_TIME      00:00:00
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  0.5
RULE_STEP     00:00:00
  
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INERTIAL_DAMPING PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP     0.75
LENGTHENING_STEP  0
MIN_SURFAREA      1.167
MAX_TRIALS         21
HEAD_TOLERANCE    0.0001
SYS_FLOW_TOL      5
LAT_FLOW_TOL      5
MINIMUM_STEP      0.5
THREADS           6
  
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[EVAPORATION]

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;;Data Source Parameters
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CONSTANT  0.0
DRY_ONLY  NO
  
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[RAINGAGES]

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;;Name      Format  Interval SCF  Source
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002yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
002yrChicago3hr
002YrSCS24 INTENSITY 0:10  1.0  TIMESERIES
002YrSCS24
005yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
005yrChicago3hr
005YrSCS24 INTENSITY 0:10  1.0  TIMESERIES
005YrSCS24
010yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
010yrChicago3hr
010YrSCS24 INTENSITY 0:10  1.0  TIMESERIES
010YrSCS24
025yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
025yrChicago3hr
025YrSCS24 INTENSITY 0:10  1.0  TIMESERIES
025YrSCS24
050yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
050yrChicago3hr
  
```

```

050YrSCS24 INTENSITY 0:10  1.0  TIMESERIES
050YrSCS24
100yrChicago3hr INTENSITY 0:10  1.0  TIMESERIES
100yrChicago3hr
100yrChicago3hr+20% INTENSITY 0:10  1.0
TIMESERIES 100yrChicago3hr+20%
100YrSCS12hr INTENSITY 0:15  1.0  TIMESERIES
100YrSCS12hr
100YrSCS24 INTENSITY 0:10  1.0  TIMESERIES
100YrSCS24
100YrSCS24+20% INTENSITY 0:10  1.0
TIMESERIES 100YrSCS24+20%
1979July01 INTENSITY 0:05  1.0  TIMESERIES
1979July01
1988Aug04 INTENSITY 0:05  1.0  TIMESERIES
1988Aug04
1996Aug08 INTENSITY 0:05  1.0  TIMESERIES
1996Aug08
25mmChicago4Hr INTENSITY 0:10  1.0  TIMESERIES
25mmChicago4Hr
2YrSCS12hr INTENSITY 0:15  1.0  TIMESERIES
2YrSCS12hr
5YrSCS12hr INTENSITY 0:15  1.0  TIMESERIES
5YrSCS12hr
No_Rain INTENSITY 0:01  1.0  TIMESERIES
No_Rain
  
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[SUBCATCHMENTS]

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;;Name      Rain Gage  Outlet  Area  %Imperv
Width %Slope CurbLen SnowPack
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;30_(CB)
A12i 100yrChicago3hr Maj-15_2 0.0402 71.4
76.001 0.5 0
;31_(CB)
A12ii 100yrChicago3hr 31_(CB) 0.0502 71.4
76.001 0.5 0
;RYCB_11_(RYCB)
A13 100yrChicago3hr RYCB_11_(RYCB) 0.1132
42.9 76 0.5 0
;ELB_13_(RYCB)
A14 100yrChicago3hr ELB_13_(RYCB) 0.1142
42.9 75.001 0.5 0
;28_(CB)
A15i 100yrChicago3hr Maj-20 0.248 71.4
103 0.5 0
;27_(CB)
A15ii 100yrChicago3hr Maj-20 0.274 71.4
103 0.5 0
;26_(CB)
A16i 100yrChicago3hr Maj-19_2 0.06 71.4
24 0.5 0
;25_(CB)
A16ii 100yrChicago3hr Maj-19_2 0.067 71.4
25 0.5 0
;24_(CB)
A17ii 100yrChicago3hr Maj-24 0.093 71.4
77 0.5 0
;23_(CB)
A18i 100yrChicago3hr Maj-24 0.189 71.4
77.001 0.5 0
;RYCB_9_(RYCB)
A19 100yrChicago3hr RYCB_9_(RYCB) 0.1327
42.9 127.998 0.5 0
;21_(CB)
A20i 100yrChicago3hr Maj-26 0.195 71.4
99.8 0.9 0
;20_(CB)
  
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A20ii 100yrChicago3hr Maj-26 0.206 71.4
 99.801 0.9 0
 ;RYCB_7_(RYCB)
 A21 100yrChicago3hr RYCB_7_(RYCB) 0.325
 50 111.999 0.5 0
 ;RYCB_7_(RYCB)
 A22 100yrChicago3hr TEE_14_(RYCB) 0.028
 42.9 47.7 0.5 0
 ;RYCB_7_(RYCB)
 A23 100yrChicago3hr TEE_14_(RYCB) 0.169
 50 72.001 0.5 0
 ;18_(CB)
 A24i 100yrChicago3hr Maj-28 0.11 71.4
 90.002 0.9 0
 ;19_(CB)
 A24ii 100yrChicago3hr Maj-28 0.237 71.4
 129.998 0.9 0
 ;RYCB_8_(RYCB)
 A25 100yrChicago3hr RYCB_8_(RYCB) 0.1549
 50 101.998 0.5 0
 ;45_(CB)
 A26i 100yrChicago3hr 142_(STM) 0.0155 71.4
 73.002 0.5 0
 ;44_(CB)
 A26ii 100yrChicago3hr 22_(RYCB) 0.0522 71.4
 72.999 0.5 0
 A28i 100yrChicago3hr DICB_2 0.9172 7
 63.179 0.5 0
 A28ii 100yrChicago3hr DICB_3 1.2702 7
 90 0.5 0
 ;TEE_11_(RYCB)
 A29 100yrChicago3hr TEE_11_(RYCB) 0.116
 50 78.569 0.5 0
 ;ELB_23_(RYCB)
 A3 100yrChicago3hr Slope1 3.0092 7
 133.382 1 0
 ;RYCB_6_(RYCB)
 A30 100yrChicago3hr RYCB_6_(RYCB) 0.014
 42.9 17.981 0.5 0
 ;TEE_5_(RYCB)
 A31 100yrChicago3hr TEE_5_(RYCB) 0.187
 50 128.806 0.5 0
 ;17_(CB)
 A32i 100yrChicago3hr Maj-35 0.155 71.4
 73.089 1 0
 ;16_(CB)
 A32ii 100yrChicago3hr Maj-35 0.082 71.4
 72.689 1 0
 ;14_(CB)
 A33i 100yrChicago3hr Maj-37 0.11 71.4
 163.52 1 0
 ;15_(CB)
 A33ii 100yrChicago3hr Maj-37 0.157 71.4
 75.739 1 0
 ;13_(CB)
 A34i 100yrChicago3hr Maj-41 0.212 71.4
 124.53 0.5 0
 ;12_(CB)
 A34ii 100yrChicago3hr Maj-41 0.276 71.4
 133.747 0.5 0
 ;10_(CB)
 A39i 100yrChicago3hr 11_(CB) 0.0786 71.4
 113.588 1 0
 ;11_(CB)
 A39ii 100yrChicago3hr 11_(CB) 0.0365 71.4
 74.537 1 0
 ;RYCB_5_(RYCB)
 A40 100yrChicago3hr RYCB_5_(RYCB) 0.1123
 50 80.064 0.5 0
 ;TEE_7_(RYCB)

A41 100yrChicago3hr TEE_7_(RYCB) 0.075
 50 54.989 0.5 0
 ;08_(CB)
 A42i 100yrChicago3hr Maj-46 0.1456 71.4
 72.329 0.5 0
 ;09_(CB)
 A42ii 100yrChicago3hr Maj-46 0.083 71.4
 72.438 0.5 0
 A42iii 100yrChicago3hr Maj-48_3 0.0254 71.4
 30 0.5 0
 ;RYCB_2_(RYCB)
 A43 100yrChicago3hr RYCB_2_(RYCB) 0.236
 50 80.93 0.5 0
 ;RYCB_3_(RYCB)
 A44 100yrChicago3hr RYCB_3_(RYCB) 0.199
 50 72.054 0.5 0
 ;03_(CB)
 A45i 100yrChicago3hr Maj-50 0.168 71.4
 77.609 0.5 0
 ;02_(CB)
 A45ii 100yrChicago3hr Maj-50 0.075 71.4
 77.672 0.5 0
 ;05_(CB)
 A46i 100yrChicago3hr Maj-52 0.157 71.4
 73.067 0.5 0
 ;04_(CB)
 A46ii 100yrChicago3hr Maj-52 0.136 71.4
 87.029 0.5 0
 ;RYCB_4_(RYCB)
 A47 100yrChicago3hr RYCB_4_(RYCB) 0.136
 50 92.998 0.5 0
 ;55_(CB)
 A48 100yrChicago3hr 104_(STM) 0.0498 71.4
 57.13 0.5 0
 ;RYCB_1_(RYCB)
 A49 100yrChicago3hr RYCB_1_(RYCB) 0.0525
 50 57.989 0.5 0
 ;TEE_43_(RYCB)
 A54 100yrChicago3hr J2 0.7963 7
 80.066 0.2 0
 ;B1_Stor
 B1 100yrChicago3hr Slope1 1.9535 7
 171.181 1 0
 ;B2_Stor
 B2 100yrChicago3hr B2_Stor 3.432 100
 279.024 1 0
 ;B3_Stor
 B3i 100yrChicago3hr Slope1 0.965 85.7
 86.65 0.5 0
 ;58_(CB)
 B4i 100yrChicago3hr 58_(CB) 0.947 28.6
 148.991 0.5 0
 ;02_(CB)
 B4ii 100yrChicago3hr Maj-50 0.047 28.6
 77.571 0.5 0
 ;04_(CB)
 B4iii 100yrChicago3hr Maj-51 0.008 28.6
 14.24 0.5 0
 ;Maj-22
 C2 100yrChicago3hr Maj-21 0.087 71.4
 60 0.5 0

 [SUBAREAS]
 ;;Subcatchment N-Imperv N-Perv S-Imperv S-Perv
 PctZero RouteTo PctRouted
 ;;-----
 A12i 0.013 0.25 1.57 4.67 0
 OUTLET

A12ii	0.013	0.25	1.57	4.67	0	A41	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A13	0.013	0.25	1.57	4.67	0	A42i	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A14	0.013	0.25	1.57	4.67	0	A42ii	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A15i	0.013	0.25	1.57	4.67	0	A42iii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A15ii	0.013	0.25	1.57	4.67	0	A43	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A16i	0.013	0.25	1.57	4.67	0	A44	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A16ii	0.013	0.25	1.57	4.67	0	A45i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A17ii	0.013	0.25	1.57	4.67	0	A45ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A18i	0.013	0.25	1.57	4.67	0	A46i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A19	0.013	0.25	1.57	4.67	0	A46ii	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A20i	0.013	0.25	1.57	4.67	0	A47	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A20ii	0.013	0.25	1.57	4.67	0	A48	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A21	0.013	0.25	1.57	4.67	0	A49	0.013	0.25	1.57	4.67	0
PERVIOUS	100					PERVIOUS	100				
A22	0.013	0.25	1.57	4.67	0	A54	0.013	0.25	1.57	4.67	0
OUTLET						PERVIOUS	100				
A23	0.013	0.25	1.57	4.67	0	B1	0.013	0.25	1.57	4.67	0
PERVIOUS	100					PERVIOUS	100				
A24i	0.013	0.25	1.57	4.67	0	B2	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A24ii	0.013	0.25	1.57	4.67	0	B3i	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A25	0.013	0.25	1.57	4.67	0	B4i	0.013	0.25	1.57	4.67	0
PERVIOUS	100					OUTLET					
A26i	0.013	0.25	1.57	4.67	0	B4ii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A26ii	0.013	0.25	1.57	4.67	0	B4iii	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A28i	0.013	0.25	1.57	4.67	0	C2	0.013	0.25	1.57	4.67	0
OUTLET						OUTLET					
A28ii	0.013	0.25	1.57	4.67	0						
OUTLET											
A29	0.013	0.25	1.57	4.67	0						
PERVIOUS	100					[INFILTRATION]					
A3	0.013	0.25	1.57	4.67	0	::Subcatchment	Param1	Param2	Param3	Param4	
PERVIOUS	100					Param5					
A30	0.013	0.25	1.57	4.67	0	::					
OUTLET											
A31	0.013	0.25	1.57	4.67	0						
PERVIOUS	100					A12i	76.2	13.2	4.14	7	0
A32i	0.013	0.25	1.57	4.67	0	A12ii	76.2	13.2	4.14	7	0
OUTLET						A13	76.2	13.2	4.14	7	0
A32ii	0.013	0.25	1.57	4.67	0	A14	76.2	13.2	4.14	7	0
OUTLET						A15i	76.2	13.2	4.14	7	0
A33i	0.013	0.25	1.57	4.67	0	A15ii	76.2	13.2	4.14	7	0
OUTLET						A16i	76.2	13.2	4.14	7	0
A33ii	0.013	0.25	1.57	4.67	0	A16ii	76.2	13.2	4.14	7	0
OUTLET						A17ii	76.2	13.2	4.14	7	0
A34i	0.013	0.25	1.57	4.67	0	A18i	76.2	13.2	4.14	7	0
OUTLET						A19	76.2	13.2	4.14	7	0
A34ii	0.013	0.25	1.57	4.67	0	A20i	76.2	13.2	4.14	7	0
OUTLET						A20ii	76.2	13.2	4.14	7	0
A39i	0.013	0.25	1.57	4.67	0	A21	76.2	13.2	4.14	7	0
OUTLET						A22	76.2	13.2	4.14	7	0
A39ii	0.013	0.25	1.57	4.67	0	A23	76.2	13.2	4.14	7	0
OUTLET						A24i	76.2	13.2	4.14	7	0
A40	0.013	0.25	1.57	4.67	0	A24ii	76.2	13.2	4.14	7	0
PERVIOUS	100					A25	76.2	13.2	4.14	7	0
						A26i	76.2	13.2	4.14	7	0
						A26ii	76.2	13.2	4.14	7	0
						A28i	76.2	13.2	4.14	7	0
						A28ii	76.2	13.2	4.14	7	0

;T/G 86.60
 58_(CB) 85.4 2.6 0 0 0
 ;T/G 87.65
 59_(CB) 85.85 2.4 0 0 0
 ;Mcon MH - Concentric
 98_(STM) 81.17 6.333 0 0 0
 ;Future CB_30, T/G 88.17 m
 DICB_1 86.93 2.868 0 0 0
 ;Future CB_49, T/G 87.17
 DICB_2 85.37 3.84 0 0 0
 ;Future CB_10, T/G 86.67 m
 DICB_3 84.87 3.28 0 0 0
 ;CB-LANDSCAPE
 ELB_1_(RYCB) 86.51 1.14 0 0 1
 ;Mcon-CBMH
 ELB_10_(RYCB) 87.65 1.311 0 0 1
 ;Mcon-CBMH
 ELB_11_(RYCB) 87.6 1.302 0 0 1
 ;Mcon-CBMH
 ELB_12_(RYCB) 88 1.303 0 0 1
 ;Mcon-CBMH
 ELB_13_(RYCB) 87.56 1.301 0 0 1
 ;Mcon-CBMH
 ELB_14_(RYCB) 87.78 1.3 0 0 1
 ;Mcon-CBMH
 ELB_2_(RYCB) 86.265 1.412 0 0 1
 ;Mcon-CBMH
 ELB_3_(RYCB) 86.48 1.324 0 0 1
 ;Mcon-CBMH
 ELB_4_(RYCB) 86.53 1.22 0 0 1
 ;Mcon-CBMH
 ELB_5_(RYCB) 86.53 1.17 0 0 1
 ;Mcon-CBMH
 ELB_6_(RYCB) 86.55 1.312 0 0 1
 ;Mcon-CBMH
 ELB_7_(RYCB) 86.8 1.309 0 0 1
 ;Mcon-CBMH
 ELB_8_(RYCB) 86.772 1.308 0 0 1
 ;Mcon-CBMH
 ELB_9_(RYCB) 87.05 1.298 0 0 1
 ;Major Spill Point
 J1 88.48 0.6 0 0 0
 ;Spill Point
 J2 87.58 0.6 0 0 0
 ;HP
 Maj-15 89.666 0.704 0 0 0
 Maj-15_2 89.36 0.654 0 0 0
 Maj-18_2 89.51 0.64 0 0 0
 Maj-19 89.388 0.602 0 0 0
 ;HP
 Maj-19_2 89.527 0.693 0 0 0
 Maj-20 89.169 0.601 0 0 0
 ;LP
 Maj-21 88.595 0.615 0 0 0
 Maj-23 89.24 0.58 0 0 0
 ;LP
 Maj-24 88.904 0.616 0 0 0
 ;HP
 Maj-25 89.152 0.618 0 0 0
 ;LP
 Maj-26 88.605 0.615 0 0 0
 ;HP
 Maj-27 88.848 0.632 0 0 0
 ;LP
 Maj-28 88.251 0.689 0 0 0
 ;HP
 Maj-29 88.595 0.615 0 0 0
 ;LP
 Maj-35 88.149 0.581 0 0 0
 ;HP

Maj-36 88.408 0.672 0 0 0
 ;LP
 Maj-37 87.993 0.617 0 0 0
 ;HP
 Maj-38 88.19 0.62 0 0 0
 ;LP
 Maj-39 88.071 0.329 0 0 0
 ;HP
 Maj-40 87.97 0.63 0 0 0
 Maj-41 87.62 0.62 0 0 0
 ;LP
 Maj-44 87.539 0.611 0 0 0
 ;HP
 Maj-45 87.812 0.688 0 0 0
 ;LP
 Maj-46 87.407 0.613 0 0 0
 Maj-48_2 87.744 0.636 0 0 0
 Maj-48_3 87.647 0.621 0 0 0
 ;LP
 Maj-50 87.425 0.615 0 0 0
 ;HP
 Maj-51 87.71 0.63 0 0 0
 ;LP
 Maj-52 87.472 0.498 0 0 0
 Maj-53 87.588 0.612 0 0 0
 ;Overland Major Spill Point
 Maj-56 88.8 0.6 0 0 0
 ;Spill Point
 Maj-60 88.618 0.679 0 0 0
 ;Overland Major Spill Point
 Maj-61 88.7 0.6 0 0 0
 ;Major System Spill Point
 Maj-63 87.72 1.091 0 0 0
 ;Major System Spill Point
 Maj-64 88.8 0.6 0 0 0
 ;Major System Spill Point
 Maj-65 87.8 1.182 0 0 0
 Maj-67 87.95 0.6 0 0 0
 Maj-Park 86.5 0.6 0 0 0
 ;Mcon-CBMH (T/G 87.3 m)
 RYCB_1_(RYCB) 86 2.1 0 0 1
 ;Mcon-CBMH (T/G 88.55 m)
 RYCB_10_(RYCB) 87.02 2.38 0 0 1
 ;Mcon-CBMH (T/G 89.3 m)
 RYCB_11_(RYCB) 87.35 2.55 0 0 1
 ;TEE (T/G 88.55 m)
 RYCB_2_(RYCB) 86.01 3.14 0 0 1
 ;Mcon-CBMH
 RYCB_3_(RYCB) 86.18 2.27 0 0 1
 ;Mcon-CBMH (T/G 88.63 m)
 RYCB_4_(RYCB) 86.12 3.11 0 0 1
 ;Mcon-CBMH
 RYCB_5_(RYCB) 86.044 2.295 0 0 1
 ;Mcon-CBMH
 RYCB_6_(RYCB) 85.72 3.209 0 0 1
 ;T/G 88.79m
 RYCB_7_(RYCB) 86.49 2.9 0 0 1
 ;Mcon-CBMH (T/G 88.45 m)
 RYCB_8_(RYCB) 86.97 2.23 0 0 1
 ;Mcon-CBMH
 RYCB_9_(RYCB) 87.54 2.05 0 0 1
 Slope1 89.066 0.6 0 0 0
 ;Dummy Null Structure for LandXML purposes
 StartNullStruct2 86.62 1.4 0 0 1
 ;Dummy Null Structure for LandXML purposes
 StartNullStruct3 84.091 3.709 0 0 0
 ;Null Structure
 STM-251_(STM) 85.31 4.327 0 0 0
 ;Mcon-CBMH
 TEE_1_(RYCB) 86.21 1.444 0 0 1

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;Mcon-CBMH
TEE_10_(RYCB) 86.59 1.311 0 0 1
;CB-LANDSCAPE
TEE_11_(RYCB) 86.68 1.367 0 0 1
;Mcon-CBMH
TEE_12_(RYCB) 86.85 1.334 0 0 1
;CB-LANDSCAPE
TEE_13_(RYCB) 87 1.291 0 0 1
;CB-LANDSCAPE
TEE_14_(RYCB) 86.861 2.639 0 0 1
;CB-LANDSCAPE
TEE_15_(RYCB) 87.38 1.98 0 0 1
;Mcon-CBMH
TEE_16_(RYCB) 87.27 1.61 0 0 1
;Mcon-CBMH
TEE_17_(RYCB) 87.39 1.45 0 0 1
;Mcon-CBMH
TEE_18_(RYCB) 87.54 1.41 0 0 1
;Mcon-CBMH
TEE_19_(RYCB) 87.44 1.317 0 0 1
;Mcon-CBMH
TEE_2_(RYCB) 86.35 1.365 0 0 1
;Mcon-CBMH
TEE_20_(RYCB) 87.29 1.331 0 0 1
;Mcon-CBMH
TEE_21_(RYCB) 87.17 1.438 0 0 1
;Mcon-CBMH
TEE_22_(RYCB) 87.78 1.31 0 0 1
;Mcon-CBMH
TEE_23_(RYCB) 87.4 1.38 0 0 1
;Mcon-CBMH
TEE_24_(RYCB) 87.69 1.32 0 0 1
;Mcon-CBMH
TEE_25_(RYCB) 87.53 1.546 0 0 1
;Mcon-CBMH
TEE_3_(RYCB) 86.25 1.37 0 0 1
;Mcon-CBMH
TEE_4_(RYCB) 86.02 1.86 0 0 1
;CB-LANDSCAPE
TEE_5_(RYCB) 86.09 1.934 0 0 1
;Mcon-CBMH
TEE_6_(RYCB) 86.35 1.525 0 0 1
;Mcon-CBMH
TEE_7_(RYCB) 86.46 1.427 0 0 1
;Mcon-CBMH
TEE_8_(RYCB) 86.34 1.523 0 0 1
;Mcon-CBMH
TEE_9_(RYCB) 86.22 1.66 0 0 1

```

[OUTFALLS]

```

;:Name Elevation Type Stage Data Gated
Route To
;:-----
;HP
Maj-18 89.547 FREE NO
Maj-22 88.834 FREE NO
;HP
Maj-48 87.78 FREE NO
;HP
Maj-49 87.673 FREE NO
OF1 85 FREE NO
;Rectangular Headwall Variable Height SI
STM-111_(STM) 80.137 FREE NO

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[STORAGE]

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;:Name Elev. MaxDepth InitDepth Shape Curve
Name/Params N/A Fevap Psi Ksat IMD
;:-----

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B2_Stor 90.5 1.5 0 TABULAR
UHAL_Onsite 0 0

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[CONDUITS]

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;:Name From Node To Node Length
Roughness InOffset OutOffset InitFlow MaxFlow
;:-----
;Mcon Circular Conc. Pipe
10_(STM) 124_(STM) 122_(STM) 16.861
0.013 83.134 83.05 0 0
;Mcon Circular Conc. Pipe
11_(STM) 122_(STM) 120_(STM) 24.629
0.013 83.036 82.974 0 0
;Mcon Circular Conc. Pipe
12_(STM) 120_(STM) 112_(STM) 91.574
0.013 82.964 82.735 0 0
;Mcon Circular Conc. Pipe
13_(STM) 112_(STM) 104_(STM) 73.804
0.013 82.204 81.983 0 0
;Mcon Circular Conc. Pipe
14_(STM) 104_(STM) 102_(STM) 41.856
0.013 81.683 81.641 0 0
;Mcon Circular Conc. Pipe
15_(10)_(STM) 138_(STM) 136_(STM) 14.785
0.013 83.724 83.65 0 0
;Mcon Circular Conc. Pipe
15_(11)_(STM) 136_(STM) 128_(STM) 62.501
0.013 83.636 83.48 0 0
;Mcon Circular Conc. Pipe
15_(12)_(STM) 148_(STM) 146_(STM) 78.542
0.013 85.33 85.21 0 0
;Mcon Circular Conc. Pipe
15_(13)_(STM) 146_(STM) 144_(STM) 78.665
0.013 85.15 85.03 0 0
;Mcon Circular Conc. Pipe
15_(5)_(STM) 114_(STM) 112_(STM) 64.641
0.013 83.666 83.44 0 0
;Mcon Circular Conc. Pipe
15_(9)_(STM) 140_(STM) 138_(STM) 113.118
0.013 84.013 83.73 0 0
;Mcon Circular Conc. Pipe
4_(STM) 150_(STM) 144_(STM) 76.294
0.013 84.679 84.49 0 0
;Mcon Circular Conc. Pipe
5_(STM) 144_(STM) 140_(STM) 77.327
0.013 84.36 84.13 0 0
;Mcon Circular Conc. Pipe
8_(STM) 128_(STM) 126_(STM) 75.98
0.013 83.47 83.28 0 0
;Mcon Circular Conc. Pipe
9_(STM) 126_(STM) 124_(STM) 53.402
0.013 83.274 83.14 0 0
C1 B2_Stor Maj-15 288.955 0.035
90.5 89.666 0 0
;Maj RY Spill Point
C18 29_(RYCB) Maj-18_2 4.776 0.035
89.84 89.55 0 0
C18_3 Maj-15 Slope1 36.415 0.013
89.666 89.066 0 0
C18_4 Slope1 Maj-15_2 37.347 0.013
89.066 89.36 0 0
C18_5 Maj-19_2 Maj-15_2 13.813 0.013
89.527 89.36 0 0
C18_6 Maj-19_2 Maj-19 27.25 0.013
89.527 89.388 0 0
C18_8 Maj-18 Maj-18_2 5 0.013
89.547 89.51 0 0
C18_9 Maj-18_2 Maj-15_2 31.942 0.013
89.51 89.36 0 0

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C19	Maj-15_2	Maj-23	11.274	0.013
89.36	89.24 0	0		
C20	Maj-19	Maj-20	24.9	0.013
89.388	89.169 0	0		
C21	Maj-20	Maj-21	64.337	0.013
89.169	88.595 0	0		
C22	Maj-22	Maj-21	13.47	0.013
88.834	88.595 0	0		
C23	Maj-23	Maj-24	31.267	0.013
89.24	88.904 0	0		
C24	Maj-25	Maj-24	35.922	0.013
89.152	88.904 0	0		
C25	Maj-25	Maj-26	59.92	0.013
89.152	88.605 0	0		
C26	Maj-27	Maj-26	40.459	0.013
88.848	88.605 0	0		
;Maj RY Spill Point				
C27	22_(RYCB)	Maj-25	17.828	0.035
89.3	89.152 0	0		
C27_1	Maj-27	Maj-60	20.292	0.013
88.848	88.618 0	0		
C27_2	Maj-60	Maj-28	39.649	0.013
88.618	88.251 0	0		
C28	Maj-29	Maj-28	31.279	0.013
88.595	88.251 0	0		
C31	Maj-Park	OF1	47.652	0.035
86.5	85 0	0		
;Maj RY Spill Point				
C31_1	RYCB_8_(RYCB)	Maj-61	1.758	
0.035	88.6 88.7 0	0		
;Maj RY Spill Point				
C31_2	Maj-61	Maj-28	17.384	0.035
88.7	88.251 0	0		
C36	Maj-29	Maj-35	35.198	0.013
88.595	88.149 0	0		
C37	Maj-36	Maj-35	37.341	0.013
88.408	88.149 0	0		
C4_1	Maj-53	J2	13.091	0.035
87.588	87.526 0	0		
C4_2	J2	58_(CB)	174.482	0.035
87.58	86.6 0	0		
C41	Maj-45	Maj-44	34.02	0.013
87.812	87.539 0	0		
C42	Maj-45	Maj-41	33.014	0.013
87.812	87.62 0	0		
C43	Maj-40	Maj-41	55.256	0.013
87.97	87.62 0	0		
C44	Maj-40	Maj-39	14.403	0.013
87.97	88.071 0	0		
C45	Maj-38	Maj-39	19.588	0.013
88.19	88.071 0	0		
C46	Maj-36	Maj-37	37.582	0.013
88.408	87.993 0	0		
C47	Maj-38	Maj-37	23.672	0.013
88.19	87.993 0	0		
C48	Maj-45	Maj-46	39.529	0.013
87.812	87.407 0	0		
C49	Maj-53	Maj-46	33.614	0.013
87.588	87.407 0	0		
C5	58_(CB)	Maj-Park	30	0.035
86.71	86.5 0	0		
C50_1	Maj-48	Maj-48_2	5	0.013
87.78	87.744 0	0		
C50_2	Maj-48_2	Maj-53	31.434	0.013
87.744	87.588 0	0		
C51	Maj-53	Maj-52	33.988	0.013
87.588	87.472 0	0		
C52	Maj-51	Maj-52	53.407	0.013
87.71	87.472 0	0		

C53	Maj-51	Maj-50	33.561	0.013
87.71	87.425 0	0		
C54	Maj-49	Maj-50	43.76	0.013
87.673	87.425 0	0		
C56	Maj-21	Maj-56	22.042	0.035
88.595	88.8 0	0		
;Major System Spill Point				
C58	TEE_14_(RYCB)	Maj-60	42.957	
0.035	88.9 88.618 0	0		
;Maj RY Spill Point				
C58_1	RYCB_2_(RYCB)	Maj-63	5.09	
0.035	87.58 87.72 0	0		
;Maj RY Spill Point				
C58_2	Maj-63	Maj-46	12.116	0.035
87.72	87.407 0	0		
;Maj RY Spill Point				
C59_1	RYCB_4_(RYCB)	Maj-65	3.487	
0.035	87.79 87.8 0	0		
;Maj RY Spill Point				
C59_2	Maj-65	Maj-48_2	8.163	0.035
87.8	87.744 0	0		
;Major System Overland Spillway				
C60	Maj-56	TEE_14_(RYCB)	23.631	
0.035	88.8 88.9 0	0		
C62	1_(RYCB)	Maj-50	27.046	0.035
87.813	87.425 0	0		
C63_1	RYCB_5_(RYCB)	Maj-67	3.561	
0.035	87.739 87.95 0	0		
C63_2	Maj-67	Maj-44	7.188	0.035
87.95	87.539 0	0		
C65_1	RYCB_6_(RYCB)	J1	22.199	
0.035	88.329 88.48 0	0		
C65_2	J1	Maj-35	15.658	0.035
88.48	88.149 0	0		
C66_1	RYCB_10_(RYCB)	Maj-64	14.534	
0.035	88.729 88.8 0	0		
C66_2	Maj-64	Maj-21	36.889	0.035
88.8	88.595 0	0		
C67	RYCB_11_(RYCB)	Slope1	10.418	
0.035	89.123 89.066 0	0		
;HDPE Pipe SI				
Pipe_-(100)_	(RYCB) TEE_6_(RYCB)	RYCB_4_(RYCB)		
43.106	0.013 86.65	86.434 0	0	
;HDPE Pipe SI				
Pipe_-(110)_	(RYCB) ELB_12_(RYCB) TEE_22_(RYCB)			
42.796	0.013 88.3	88.086 0	0	
;HDPE Pipe SI				
Pipe_-(111)_	(RYCB) TEE_22_(RYCB) RYCB_9_(RYCB)			
36.137	0.013 88.08	87.899 0	0	
;HDPE Pipe SI				
Pipe_-(114)_	(RYCB) ELB_10_(RYCB) TEE_18_(RYCB)			
20.158	0.013 87.95	87.849 0	0	
;HDPE Pipe SI				
Pipe_-(117)_	(RYCB) ELB_14_(RYCB) TEE_24_(RYCB)			
14.18	0.013 88.08	88.009 0	0	
;HDPE Pipe SI				
Pipe_-(118)_	(RYCB) TEE_24_(RYCB) TEE_25_(RYCB)			
29.666	0.013 87.99	87.842 0	0	
;HDPE Pipe SI				
Pipe_-(119)_	(RYCB) ELB_13_(RYCB) TEE_23_(RYCB)			
29.54	0.013 87.86	87.712 0	0	
;HDPE Pipe SI				
Pipe_-(134)_	(RYCB) TEE_10_(RYCB) TEE_11_(RYCB)			
40.369	0.013 86.89	86.688 0	0	
;HDPE Pipe SI				
Pipe_-(137)_	(RYCB) TEE_7_(RYCB) TEE_8_(RYCB)			
22.479	0.013 86.76	86.648 0	0	
;HDPE Pipe SI				
Pipe_-(138)_	(RYCB) TEE_8_(RYCB) TEE_9_(RYCB)			
21.988	0.013 86.64	86.53 0	0	

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;HDPE Pipe SI
Pipe -(139)(RYCB) ELB_3_(RYCB) TEE_2_(RYCB)
20.228 0.013 86.78 86.681 0 0
;HDPE Pipe SI
Pipe -(14)(RYCB) TEE_15_(RYCB) RYCB_7_(RYCB)
4.757 0.013 87.38 87.356 0 0
;HDPE Pipe SI
Pipe -(140)(RYCB) TEE_2_(RYCB) RYCB_3_(RYCB)
20.776 0.013 86.65 86.544 0 0
;HDPE Pipe SI
Pipe -(141)(RYCB) ELB_11_(RYCB) TEE_19_(RYCB)
18.513 0.013 87.9 87.752 0 0
;HDPE Pipe SI
Pipe -(142)(RYCB) TEE_19_(RYCB) TEE_20_(RYCB)
27.38 0.013 87.74 87.603 0 0
;HDPE Pipe SI
Pipe -(143)(RYCB) TEE_20_(RYCB) TEE_21_(RYCB)
22.082 0.013 87.59 87.48 0 0
;HDPE Pipe SI
Pipe -(144)(RYCB) TEE_21_(RYCB) RYCB_8_(RYCB)
33.251 0.013 87.47 87.304 0 0
;HDPE Pipe SI
Pipe -(15)(RYCB) RYCB_7_(RYCB) 15_RYCB
39.009 0.013 86.79 86.595 0 0
;HDPE Pipe SI
Pipe -(150)(RYCB) TEE_18_(RYCB) TEE_17_(RYCB)
21.983 0.013 87.84 87.73 0 0
;HDPE Pipe SI
Pipe -(151)(RYCB) TEE_17_(RYCB) TEE_16_(RYCB)
22.116 0.013 87.69 87.579 0 0
;HDPE Pipe SI
Pipe -(152)(RYCB) TEE_16_(RYCB) TEE_15_(RYCB)
36.027 0.013 87.57 87.39 0 0
;HDPE Pipe SI
Pipe -(153)(RYCB) ELB_8_(RYCB) TEE_10_(RYCB)
17.189 0.013 87.072 86.9 0 0
;HDPE Pipe SI
Pipe -(154)(RYCB) ELB_9_(RYCB) TEE_12_(RYCB)
38.096 0.013 87.35 87.16 0 0
;HDPE Pipe SI
Pipe -(155)(RYCB) TEE_12_(RYCB) TEE_13_(RYCB)
17.927 0.013 87.15 87.06 0 0
;HDPE Pipe SI
Pipe -(156)(1)(RYCB) TEE_14_(RYCB)
RYCB_7_(RYCB) 3.241 0.013 86.861 86.845 0
0
;HDPE Pipe SI
Pipe -(156)(RYCB) TEE_13_(RYCB) TEE_14_(RYCB)
27.79 0.013 87 86.861 0 0
;HDPE Pipe SI
Pipe -(16)(RYCB) TEE_5_(RYCB) RYCB_6_(RYCB)
3.09 0.013 86.09 86.075 0 0
;HDPE Pipe SI
Pipe -(161)(RYCB) ELB_1_(RYCB) RYCB_1_(RYCB)
36.543 0.013 86.51 86.327 0 0
;HDPE Pipe SI
Pipe -(164)(RYCB) TEE_23_(RYCB) RYCB_10_(RYCB)
28.561 0.013 87.7 87.557 0 0
;HDPE Pipe SI
Pipe -(165)(RYCB) TEE_25_(RYCB) RYCB_11_(RYCB)
30.956 0.013 87.83 87.675 0 0
;HDPE Pipe SI
Pipe -(17)(RYCB) TEE_11_(RYCB) RYCB_6_(RYCB)
5.41 0.013 86.68 86.653 0 0
;HDPE Pipe SI
Pipe -(19)(RYCB) RYCB_9_(RYCB) 22_(RYCB)
31.338 0.013 87.84 87.683 0 0
;HDPE Pipe SI
Pipe -(25)(RYCB) RYCB_11_(RYCB) 31_(CB) 6.05
0.013 87.65 87.62 0 0

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;HDPE Pipe SI
Pipe -(27)(RYCB) RYCB_3_(RYCB) 1_(RYCB) 30.6
0.013 86.48 86.327 0 0
;HDPE Pipe SI
Pipe -(73)(RYCB) RYCB_8_(RYCB) 18_(CB) 9.658
0.013 87.27 87.222 0 0
;HDPE Pipe SI
Pipe -(87)(RYCB) StartNullStruct2 TEE_1_(RYCB)
21.137 0.013 86.62 86.515 0 0
;HDPE Pipe SI
Pipe -(88)(RYCB) TEE_1_(RYCB) RYCB_2_(RYCB)
36.065 0.013 86.51 86.33 0 0
;HDPE Pipe SI
Pipe -(89)(RYCB) ELB_4_(RYCB) RYCB_3_(RYCB)
30.528 0.013 86.75 86.6 0 0
;HDPE Pipe SI
Pipe -(9)(RYCB) RYCB_5_(RYCB) 11_(CB) 5.75
0.013 86.35 86.321 0 0
;HDPE Pipe SI
Pipe -(90)(RYCB) StartNullStruct2 ELB_2_(RYCB)
11.016 0.013 86.62 86.565 0 0
;HDPE Pipe SI
Pipe -(93)(RYCB) ELB_5_(RYCB) TEE_3_(RYCB)
39.684 0.013 86.75 86.56 0 0
;HDPE Pipe SI
Pipe -(94)(RYCB) TEE_3_(RYCB) TEE_4_(RYCB)
43.993 0.013 86.55 86.33 0 0
;HDPE Pipe SI
Pipe -(95)(RYCB) TEE_4_(RYCB) TEE_5_(RYCB)
43.248 0.013 86.32 86.104 0 0
;HDPE Pipe SI
Pipe -(96)(RYCB) ELB_7_(RYCB) TEE_7_(RYCB)
25.116 0.013 87.1 86.82 0 0
;HDPE Pipe SI
Pipe -(98)(RYCB) TEE_9_(RYCB) RYCB_5_(RYCB)
35.118 0.013 86.52 86.344 0 0
;HDPE Pipe SI
Pipe -(99)(RYCB) ELB_6_(RYCB) TEE_6_(RYCB)
38.969 0.013 86.85 86.655 0 0
;Mcon Circular Conc. Pipe
STM-23_(STM) 106_(STM) 104_(STM) 97.6
0.013 83.839 83.595 0 0
;Mcon Circular Conc. Pipe
STM-24_(STM) 108_(STM) 106_(STM) 26.241
0.013 83.916 83.85 0 0
;lpx PVC DR 35
STM-28_(STM) 110_(STM) 108_(STM) 29.106
0.013 84.236 84.114 0 0
;Mcon Circular Conc. Pipe
STM-34_(1)(1)(STM) 98_(STM) 2121_(STM) 40.5
0.013 81.46 81.42 0 0
;Mcon Circular Conc. Pipe
STM-34_(1)(STM) 100_(STM) 98_(STM) 39.5
0.013 81.56 81.52 0 0
;Mcon Circular Conc. Pipe
STM-34_(STM) 102_(STM) 100_(STM) 12.1
0.013 81.61 81.598 0 0
;Mcon Circular Conc. Pipe
STM-35_(STM) 2121_(STM) 2142_(STM) 83.9
0.013 80.72 80.59 0 0
;Mcon Circular Conc. Pipe
STM-36_(STM) 2142_(STM) STM-111_(STM) 65.7
0.013 80.43 80.36 0 0
;HDPE Pipe SI
STM-81_(STM) 142_(STM) 140_(STM) 20.687
0.013 85.244 85.11 0 0
;HDPE Pipe SI
STM-82_(STM) StartNullStruct3 104_(STM) 37.594
0.013 84.091 83.903 0 0
;HDPE Pipe SI

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STM-83_(STM) STM-251_(STM) 144_(STM) 37.8
 0.013 85.609 85.225 0 0

[ORIFICES]

;;Name	From Node	To Node	Type	
Offset	Qcoeff	Gated	CloseTime	
CB-02	02_(CB)	106_(STM)	SIDE	85.6
0.62	NO	0		
CB-03	03_(CB)	106_(STM)	SIDE	85.6
0.62	NO	0		
CB-04	04_(CB)	104_(STM)	SIDE	
85.53	0.62	NO	0	
CB-05	05_(CB)	104_(STM)	SIDE	
85.531	0.62	NO	0	
CB-06	RYCB_1_(RYCB)	104_(STM)	SIDE	
86.19	0.62	NO	0	
CB-08	08_(CB)	112_(STM)	SIDE	
85.436	0.62	NO	0	
CB-09	09_(CB)	112_(STM)	SIDE	
85.425	0.62	NO	0	
CB-10	DICB_3	114_(STM)	SIDE	
84.87	0.62	NO	0	
CB-11	11_(CB)	114_(STM)	SIDE	
86.321	0.62	NO	0	
CB-12	12_(CB)	120_(STM)	SIDE	
85.643	0.62	NO	0	
CB-13	13_(CB)	120_(STM)	SIDE	
85.793	0.62	NO	0	
CB-14	14_(CB)	126_(STM)	SIDE	
86.012	0.62	NO	0	
CB-15	15_(CB)	126_(STM)	SIDE	
86.016	0.62	NO	0	
CB-16	16_(CB)	128_(STM)	SIDE	
86.173	0.62	NO	0	
CB-17	17_(CB)	128_(STM)	SIDE	
86.176	0.62	NO	0	
CB-18	18_(CB)	136_(STM)	SIDE	
87.222	0.62	NO	0	
CB-19	19_(CB)	136_(STM)	SIDE	
86.281	0.62	NO	0	
CB-20	20_(CB)	140_(STM)	SIDE	
86.623	0.62	NO	0	
CB-21	21_(CB)	140_(STM)	SIDE	
86.773	0.62	NO	0	
CB-23	23_(CB)	144_(STM)	SIDE	
86.923	0.62	NO	0	
CB-24	24_(CB)	144_(STM)	SIDE	
86.923	0.62	NO	0	
CB-25	25_(CB)	146_(STM)	SIDE	
86.775	0.82	NO	0	
CB-26	26_(CB)	146_(STM)	SIDE	
86.775	0.82	NO	0	
CB-27	27_(CB)	148_(STM)	SIDE	
86.775	0.62	NO	0	
CB-28	28_(CB)	148_(STM)	SIDE	
86.775	0.62	NO	0	
;;On Slope				
CB-30	DICB_1	150_(STM)	SIDE	
86.93	0.82	NO	0	
;;On Slope				
CB-31	31_(CB)	150_(STM)	SIDE	
87.62	0.82	NO	0	
;;CICB				
OR-02	Maj-50	02_(CB)	SIDE	87.425
0.62	NO	0		
;;CICB				
OR-03	Maj-50	03_(CB)	SIDE	87.425
0.62	NO	0		

;;CICB				
OR-04	Maj-52	04_(CB)	SIDE	87.472
0.62	NO	0		
;;CICB				
OR-05	Maj-52	05_(CB)	SIDE	87.472
0.62	NO	0		
OR-08	Maj-46	08_(CB)	BOTTOM	
87.407	0.62	NO	0	
OR-09	Maj-46	09_(CB)	BOTTOM	
87.407	0.62	NO	0	
OR1	59_(CB)	112_(STM)	SIDE	
85.85	0.62	NO	0	
OR-10	Maj-44	DICB_3	BOTTOM	
87.539	0.62	NO	0	
OR-11	Maj-44	11_(CB)	BOTTOM	
87.539	0.62	NO	0	
OR-12	Maj-41	12_(CB)	BOTTOM	
87.62	0.62	NO	0	
OR-13	Maj-41	13_(CB)	BOTTOM	
87.62	0.62	NO	0	
OR-14	Maj-37	14_(CB)	BOTTOM	
87.993	0.62	NO	0	
OR-15	Maj-37	15_(CB)	BOTTOM	
87.993	0.62	NO	0	
OR-16	Maj-35	16_(CB)	BOTTOM	
88.149	0.62	NO	0	
OR-17	Maj-35	17_(CB)	BOTTOM	
88.149	0.62	NO	0	
OR-18	Maj-28	18_(CB)	BOTTOM	
88.251	0.62	NO	0	
OR-19	Maj-28	19_(CB)	BOTTOM	
88.251	0.62	NO	0	
;;CICB				
OR2	Maj-48_3	59_(CB)	SIDE	
87.647	0.62	NO	0	
OR-20	Maj-26	20_(CB)	BOTTOM	
88.605	0.62	NO	0	
OR-21	Maj-26	21_(CB)	BOTTOM	
88.605	0.62	NO	0	
OR-23	Maj-24	23_(CB)	BOTTOM	
88.904	0.62	NO	0	
OR-24	Maj-24	24_(CB)	BOTTOM	
88.904	0.62	NO	0	
OR-25	Maj-19	25_(CB)	BOTTOM	
89.388	0.62	NO	0	
;;CICB				
OR-26	Maj-19	26_(CB)	SIDE	89.388
0.62	NO	0		
;;Double CB				
OR-27	Maj-21	27_(CB)	BOTTOM	
88.595	0.62	NO	0	
;;Double CB				
OR-28	Maj-21	28_(CB)	BOTTOM	
88.595	0.62	NO	0	
OR3	Slope1	DICB_1	BOTTOM	
89.066	0.62	NO	0	
;;CICB				
OR-31	Slope1	31_(CB)	SIDE	89.066
0.62	NO	0		
OR4	DICB_2	128_(STM)	SIDE	
85.37	0.62	NO	0	
OR5	Maj-29	DICB_2	SIDE	88.595
0.65	NO	0		
RYCB-02	RYCB_2_(RYCB)	112_(STM)	SIDE	
86.33	0.62	NO	0	
RYCB-03	1_(RYCB)	110_(STM)	SIDE	
86.327	0.62	NO	0	
RYCB-04	RYCB_4_(RYCB)	StartNullStruct3	SIDE	
86.42	0.62	NO	0	

RYCB-06 RYCB_6_(RYCB) 128_(STM) SIDE
86.075 0.82 NO 0
;Direct Connection
RYCB-07 15_RYCB 138_(STM) SIDE
86.595 0.82 NO 0
RYCB-10 RYCB_10_(RYCB) 148_(STM) SIDE
87.33 0.62 NO 0
RYCB-22 22_(RYCB) 142_(STM) SIDE
87.683 0.62 NO 0
RYCB-29 29_(RYCB) STM-251_(STM) SIDE
88.539 0.62 NO 0

[OUTLETS]

Name	From Node	To Node	Offset	Type
QTable/Qcoeff	Qexpon	Gated		
B2-Out	B2_Stor	150_(STM)	90.5	
TABULAR/HEAD	B2-Out		NO	
B4-Out	58_(CB)	2142_(STM)	85.4	
TABULAR/HEAD	B4-Out		NO	

[XSECTIONS]

Link	Shape	Geom1	Geom2	Geom3
Geom4	Barrels	Culvert		
10_(STM)	CIRCULAR	1.35	0	0
11_(STM)	CIRCULAR	1.35	0	0
12_(STM)	CIRCULAR	1.35	0	0
13_(STM)	CIRCULAR	1.35	0	0
14_(STM)	CIRCULAR	1.65	0	0
15_(10)_(STM)	CIRCULAR	1.35	0	0
15_(11)_(STM)	CIRCULAR	1.35	0	0
15_(12)_(STM)	CIRCULAR	0.75	0	0
15_(13)_(STM)	CIRCULAR	0.75	0	0
15_(5)_(STM)	CIRCULAR	0.525	0	0
15_(9)_(STM)	CIRCULAR	1.35	0	0
4_(STM)	CIRCULAR	1.2	0	0
5_(STM)	CIRCULAR	1.35	0	0
8_(STM)	CIRCULAR	1.35	0	0
9_(STM)	CIRCULAR	1.35	0	0
C1	TRIANGULAR	0.5	3	0
C18	TRIANGULAR	0.6	3.6	0
C18_3	IRREGULAR	18mROWwSidewalk	0	0
C18_4	IRREGULAR	18mROWwSidewalk	0	0
C18_5	IRREGULAR	24mROW-DbI-Sidewalk	0	0
C18_6	IRREGULAR	24mROW-DbI-Sidewalk	0	0

C18_8	IRREGULAR	24mROW-DbI-Sidewalk	0	0
C18_9	IRREGULAR	24mROW-DbI-Sidewalk	0	0
C19	IRREGULAR	18mROW-No-Sidewalk	0	0
C20	IRREGULAR	24mROW-DbI-Sidewalk	0	0
C21	IRREGULAR	24mROW-DbI-Sidewalk	0	0
C22	IRREGULAR	24mROW-DbI-Sidewalk	0	0
C23	IRREGULAR	18mROW-No-Sidewalk	0	0
C24	IRREGULAR	18mROW-No-Sidewalk	0	0
C25	IRREGULAR	18mROW-No-Sidewalk	0	0
C26	IRREGULAR	18mROW-No-Sidewalk	0	0
C27	TRIANGULAR	0.6	3.6	0
C27_1	IRREGULAR	18mROW-No-Sidewalk	0	0
C27_2	IRREGULAR	18mROW-No-Sidewalk	0	0
C28	IRREGULAR	18mROW-No-Sidewalk	0	0
C31	TRIANGULAR	0.6	3.6	0
C31_1	TRIANGULAR	0.6	3.6	0
C31_2	TRIANGULAR	0.6	3.6	0
C36	IRREGULAR	18mROW-No-Sidewalk	0	0
C37	IRREGULAR	18mROW-No-Sidewalk	0	0
C4_1	TRIANGULAR	0.6	3.6	0
C4_2	TRIANGULAR	0.6	3.6	0
C41	IRREGULAR	18mROW-No-Sidewalk	0	0
C42	IRREGULAR	18mROW-No-Sidewalk	0	0
C43	IRREGULAR	18mROW-No-Sidewalk	0	0
C44	IRREGULAR	18mROW-No-Sidewalk	0	0
C45	IRREGULAR	18mROW-No-Sidewalk	0	0
C46	IRREGULAR	18mROW-No-Sidewalk	0	0
C47	IRREGULAR	18mROW-No-Sidewalk	0	0
C48	IRREGULAR	18mROW-No-Sidewalk	0	0
C49	IRREGULAR	18mROW-No-Sidewalk	0	0
C5	TRIANGULAR	0.6	3.6	0
C50_1	IRREGULAR	18mROWwSidewalk	0	0
C50_2	IRREGULAR	18mROWwSidewalk	0	0
C51	IRREGULAR	18mROWwSidewalk	0	0
C52	IRREGULAR	18mROWwSidewalk	0	0

C53	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(150)_(RYCB) CIRCULAR	0.25	0	0	
0	1				0	1			
C54	IRREGULAR	18mROWwSidewalk	0	0	Pipe_-(151)_(RYCB) CIRCULAR	0.25	0	0	
0	1				0	1			
C56	TRIANGULAR	0.6	3.6	0	0	Pipe_-(152)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C58	TRIANGULAR	0.6	3.6	0	0	Pipe_-(153)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C58_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(154)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C58_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(155)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C59_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(156)_(1)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C59_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(156)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C60	TRIANGULAR	0.6	3.6	0	0	Pipe_-(16)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C62	TRIANGULAR	0.6	3.6	0	0	Pipe_-(161)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C63_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(164)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C63_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(165)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C65_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(17)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C65_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(19)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C66_1	TRIANGULAR	0.6	3.6	0	0	Pipe_-(25)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C66_2	TRIANGULAR	0.6	3.6	0	0	Pipe_-(27)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
C67	TRIANGULAR	0.6	3.6	0	0	Pipe_-(73)_(RYCB) CIRCULAR	0.25	0	0
1					0	1			
Pipe_-(100)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(87)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(110)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(88)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(111)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(89)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(114)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(9)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(117)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(90)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(118)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(93)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(119)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(94)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(134)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(95)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(137)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(96)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(138)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(98)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(139)_(RYCB) CIRCULAR	0.25	0	0	Pipe_-(99)_(RYCB) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(14)_(RYCB) CIRCULAR	0.25	0	0	STM-23_(STM) CIRCULAR	0.45	0	0	0	
0	1			0	1				
Pipe_-(140)_(RYCB) CIRCULAR	0.25	0	0	STM-24_(STM) CIRCULAR	0.45	0	0	0	
0	1			0	1				
Pipe_-(141)_(RYCB) CIRCULAR	0.25	0	0	STM-28_(STM) CIRCULAR	0.25	0	0	0	
0	1			0	1				
Pipe_-(142)_(RYCB) CIRCULAR	0.25	0	0	STM-34_(1)_(1)_(STM) CIRCULAR	1.65	0	0	0	
0	1			0	1				
Pipe_-(143)_(RYCB) CIRCULAR	0.25	0	0	STM-34_(1)_(STM) CIRCULAR	1.65	0	0	0	
0	1			0	1				
Pipe_-(144)_(RYCB) CIRCULAR	0.25	0	0	STM-34_(STM) CIRCULAR	1.65	0	0	0	
0	1			0	1				
Pipe_-(15)_(RYCB) CIRCULAR	0.3	0	0	STM-35_(STM) CIRCULAR	1.65	0	0	0	
0	1			0	1				

STM-36_(STM)	CIRCULAR	1.65	0	0	0	OR-20	RECT_CLOSED	0.35	0.35	0
0	1					0				
STM-81_(STM)	CIRCULAR	0.25	0	0	0	OR-21	RECT_CLOSED	0.35	0.35	0
0	1					0				
STM-82_(STM)	CIRCULAR	0.25	0	0	0	OR-23	RECT_CLOSED	0.35	0.35	0
0	1					0				
STM-83_(STM)	CIRCULAR	0.25	0	0	0	OR-24	RECT_CLOSED	0.35	0.35	0
0	1					0				
CB-02	CIRCULAR	0.094	0	0	0	OR-25	RECT_CLOSED	0.35	0.35	0
CB-03	CIRCULAR	0.102	0	0	0	0				
CB-04	CIRCULAR	0.094	0	0	0	OR-26	RECT_CLOSED	0.13	0.65	0
CB-05	CIRCULAR	0.094	0	0	0	0				
CB-06	CIRCULAR	0.083	0	0	0	OR-27	RECT_CLOSED	0.35	0.7	0
CB-08	CIRCULAR	0.102	0	0	0	0				
CB-09	CIRCULAR	0.094	0	0	0	OR-28	RECT_CLOSED	0.35	0.7	0
CB-10	CIRCULAR	0.094	0	0	0	0				
CB-11	CIRCULAR	0.127	0	0	0	OR3	RECT_CLOSED	0.35	0.35	0
CB-12	CIRCULAR	0.127	0	0	0	0				
CB-13	CIRCULAR	0.127	0	0	0	OR-31	RECT_CLOSED	0.13	0.65	0
CB-14	CIRCULAR	0.094	0	0	0	0				
CB-15	CIRCULAR	0.094	0	0	0	OR4	CIRCULAR	0.083	0	0
CB-16	CIRCULAR	0.083	0	0	0	OR5	CIRCULAR	0.35	0	0
CB-17	CIRCULAR	0.094	0	0	0	RYCB-02	CIRCULAR	0.094	0	0
CB-18	CIRCULAR	0.152	0	0	0	RYCB-03	CIRCULAR	0.152	0	0
CB-19	CIRCULAR	0.152	0	0	0	RYCB-04	CIRCULAR	0.083	0	0
CB-20	CIRCULAR	0.108	0	0	0	RYCB-06	CIRCULAR	0.2	0	0
CB-21	CIRCULAR	0.108	0	0	0	RYCB-07	CIRCULAR	0.25	0	0
CB-23	CIRCULAR	0.127	0	0	0	RYCB-10	CIRCULAR	0.178	0	0
CB-24	CIRCULAR	0.127	0	0	0	RYCB-22	CIRCULAR	0.152	0	0
CB-25	CIRCULAR	0.25	0	0	0	RYCB-29	CIRCULAR	0.152	0	0
CB-26	CIRCULAR	0.25	0	0	0					
CB-27	CIRCULAR	0.152	0	0	0					
CB-28	CIRCULAR	0.152	0	0	0					
CB-30	CIRCULAR	0.178	0	0	0					
CB-31	CIRCULAR	0.25	0	0	0					
OR-02	RECT_CLOSED	0.13	0.65	0						
0										
OR-03	RECT_CLOSED	0.13	0.65	0						
0										
OR-04	RECT_CLOSED	0.13	0.65	0						
0										
OR-05	RECT_CLOSED	0.13	0.65	0						
0										
OR-08	RECT_CLOSED	0.35	0.35	0						
0										
OR-09	RECT_CLOSED	0.35	0.35	0						
0										
OR1	CIRCULAR	0.083	0	0	0					
OR-10	RECT_CLOSED	0.35	0.35	0						
0										
OR-11	RECT_CLOSED	0.35	0.35	0						
0										
OR-12	RECT_CLOSED	0.35	0.35	0						
0										
OR-13	RECT_CLOSED	0.35	0.35	0						
0										
OR-14	RECT_CLOSED	0.35	0.35	0						
0										
OR-15	RECT_CLOSED	0.35	0.35	0						
0										
OR-16	RECT_CLOSED	0.35	0.35	0						
0										
OR-17	RECT_CLOSED	0.35	0.35	0						
0										
OR-18	RECT_CLOSED	0.35	0.35	0						
0										
OR-19	RECT_CLOSED	0.35	0.35	0						
0										
OR2	RECT_CLOSED	0.13	0.65	0						
0										

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.035 0.035 0.013
X1 16.5mROW-Dbl-Sidewalk 9 2 14.5 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10.9 0.15 2 0.15 4 0 4.01
0.13 8.25
GR 0 12.49 0.15 12.5 0.15 14.5 0.6 25.6
;
NC 0.035 0.035 0.013
X1 16.5mROW-No-Sidewalk 9 3.8 12.7 0.0 0.0
0.0 0.0 0.0
GR 0.6 -9.1 0.15 3.8 0.15 4 0 4.01
0.13 8.25
GR 0 12.49 0.15 12.5 0.15 12.7 0.6 25.6
;
NC 0.035 0.035 0.013
X1 16.5mROWwSidewalk 9 2 12.7 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10.9 0.15 2 0.15 4 0 4.01
0.13 8.25
GR 0 12.49 0.15 12.5 0.15 12.7 0.6 25.6
;
NC 0.035 0.035 0.013
X1 18mROW-Dbl-Sidewalk 9 5.5 18 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10 0.09 5.5 0.08 7.5 0 7.5
0.13 11.75
GR 0 16 0.08 16 0.09 18 0.6 29.25
;
NC 0.035 0.035 0.013
X1 18mROW-No-Sidewalk 7 7.5 16 0.0 0.0
0.0 0.0 0.0
GR 0.6 -10 0.08 7.5 0 7.5 0.13 11.75
0 16
GR 0.08 16 0.6 29.25
;
NC 0.035 0.035 0.013

X1 18mROWwSidewalk 8 2.75 16 0.0 0.0
 0.0 0.0 0.0
 GR 0.6 -10 0.09 2.75 0.08 7.5 0 7.5
 0.13 11.75
 GR 0 16 0.08 16 0.6 29.25
 ;
 NC 0.035 0.035 0.013
 X1 18mROWwSidewalk-Half 5 2.75 16 0.0 0.0
 0.0 0.0 0.0
 GR 0.6 -10 0.09 2.75 0.08 7.5 0 7.5
 0.13 11.75
 ;
 NC 0.035 0.035 0.013
 X1 24mROW-DbI-Sidewalk 9 3.6 20.4 0.0 0.0
 0.0 0.0 0.0
 GR 0.6 -9.3 0.15 3.6 0.15 7.5 0 7.51
 0.13 12
 GR 0 16.49 0.15 16.5 0.15 20.4 0.6 33.3

[LOSSES]

Link	Kentry	Kexit	Kavg	Flap Gate	Seepage
10_(STM)	0	0.26	0	NO	0
11_(STM)	0	0.11	0	NO	0
12_(STM)	0	1.33	0	NO	0
13_(STM)	0	0.02	0	NO	0
14_(STM)	0	0.47	0	NO	0
15_(10)_(STM)	0	0.39	0	NO	0
15_(11)_(STM)	0	0.035	0	NO	0
15_(12)_(STM)	0	0.035	0	NO	0
15_(13)_(STM)	0	1.33	0	NO	0
15_(5)_(STM)	0	0.02	0	NO	0
15_(9)_(STM)	0	0.47	0	NO	0
4_(STM)	0	0.035	0	NO	0
5_(STM)	0	1.33	0	NO	0
8_(STM)	0	0.035	0	NO	0
9_(STM)	0	0.32	0	NO	0
Pipe_-(110)_(RYCB)	0	0.02	0	NO	0
Pipe_-(111)_(RYCB)	0	1.33	0	NO	0
Pipe_-(114)_(RYCB)	0	0.035	0	NO	0
Pipe_-(117)_(RYCB)	0	0.035	0	NO	0
Pipe_-(118)_(RYCB)	0	0.035	0	NO	0
Pipe_-(119)_(RYCB)	0	0.035	0	NO	0
Pipe_-(134)_(RYCB)	0	0.035	0	NO	0
Pipe_-(137)_(RYCB)	0	0.035	0	NO	0
Pipe_-(138)_(RYCB)	0	0.02	0	NO	0
Pipe_-(139)_(RYCB)	0	0.08	0	NO	0
Pipe_-(14)_(RYCB)	0	1.33	0	NO	0
Pipe_-(140)_(RYCB)	0	1.33	0	NO	0
Pipe_-(141)_(RYCB)	0	0.035	0	NO	0
Pipe_-(142)_(RYCB)	0	0.035	0	NO	0
Pipe_-(143)_(RYCB)	0	0.035	0	NO	0
Pipe_-(144)_(RYCB)	0	0.54	0	NO	0
Pipe_-(15)_(RYCB)	0	0.84	0	NO	0
Pipe_-(150)_(RYCB)	0	0.035	0	NO	0
Pipe_-(151)_(RYCB)	0	0.035	0	NO	0
Pipe_-(152)_(RYCB)	0	0.035	0	NO	0
Pipe_-(153)_(RYCB)	0	0.035	0	NO	0
Pipe_-(154)_(RYCB)	0	0.02	0	NO	0
Pipe_-(155)_(RYCB)	0	1.33	0	NO	0
Pipe_-(156)_(1)_(RYCB)	0	0.84	0	NO	0
Pipe_-(156)_(RYCB)	0	0.02	0	NO	0
Pipe_-(161)_(RYCB)	0	0.035	0	NO	0
Pipe_-(165)_(RYCB)	0	0.035	0	NO	0
Pipe_-(87)_(RYCB)	0	0.02	0	NO	0
Pipe_-(89)_(RYCB)	0	1.33	0	NO	0
Pipe_-(93)_(RYCB)	0	0.02	0	NO	0
Pipe_-(94)_(RYCB)	0	0.02	0	NO	0
Pipe_-(95)_(RYCB)	0	0.035	0	NO	0
Pipe_-(96)_(RYCB)	0	1.33	0	NO	0

Pipe_-(98)_(RYCB)	0	0.035	0	NO	0
Pipe_-(99)_(RYCB)	0	0.035	0	NO	0
STM-23_(STM)	0	1.33	0	NO	0
STM-24_(STM)	0	0.08	0	NO	0
STM-28_(STM)	0	0.055	0	NO	0
STM-34_(1)_(1)_(STM)	0	1.07	0	NO	0
STM-34_(1)_(STM)	0	0.08	0	NO	0
STM-34_(STM)	0	0.54	0	NO	0
STM-35_(STM)	0	0.32	0	NO	0
STM-36_(STM)	0	0.39	0	NO	0
STM-81_(STM)	0	1.33	0	NO	0
STM-82_(STM)	0	1.33	0	NO	0
STM-83_(STM)	0	1.33	0	NO	0

[CURVES]

Name	Type	X-Value	Y-Value
;100% capture of flow to this CB			
100%_Capture	Rating	0	0
100%_Capture		0.01	0.001
100%_Capture		0.1	1
100%_Capture		0.3	5

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

102mm-ICD	Rating	0	0
102mm-ICD		0.01	0.0266
102mm-ICD		0.15	0.0278
102mm-ICD		0.3	0.0296
102mm-ICD		0.35	0.03

102mm-ICD-RLCB	Rating	0	0
102mm-ICD-RLCB		0.01	0.0301
102mm-ICD-RLCB		0.15	0.0312
102mm-ICD-RLCB		0.3	0.0328
102mm-ICD-RLCB		0.35	0.0332

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

108mm-ICD	Rating	0	0
108mm-ICD		0.01	0.0298
108mm-ICD		0.15	0.0312
108mm-ICD		0.3	0.0332
108mm-ICD		0.35	0.0337

108mm-ICD-RLCB	Rating	0	0
108mm-ICD-RLCB		0.01	0.0338
108mm-ICD-RLCB		0.15	0.035
108mm-ICD-RLCB		0.3	0.0367
108mm-ICD-RLCB		0.35	0.0372

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

127mm-ICD	Rating	0	0
127mm-ICD		0.01	0.0413
127mm-ICD		0.15	0.0432
127mm-ICD		0.3	0.0458
127mm-ICD		0.35	0.0466

127mm-ICD-RLCB	Rating	0	0
127mm-ICD-RLCB		0.01	0.047
127mm-ICD-RLCB		0.15	0.048
127mm-ICD-RLCB		0.3	0.051
127mm-ICD-RLCB		0.35	0.052

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB
 152mm-ICD Rating 0 0
 152mm-ICD 0.01 0.0591
 152mm-ICD 0.15 0.0618
 152mm-ICD 0.3 0.0657
 152mm-ICD 0.35 0.0667

152mm-ICD-RLCB Rating 0 0
 152mm-ICD-RLCB 0.01 0.067
 152mm-ICD-RLCB 0.15 0.069
 152mm-ICD-RLCB 0.3 0.073
 152mm-ICD-RLCB 0.35 0.074

;Sx0.03
 16ROW_1CB_So0.005 Rating 0 0
 16ROW_1CB_So0.005 0.01 0.0003
 16ROW_1CB_So0.005 0.02 0.0011
 16ROW_1CB_So0.005 0.03 0.0037
 16ROW_1CB_So0.005 0.04 0.0072
 16ROW_1CB_So0.005 0.05 0.0132
 16ROW_1CB_So0.005 0.06 0.0168
 16ROW_1CB_So0.005 0.07 0.0214
 16ROW_1CB_So0.005 0.08 0.0253
 16ROW_1CB_So0.005 0.09 0.0286
 16ROW_1CB_So0.005 0.1 0.0331
 16ROW_1CB_So0.005 0.11 0.0367
 16ROW_1CB_So0.005 0.12 0.0409
 16ROW_1CB_So0.005 0.13 0.0446
 16ROW_1CB_So0.005 0.14 0.048
 16ROW_1CB_So0.005 0.15 0.049
 16ROW_1CB_So0.005 0.16 0.049
 16ROW_1CB_So0.005 0.17 0.049
 16ROW_1CB_So0.005 0.18 0.049
 16ROW_1CB_So0.005 0.19 0.049
 16ROW_1CB_So0.005 0.2 0.049
 16ROW_1CB_So0.005 0.21 0.049
 16ROW_1CB_So0.005 0.22 0.049
 16ROW_1CB_So0.005 0.23 0.049
 16ROW_1CB_So0.005 0.24 0.049
 16ROW_1CB_So0.005 0.25 0.049
 16ROW_1CB_So0.005 0.26 0.049
 16ROW_1CB_So0.005 0.27 0.049
 16ROW_1CB_So0.005 0.28 0.049
 16ROW_1CB_So0.005 0.29 0.049
 16ROW_1CB_So0.005 0.3 0.049
 16ROW_1CB_So0.005 0.31 0.049
 16ROW_1CB_So0.005 0.32 0.049
 16ROW_1CB_So0.005 0.33 0.049
 16ROW_1CB_So0.005 0.34 0.049
 16ROW_1CB_So0.005 0.35 0.049
 16ROW_1CB_So0.005 0.36 0.049
 16ROW_1CB_So0.005 0.37 0.049
 16ROW_1CB_So0.005 0.38 0.049
 16ROW_1CB_So0.005 0.39 0.049
 16ROW_1CB_So0.005 0.4 0.049

;Sx0.03
 16ROW_1CB_So0.01 Rating 0 0
 16ROW_1CB_So0.01 0.01 0.0005
 16ROW_1CB_So0.01 0.02 0.0016
 16ROW_1CB_So0.01 0.03 0.0052
 16ROW_1CB_So0.01 0.04 0.0101
 16ROW_1CB_So0.01 0.05 0.0158
 16ROW_1CB_So0.01 0.06 0.0206
 16ROW_1CB_So0.01 0.07 0.0254
 16ROW_1CB_So0.01 0.08 0.029
 16ROW_1CB_So0.01 0.09 0.0343
 16ROW_1CB_So0.01 0.1 0.0382
 16ROW_1CB_So0.01 0.11 0.043
 16ROW_1CB_So0.01 0.12 0.0463

16ROW_1CB_So0.01 0.13 0.049
 16ROW_1CB_So0.01 0.14 0.049
 16ROW_1CB_So0.01 0.15 0.049
 16ROW_1CB_So0.01 0.16 0.049
 16ROW_1CB_So0.01 0.17 0.049
 16ROW_1CB_So0.01 0.18 0.049
 16ROW_1CB_So0.01 0.19 0.049
 16ROW_1CB_So0.01 0.2 0.049
 16ROW_1CB_So0.01 0.21 0.049
 16ROW_1CB_So0.01 0.22 0.049
 16ROW_1CB_So0.01 0.23 0.049
 16ROW_1CB_So0.01 0.24 0.049
 16ROW_1CB_So0.01 0.25 0.049
 16ROW_1CB_So0.01 0.26 0.049
 16ROW_1CB_So0.01 0.27 0.049
 16ROW_1CB_So0.01 0.28 0.049
 16ROW_1CB_So0.01 0.29 0.049
 16ROW_1CB_So0.01 0.3 0.049
 16ROW_1CB_So0.01 0.31 0.049
 16ROW_1CB_So0.01 0.32 0.049
 16ROW_1CB_So0.01 0.33 0.049
 16ROW_1CB_So0.01 0.34 0.049
 16ROW_1CB_So0.01 0.35 0.049
 16ROW_1CB_So0.01 0.36 0.049
 16ROW_1CB_So0.01 0.37 0.049

;Sx0.03
 16ROW_1CB_So0.02 Rating 0 0
 16ROW_1CB_So0.02 0.01 0.0006
 16ROW_1CB_So0.02 0.02 0.0019
 16ROW_1CB_So0.02 0.03 0.0062
 16ROW_1CB_So0.02 0.04 0.012
 16ROW_1CB_So0.02 0.05 0.0154
 16ROW_1CB_So0.02 0.06 0.0192
 16ROW_1CB_So0.02 0.07 0.0236
 16ROW_1CB_So0.02 0.08 0.0275
 16ROW_1CB_So0.02 0.09 0.0316
 16ROW_1CB_So0.02 0.1 0.0363
 16ROW_1CB_So0.02 0.11 0.041
 16ROW_1CB_So0.02 0.12 0.045
 16ROW_1CB_So0.02 0.13 0.045
 16ROW_1CB_So0.02 0.14 0.045
 16ROW_1CB_So0.02 0.15 0.045
 16ROW_1CB_So0.02 0.16 0.045
 16ROW_1CB_So0.02 0.17 0.045
 16ROW_1CB_So0.02 0.18 0.045
 16ROW_1CB_So0.02 0.19 0.045
 16ROW_1CB_So0.02 0.2 0.045
 16ROW_1CB_So0.02 0.21 0.045
 16ROW_1CB_So0.02 0.22 0.045
 16ROW_1CB_So0.02 0.23 0.045
 16ROW_1CB_So0.02 0.24 0.045
 16ROW_1CB_So0.02 0.25 0.045
 16ROW_1CB_So0.02 0.26 0.045
 16ROW_1CB_So0.02 0.27 0.045
 16ROW_1CB_So0.02 0.28 0.045
 16ROW_1CB_So0.02 0.29 0.045
 16ROW_1CB_So0.02 0.3 0.045
 16ROW_1CB_So0.02 0.31 0.045
 16ROW_1CB_So0.02 0.32 0.045

;Sx0.03
 16ROW_1CB_So0.03 Rating 0 0
 16ROW_1CB_So0.03 0.01 0.0005
 16ROW_1CB_So0.03 0.02 0.0017
 16ROW_1CB_So0.03 0.03 0.0057
 16ROW_1CB_So0.03 0.04 0.011
 16ROW_1CB_So0.03 0.05 0.0146
 16ROW_1CB_So0.03 0.06 0.0179
 16ROW_1CB_So0.03 0.07 0.0216

16ROW_1CB_So0.03	0.08	0.0256
16ROW_1CB_So0.03	0.09	0.0298
16ROW_1CB_So0.03	0.1	0.0335
16ROW_1CB_So0.03	0.11	0.038
16ROW_1CB_So0.03	0.12	0.039
16ROW_1CB_So0.03	0.13	0.039
16ROW_1CB_So0.03	0.14	0.039
16ROW_1CB_So0.03	0.15	0.039
16ROW_1CB_So0.03	0.16	0.039
16ROW_1CB_So0.03	0.17	0.039
16ROW_1CB_So0.03	0.18	0.039
16ROW_1CB_So0.03	0.19	0.039
16ROW_1CB_So0.03	0.2	0.039
16ROW_1CB_So0.03	0.21	0.039
16ROW_1CB_So0.03	0.22	0.039
16ROW_1CB_So0.03	0.23	0.039
16ROW_1CB_So0.03	0.24	0.039
16ROW_1CB_So0.03	0.25	0.039
16ROW_1CB_So0.03	0.26	0.039
16ROW_1CB_So0.03	0.27	0.039
16ROW_1CB_So0.03	0.28	0.039
16ROW_1CB_So0.03	0.29	0.039
16ROW_1CB_So0.03	0.3	0.039

24ROW_1CB_So0.005	0.18	0.049
24ROW_1CB_So0.005	0.19	0.049
24ROW_1CB_So0.005	0.2	0.049
24ROW_1CB_So0.005	0.21	0.049
24ROW_1CB_So0.005	0.22	0.049
24ROW_1CB_So0.005	0.23	0.049
24ROW_1CB_So0.005	0.24	0.049
24ROW_1CB_So0.005	0.25	0.049
24ROW_1CB_So0.005	0.26	0.049
24ROW_1CB_So0.005	0.27	0.049
24ROW_1CB_So0.005	0.28	0.049
24ROW_1CB_So0.005	0.29	0.049
24ROW_1CB_So0.005	0.3	0.049
24ROW_1CB_So0.005	0.31	0.049
24ROW_1CB_So0.005	0.32	0.049
24ROW_1CB_So0.005	0.33	0.049
24ROW_1CB_So0.005	0.34	0.049
24ROW_1CB_So0.005	0.35	0.049
24ROW_1CB_So0.005	0.36	0.049
24ROW_1CB_So0.005	0.37	0.049
24ROW_1CB_So0.005	0.38	0.049
24ROW_1CB_So0.005	0.39	0.049
24ROW_1CB_So0.005	0.4	0.049

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB		
178mm-ICD	Rating	0
178mm-ICD	0.01	0.0811
178mm-ICD	0.15	0.0848
178mm-ICD	0.3	0.0901
178mm-ICD	0.35	0.0915

178mm-ICD-RLCB		
178mm-ICD-RLCB	Rating	0
178mm-ICD-RLCB	0.01	0.092
178mm-ICD-RLCB	0.15	0.095
178mm-ICD-RLCB	0.3	0.1
178mm-ICD-RLCB	0.35	0.101

;1 Single CB on single lead pipe. Single CB is limited by 250mm Lead pipe at 1.2m head. Q=195.3 L/s

1-CB	Rating	0
1-CB	0.05	0.1953
1-CB	1	0.1954

;1 DCB on single lead pipe. DCB is limited by 300mm Lead pipe at 1.2m head. Q=281.2 L/s

1-DCB	Rating	0
1-DCB	0.05	0.2812
1-DCB	1	0.2813

;Sx0.03

24ROW_1CB_So0.005	Rating	0
24ROW_1CB_So0.005	0.01	0.0004
24ROW_1CB_So0.005	0.02	0.0012
24ROW_1CB_So0.005	0.03	0.0039
24ROW_1CB_So0.005	0.04	0.0076
24ROW_1CB_So0.005	0.05	0.0136
24ROW_1CB_So0.005	0.06	0.0174
24ROW_1CB_So0.005	0.07	0.022
24ROW_1CB_So0.005	0.08	0.0258
24ROW_1CB_So0.005	0.09	0.0296
24ROW_1CB_So0.005	0.1	0.034
24ROW_1CB_So0.005	0.11	0.0378
24ROW_1CB_So0.005	0.12	0.0418
24ROW_1CB_So0.005	0.13	0.0453
24ROW_1CB_So0.005	0.14	0.0486
24ROW_1CB_So0.005	0.15	0.049
24ROW_1CB_So0.005	0.16	0.049
24ROW_1CB_So0.005	0.17	0.049

;Sx0.03

24ROW_1CB_So0.01	Rating	0
24ROW_1CB_So0.01	0.01	0.0005
24ROW_1CB_So0.01	0.02	0.0017
24ROW_1CB_So0.01	0.03	0.0055
24ROW_1CB_So0.01	0.04	0.0107
24ROW_1CB_So0.01	0.05	0.0164
24ROW_1CB_So0.01	0.06	0.0212
24ROW_1CB_So0.01	0.07	0.0259
24ROW_1CB_So0.01	0.08	0.03
24ROW_1CB_So0.01	0.09	0.0351
24ROW_1CB_So0.01	0.1	0.0396
24ROW_1CB_So0.01	0.11	0.044
24ROW_1CB_So0.01	0.12	0.0473
24ROW_1CB_So0.01	0.13	0.049
24ROW_1CB_So0.01	0.14	0.049
24ROW_1CB_So0.01	0.15	0.049
24ROW_1CB_So0.01	0.16	0.049
24ROW_1CB_So0.01	0.17	0.049
24ROW_1CB_So0.01	0.18	0.049
24ROW_1CB_So0.01	0.19	0.049
24ROW_1CB_So0.01	0.2	0.049
24ROW_1CB_So0.01	0.21	0.049
24ROW_1CB_So0.01	0.22	0.049
24ROW_1CB_So0.01	0.23	0.049
24ROW_1CB_So0.01	0.24	0.049
24ROW_1CB_So0.01	0.25	0.049
24ROW_1CB_So0.01	0.26	0.049
24ROW_1CB_So0.01	0.27	0.049
24ROW_1CB_So0.01	0.28	0.049
24ROW_1CB_So0.01	0.29	0.049
24ROW_1CB_So0.01	0.3	0.049
24ROW_1CB_So0.01	0.31	0.049
24ROW_1CB_So0.01	0.32	0.049
24ROW_1CB_So0.01	0.33	0.049
24ROW_1CB_So0.01	0.34	0.049
24ROW_1CB_So0.01	0.35	0.049
24ROW_1CB_So0.01	0.36	0.049
24ROW_1CB_So0.01	0.37	0.049

;Sx0.03

24ROW_1CB_So0.02	Rating	0
24ROW_1CB_So0.02	0.01	0.0006
24ROW_1CB_So0.02	0.02	0.002
24ROW_1CB_So0.02	0.03	0.0066
24ROW_1CB_So0.02	0.04	0.0123

24ROW_1CB_So0.02 0.05 0.0158
 24ROW_1CB_So0.02 0.06 0.0198
 24ROW_1CB_So0.02 0.07 0.0243
 24ROW_1CB_So0.02 0.08 0.0281
 24ROW_1CB_So0.02 0.09 0.0325
 24ROW_1CB_So0.02 0.1 0.0373
 24ROW_1CB_So0.02 0.11 0.0418
 24ROW_1CB_So0.02 0.12 0.045
 24ROW_1CB_So0.02 0.13 0.045
 24ROW_1CB_So0.02 0.14 0.045
 24ROW_1CB_So0.02 0.15 0.045
 24ROW_1CB_So0.02 0.16 0.045
 24ROW_1CB_So0.02 0.17 0.045
 24ROW_1CB_So0.02 0.18 0.045
 24ROW_1CB_So0.02 0.19 0.045
 24ROW_1CB_So0.02 0.2 0.045
 24ROW_1CB_So0.02 0.21 0.045
 24ROW_1CB_So0.02 0.22 0.045
 24ROW_1CB_So0.02 0.23 0.045
 24ROW_1CB_So0.02 0.24 0.045
 24ROW_1CB_So0.02 0.25 0.045
 24ROW_1CB_So0.02 0.26 0.045
 24ROW_1CB_So0.02 0.27 0.045
 24ROW_1CB_So0.02 0.28 0.045
 24ROW_1CB_So0.02 0.29 0.045
 24ROW_1CB_So0.02 0.3 0.045
 24ROW_1CB_So0.02 0.31 0.045
 24ROW_1CB_So0.02 0.32 0.045

;Sx0.03

24ROW_1CB_So0.03 Rating 0 0
 24ROW_1CB_So0.03 0.01 0.0006
 24ROW_1CB_So0.03 0.02 0.0018
 24ROW_1CB_So0.03 0.03 0.006
 24ROW_1CB_So0.03 0.04 0.0113
 24ROW_1CB_So0.03 0.05 0.015
 24ROW_1CB_So0.03 0.06 0.0183
 24ROW_1CB_So0.03 0.07 0.0225
 24ROW_1CB_So0.03 0.08 0.0264
 24ROW_1CB_So0.03 0.09 0.0306
 24ROW_1CB_So0.03 0.1 0.0343
 24ROW_1CB_So0.03 0.11 0.0388
 24ROW_1CB_So0.03 0.12 0.039
 24ROW_1CB_So0.03 0.13 0.039
 24ROW_1CB_So0.03 0.14 0.039
 24ROW_1CB_So0.03 0.15 0.039
 24ROW_1CB_So0.03 0.16 0.039
 24ROW_1CB_So0.03 0.17 0.039
 24ROW_1CB_So0.03 0.18 0.039
 24ROW_1CB_So0.03 0.19 0.039
 24ROW_1CB_So0.03 0.2 0.039
 24ROW_1CB_So0.03 0.21 0.039
 24ROW_1CB_So0.03 0.22 0.039
 24ROW_1CB_So0.03 0.23 0.039
 24ROW_1CB_So0.03 0.24 0.039
 24ROW_1CB_So0.03 0.25 0.039
 24ROW_1CB_So0.03 0.26 0.039
 24ROW_1CB_So0.03 0.27 0.039
 24ROW_1CB_So0.03 0.28 0.039
 24ROW_1CB_So0.03 0.29 0.039
 24ROW_1CB_So0.03 0.3 0.039

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

;Assumes 2 CB's with individual ICD's

2x102mm-ICD Rating 0 0
 2x102mm-ICD 0.005 0.0532
 2x102mm-ICD 0.15 0.0556
 2x102mm-ICD 0.3 0.0592

2x102mm-ICD 0.35 0.06

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

;Assumes 2 CB's with individual ICD's

2x152mm-ICD Rating 0 0
 2x152mm-ICD 0.005 0.1182
 2x152mm-ICD 0.15 0.1236
 2x152mm-ICD 0.3 0.1314
 2x152mm-ICD 0.35 0.1334

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

83mm-ICD Rating 0 0
 83mm-ICD 0.01 0.0176
 83mm-ICD 0.15 0.0184
 83mm-ICD 0.3 0.0196
 83mm-ICD 0.35 0.0199

83mm-ICD-RLCB Rating 0 0

83mm-ICD-RLCB 0.01 0.0199
 83mm-ICD-RLCB 0.15 0.0207
 83mm-ICD-RLCB 0.3 0.0217
 83mm-ICD-RLCB 0.35 0.022

;Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD).

;Depth from top of CB

94mm-ICD Rating 0 0
 94mm-ICD 0.01 0.0226
 94mm-ICD 0.15 0.0236
 94mm-ICD 0.3 0.0251
 94mm-ICD 0.35 0.0255

94mm-ICD-RLCB Rating 0 0

94mm-ICD-RLCB 0.01 0.0256
 94mm-ICD-RLCB 0.15 0.0265
 94mm-ICD-RLCB 0.3 0.0278
 94mm-ICD-RLCB 0.35 0.0282

;Block 160 - Medium Density Residential

;0.883 ha C=0.80 tc= 10 min

;5 Year Rational = 205 L/s

B1-Out Rating 0 0
 B1-Out 0.01 0.205
 B1-Out 0.3 0.234

;Existing UHAUL site

;3.43 ha R=0.90 tc= 12 min

;5 Year Rational (via Novatech)= 786.6 L/s

B2-Out Rating 0 0
 B2-Out 0.01 0.787
 B2-Out 0.3 0.897

;Block 161 - Medium Density Residential

;0.965 ha C=0.80 tc= 10 min

;5 Year Rational = 224 L/s

B3-Out Rating 0 0
 B3-Out 0.01 0.224
 B3-Out 0.3 0.255

;Park Lands

;1.00 ha R=0.25 tc= 10 min

;5 Year Rational (via Novatech) = 129 L/s

B4-Out Rating 0 0
 B4-Out 0.01 0.1297
 B4-Out 0.3 0.1479

;540 m³ of storage assumed for site based on MArch 2020
UHAUL site Design Brief

UHAL_Onsite	Storage	0	1800
UHAL_Onsite		0.3	1800
UHAL_Onsite		0.31	1
UHAL_Onsite		2	1

[TIMESERIES]

;;Name Date Time Value

;;

;Rainfall (mm/hr)

002YrChicago3hr	01-01-2019	00:00:00	0
002YrChicago3hr	01-01-2019	00:10:00	2.81459
002YrChicago3hr	01-01-2019	00:20:00	3.49824
002YrChicago3hr	01-01-2019	00:30:00	4.68718
002YrChicago3hr	01-01-2019	00:40:00	7.30485
002YrChicago3hr	01-01-2019	00:50:00	18.20881
002YrChicago3hr	01-01-2019	01:00:00	76.805
002YrChicago3hr	01-01-2019	01:10:00	24.07906
002YrChicago3hr	01-01-2019	01:20:00	12.36376
002YrChicago3hr	01-01-2019	01:30:00	8.32403
002YrChicago3hr	01-01-2019	01:40:00	6.30341
002YrChicago3hr	01-01-2019	01:50:00	5.09498
002YrChicago3hr	01-01-2019	02:00:00	4.29133
002YrChicago3hr	01-01-2019	02:10:00	3.71786
002YrChicago3hr	01-01-2019	02:20:00	3.28762
002YrChicago3hr	01-01-2019	02:30:00	2.95254
002YrChicago3hr	01-01-2019	02:40:00	2.68388
002YrChicago3hr	01-01-2019	02:50:00	2.46348
002YrChicago3hr	01-01-2019	03:00:00	2.27921

;Rainfall (mm/hr)

002YrSCS24	01-01-2019	00:00:00	0.53
002YrSCS24	01-01-2019	00:10:00	0.53
002YrSCS24	01-01-2019	00:20:00	0.53
002YrSCS24	01-01-2019	00:30:00	0.53
002YrSCS24	01-01-2019	00:40:00	0.53
002YrSCS24	01-01-2019	00:50:00	0.53
002YrSCS24	01-01-2019	01:00:00	0.53
002YrSCS24	01-01-2019	01:10:00	0.53
002YrSCS24	01-01-2019	01:20:00	0.53
002YrSCS24	01-01-2019	01:30:00	0.53
002YrSCS24	01-01-2019	01:40:00	0.53
002YrSCS24	01-01-2019	01:50:00	0.53
002YrSCS24	01-01-2019	02:00:00	0.63
002YrSCS24	01-01-2019	02:10:00	0.63
002YrSCS24	01-01-2019	02:20:00	0.63
002YrSCS24	01-01-2019	02:30:00	0.63
002YrSCS24	01-01-2019	02:40:00	0.63
002YrSCS24	01-01-2019	02:50:00	0.63
002YrSCS24	01-01-2019	03:00:00	0.63
002YrSCS24	01-01-2019	03:10:00	0.63
002YrSCS24	01-01-2019	03:20:00	0.63
002YrSCS24	01-01-2019	03:30:00	0.63
002YrSCS24	01-01-2019	03:40:00	0.63
002YrSCS24	01-01-2019	03:50:00	0.63
002YrSCS24	01-01-2019	04:00:00	0.78
002YrSCS24	01-01-2019	04:10:00	0.78
002YrSCS24	01-01-2019	04:20:00	0.78
002YrSCS24	01-01-2019	04:30:00	0.78
002YrSCS24	01-01-2019	04:40:00	0.78
002YrSCS24	01-01-2019	04:50:00	0.78
002YrSCS24	01-01-2019	05:00:00	0.78
002YrSCS24	01-01-2019	05:10:00	0.78
002YrSCS24	01-01-2019	05:20:00	0.78
002YrSCS24	01-01-2019	05:30:00	0.78
002YrSCS24	01-01-2019	05:40:00	0.78
002YrSCS24	01-01-2019	05:50:00	0.78
002YrSCS24	01-01-2019	06:00:00	0.87
002YrSCS24	01-01-2019	06:10:00	0.87

002YrSCS24	01-01-2019	06:20:00	0.87
002YrSCS24	01-01-2019	06:30:00	0.87
002YrSCS24	01-01-2019	06:40:00	0.87
002YrSCS24	01-01-2019	06:50:00	0.87
002YrSCS24	01-01-2019	07:00:00	1.07
002YrSCS24	01-01-2019	07:10:00	1.07
002YrSCS24	01-01-2019	07:20:00	1.07
002YrSCS24	01-01-2019	07:30:00	1.07
002YrSCS24	01-01-2019	07:40:00	1.07
002YrSCS24	01-01-2019	07:50:00	1.07
002YrSCS24	01-01-2019	08:00:00	1.26
002YrSCS24	01-01-2019	08:10:00	1.26
002YrSCS24	01-01-2019	08:20:00	1.26
002YrSCS24	01-01-2019	08:30:00	1.36
002YrSCS24	01-01-2019	08:40:00	1.36
002YrSCS24	01-01-2019	08:50:00	1.36
002YrSCS24	01-01-2019	09:00:00	1.55
002YrSCS24	01-01-2019	09:10:00	1.55
002YrSCS24	01-01-2019	09:20:00	1.55
002YrSCS24	01-01-2019	09:30:00	1.74
002YrSCS24	01-01-2019	09:40:00	1.74
002YrSCS24	01-01-2019	09:50:00	1.74
002YrSCS24	01-01-2019	10:00:00	2.23
002YrSCS24	01-01-2019	10:10:00	2.23
002YrSCS24	01-01-2019	10:20:00	2.23
002YrSCS24	01-01-2019	10:30:00	3.01
002YrSCS24	01-01-2019	10:40:00	3.01
002YrSCS24	01-01-2019	10:50:00	3.01
002YrSCS24	01-01-2019	11:00:00	4.65
002YrSCS24	01-01-2019	11:10:00	4.65
002YrSCS24	01-01-2019	11:20:00	4.65
002YrSCS24	01-01-2019	11:30:00	14.35
002YrSCS24	01-01-2019	11:40:00	36.84
002YrSCS24	01-01-2019	11:50:00	59.33
002YrSCS24	01-01-2019	12:00:00	6.98
002YrSCS24	01-01-2019	12:10:00	6.98
002YrSCS24	01-01-2019	12:20:00	6.98
002YrSCS24	01-01-2019	12:30:00	3.59
002YrSCS24	01-01-2019	12:40:00	3.59
002YrSCS24	01-01-2019	12:50:00	3.59
002YrSCS24	01-01-2019	13:00:00	2.62
002YrSCS24	01-01-2019	13:10:00	2.62
002YrSCS24	01-01-2019	13:20:00	2.62
002YrSCS24	01-01-2019	13:30:00	2.04
002YrSCS24	01-01-2019	13:40:00	2.04
002YrSCS24	01-01-2019	13:50:00	2.04
002YrSCS24	01-01-2019	14:00:00	1.45
002YrSCS24	01-01-2019	14:10:00	1.45
002YrSCS24	01-01-2019	14:20:00	1.45
002YrSCS24	01-01-2019	14:30:00	1.45
002YrSCS24	01-01-2019	14:40:00	1.45
002YrSCS24	01-01-2019	14:50:00	1.45
002YrSCS24	01-01-2019	15:00:00	1.45
002YrSCS24	01-01-2019	15:10:00	1.45
002YrSCS24	01-01-2019	15:20:00	1.45
002YrSCS24	01-01-2019	15:30:00	1.45
002YrSCS24	01-01-2019	15:40:00	1.45
002YrSCS24	01-01-2019	15:50:00	1.45
002YrSCS24	01-01-2019	16:00:00	0.87
002YrSCS24	01-01-2019	16:10:00	0.87
002YrSCS24	01-01-2019	16:20:00	0.87
002YrSCS24	01-01-2019	16:30:00	0.87
002YrSCS24	01-01-2019	16:40:00	0.87
002YrSCS24	01-01-2019	16:50:00	0.87
002YrSCS24	01-01-2019	17:00:00	0.87
002YrSCS24	01-01-2019	17:10:00	0.87
002YrSCS24	01-01-2019	17:20:00	0.87
002YrSCS24	01-01-2019	17:30:00	0.87
002YrSCS24	01-01-2019	17:40:00	0.87
002YrSCS24	01-01-2019	17:50:00	0.87

050YrSCS24 01-01-2019 23:20:00 1.16
050YrSCS24 01-01-2019 23:30:00 1.16
050YrSCS24 01-01-2019 23:40:00 1.16
050YrSCS24 01-01-2019 23:50:00 1.16

100YrSCS12hr 01-01-2019 5:30:00 46.08
100YrSCS12hr 01-01-2019 5:45:00 126.72
100YrSCS12hr 01-01-2019 6:00:00 17.28
100YrSCS12hr 01-01-2019 6:15:00 17.28
100YrSCS12hr 01-01-2019 6:30:00 7.68
100YrSCS12hr 01-01-2019 6:45:00 7.68
100YrSCS12hr 01-01-2019 7:00:00 5.76
100YrSCS12hr 01-01-2019 7:15:00 5.76
100YrSCS12hr 01-01-2019 7:30:00 5.76
100YrSCS12hr 01-01-2019 7:45:00 5.76
100YrSCS12hr 01-01-2019 8:00:00 3.36
100YrSCS12hr 01-01-2019 8:15:00 3.36
100YrSCS12hr 01-01-2019 8:30:00 3.36
100YrSCS12hr 01-01-2019 8:45:00 3.36
100YrSCS12hr 01-01-2019 9:00:00 3.36
100YrSCS12hr 01-01-2019 9:15:00 3.36
100YrSCS12hr 01-01-2019 9:30:00 3.36
100YrSCS12hr 01-01-2019 9:45:00 3.36
100YrSCS12hr 01-01-2019 10:00:00 1.92
100YrSCS12hr 01-01-2019 10:15:00 1.92
100YrSCS12hr 01-01-2019 10:30:00 1.92
100YrSCS12hr 01-01-2019 10:45:00 1.92
100YrSCS12hr 01-01-2019 11:00:00 1.92
100YrSCS12hr 01-01-2019 11:15:00 1.92
100YrSCS12hr 01-01-2019 11:30:00 1.92
100YrSCS12hr 01-01-2019 11:45:00 1.92
100YrSCS12hr 01-01-2019 12:00:00 0

;Rainfall (mm/hr)

100yrChicago3hr 01-01-2019 00:00:00 0
100yrChicago3hr 01-01-2019 00:10:00 6.04573
100yrChicago3hr 01-01-2019 00:20:00 7.54219
100yrChicago3hr 01-01-2019 00:30:00 10.1588
100yrChicago3hr 01-01-2019 00:40:00 15.96889
100yrChicago3hr 01-01-2019 01:00:00 40.65497
100yrChicago3hr 01-01-2019 01:10:00 178.559
100yrChicago3hr 01-01-2019 01:10:00 54.04853
100yrChicago3hr 01-01-2019 01:20:00 27.3187
100yrChicago3hr 01-01-2019 01:30:00 18.24039
100yrChicago3hr 01-01-2019 01:40:00 13.73692
100yrChicago3hr 01-01-2019 01:50:00 11.05876
100yrChicago3hr 01-01-2019 02:00:00 9.28521
100yrChicago3hr 01-01-2019 02:10:00 8.02389
100yrChicago3hr 01-01-2019 02:20:00 7.08022
100yrChicago3hr 01-01-2019 02:30:00 6.34698
100yrChicago3hr 01-01-2019 02:40:00 5.76029
100yrChicago3hr 01-01-2019 02:50:00 5.27978
100yrChicago3hr 01-01-2019 03:00:00 4.87871

;Rainfall (mm/hr)

100yrChicago3hr+20% 01-01-2019 00:00:00 0
100yrChicago3hr+20% 01-01-2019 00:10:00 7.25488
100yrChicago3hr+20% 01-01-2019 00:20:00 9.05063
100yrChicago3hr+20% 01-01-2019 00:30:00 12.19056
100yrChicago3hr+20% 01-01-2019 00:40:00 19.16267
100yrChicago3hr+20% 01-01-2019 00:50:00 48.78596
100yrChicago3hr+20% 01-01-2019 01:00:00 214.2708
100yrChicago3hr+20% 01-01-2019 01:10:00 64.85824
100yrChicago3hr+20% 01-01-2019 01:20:00 32.78244
100yrChicago3hr+20% 01-01-2019 01:30:00 21.88847
100yrChicago3hr+20% 01-01-2019 01:40:00 16.4843
100yrChicago3hr+20% 01-01-2019 01:50:00 13.27051
100yrChicago3hr+20% 01-01-2019 02:00:00 11.14225
100yrChicago3hr+20% 01-01-2019 02:10:00 9.62867
100yrChicago3hr+20% 01-01-2019 02:20:00 8.49626
100yrChicago3hr+20% 01-01-2019 02:30:00 7.61638
100yrChicago3hr+20% 01-01-2019 02:40:00 6.91235
100yrChicago3hr+20% 01-01-2019 02:50:00 6.33574
100yrChicago3hr+20% 01-01-2019 03:00:00 5.85445

;Rainfall (mm/hr)

100YrSCS12hr 01-01-2019 0:00:00 2.4
100YrSCS12hr 01-01-2019 0:15:00 2.4
100YrSCS12hr 01-01-2019 0:30:00 2.4
100YrSCS12hr 01-01-2019 0:45:00 2.4
100YrSCS12hr 01-01-2019 1:00:00 2.4
100YrSCS12hr 01-01-2019 1:15:00 2.4
100YrSCS12hr 01-01-2019 1:30:00 2.4
100YrSCS12hr 01-01-2019 1:45:00 2.4
100YrSCS12hr 01-01-2019 2:00:00 2.88
100YrSCS12hr 01-01-2019 2:15:00 2.88
100YrSCS12hr 01-01-2019 2:30:00 2.88
100YrSCS12hr 01-01-2019 2:45:00 2.88
100YrSCS12hr 01-01-2019 3:00:00 3.84
100YrSCS12hr 01-01-2019 3:15:00 3.84
100YrSCS12hr 01-01-2019 3:30:00 3.84
100YrSCS12hr 01-01-2019 3:45:00 3.84
100YrSCS12hr 01-01-2019 4:00:00 5.76
100YrSCS12hr 01-01-2019 4:15:00 5.76
100YrSCS12hr 01-01-2019 4:30:00 7.68
100YrSCS12hr 01-01-2019 4:45:00 7.68
100YrSCS12hr 01-01-2019 5:00:00 11.52
100YrSCS12hr 01-01-2019 5:15:00 11.52

;Rainfall (mm/hr)

100YrSCS24 01/01/2019 00:00:00 1.17
100YrSCS24 01/01/2019 00:10:00 1.17
100YrSCS24 01/01/2019 00:20:00 1.17
100YrSCS24 01/01/2019 00:30:00 1.17
100YrSCS24 01/01/2019 00:40:00 1.17
100YrSCS24 01/01/2019 00:50:00 1.17
100YrSCS24 01/01/2019 01:00:00 1.17
100YrSCS24 01/01/2019 01:10:00 1.17
100YrSCS24 01/01/2019 01:20:00 1.17
100YrSCS24 01/01/2019 01:30:00 1.17
100YrSCS24 01/01/2019 01:40:00 1.17
100YrSCS24 01/01/2019 01:50:00 1.17
100YrSCS24 01/01/2019 02:00:00 1.39
100YrSCS24 01/01/2019 02:10:00 1.39
100YrSCS24 01/01/2019 02:20:00 1.39
100YrSCS24 01/01/2019 02:30:00 1.39
100YrSCS24 01/01/2019 02:40:00 1.39
100YrSCS24 01/01/2019 02:50:00 1.39
100YrSCS24 01/01/2019 03:00:00 1.39
100YrSCS24 01/01/2019 03:10:00 1.39
100YrSCS24 01/01/2019 03:20:00 1.39
100YrSCS24 01/01/2019 03:30:00 1.39
100YrSCS24 01/01/2019 03:40:00 1.39
100YrSCS24 01/01/2019 03:50:00 1.39
100YrSCS24 01/01/2019 04:00:00 1.71
100YrSCS24 01/01/2019 04:10:00 1.71
100YrSCS24 01/01/2019 04:20:00 1.71
100YrSCS24 01/01/2019 04:30:00 1.71
100YrSCS24 01/01/2019 04:40:00 1.71
100YrSCS24 01/01/2019 04:50:00 1.71
100YrSCS24 01/01/2019 05:00:00 1.71
100YrSCS24 01/01/2019 05:10:00 1.71
100YrSCS24 01/01/2019 05:20:00 1.71
100YrSCS24 01/01/2019 05:30:00 1.71
100YrSCS24 01/01/2019 05:40:00 1.71
100YrSCS24 01/01/2019 05:50:00 1.71
100YrSCS24 01/01/2019 06:00:00 1.92
100YrSCS24 01/01/2019 06:10:00 1.92
100YrSCS24 01/01/2019 06:20:00 1.92
100YrSCS24 01/01/2019 06:30:00 1.92
100YrSCS24 01/01/2019 06:40:00 1.92

1979July01	01-01-2019 02:25:00	3.8
1979July01	01-01-2019 02:30:00	3.8
1979July01	01-01-2019 02:35:00	3.8
1979July01	01-01-2019 02:40:00	3.8
1979July01	01-01-2019 02:45:00	3.8
1979July01	01-01-2019 02:50:00	3.8
1979July01	01-01-2019 02:55:00	3.8

1988Aug04	01-01-2019 05:05:00	10
1988Aug04	01-01-2019 05:10:00	6.3
1988Aug04	01-01-2019 05:15:00	5.1
1988Aug04	01-01-2019 05:20:00	9.8
1988Aug04	01-01-2019 05:25:00	2.6
1988Aug04	01-01-2019 05:30:00	1.7

;Rainfall (mm/hr)

1988Aug04	01-01-2019 00:00:00	0.1
1988Aug04	01-01-2019 00:05:00	0.1
1988Aug04	01-01-2019 00:10:00	0
1988Aug04	01-01-2019 00:15:00	3.7
1988Aug04	01-01-2019 00:20:00	6.2
1988Aug04	01-01-2019 00:25:00	101.5
1988Aug04	01-01-2019 00:30:00	15.5
1988Aug04	01-01-2019 00:35:00	29.3
1988Aug04	01-01-2019 00:40:00	19.8
1988Aug04	01-01-2019 00:45:00	1.5
1988Aug04	01-01-2019 00:50:00	1.7
1988Aug04	01-01-2019 00:55:00	5.4
1988Aug04	01-01-2019 01:00:00	24.6
1988Aug04	01-01-2019 01:05:00	26.5
1988Aug04	01-01-2019 01:10:00	34.9
1988Aug04	01-01-2019 01:15:00	10.2
1988Aug04	01-01-2019 01:20:00	27.1
1988Aug04	01-01-2019 01:25:00	104.4
1988Aug04	01-01-2019 01:30:00	27.5
1988Aug04	01-01-2019 01:35:00	62.5
1988Aug04	01-01-2019 01:40:00	31.8
1988Aug04	01-01-2019 01:45:00	79.8
1988Aug04	01-01-2019 01:50:00	67.5
1988Aug04	01-01-2019 01:55:00	156.2
1988Aug04	01-01-2019 02:00:00	5.1
1988Aug04	01-01-2019 02:05:00	0.2
1988Aug04	01-01-2019 02:10:00	0.2
1988Aug04	01-01-2019 02:15:00	0.2
1988Aug04	01-01-2019 02:20:00	0.2
1988Aug04	01-01-2019 02:25:00	0.2
1988Aug04	01-01-2019 02:30:00	0.2
1988Aug04	01-01-2019 02:35:00	0.2
1988Aug04	01-01-2019 02:40:00	0.2
1988Aug04	01-01-2019 02:45:00	0.2
1988Aug04	01-01-2019 02:50:00	0.2
1988Aug04	01-01-2019 02:55:00	12.8
1988Aug04	01-01-2019 03:00:00	14
1988Aug04	01-01-2019 03:05:00	22.2
1988Aug04	01-01-2019 03:10:00	21.8
1988Aug04	01-01-2019 03:15:00	1.4
1988Aug04	01-01-2019 03:20:00	0.2
1988Aug04	01-01-2019 03:25:00	0.2
1988Aug04	01-01-2019 03:30:00	0.2
1988Aug04	01-01-2019 03:35:00	0.2
1988Aug04	01-01-2019 03:40:00	0.2
1988Aug04	01-01-2019 03:45:00	0.2
1988Aug04	01-01-2019 03:50:00	0.2
1988Aug04	01-01-2019 03:55:00	0.2
1988Aug04	01-01-2019 04:00:00	0.2
1988Aug04	01-01-2019 04:05:00	0.2
1988Aug04	01-01-2019 04:10:00	0.2
1988Aug04	01-01-2019 04:15:00	0.2
1988Aug04	01-01-2019 04:20:00	0.2
1988Aug04	01-01-2019 04:25:00	0.2
1988Aug04	01-01-2019 04:30:00	0.2
1988Aug04	01-01-2019 04:35:00	0.2
1988Aug04	01-01-2019 04:40:00	0.2
1988Aug04	01-01-2019 04:45:00	0.2
1988Aug04	01-01-2019 04:50:00	0.2
1988Aug04	01-01-2019 04:55:00	2.9
1988Aug04	01-01-2019 05:00:00	7.8

;Rainfall (mm/hr)

1996Aug08	01-01-2019 00:00:00	4
1996Aug08	01-01-2019 00:05:00	11.9
1996Aug08	01-01-2019 00:10:00	26.5
1996Aug08	01-01-2019 00:15:00	13.3
1996Aug08	01-01-2019 00:20:00	0
1996Aug08	01-01-2019 00:25:00	2.7
1996Aug08	01-01-2019 00:30:00	0
1996Aug08	01-01-2019 00:35:00	8
1996Aug08	01-01-2019 00:40:00	18.6
1996Aug08	01-01-2019 00:45:00	10.6
1996Aug08	01-01-2019 00:50:00	21.2
1996Aug08	01-01-2019 00:55:00	2.7
1996Aug08	01-01-2019 01:00:00	2.7
1996Aug08	01-01-2019 01:05:00	15.9
1996Aug08	01-01-2019 01:10:00	66.3
1996Aug08	01-01-2019 01:15:00	55.7
1996Aug08	01-01-2019 01:20:00	122
1996Aug08	01-01-2019 01:25:00	88.9
1996Aug08	01-01-2019 01:30:00	9.3
1996Aug08	01-01-2019 01:35:00	8
1996Aug08	01-01-2019 01:40:00	4
1996Aug08	01-01-2019 01:45:00	0
1996Aug08	01-01-2019 01:50:00	2.7
1996Aug08	01-01-2019 01:55:00	0
1996Aug08	01-01-2019 02:00:00	0
1996Aug08	01-01-2019 02:05:00	0
1996Aug08	01-01-2019 02:10:00	5.3
1996Aug08	01-01-2019 02:15:00	0
1996Aug08	01-01-2019 02:20:00	0
1996Aug08	01-01-2019 02:25:00	0
1996Aug08	01-01-2019 02:30:00	0
1996Aug08	01-01-2019 02:35:00	0
1996Aug08	01-01-2019 02:40:00	0
1996Aug08	01-01-2019 02:45:00	4
1996Aug08	01-01-2019 02:50:00	53.1
1996Aug08	01-01-2019 02:55:00	69
1996Aug08	01-01-2019 03:00:00	63.7
1996Aug08	01-01-2019 03:05:00	58.4
1996Aug08	01-01-2019 03:10:00	47.8
1996Aug08	01-01-2019 03:15:00	15.9
1996Aug08	01-01-2019 03:20:00	13.3
1996Aug08	01-01-2019 03:25:00	8
1996Aug08	01-01-2019 03:30:00	5.3
1996Aug08	01-01-2019 03:35:00	6.6
1996Aug08	01-01-2019 03:40:00	2.7
1996Aug08	01-01-2019 03:45:00	4
1996Aug08	01-01-2019 03:50:00	2.7
1996Aug08	01-01-2019 03:55:00	4
1996Aug08	01-01-2019 04:00:00	2.7
1996Aug08	01-01-2019 04:05:00	5.3
1996Aug08	01-01-2019 04:10:00	4
1996Aug08	01-01-2019 04:15:00	2.7
1996Aug08	01-01-2019 04:20:00	4
1996Aug08	01-01-2019 04:25:00	2.7
1996Aug08	01-01-2019 04:30:00	1.3
1996Aug08	01-01-2019 04:35:00	1.3
1996Aug08	01-01-2019 04:40:00	0
1996Aug08	01-01-2019 04:45:00	0
1996Aug08	01-01-2019 04:50:00	0
1996Aug08	01-01-2019 04:55:00	0
1996Aug08	01-01-2019 05:00:00	2.7
1996Aug08	01-01-2019 05:05:00	0

1996Aug08 01-01-2019 05:10:00 0
 1996Aug08 01-01-2019 05:15:00 0
 1996Aug08 01-01-2019 05:20:00 0
 1996Aug08 01-01-2019 05:25:00 0
 1996Aug08 01-01-2019 05:30:00 0
 1996Aug08 01-01-2019 05:35:00 0
 1996Aug08 01-01-2019 05:40:00 1.3

;Rainfall (mm/hr)

25mmChicago4Hr 01-01-2019 00:00:00 0
 25mmChicago4Hr 01-01-2019 00:10:00 1.5122
 25mmChicago4Hr 01-01-2019 00:20:00 1.7483
 25mmChicago4Hr 01-01-2019 00:30:00 2.0803
 25mmChicago4Hr 01-01-2019 00:40:00 2.5819
 25mmChicago4Hr 01-01-2019 00:50:00 3.4597
 25mmChicago4Hr 01-01-2019 01:00:00 5.3924
 25mmChicago4Hr 01-01-2019 01:10:00 13.4405
 25mmChicago4Hr 01-01-2019 01:20:00 56.6613
 25mmChicago4Hr 01-01-2019 01:30:00 17.7634
 25mmChicago4Hr 01-01-2019 01:40:00 9.1177
 25mmChicago4Hr 01-01-2019 01:50:00 6.1375
 25mmChicago4Hr 01-01-2019 02:00:00 4.6474
 25mmChicago4Hr 01-01-2019 02:10:00 3.7548
 25mmChicago4Hr 01-01-2019 02:20:00 3.1647
 25mmChicago4Hr 01-01-2019 02:30:00 2.7442
 25mmChicago4Hr 01-01-2019 02:40:00 2.427
 25mmChicago4Hr 01-01-2019 02:50:00 2.1762
 25mmChicago4Hr 01-01-2019 03:00:00 1.977
 25mmChicago4Hr 01-01-2019 03:10:00 1.8147
 25mmChicago4Hr 01-01-2019 03:20:00 1.6819
 25mmChicago4Hr 01-01-2019 03:30:00 1.5639
 25mmChicago4Hr 01-01-2019 03:40:00 1.468
 25mmChicago4Hr 01-01-2019 03:50:00 1.3795
 25mmChicago4Hr 01-01-2019 04:00:00 1.3057

;Rainfall (mm/hr)

2YrSCS12hr 01-01-2019 0:00:00 1.08
 2YrSCS12hr 01-01-2019 0:15:00 1.08
 2YrSCS12hr 01-01-2019 0:30:00 1.08
 2YrSCS12hr 01-01-2019 0:45:00 1.08
 2YrSCS12hr 01-01-2019 1:00:00 1.08
 2YrSCS12hr 01-01-2019 1:15:00 1.08
 2YrSCS12hr 01-01-2019 1:30:00 1.08
 2YrSCS12hr 01-01-2019 1:45:00 1.08
 2YrSCS12hr 01-01-2019 2:00:00 1.296
 2YrSCS12hr 01-01-2019 2:15:00 1.296
 2YrSCS12hr 01-01-2019 2:30:00 1.296
 2YrSCS12hr 01-01-2019 2:45:00 1.296
 2YrSCS12hr 01-01-2019 3:00:00 1.728
 2YrSCS12hr 01-01-2019 3:15:00 1.728
 2YrSCS12hr 01-01-2019 3:30:00 1.728
 2YrSCS12hr 01-01-2019 3:45:00 1.728
 2YrSCS12hr 01-01-2019 4:00:00 2.592
 2YrSCS12hr 01-01-2019 4:15:00 2.592
 2YrSCS12hr 01-01-2019 4:30:00 3.456
 2YrSCS12hr 01-01-2019 4:45:00 3.456
 2YrSCS12hr 01-01-2019 5:00:00 5.184
 2YrSCS12hr 01-01-2019 5:15:00 5.184
 2YrSCS12hr 01-01-2019 5:30:00 20.736
 2YrSCS12hr 01-01-2019 5:45:00 57.024
 2YrSCS12hr 01-01-2019 6:00:00 7.776
 2YrSCS12hr 01-01-2019 6:15:00 7.776
 2YrSCS12hr 01-01-2019 6:30:00 3.456
 2YrSCS12hr 01-01-2019 6:45:00 3.456
 2YrSCS12hr 01-01-2019 7:00:00 2.592
 2YrSCS12hr 01-01-2019 7:15:00 2.592
 2YrSCS12hr 01-01-2019 7:30:00 2.592
 2YrSCS12hr 01-01-2019 7:45:00 2.592
 2YrSCS12hr 01-01-2019 8:00:00 1.512
 2YrSCS12hr 01-01-2019 8:15:00 1.512

2YrSCS12hr 01-01-2019 8:30:00 1.512
 2YrSCS12hr 01-01-2019 8:45:00 1.512
 2YrSCS12hr 01-01-2019 9:00:00 1.512
 2YrSCS12hr 01-01-2019 9:15:00 1.512
 2YrSCS12hr 01-01-2019 9:30:00 1.512
 2YrSCS12hr 01-01-2019 9:45:00 1.512
 2YrSCS12hr 01-01-2019 10:00:00 0.864
 2YrSCS12hr 01-01-2019 10:15:00 0.864
 2YrSCS12hr 01-01-2019 10:30:00 0.864
 2YrSCS12hr 01-01-2019 10:45:00 0.864
 2YrSCS12hr 01-01-2019 11:00:00 0.864
 2YrSCS12hr 01-01-2019 11:15:00 0.864
 2YrSCS12hr 01-01-2019 11:30:00 0.864
 2YrSCS12hr 01-01-2019 12:00:00 0

;Rainfall (mm/hr)

5YrSCS12hr 01-01-2019 0:00:00 1.44
 5YrSCS12hr 01-01-2019 0:15:00 1.44
 5YrSCS12hr 01-01-2019 0:30:00 1.44
 5YrSCS12hr 01-01-2019 0:45:00 1.44
 5YrSCS12hr 01-01-2019 1:00:00 1.44
 5YrSCS12hr 01-01-2019 1:15:00 1.44
 5YrSCS12hr 01-01-2019 1:30:00 1.44
 5YrSCS12hr 01-01-2019 1:45:00 1.44
 5YrSCS12hr 01-01-2019 2:00:00 1.728
 5YrSCS12hr 01-01-2019 2:15:00 1.728
 5YrSCS12hr 01-01-2019 2:30:00 1.728
 5YrSCS12hr 01-01-2019 2:45:00 1.728
 5YrSCS12hr 01-01-2019 3:00:00 2.304
 5YrSCS12hr 01-01-2019 3:15:00 2.304
 5YrSCS12hr 01-01-2019 3:30:00 2.304
 5YrSCS12hr 01-01-2019 3:45:00 2.304
 5YrSCS12hr 01-01-2019 4:00:00 3.456
 5YrSCS12hr 01-01-2019 4:15:00 3.456
 5YrSCS12hr 01-01-2019 4:30:00 4.608
 5YrSCS12hr 01-01-2019 4:45:00 4.608
 5YrSCS12hr 01-01-2019 5:00:00 6.912
 5YrSCS12hr 01-01-2019 5:15:00 6.912
 5YrSCS12hr 01-01-2019 5:30:00 27.648
 5YrSCS12hr 01-01-2019 5:45:00 76.032
 5YrSCS12hr 01-01-2019 6:00:00 10.368
 5YrSCS12hr 01-01-2019 6:15:00 10.368
 5YrSCS12hr 01-01-2019 6:30:00 4.608
 5YrSCS12hr 01-01-2019 6:45:00 4.608
 5YrSCS12hr 01-01-2019 7:00:00 3.456
 5YrSCS12hr 01-01-2019 7:15:00 3.456
 5YrSCS12hr 01-01-2019 7:30:00 3.456
 5YrSCS12hr 01-01-2019 7:45:00 3.456
 5YrSCS12hr 01-01-2019 8:00:00 2.016
 5YrSCS12hr 01-01-2019 8:15:00 2.016
 5YrSCS12hr 01-01-2019 8:30:00 2.016
 5YrSCS12hr 01-01-2019 8:45:00 2.016
 5YrSCS12hr 01-01-2019 9:00:00 2.016
 5YrSCS12hr 01-01-2019 9:15:00 2.016
 5YrSCS12hr 01-01-2019 9:30:00 2.016
 5YrSCS12hr 01-01-2019 9:45:00 2.016
 5YrSCS12hr 01-01-2019 10:00:00 1.152
 5YrSCS12hr 01-01-2019 10:15:00 1.152
 5YrSCS12hr 01-01-2019 10:30:00 1.152
 5YrSCS12hr 01-01-2019 10:45:00 1.152
 5YrSCS12hr 01-01-2019 11:00:00 1.152
 5YrSCS12hr 01-01-2019 11:15:00 1.152
 5YrSCS12hr 01-01-2019 11:30:00 1.152
 5YrSCS12hr 01-01-2019 11:45:00 1.152
 5YrSCS12hr 01-01-2019 12:00:00 0

;Depth (m)

MH-111-100YrCHI3Hr 01/01/2019 00:00:00 80.571
 MH-111-100YrCHI3Hr 01/01/2019 00:05:00 80.571
 MH-111-100YrCHI3Hr 01/01/2019 00:10:00 80.572

MH-111-July_1_1979 01/01/2019 16:15:00 82.233
 MH-111-July_1_1979 01/01/2019 16:20:00 82.231
 MH-111-July_1_1979 01/01/2019 16:25:00 82.229
 MH-111-July_1_1979 01/01/2019 16:30:00 82.227
 MH-111-July_1_1979 01/01/2019 16:35:00 82.224
 MH-111-July_1_1979 01/01/2019 16:40:00 82.222
 MH-111-July_1_1979 01/01/2019 16:45:00 82.22
 MH-111-July_1_1979 01/01/2019 16:50:00 82.218
 MH-111-July_1_1979 01/01/2019 16:55:00 82.215
 MH-111-July_1_1979 01/01/2019 17:00:00 82.213
 MH-111-July_1_1979 01/01/2019 17:05:00 82.211
 MH-111-July_1_1979 01/01/2019 17:10:00 82.209
 MH-111-July_1_1979 01/01/2019 17:15:00 82.207
 MH-111-July_1_1979 01/01/2019 17:20:00 82.205
 MH-111-July_1_1979 01/01/2019 17:25:00 82.202
 MH-111-July_1_1979 01/01/2019 17:30:00 82.2
 MH-111-July_1_1979 01/01/2019 17:35:00 82.198
 MH-111-July_1_1979 01/01/2019 17:40:00 82.196
 MH-111-July_1_1979 01/01/2019 17:45:00 82.194
 MH-111-July_1_1979 01/01/2019 17:50:00 82.192
 MH-111-July_1_1979 01/01/2019 17:55:00 82.189
 MH-111-July_1_1979 01/01/2019 18:00:00 82.187
 MH-111-July_1_1979 01/01/2019 18:05:00 82.185
 MH-111-July_1_1979 01/01/2019 18:10:00 82.183
 MH-111-July_1_1979 01/01/2019 18:15:00 82.181
 MH-111-July_1_1979 01/01/2019 18:20:00 82.179
 MH-111-July_1_1979 01/01/2019 18:25:00 82.177
 MH-111-July_1_1979 01/01/2019 18:30:00 82.175
 MH-111-July_1_1979 01/01/2019 18:35:00 82.173
 MH-111-July_1_1979 01/01/2019 18:40:00 82.171
 MH-111-July_1_1979 01/01/2019 18:45:00 82.169
 MH-111-July_1_1979 01/01/2019 18:50:00 82.167
 MH-111-July_1_1979 01/01/2019 18:55:00 82.164
 MH-111-July_1_1979 01/01/2019 19:00:00 82.163
 MH-111-July_1_1979 01/01/2019 19:05:00 82.16
 MH-111-July_1_1979 01/01/2019 19:10:00 82.159
 MH-111-July_1_1979 01/01/2019 19:15:00 82.156
 MH-111-July_1_1979 01/01/2019 19:20:00 82.154
 MH-111-July_1_1979 01/01/2019 19:25:00 82.152
 MH-111-July_1_1979 01/01/2019 19:30:00 82.151
 MH-111-July_1_1979 01/01/2019 19:35:00 82.148
 MH-111-July_1_1979 01/01/2019 19:40:00 82.147
 MH-111-July_1_1979 01/01/2019 19:45:00 82.144
 MH-111-July_1_1979 01/01/2019 19:50:00 82.143
 MH-111-July_1_1979 01/01/2019 19:55:00 82.141
 MH-111-July_1_1979 01/01/2019 20:00:00 82.139
 MH-111-July_1_1979 01/01/2019 20:05:00 82.137
 MH-111-July_1_1979 01/01/2019 20:10:00 82.135
 MH-111-July_1_1979 01/01/2019 20:15:00 82.133
 MH-111-July_1_1979 01/01/2019 20:20:00 82.131
 MH-111-July_1_1979 01/01/2019 20:25:00 82.129
 MH-111-July_1_1979 01/01/2019 20:30:00 82.127
 MH-111-July_1_1979 01/01/2019 20:35:00 82.125
 MH-111-July_1_1979 01/01/2019 20:40:00 82.123
 MH-111-July_1_1979 01/01/2019 20:45:00 82.121
 MH-111-July_1_1979 01/01/2019 20:50:00 82.12
 MH-111-July_1_1979 01/01/2019 20:55:00 82.118
 MH-111-July_1_1979 01/01/2019 21:00:00 82.116
 MH-111-July_1_1979 01/01/2019 21:05:00 82.114
 MH-111-July_1_1979 01/01/2019 21:10:00 82.112
 MH-111-July_1_1979 01/01/2019 21:15:00 82.11
 MH-111-July_1_1979 01/01/2019 21:20:00 82.108
 MH-111-July_1_1979 01/01/2019 21:25:00 82.106
 MH-111-July_1_1979 01/01/2019 21:30:00 82.105
 MH-111-July_1_1979 01/01/2019 21:35:00 82.103
 MH-111-July_1_1979 01/01/2019 21:40:00 82.101
 MH-111-July_1_1979 01/01/2019 21:45:00 82.099
 MH-111-July_1_1979 01/01/2019 21:50:00 82.097
 MH-111-July_1_1979 01/01/2019 21:55:00 82.095
 MH-111-July_1_1979 01/01/2019 22:00:00 82.094

MH-111-July_1_1979 01/01/2019 22:05:00 82.092
 MH-111-July_1_1979 01/01/2019 22:10:00 82.09
 MH-111-July_1_1979 01/01/2019 22:15:00 82.088
 MH-111-July_1_1979 01/01/2019 22:20:00 82.087
 MH-111-July_1_1979 01/01/2019 22:25:00 82.084
 MH-111-July_1_1979 01/01/2019 22:30:00 82.083
 MH-111-July_1_1979 01/01/2019 22:35:00 82.081
 MH-111-July_1_1979 01/01/2019 22:40:00 82.08
 MH-111-July_1_1979 01/01/2019 22:45:00 82.077
 MH-111-July_1_1979 01/01/2019 22:50:00 82.076
 MH-111-July_1_1979 01/01/2019 22:55:00 82.074
 MH-111-July_1_1979 01/01/2019 23:00:00 82.072
 MH-111-July_1_1979 01/01/2019 23:05:00 82.07
 MH-111-July_1_1979 01/01/2019 23:10:00 82.069
 MH-111-July_1_1979 01/01/2019 23:15:00 82.067
 MH-111-July_1_1979 01/01/2019 23:20:00 82.066
 MH-111-July_1_1979 01/01/2019 23:25:00 82.064
 MH-111-July_1_1979 01/01/2019 23:30:00 82.062
 MH-111-July_1_1979 01/01/2019 23:35:00 82.06
 MH-111-July_1_1979 01/01/2019 23:40:00 82.059
 MH-111-July_1_1979 01/01/2019 23:45:00 82.057
 MH-111-July_1_1979 01/01/2019 23:50:00 82.055
 MH-111-July_1_1979 01/01/2019 23:55:00 82.053
 MH-111-July_1_1979 01/02/2019 00:00:00 82.052

No_Rain 01/01/2019 00:00 0
 No_Rain 12/31/2019 0:00 0

[REPORT]
 ;;Reporting Options
 INPUT YES
 CONTROLS NO
 SUBCATCHMENTS ALL
 NODES ALL
 LINKS ALL

[TAGS]
 Node 02_(CB) CB
 Node 03_(CB) CB
 Node 04_(CB) CB
 Node 05_(CB) CB
 Node 08_(CB) CB
 Node 09_(CB) CB
 Node 1_(RYCB) RY
 Node 100_(STM) STM
 Node 102_(STM) STM
 Node 104_(STM) STM
 Node 106_(STM) STM
 Node 108_(STM) STM
 Node 11_(CB) CB
 Node 110_(STM) STM
 Node 112_(STM) STM
 Node 114_(STM) STM
 Node 12_(CB) CB
 Node 120_(STM) STM
 Node 122_(STM) STM
 Node 124_(STM) STM
 Node 126_(STM) STM
 Node 128_(STM) STM
 Node 13_(CB) CB
 Node 136_(STM) STM
 Node 138_(STM) STM
 Node 14_(CB) CB
 Node 140_(STM) STM
 Node 142_(STM) STM
 Node 144_(STM) STM
 Node 146_(STM) STM
 Node 148_(STM) STM
 Node 15_(CB) CB
 Node 15_RYCB RY

Node 150_(STM) STM
 Node 16_(CB) CB
 Node 17_(CB) CB
 Node 18_(CB) CB
 Node 19_(CB) CB
 Node 20_(CB) CB
 Node 21_(CB) CB
 Node 2121_(STM) STM
 Node 2142_(STM) STM
 Node 22_(RYCB) RY
 Node 23_(CB) CB
 Node 24_(CB) CB
 Node 25_(CB) CB
 Node 26_(CB) CB
 Node 27_(CB) CB
 Node 28_(CB) CB
 Node 29_(RYCB) RY
 Node 31_(CB) CB
 Node 58_(CB) CB
 Node 59_(CB) CB
 Node 98_(STM) STM
 Node DICB_1 CB
 Node DICB_3 CB
 Node ELB_1_(RYCB) RY
 Node ELB_10_(RYCB) RY
 Node ELB_11_(RYCB) RY
 Node ELB_12_(RYCB) RY
 Node ELB_13_(RYCB) RY
 Node ELB_14_(RYCB) RY
 Node ELB_2_(RYCB) RY
 Node ELB_3_(RYCB) RY
 Node ELB_4_(RYCB) RY
 Node ELB_5_(RYCB) RY
 Node ELB_6_(RYCB) RY
 Node ELB_7_(RYCB) RY
 Node ELB_8_(RYCB) RY
 Node ELB_9_(RYCB) RY
 Node J1 Maj
 Node J2 Maj
 Node Maj-15 Maj
 Node Maj-15_2 Maj
 Node Maj-18_2 Maj
 Node Maj-19 Maj
 Node Maj-19_2 Maj
 Node Maj-20 Maj
 Node Maj-21 Maj
 Node Maj-23 Maj
 Node Maj-24 Maj
 Node Maj-25 Maj
 Node Maj-26 Maj
 Node Maj-27 Maj
 Node Maj-28 Maj
 Node Maj-29 Maj
 Node Maj-35 Maj
 Node Maj-36 Maj
 Node Maj-37 Maj
 Node Maj-38 Maj
 Node Maj-39 Maj
 Node Maj-40 Maj
 Node Maj-41 Maj
 Node Maj-44 Maj
 Node Maj-45 Maj
 Node Maj-46 Maj
 Node Maj-48_2 Maj
 Node Maj-48_3 Maj
 Node Maj-50 Maj
 Node Maj-51 Maj
 Node Maj-52 Maj
 Node Maj-53 Maj
 Node Maj-56 Maj

Node Maj-60 Maj
 Node Maj-61 Maj
 Node Maj-63 Maj
 Node Maj-64 Maj
 Node Maj-65 Maj
 Node Maj-67 Maj
 Node Maj-Park Maj
 Node RYCB_1_(RYCB) RY
 Node RYCB_10_(RYCB) RY
 Node RYCB_11_(RYCB) RY
 Node RYCB_2_(RYCB) RY
 Node RYCB_3_(RYCB) RY
 Node RYCB_4_(RYCB) RY
 Node RYCB_5_(RYCB) RY
 Node RYCB_6_(RYCB) RY
 Node RYCB_7_(RYCB) RY
 Node RYCB_8_(RYCB) RY
 Node RYCB_9_(RYCB) RY
 Node Slope1 Maj
 Node StartNullStruct2 RY
 Node StartNullStruct3 STM
 Node STM-251_(STM) STM
 Node TEE_1_(RYCB) RY
 Node TEE_10_(RYCB) RY
 Node TEE_11_(RYCB) RY
 Node TEE_12_(RYCB) RY
 Node TEE_13_(RYCB) RY
 Node TEE_14_(RYCB) RY
 Node TEE_15_(RYCB) RY
 Node TEE_16_(RYCB) RY
 Node TEE_17_(RYCB) RY
 Node TEE_18_(RYCB) RY
 Node TEE_19_(RYCB) RY
 Node TEE_2_(RYCB) RY
 Node TEE_20_(RYCB) RY
 Node TEE_21_(RYCB) RY
 Node TEE_22_(RYCB) RY
 Node TEE_23_(RYCB) RY
 Node TEE_24_(RYCB) RY
 Node TEE_25_(RYCB) RY
 Node TEE_3_(RYCB) RY
 Node TEE_4_(RYCB) RY
 Node TEE_5_(RYCB) RY
 Node TEE_6_(RYCB) RY
 Node TEE_7_(RYCB) RY
 Node TEE_8_(RYCB) RY
 Node TEE_9_(RYCB) RY
 Node Maj-18 Maj
 Node Maj-22 Maj
 Node Maj-48 Maj
 Node Maj-49 Maj
 Node STM-111_(STM) STM
 Link 10_(STM) STM
 Link 11_(STM) STM
 Link 12_(STM) STM
 Link 13_(STM) STM
 Link 14_(STM) STM
 Link 15_(10)_(STM) STM
 Link 15_(11)_(STM) STM
 Link 15_(12)_(STM) STM
 Link 15_(13)_(STM) STM
 Link 15_(5)_(STM) STM
 Link 15_(9)_(STM) STM
 Link 4_(STM) STM
 Link 5_(STM) STM
 Link 8_(STM) STM
 Link 9_(STM) STM
 Link C1 Ditch
 Link C18 Maj
 Link C18_3 Maj

Link	C18_4	Maj	Link	Pipe_-_ (143)_ (RYCB) RY
Link	C18_5	Maj	Link	Pipe_-_ (144)_ (RYCB) RY
Link	C18_6	Maj	Link	Pipe_-_ (15)_ (RYCB) RY
Link	C18_8	Maj	Link	Pipe_-_ (150)_ (RYCB) RY
Link	C18_9	Maj	Link	Pipe_-_ (151)_ (RYCB) RY
Link	C19	Maj	Link	Pipe_-_ (152)_ (RYCB) RY
Link	C20	Maj	Link	Pipe_-_ (153)_ (RYCB) RY
Link	C21	Maj	Link	Pipe_-_ (154)_ (RYCB) RY
Link	C22	Maj	Link	Pipe_-_ (155)_ (RYCB) RY
Link	C23	Maj	Link	Pipe_-_ (156)_ (1)_ (RYCB) RY
Link	C24	Maj	Link	Pipe_-_ (156)_ (RYCB) RY
Link	C25	Maj	Link	Pipe_-_ (16)_ (RYCB) RY
Link	C26	Maj	Link	Pipe_-_ (161)_ (RYCB) RY
Link	C27	Maj	Link	Pipe_-_ (164)_ (RYCB) RY
Link	C27_1	Maj	Link	Pipe_-_ (165)_ (RYCB) RY
Link	C27_2	Maj	Link	Pipe_-_ (17)_ (RYCB) RY
Link	C28	Maj	Link	Pipe_-_ (19)_ (RYCB) RY
Link	C31	Maj	Link	Pipe_-_ (25)_ (RYCB) RY
Link	C31_1	Maj	Link	Pipe_-_ (27)_ (RYCB) RY
Link	C31_2	Maj	Link	Pipe_-_ (73)_ (RYCB) RY
Link	C36	Maj	Link	Pipe_-_ (87)_ (RYCB) RY
Link	C37	Maj	Link	Pipe_-_ (88)_ (RYCB) RY
Link	C4_1	Maj	Link	Pipe_-_ (89)_ (RYCB) RY
Link	C4_2	Maj	Link	Pipe_-_ (9)_ (RYCB) RY
Link	C41	Maj	Link	Pipe_-_ (90)_ (RYCB) RY
Link	C42	Maj	Link	Pipe_-_ (93)_ (RYCB) RY
Link	C43	Maj	Link	Pipe_-_ (94)_ (RYCB) RY
Link	C44	Maj	Link	Pipe_-_ (95)_ (RYCB) RY
Link	C45	Maj	Link	Pipe_-_ (96)_ (RYCB) RY
Link	C46	Maj	Link	Pipe_-_ (98)_ (RYCB) RY
Link	C47	Maj	Link	Pipe_-_ (99)_ (RYCB) RY
Link	C48	Maj	Link	STM-23_ (STM) STM
Link	C49	Maj	Link	STM-24_ (STM) STM
Link	C5	Maj	Link	STM-28_ (STM) STM
Link	C50_1	Maj	Link	STM-34_ (1)_ (1)_ (STM) STM
Link	C50_2	Maj	Link	STM-34_ (1)_ (STM) STM
Link	C51	Maj	Link	STM-34_ (STM) STM
Link	C52	Maj	Link	STM-35_ (STM) STM
Link	C53	Maj	Link	STM-36_ (STM) STM
Link	C54	Maj	Link	STM-81_ (STM) STM
Link	C56	Maj	Link	STM-82_ (STM) STM
Link	C58	Maj	Link	STM-83_ (STM) STM
Link	C58_1	Maj	Link	CB-02 ICD
Link	C58_2	Maj	Link	CB-03 ICD
Link	C59_1	Maj	Link	CB-04 ICD
Link	C59_2	Maj	Link	CB-05 ICD
Link	C60	Maj	Link	CB-06 ICD
Link	C62	Maj	Link	CB-08 ICD
Link	C63_1	Maj	Link	CB-09 ICD
Link	C63_2	Maj	Link	CB-10 ICD
Link	C65_1	Maj	Link	CB-11 ICD
Link	C65_2	Maj	Link	CB-12 ICD
Link	C66_1	Maj	Link	CB-13 ICD
Link	C66_2	Maj	Link	CB-14 ICD
Link	C67	Maj	Link	CB-15 ICD
Link	Pipe_-_ (100)_ (RYCB) RY		Link	CB-16 ICD
Link	Pipe_-_ (110)_ (RYCB) RY		Link	CB-17 ICD
Link	Pipe_-_ (111)_ (RYCB) RY		Link	CB-18 ICD
Link	Pipe_-_ (114)_ (RYCB) RY		Link	CB-19 ICD
Link	Pipe_-_ (117)_ (RYCB) RY		Link	CB-20 ICD
Link	Pipe_-_ (118)_ (RYCB) RY		Link	CB-21 ICD
Link	Pipe_-_ (119)_ (RYCB) RY		Link	CB-23 ICD
Link	Pipe_-_ (134)_ (RYCB) RY		Link	CB-24 ICD
Link	Pipe_-_ (137)_ (RYCB) RY		Link	CB-25 Lead
Link	Pipe_-_ (138)_ (RYCB) RY		Link	CB-26 Lead
Link	Pipe_-_ (139)_ (RYCB) RY		Link	CB-27 ICD
Link	Pipe_-_ (14)_ (RYCB) RY		Link	CB-28 ICD
Link	Pipe_-_ (140)_ (RYCB) RY		Link	CB-30 ICD
Link	Pipe_-_ (141)_ (RYCB) RY		Link	CB-31 Lead
Link	Pipe_-_ (142)_ (RYCB) RY		Link	OR-02 Grate

Link	OR-03	Grate	138_(STM)	381527.988	5034210.775
Link	OR-04	Grate	14_(CB)	381597.707	5034039.587
Link	OR-05	Grate	140_(STM)	381631.534	5034256.315
Link	OR-08	Grate	142_(STM)	381640.84	5034237.84
Link	OR-09	Grate	144_(STM)	381600.199	5034327.009
Link	OR1	ICD	146_(STM)	381528.36	5034294.959
Link	OR-10	Grate	148_(STM)	381456.173	5034264.012
Link	OR-11	Grate	15_(CB)	381589.912	5034036.197
Link	OR-12	Grate	15_RYCB	381522.627	5034214.255
Link	OR-13	Grate	150_(STM)	381569.837	5034397.001
Link	OR-14	Grate	16_(CB)	381567.802	5034108.366
Link	OR-15	Grate	17_(CB)	381560.007	5034104.977
Link	OR-16	Grate	18_(CB)	381541.884	5034167.976
Link	OR-17	Grate	19_(CB)	381534.089	5034164.586
Link	OR-18	Grate	20_(CB)	381581.406	5034227.395
Link	OR-19	Grate	21_(CB)	381578.057	5034235.207
Link	OR2	Grate	2121_(STM)	381797.506	5033862.116
Link	OR-20	Grate	2142_(STM)	381733.715	5033824.051
Link	OR-21	Grate	22_(RYCB)	381646.054	5034240.141
Link	OR-23	Grate	23_(CB)	381624.155	5034289.758
Link	OR-24	Grate	24_(CB)	381616.38	5034286.326
Link	OR-25	Grate	25_(CB)	381569.18	5034305.469
Link	OR-26	Grate	26_(CB)	381565.878	5034313.223
Link	OR-27	Grate	27_(CB)	381486.175	5034268.55
Link	OR-28	Grate	28_(CB)	381482.272	5034277.449
Link	OR3	Grate	29_(RYCB)	381634.571	5034343.916
Link	OR-31	Grate	31_(CB)	381584.351	5034358.98
Link	OR4	ICD	58_(CB)	381708.111	5033853.995
Link	OR5	Grate	59_(CB)	381762.072	5033997.514
Link	RYCB-02	ICD	98_(STM)	381785.194	5033899.178
Link	RYCB-03	ICD	DICB_1	381592.282	5034362.433
Link	RYCB-04	ICD	DICB_2	381578.495	5034153.747
Link	RYCB-06	Lead	DICB_3	381712.816	5034088.875
Link	RYCB-07	Lead	ELB_1_(RYCB)	381700.573	5033926.894
Link	RYCB-10	ICD	ELB_10_(RYCB)	381599.13	5034277.804
Link	RYCB-22	ICD	ELB_11_(RYCB)	381637.075	5034217.32
Link	RYCB-29	ICD	ELB_12_(RYCB)	381642.665	5034324.923

[MAP]

DIMENSIONS 381264.26565 5033747.0677
381848.96735 5034901.1063
UNITS Meters

[COORDINATES]

::Node	X-Coord	Y-Coord
02_(CB)	381640.363	5033940.449
03_(CB)	381639.319	5033948.683
04_(CB)	381707.362	5033964.513
05_(CB)	381704.042	5033972.256
08_(CB)	381742.356	5034021.942
09_(CB)	381735.199	5034018.381
1_(RYCB)	381613.893	5033947.165
100_(STM)	381764.117	5033934.567
102_(STM)	381768.733	5033945.462
104_(STM)	381751.832	5033983.755
106_(STM)	381661.746	5033946.201
108_(STM)	381636.072	5033940.78
11_(CB)	381705.04	5034085.441
110_(STM)	381606.992	5033939.535
112_(STM)	381722.061	5034051.287
114_(STM)	381695.933	5034110.412
12_(CB)	381693.043	5034036.978
120_(STM)	381637.884	5034015.234
122_(STM)	381613.388	5034012.674
124_(STM)	381598.561	5034020.702
126_(STM)	381577.374	5034069.721
128_(STM)	381546.966	5034139.351
13_(CB)	381689.694	5034044.79
136_(STM)	381522.723	5034196.958

J1	381549.496	5034106.162
J2	381757.843	5033977.487
Maj-15	381573.401	5034393.553
Maj-15_2	381603.958	5034326.421
Maj-18_2	381633.162	5034339.357
Maj-19	381566.414	5034309.792
Maj-19_2	381591.329	5034320.826
Maj-20	381543.507	5034300.033
Maj-21	381484.13	5034275.269
Maj-23	381608.541	5034316.121
Maj-24	381621.369	5034287.607
Maj-25	381635.742	5034254.688
Maj-26	381580.14	5034232.359
Maj-27	381542.959	5034216.408
Maj-28	381537.056	5034166.524
Maj-29	381551.053	5034138.553
Maj-35	381565.153	5034106.303
Maj-36	381580.163	5034072.113
Maj-37	381594.925	5034037.553
Maj-38	381607.643	5034017.588
Maj-39	381627.215	5034016.837
Maj-40	381641.204	5034020.262
Maj-41	381691.979	5034042.056

Maj-44	381709.885	5034086.785
Maj-45	381722.3	5034055.112
Maj-46	381739.691	5034019.616
Maj-48_2	381781.911	5034001.189
Maj-48_3	381763.999	5033993.482
Maj-50	381640.747	5033943.96
Maj-51	381672.455	5033954.954
Maj-52	381721.553	5033975.967
Maj-53	381753.038	5033988.766
Maj-56	381494.997	5034256.092
Maj-60	381528.438	5034203.663
Maj-61	381544.191	5034175.631
Maj-63	381730.205	5034016.811
Maj-64	381448.655	5034285.38
Maj-65	381778.382	5034008.55
Maj-67	381703.616	5034083.059
Maj-Park	381728.399	5033825.619
RYCB_1_(RYCB)	381734.202	5033941.191
RYCB_10_(RYCB)	381442.319	5034298.46
RYCB_11_(RYCB)	381578.806	5034356.559
RYCB_2_(RYCB)	381725.556	5034014.74
RYCB_3_(RYCB)	381612.277	5033977.722
RYCB_4_(RYCB)	381781.005	5034010.848
RYCB_5_(RYCB)	381699.781	5034083.118
RYCB_6_(RYCB)	381529.161	5034097.261
RYCB_7_(RYCB)	381502.626	5034236.326
RYCB_8_(RYCB)	381544.063	5034177.384
RYCB_9_(RYCB)	381674.723	5034252.795
Slope1	381588.486	5034360.411
StartNullStruct2	381672.996	5033992.169
StartNullStruct3	381785.825	5033999.81
STM-251_(STM)	381634.726	5034343.823
TEE_1_(RYCB)	381692.419	5034000.507
TEE_10_(RYCB)	381510.902	5034139.24
TEE_11_(RYCB)	381526.967	5034102.206
TEE_12_(RYCB)	381481.223	5034207.753
TEE_13_(RYCB)	381474.067	5034224.19
TEE_14_(RYCB)	381499.643	5034235.058
TEE_15_(RYCB)	381507.237	5034238.213
TEE_16_(RYCB)	381540.082	5034252.461
TEE_17_(RYCB)	381560.408	5034261.179
TEE_18_(RYCB)	381580.624	5034269.812
TEE_19_(RYCB)	381620.112	5034209.907
TEE_2_(RYCB)	381633.017	5033978.954
TEE_20_(RYCB)	381594.914	5034199.197
TEE_21_(RYCB)	381574.635	5034190.459
TEE_22_(RYCB)	381660.032	5034285.809
TEE_23_(RYCB)	381468.715	5034309.368
TEE_24_(RYCB)	381523.065	5034332.731
TEE_25_(RYCB)	381550.359	5034344.355
TEE_3_(RYCB)	381565.175	5034014.419
TEE_4_(RYCB)	381547.662	5034054.776
TEE_5_(RYCB)	381530.407	5034094.432
TEE_6_(RYCB)	381764.108	5034050.504
TEE_7_(RYCB)	381626.502	5034052.072
TEE_8_(RYCB)	381647.239	5034060.747
TEE_9_(RYCB)	381667.469	5034069.361
Maj-18	381637.356	5034341.21
Maj-22	381471.715	5034270.038
Maj-48	381786.497	5034003.157
Maj-49	381597.176	5033939.913
OF1	381690.918	5033799.524
STM-111_(STM)	381695.19	5033799.968
B2_Stor	381428.703	5034532.135

[VERTICES]

::Link	X-Coord	Y-Coord
C1	381421.347	5034520.461
C1	381428.796	5034447.459

C1	381531.594	5034491.037
C27_1	381530.457	5034209.127
C27_2	381525.808	5034196.544
C31	381717.936	5033820.342
C31	381703.646	5033812.793
C31_2	381544.884	5034166.116
C4_2	381790.27	5033909.495
C58	381517.209	5034212.082
C58_2	381736.37	5034014.996
C60	381502.529	5034238.486
C63_2	381705.821	5034083.025
C67	381582.176	5034355.673
RYCB-29	381634.762	5034344
B2-Out	381413.192	5034526.387
B2-Out	381420.106	5034449.518
B2-Out	381424.58	5034439.35
B2-Out	381528.7	5034484.902

[POLYGONS]

::Subcatchment	X-Coord	Y-Coord
A12i	381603.575	5034325.904
A12i	381599.09	5034336.199
A12i	381626.891	5034348.374
A12i	381632.397	5034351
A12i	381636.88	5034340.972
A12i	381603.575	5034325.904
A12ii	381588.266	5034361.047
A12ii	381603.575	5034325.904
A12ii	381590.101	5034319.808
A12ii	381582.52	5034337.492
A12ii	381585.089	5034338.593
A12ii	381579.688	5034351.312
A12ii	381579.992	5034357.472
A12ii	381588.266	5034361.047
A13	381530.192	5034320.178
A13	381515.153	5034313.748
A13	381509.139	5034327.791
A13	381579.992	5034357.472
A13	381579.648	5034351.406
A13	381585.024	5034338.57
A13	381582.52	5034337.492
A13	381580.785	5034341.808
A13	381558.955	5034332.475
A13	381530.192	5034320.178
A14	381447.103	5034284.654
A14	381441.002	5034298.989
A14	381509.139	5034327.791
A14	381512.599	5034319.721
A14	381515.151	5034313.747
A14	381493.903	5034304.663
A14	381466.674	5034293.021
A14	381447.103	5034284.654
A15i	381567.244	5034310.002
A15i	381567.244	5034310.002
A15i	381472.296	5034269.296
A15i	381462.819	5034291.373
A15i	381493.903	5034304.663
A15i	381515.153	5034313.748
A15i	381546.959	5034327.346
A15i	381557.84	5034331.998
A15i	381567.244	5034310.002
A15ii	381472.296	5034269.296
A15ii	381567.244	5034310.002
A15ii	381567.244	5034310.002
A15ii	381577.731	5034285.474
A15ii	381499.928	5034251.954
A15ii	381498.003	5034256.002
A15ii	381492.764	5034253.757
A15ii	381494.517	5034249.639

A15ii	381482.768	5034244.552	A21	381514.208	5034225.655
A15ii	381472.789	5034268.148	A21	381507.271	5034235.078
A15ii	381472.296	5034269.296	A21	381499.928	5034251.954
A16i	381590.176	5034319.842	A21	381602.709	5034296.167
A16i	381590.1	5034319.81	A21	381606.078	5034288.284
A16i	381568.321	5034310.464	A21	381611.967	5034284.565
A16i	381567.244	5034310.002	A22	381498.141	5034256.061
A16i	381557.84	5034331.998	A22	381507.271	5034235.078
A16i	381580.785	5034341.808	A22	381520.172	5034217.553
A16i	381590.176	5034319.842	A22	381516.384	5034212.577
A16ii	381567.244	5034310.002	A22	381502.03	5034232.083
A16ii	381568.321	5034310.464	A22	381492.764	5034253.757
A16ii	381590.1	5034319.81	A22	381498.141	5034256.061
A16ii	381590.176	5034319.842	A23	381509.221	5034177.744
A16ii	381600.673	5034295.291	A23	381495.8	5034171.963
A16ii	381577.792	5034285.449	A23	381472.748	5034224.61
A16ii	381569.597	5034304.499	A23	381467.289	5034237.916
A16ii	381567.244	5034310.002	A23	381482.787	5034244.56
A17ii	381603.575	5034325.904	A23	381494.55	5034249.652
A17ii	381634.735	5034255.086	A23	381502.03	5034232.083
A17ii	381634.856	5034255.039	A23	381509.754	5034221.839
A17ii	381625.735	5034258.586	A23	381508.667	5034221.039
A17ii	381621.236	5034263.563	A23	381500.297	5034204.233
A17ii	381617.344	5034261.852	A23	381504.385	5034189.257
A17ii	381610.829	5034276.619	A23	381509.221	5034177.744
A17ii	381611.967	5034284.565	A24i	381549.922	5034138.762
A17ii	381606.225	5034288.349	A24i	381526.351	5034193.134
A17ii	381602.709	5034296.167	A24i	381526.04	5034194.114
A17ii	381600.627	5034295.272	A24i	381525.797	5034195.112
A17ii	381590.101	5034319.808	A24i	381525.623	5034196.125
A17ii	381603.575	5034325.904	A24i	381525.518	5034197.147
A18i	381634.856	5034255.039	A24i	381525.484	5034198.174
A18i	381634.735	5034255.086	A24i	381525.52	5034199.201
A18i	381603.575	5034325.904	A24i	381525.627	5034200.223
A18i	381636.881	5034340.972	A24i	381525.803	5034201.235
A18i	381642.191	5034328.913	A24i	381526.048	5034202.233
A18i	381628.738	5034322.599	A24i	381526.361	5034203.212
A18i	381638.99	5034299.797	A24i	381526.74	5034204.167
A18i	381644.221	5034287.878	A24i	381527.183	5034205.094
A18i	381654.793	5034263.788	A24i	381527.689	5034205.989
A18i	381634.856	5034255.039	A24i	381528.255	5034206.846
A19	381642.191	5034328.913	A24i	381528.879	5034207.663
A19	381678.77	5034246.057	A24i	381529.557	5034208.435
A19	381664.911	5034240.76	A24i	381530.286	5034209.159
A19	381662.063	5034247.212	A24i	381531.063	5034209.832
A19	381656.121	5034260.762	A24i	381531.884	5034210.449
A19	381643.608	5034289.274	A24i	381532.746	5034211.009
A19	381633.156	5034313.091	A24i	381533.644	5034211.509
A19	381628.751	5034322.572	A24i	381534.574	5034211.946
A19	381642.191	5034328.913	A24i	381543.015	5034215.565
A20i	381634.488	5034254.988	A24i	381543.081	5034215.412
A20i	381543.015	5034215.565	A24i	381546.561	5034207.293
A20i	381534.487	5034235.449	A24i	381551.831	5034194.996
A20i	381614.086	5034269.236	A24i	381543.421	5034191.366
A20i	381617.343	5034261.859	A24i	381541.924	5034190.72
A20i	381621.236	5034263.563	A24i	381545.113	5034183.28
A20i	381625.735	5034258.586	A24i	381543.011	5034177.3
A20i	381634.488	5034254.988	A24i	381549.92	5034172.284
A20ii	381543.081	5034215.412	A24i	381556.16	5034157.729
A20ii	381634.809	5034254.918	A24i	381552.823	5034154.734
A20ii	381631.345	5034245.978	A24i	381558.434	5034147.596
A20ii	381631.936	5034239.319	A24i	381560.273	5034143.444
A20ii	381635.518	5034231.203	A24i	381549.922	5034138.762
A20ii	381551.831	5034194.996	A24ii	381543.015	5034215.565
A20ii	381543.081	5034215.412	A24ii	381534.574	5034211.946
A21	381611.967	5034284.565	A24ii	381533.644	5034211.509
A21	381610.829	5034276.619	A24ii	381532.746	5034211.009
A21	381614.086	5034269.236	A24ii	381531.884	5034210.449
A21	381570.95	5034251.169	A24ii	381531.063	5034209.832
A21	381525.154	5034231.426	A24ii	381530.286	5034209.159

A24ii	381529.557	5034208.435	A28i	381560.238	5034143.523
A24ii	381528.879	5034207.663	A28ii	381745.243	5034095.526
A24ii	381528.255	5034206.846	A28ii	381731.799	5034089.596
A24ii	381527.689	5034205.989	A28ii	381729.022	5034095.885
A24ii	381527.183	5034205.094	A28ii	381708.666	5034087.757
A24ii	381526.74	5034204.167	A28ii	381699.835	5034084.13
A24ii	381526.361	5034203.212	A28ii	381626.965	5034053.18
A24ii	381526.048	5034202.233	A28ii	381616.019	5034078.356
A24ii	381525.803	5034201.235	A28ii	381602.598	5034072.459
A24ii	381525.627	5034200.223	A28ii	381594.759	5034069.099
A24ii	381525.52	5034199.201	A28ii	381588.029	5034068.502
A24ii	381525.484	5034198.174	A28ii	381579.093	5034071.743
A24ii	381525.518	5034197.147	A28ii	381582.507	5034081.119
A24ii	381525.623	5034196.125	A28ii	381584.397	5034085.879
A24ii	381525.797	5034195.112	A28ii	381585.829	5034089.482
A24ii	381526.04	5034194.114	A28ii	381583.973	5034093.75
A24ii	381526.351	5034193.134	A28ii	381578.962	5034105.309
A24ii	381549.922	5034138.762	A28ii	381572.521	5034109.076
A24ii	381529.865	5034130.075	A28ii	381574.164	5034116.309
A24ii	381504.385	5034189.257	A28ii	381570.953	5034124.316
A24ii	381500.297	5034204.233	A28ii	381706.735	5034183.002
A24ii	381508.667	5034221.039	A28ii	381745.243	5034095.526
A24ii	381509.633	5034221.75	A29	381495.658	5034171.847
A24ii	381516.384	5034212.577	A29	381509.292	5034177.575
A24ii	381520.078	5034217.429	A29	381520.124	5034152.567
A24ii	381514.208	5034225.655	A29	381540.518	5034105.476
A24ii	381525.154	5034231.426	A29	381532.563	5034102.017
A24ii	381534.487	5034235.449	A29	381526.506	5034100.783
A24ii	381539.469	5034223.837	A29	381495.658	5034171.847
A24ii	381543.015	5034215.565	A3	381425.905	5034450.972
A25	381635.518	5034231.203	A3	381531.128	5034496.071
A25	381641.616	5034217.048	A3	381563.233	5034509.833
A25	381544.819	5034175.987	A3	381605.188	5034413.776
A25	381543.011	5034177.3	A3	381632.595	5034350.922
A25	381545.108	5034183.386	A3	381599.09	5034336.199
A25	381541.921	5034190.773	A3	381588.266	5034361.047
A25	381551.831	5034194.996	A3	381579.992	5034357.472
A25	381631.649	5034229.445	A3	381509.139	5034327.791
A25	381635.518	5034231.203	A3	381441.002	5034298.989
A26i	381634.809	5034254.919	A3	381382.967	5034432.55
A26i	381643.948	5034234.269	A3	381397.323	5034438.703
A26i	381635.518	5034231.203	A3	381409.135	5034443.769
A26i	381633.932	5034234.796	A3	381406.699	5034450.733
A26i	381631.936	5034239.319	A3	381404.738	5034457.846
A26i	381631.345	5034245.978	A3	381403.261	5034465.075
A26i	381634.809	5034254.919	A3	381402.85	5034467.694
A26ii	381643.948	5034234.269	A3	381412.794	5034468.768
A26ii	381634.809	5034254.919	A3	381416.164	5034469.132
A26ii	381634.856	5034255.039	A3	381421.825	5034469.744
A26ii	381654.793	5034263.788	A3	381421.996	5034468.268
A26ii	381664.911	5034240.76	A3	381422.467	5034464.976
A26ii	381643.948	5034234.269	A3	381422.944	5034462.427
A28i	381560.238	5034143.523	A3	381423.363	5034460.249
A28i	381558.434	5034147.596	A3	381424.283	5034456.664
A28i	381552.823	5034154.734	A3	381424.51	5034455.577
A28i	381556.16	5034157.729	A3	381425.905	5034450.972
A28i	381553.216	5034164.599	A30	381526.565	5034100.795
A28i	381549.92	5034172.284	A30	381532.563	5034102.017
A28i	381544.819	5034175.987	A30	381548.474	5034108.935
A28i	381641.616	5034217.048	A30	381550.866	5034103.433
A28i	381635.518	5034231.203	A30	381534.376	5034096.263
A28i	381643.948	5034234.269	A30	381528.997	5034095.171
A28i	381664.911	5034240.76	A30	381526.565	5034100.795
A28i	381678.77	5034246.057	A31	381592.957	5033994.457
A28i	381697.738	5034203.163	A31	381583.104	5033977.186
A28i	381706.635	5034183.003	A31	381580.359	5033977.041
A28i	381570.953	5034124.316	A31	381534.283	5034083.013
A28i	381567.791	5034132.197	A31	381528.997	5034095.171
A28i	381563.39	5034130.431	A31	381534.376	5034096.263
A28i	381562.044	5034139.444	A31	381542.909	5034099.979

A31	381577.987	5034019.272	A34i	381723.329	5034054.572
A31	381583.698	5034007.256	A34i	381639.998	5034018.866
A31	381591.935	5033995.041	A34i	381638.115	5034018.123
A31	381592.957	5033994.457	A34i	381636.191	5034017.492
A32i	381549.922	5034138.762	A34i	381634.233	5034016.975
A32i	381579.085	5034071.762	A34i	381632.249	5034016.573
A32i	381558.972	5034063.02	A34i	381630.244	5034016.289
A32i	381542.909	5034099.979	A34i	381628.226	5034016.123
A32i	381550.866	5034103.433	A34i	381614.234	5034015.383
A32i	381548.472	5034108.939	A34i	381613.223	5034015.364
A32i	381540.517	5034105.478	A34i	381612.213	5034015.412
A32i	381529.865	5034130.075	A34i	381611.209	5034015.529
A32i	381549.922	5034138.762	A34i	381610.215	5034015.713
A32ii	381579.085	5034071.762	A34i	381609.235	5034015.964
A32ii	381549.948	5034138.774	A34i	381608.275	5034016.28
A32ii	381560.273	5034143.444	A34i	381607.69	5034016.517
A32ii	381562.044	5034139.444	A34i	381609.318	5034020.435
A32ii	381563.39	5034130.431	A34i	381612.521	5034028.874
A32ii	381567.791	5034132.197	A34i	381621.758	5034029.049
A32ii	381574.164	5034116.309	A34i	381630.507	5034029.725
A32ii	381572.521	5034109.076	A34i	381632.048	5034025.707
A32ii	381578.962	5034105.309	A34i	381633.576	5034026.109
A32ii	381583.973	5034093.75	A34i	381635.08	5034026.593
A32ii	381585.829	5034089.482	A34i	381636.556	5034027.159
A32ii	381584.397	5034085.879	A34i	381637.998	5034027.804
A32ii	381582.507	5034081.119	A34i	381632.965	5034039.378
A32ii	381579.085	5034071.762	A34i	381702.128	5034069.506
A33i	381607.69	5034016.517	A34i	381705.586	5034061.921
A33i	381607.338	5034016.66	A34i	381709.474	5034063.637
A33i	381606.429	5034017.102	A34i	381714.153	5034058.186
A33i	381605.552	5034017.605	A34i	381723.329	5034054.572
A33i	381604.71	5034018.165	A34ii	381607.69	5034016.517
A33i	381603.908	5034018.781	A34ii	381608.275	5034016.28
A33i	381603.15	5034019.45	A34ii	381609.235	5034015.964
A33i	381602.438	5034020.168	A34ii	381610.215	5034015.713
A33i	381601.776	5034020.932	A34ii	381611.209	5034015.529
A33i	381601.168	5034021.74	A34ii	381612.213	5034015.412
A33i	381600.615	5034022.586	A34ii	381613.223	5034015.364
A33i	381600.12	5034023.468	A34ii	381614.234	5034015.383
A33i	381599.686	5034024.381	A34ii	381628.226	5034016.123
A33i	381579.093	5034071.743	A34ii	381630.244	5034016.289
A33i	381588.029	5034068.502	A34ii	381632.249	5034016.573
A33i	381594.759	5034069.099	A34ii	381634.233	5034016.975
A33i	381602.598	5034072.459	A34ii	381636.191	5034017.492
A33i	381621.758	5034029.049	A34ii	381638.115	5034018.123
A33i	381612.521	5034028.874	A34ii	381639.998	5034018.866
A33i	381611.043	5034024.972	A34ii	381723.329	5034054.572
A33i	381609.318	5034020.435	A34ii	381719.791	5034045.445
A33i	381607.69	5034016.517	A34ii	381720.368	5034038.953
A33ii	381579.077	5034071.756	A34ii	381716.479	5034037.237
A33ii	381599.686	5034024.381	A34ii	381719.87	5034029.337
A33ii	381600.12	5034023.468	A34ii	381648.09	5033998.713
A33ii	381600.615	5034022.586	A34ii	381644.337	5033997.195
A33ii	381601.168	5034021.74	A34ii	381632.243	5033994.489
A33ii	381601.776	5034020.932	A34ii	381608.729	5033993.33
A33ii	381602.438	5034020.168	A34ii	381593.066	5033994.395
A33ii	381603.15	5034019.45	A34ii	381606.057	5034012.585
A33ii	381603.908	5034018.781	A34ii	381607.69	5034016.517
A33ii	381604.71	5034018.165	A39i	381723.308	5034054.581
A33ii	381605.552	5034017.605	A39i	381708.666	5034087.757
A33ii	381606.429	5034017.102	A39i	381729.022	5034095.885
A33ii	381607.338	5034016.66	A39i	381731.799	5034089.596
A33ii	381607.69	5034016.517	A39i	381743.35	5034063.437
A33ii	381605.999	5034012.447	A39i	381723.308	5034054.581
A33ii	381593.066	5033994.395	A39ii	381708.666	5034087.757
A33ii	381591.935	5033995.041	A39ii	381723.308	5034054.581
A33ii	381583.698	5034007.256	A39ii	381714.153	5034058.186
A33ii	381577.993	5034019.275	A39ii	381709.474	5034063.637
A33ii	381558.974	5034063.016	A39ii	381705.477	5034061.918
A33ii	381579.077	5034071.756	A39ii	381698.78	5034077.094

A39ii	381700.697	5034083.527	A44	381635.91	5033965.77
A39ii	381699.835	5034084.13	A44	381588.359	5033961.652
A39ii	381708.666	5034087.757	A44	381587.259	5033961.173
A40	381626.965	5034053.18	A45i	381587.259	5033961.173
A40	381699.835	5034084.13	A45i	381588.359	5033961.652
A40	381700.697	5034083.527	A45i	381588.217	5033961.59
A40	381698.831	5034077.225	A45i	381588.359	5033961.652
A40	381702.208	5034069.573	A45i	381635.985	5033965.776
A40	381632.99	5034039.389	A45i	381647.327	5033967.806
A40	381626.965	5034053.18	A45i	381658.352	5033971.585
A41	381616.019	5034078.356	A45i	381664.49	5033974.096
A41	381637.998	5034027.804	A45i	381672.844	5033954.229
A41	381636.454	5034027.133	A45i	381662.673	5033950.069
A41	381635.015	5034026.57	A45i	381656.714	5033948.114
A41	381633.544	5034026.094	A45i	381650.651	5033946.512
A41	381632.048	5034025.707	A45i	381644.505	5033945.268
A41	381630.471	5034029.819	A45i	381638.296	5033944.386
A41	381621.758	5034029.049	A45i	381632.047	5033943.869
A41	381618.854	5034035.628	A45i	381607.333	5033942.562
A41	381616.498	5034040.564	A45i	381605.976	5033942.469
A41	381612.427	5034050.189	A45i	381604.627	5033942.296
A41	381602.577	5034072.506	A45i	381603.29	5033942.044
A41	381616.019	5034078.356	A45i	381601.971	5033941.712
A42i	381752.52	5033988.394	A45i	381600.673	5033941.303
A42i	381723.321	5034054.551	A45i	381599.403	5033940.817
A42i	381743.359	5034063.417	A45i	381596.633	5033939.613
A42i	381767.382	5034009.019	A45i	381587.259	5033961.173
A42i	381769.257	5034004.646	A45ii	381596.633	5033939.613
A42i	381760.423	5034000.68	A45ii	381599.403	5033940.817
A42i	381752.52	5033988.394	A45ii	381600.673	5033941.303
A42ii	381723.329	5034054.572	A45ii	381601.971	5033941.712
A42ii	381752.52	5033988.394	A45ii	381603.29	5033942.044
A42ii	381740.112	5033983.079	A45ii	381604.627	5033942.296
A42ii	381735.054	5033995.152	A45ii	381605.976	5033942.469
A42ii	381728.327	5034010.394	A45ii	381607.333	5033942.562
A42ii	381730.178	5034016.726	A45ii	381632.047	5033943.869
A42ii	381723.331	5034021.466	A45ii	381638.296	5033944.386
A42ii	381716.47	5034037.26	A45ii	381644.505	5033945.268
A42ii	381720.368	5034038.953	A45ii	381650.651	5033946.512
A42ii	381719.776	5034045.612	A45ii	381656.714	5033948.114
A42ii	381723.329	5034054.572	A45ii	381662.673	5033950.069
A42iii	381760.423	5034000.68	A45ii	381672.844	5033954.229
A42iii	381782.791	5034010.45	A45ii	381676.204	5033945.164
A42iii	381786.259	5034002.846	A45ii	381662.718	5033939.873
A42iii	381752.566	5033988.289	A45ii	381652.843	5033937.109
A42iii	381760.423	5034000.68	A45ii	381646.586	5033935.831
A43	381658.29	5033971.559	A45ii	381639.597	5033934.819
A43	381652.974	5033984.733	A45ii	381632.558	5033934.232
A43	381650.434	5033983.765	A45ii	381607.711	5033932.918
A43	381645.443	5033997.642	A45ii	381602.883	5033931.977
A43	381655.556	5034001.733	A45ii	381600.42	5033930.904
A43	381719.905	5034029.352	A45ii	381596.633	5033939.613
A43	381723.331	5034021.466	A46i	381740.213	5033983.122
A43	381730.257	5034016.76	A46i	381740.056	5033982.939
A43	381728.308	5034010.436	A46i	381672.844	5033954.229
A43	381731.729	5034002.815	A46i	381672.521	5033955.1
A43	381668.635	5033975.791	A46i	381664.49	5033974.096
A43	381658.29	5033971.559	A46i	381668.606	5033975.86
A44	381587.259	5033961.173	A46i	381678.748	5033980.123
A44	381580.359	5033977.041	A46i	381731.69	5034002.773
A44	381583.104	5033977.186	A46i	381740.213	5033983.122
A44	381593.066	5033994.395	A46ii	381672.844	5033954.229
A44	381608.729	5033993.33	A46ii	381740.056	5033982.939
A44	381632.243	5033994.489	A46ii	381740.213	5033983.122
A44	381644.337	5033997.195	A46ii	381752.566	5033988.289
A44	381645.441	5033997.641	A46ii	381744.291	5033974.348
A44	381650.431	5033983.764	A46ii	381746.161	5033969.986
A44	381652.974	5033984.733	A46ii	381724.771	5033960.685
A44	381658.352	5033971.585	A46ii	381728.024	5033953.086
A44	381647.327	5033967.806	A46ii	381694.461	5033938.716

A46ii	381689.214	5033950.742	B1	381429.155	5034462.326
A46ii	381676.204	5033945.164	B1	381430.333	5034457.869
A46ii	381672.844	5033954.229	B1	381431.785	5034453.492
A47	381745.243	5034095.526	B1	381426.008	5034451.003
A47	381782.791	5034010.45	B1	381424.51	5034455.577
A47	381769.257	5034004.647	B1	381424.283	5034456.664
A47	381767.382	5034009.019	B1	381423.363	5034460.249
A47	381763.615	5034017.555	B1	381422.944	5034462.427
A47	381735.495	5034081.222	B1	381422.467	5034464.976
A47	381731.8	5034089.593	B1	381421.996	5034468.268
A47	381745.243	5034095.526	B1	381421.825	5034469.744
A48	381786.259	5034002.846	B1	381412.794	5034468.768
A48	381790.062	5033993.977	B1	381402.85	5034467.694
A48	381776.62	5033988.214	B1	381403.261	5034465.075
A48	381746.161	5033969.986	B1	381404.738	5034457.846
A48	381744.291	5033974.348	B1	381406.699	5034450.733
A48	381752.566	5033988.289	B1	381409.135	5034443.769
A48	381786.259	5034002.846	B1	381403.781	5034441.568
A49	381707.071	5033928.476	B1	381382.967	5034432.55
A49	381700.017	5033925.509	B2	381530.741	5034583.975
A49	381694.461	5033938.716	B2	381424.704	5034522.35
A49	381728.024	5033953.086	B2	381316.325	5034768.58
A49	381732.038	5033943.711	B2	381315.387	5034770.71
A49	381733.678	5033939.884	B2	381447.869	5034848.65
A49	381707.071	5033928.476	B2	381463.21	5034813.696
A54	381789.558	5033900.625	B2	381436.808	5034798.092
A54	381781.834	5033896.02	B2	381530.741	5034583.975
A54	381733.358	5033867.077	B3i	381431.785	5034453.492
A54	381707.071	5033928.476	B3i	381430.333	5034457.869
A54	381722.078	5033934.91	B3i	381429.155	5034462.326
A54	381733.678	5033939.884	B3i	381428.255	5034466.848
A54	381732.038	5033943.711	B3i	381427.638	5034471.418
A54	381728.024	5033953.086	B3i	381427.305	5034476.016
A54	381724.771	5033960.685	B3i	381427.257	5034480.627
A54	381746.161	5033969.986	B3i	381427.326	5034481.699
A54	381776.62	5033988.214	B3i	381428.245	5034489.879
A54	381790.062	5033993.975	B3i	381428.351	5034492.892
A54	381822.39	5033920.729	B3i	381428.717	5034500.592
A54	381789.558	5033900.625	B3i	381428.593	5034508.299
B1	381382.967	5034432.55	B3i	381427.978	5034515.982
B1	381300.46	5034616.904	B3i	381426.875	5034523.611
B1	381306.314	5034623.312	B3i	381530.743	5034583.97
B1	381331.724	5034634.567	B3i	381563.223	5034509.829
B1	381332.529	5034635.281	B3i	381431.785	5034453.492
B1	381332.991	5034635.944	B4i	381691.588	5033945.198
B1	381333.31	5034636.687	B4i	381699.904	5033925.461
B1	381333.489	5034637.748	B4i	381707.071	5033928.476
B1	381331.194	5034646.567	B4i	381733.358	5033867.077
B1	381323.214	5034649.432	B4i	381726.731	5033863.113
B1	381332.596	5034655.255	B4i	381649.852	5033817.212
B1	381338.741	5034658.094	B4i	381602.985	5033925.012
B1	381314.105	5034714.313	B4i	381605.53	5033926.1
B1	381298.068	5034750.52	B4i	381608.677	5033926.961
B1	381290.843	5034752.831	B4i	381632.876	5033928.241
B1	381295.775	5034755.874	B4i	381640.276	5033928.858
B1	381316.325	5034768.58	B4i	381647.625	5033929.921
B1	381335.973	5034723.941	B4i	381654.461	5033931.331
B1	381395.985	5034587.599	B4i	381664.627	5033934.177
B1	381424.704	5034522.35	B4i	381686.036	5033942.851
B1	381426.875	5034523.611	B4i	381691.588	5033945.198
B1	381427.978	5034515.982	B4ii	381600.42	5033930.904
B1	381428.593	5034508.299	B4ii	381602.883	5033931.977
B1	381428.717	5034500.592	B4ii	381607.711	5033932.918
B1	381428.351	5034492.892	B4ii	381632.558	5033934.232
B1	381428.245	5034489.879	B4ii	381639.597	5033934.819
B1	381427.326	5034481.699	B4ii	381646.586	5033935.831
B1	381427.257	5034480.627	B4ii	381652.843	5033937.109
B1	381427.305	5034476.016	B4ii	381662.718	5033939.873
B1	381427.638	5034471.418	B4ii	381676.204	5033945.164
B1	381428.255	5034466.848	B4ii	381678.395	5033939.755

B4ii	381691.563	5033945.188
B4ii	381690.549	5033944.759
B4ii	381686.036	5033942.851
B4ii	381664.627	5033934.177
B4ii	381654.461	5033931.331
B4ii	381647.625	5033929.921
B4ii	381640.276	5033928.858
B4ii	381632.876	5033928.241
B4ii	381608.677	5033926.961
B4ii	381605.53	5033926.1
B4ii	381602.985	5033925.012
B4ii	381600.42	5033930.904
B4iii	381676.204	5033945.164
B4iii	381689.214	5033950.742
B4iii	381691.563	5033945.188
B4iii	381678.395	5033939.755
B4iii	381676.204	5033945.164
C2	381447.104	5034284.654
C2	381462.819	5034291.373
C2	381482.826	5034244.577
C2	381467.309	5034237.869
C2	381447.104	5034284.654

[SYMBOLS]

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;;Gage      X-Coord      Y-Coord
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[PROFILES]

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;;Name      Links
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"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" Pipe_-_ (141)_(RYCB) Pipe_-_ (142)_(RYCB) Pipe_-_ (143)_(RYCB) Pipe_-_ (144)_(RYCB) C31_1

"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" C31_2 OR19 CB-21 15_(11)_(STM) 8_(STM)

"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" 9_(STM) 10_(STM) 11_(STM) 12_(STM) 13_(STM)

"Profile 001. Junction RYCB_6_(1)_(19)_(RYCB) to Junction 108_(STM)" STM-23_(STM) STM-24_(STM)

"Profile 002. Outfall Maj-01 to Junction STM-251_(STM)" C1_1 C1_2 C2_1 C2_2 CB-06

"Profile 002. Outfall Maj-01 to Junction STM-251_(STM)" CB-43 15_(19)_(STM) 15_(20)_(STM) 15_(21)_(STM) 15_(22)_(STM)

"Profile 002. Outfall Maj-01 to Junction STM-251_(STM)" 15_(14)_(STM) 15_(15)_(STM) 15_(16)_(STM) 4_(STM) STM-83_(STM)

"Profile 003. Junction RYCB_6_(1)_(9)_(RYCB) to Junction 112_(STM)" Pipe_-_ (145)_(RYCB) Pipe_-_ (146)_(RYCB) Pipe_-_ (147)_(RYCB) Pipe_-_ (148)_(RYCB) Pipe_-_ (10)_(RYCB)

"Profile 003. Junction RYCB_6_(1)_(9)_(RYCB) to Junction 112_(STM)" Pipe_-_ (11)_(RYCB) RYCB-18 15_(4)_(STM) 15_(5)_(STM)

"Profile 004. Junction RYCB_6_(1)_(13)_(RYCB) to Junction 104_(STM)" C50 Pipe_-_ (99)_(RYCB) Pipe_-_ (100)_(RYCB) C59_1 C59_2

"Profile 004. Junction RYCB_6_(1)_(13)_(RYCB) to Junction 104_(STM)" C50_2 C55 OR44 CB-56

"Profile 005. Junction RYCB_6_(1)_(21)_(RYCB) to Junction 144_(STM)" Pipe_-_ (110)_(RYCB) Pipe_-_ (111)_(RYCB) Pipe_-_ (19)_(RYCB) C27 C24

"Profile 005. Junction RYCB_6_(1)_(21)_(RYCB) to Junction 144_(STM)" OR-15 CB-26

"Profile 006. Junction Maj-04 to Junction 164_(STM)" C4_1 C4_2 C5_1 C5_2 C6_2

"Profile 006. Junction Maj-04 to Junction 164_(STM)" OR4 CB-41

"Profile 007. Junction RYCB_6_(1)_(24)_(RYCB) to Junction 136_(STM)" Pipe_-_ (114)_(RYCB) Pipe_-_ (150)_(RYCB) Pipe_-_ (151)_(RYCB) Pipe_-_ (152)_(RYCB) Pipe_-_ (14)_(RYCB)

"Profile 007. Junction RYCB_6_(1)_(24)_(RYCB) to Junction 136_(STM)" Pipe_-_ (15)_(RYCB) 15_(10)_(STM)_2

"Profile 008. Junction RYCB_6_(1)_(31)_(RYCB) to Junction 150_(STM)" Pipe_-_ (123)_(RYCB) Pipe_-_ (124)_(RYCB) Pipe_-_ (125)_(RYCB) Pipe_-_ (23)_(RYCB) CB-35

"Profile 008. Junction RYCB_6_(1)_(31)_(RYCB) to Junction 150_(STM)" 3_(STM)

"Profile 009. Junction RYCB_6_(1)_(6)_(RYCB) to Junction 114_(STM)" Pipe_-_ (96)_(RYCB) Pipe_-_ (137)_(RYCB) Pipe_-_ (138)_(RYCB) Pipe_-_ (98)_(RYCB) Pipe_-_ (9)_(RYCB)

"Profile 009. Junction RYCB_6_(1)_(6)_(RYCB) to Junction 114_(STM)" CB-11

"Profile 010. Junction Maj-34_2 to Junction 128_(STM)" C18_7 C32 OR23 CB-47 7_(STM)

"Profile 010. Junction Maj-34_2 to Junction 128_(STM)" 7_(1)_(STM)

"Profile 011. Junction Maj-19 to Junction 144_(STM)" C20 C21 OR46 CB-30 15_(12)_(STM)

"Profile 011. Junction Maj-19 to Junction 144_(STM)" 15_(13)_(STM)

"Profile 012. Junction RYCB_6_(1)_(26)_(RYCB) to Junction 150_(STM)" Pipe_-_ (117)_(RYCB) Pipe_-_ (118)_(RYCB) Pipe_-_ (165)_(RYCB) Pipe_-_ (25)_(RYCB) CB-33

"Profile 013. Junction Maj-11 to Junction 152_(STM)" C13 OR8 CB-54 1_(STM) 2_(STM)

"Profile 014. Junction RYCB_6_(1)_(36)_(RYCB) to Junction 162_(STM)" Pipe_-_ (126)_(RYCB) Pipe_-_ (127)_(RYCB) Pipe_-_ (128)_(RYCB) Pipe_-_ (74)_(RYCB) RYCB-52

"Profile 015. Junction Maj-07 to Junction 162_(STM)" C7 C8 C9 OR5 CB-39

"Profile 016. Junction RYCB_6_(1)_(2)_(1)_(RYCB) to Junction 108_(STM)" Pipe_-_ (139)_(RYCB) Pipe_-_ (140)_(RYCB) Pipe_-_ (27)_(RYCB) RYCB-03 STM-28_(STM)

"Profile 017. Junction TEE_2_(2)_(RYCB) to Outfall 2121_(STM)" Pipe_-_ (159)_(RYCB) Pipe_-_ (160)_(RYCB) Pipe_-_ (1)_(RYCB)_1 Pipe_-_ (1)_(RYCB)_2 Pipe_-_ (4)_(RYCB)

"Profile 017. Junction TEE_2_(2)_(RYCB) to Outfall 2121_(STM)" STM-34_(1)_(STM)_2

"Profile 018. Junction RYCB_6_(1)_(3)_(RYCB) to Junction 128_(STM)" Pipe_-_ (93)_(RYCB) Pipe_-_ (94)_(RYCB) Pipe_-_ (95)_(RYCB) Pipe_-_ (16)_(RYCB) RYCB-26

"Profile 019. Junction Maj-25 to Junction STM-Split" C25 OR-16 CB-23 15_(9)_(STM) 15_(10)_(STM)_1

"Profile 020. Junction Maj-15 to Junction Maj-24" C18_3 C18_4 C19 C23

"Profile 021. Junction RYCB_6_(1)_(37)_(RYCB) to Junction 152_(STM)" Pipe_-_ (129)_(RYCB) Pipe_-_ (130)_(RYCB) Pipe_-_ (22)_(RYCB) CB-31a

"Profile 022. Junction RYCB_6_(1)_(28)_(RYCB) to Junction 162_(STM)" Pipe_-_ (120)_(RYCB) Pipe_-_ (121)_(RYCB) Pipe_-_ (77)_(RYCB) RYCB-34

"Profile 023. Junction RYCB_6_(1)_(2)_(RYCB) to Junction 112_(STM)" Pipe_-_ (87)_(RYCB) Pipe_-_ (88)_(RYCB) Pipe_-_ (7)_(RYCB) CB-9

"Profile 024. Junction Maj-36 to Junction 116_(STM)" C38 OR28 CB-51 15_(3)_(STM)

"Profile 025. Junction TEE_1_(1)_(RYCB) to Junction STM-Split3" Pipe_-_ (157)_(RYCB) Pipe_-_ (158)_(RYCB) Pipe_-_ (2)_(RYCB) Pipe_-_ (3)_(RYCB)

"Profile 026. Junction RYCB_6_(1)_(40)_(RYCB) to Junction STM-251_(STM)" Pipe_-_ (132)_(RYCB) Pipe_-_ (133)_(RYCB) Pipe_-_ (24)_(RYCB) CB-31

"Profile 027. Junction Maj-25 to Junction 132_(STM)" C29 OR25 CB-45 6_(STM)

"Profile 028. Junction Maj-55 to Junction STM-Split3" C1 OR-51 CB-57 STM-34_(1)_(STM)_1

"Profile 029. Junction Maj-17 to Junction 158_(STM)" C11 OR-10 CB-37

"Profile 030. Junction RYCB_6_(1)_(25)_(RYCB) to Junction 148_(STM)" Pipe_-_ (119)_(RYCB) Pipe_-_ (164)_(RYCB) RYCB-10

"Profile 031. Junction Maj-51 to Junction 106_(STM)" C53 OR42 CB-3

"Profile 032. Junction TEE_1_(1)_(1)_(RYCB) to Junction 104_(STM)" Pipe_-_ (161)_(RYCB) RYCB-01 CB-06

"Profile 033. Junction Maj-40 to Junction 120_(STM)" C43 OR32 CB-13-C

"Profile 034. Junction Maj-38 to Junction 122_(STM)" C45 OR34 CB-15

"Profile 035. Junction RYCB_6_(1)_(16)_(1)_(RYCB) to Junction Structure_-_ (26)_(RYCB)" Pipe_-_ (153)_(RYCB) Pipe_-_ (134)_(RYCB) Pipe_-_ (17)_(RYCB)

"Profile 036. Junction Maj-29 to Junction 128_(STM)" C36 OR27 CB-19

"Profile 037. Junction Maj-31 to Junction 130_(STM)" C34 OR21 CB-49

"Profile 038. Junction RYCB_6_(1)_(16)_(2)_(RYCB) to Junction Structure_-_ (7)_(RYCB)" Pipe_-_ (154)_(RYCB) Pipe_-_ (155)_(RYCB) Pipe_-_ (156)_(RYCB)

"Profile 039. Junction Maj-19_2 to Junction 146_(STM)" C18_6 OR-13 CB-28

"Profile 040. Junction Maj-53 to Junction 104_(STM)" C51 OR40 CB-5

"Profile 041. Junction TEE_4_(RYCB) to Junction 104_(STM)" RYCB-04 RYCB-04 STM-82_(STM)

"Profile 042. Junction RYCB_6_(1)_(13)_(RYCB) to Junction Structure_-_ (17)_(RYCB)" Pipe_-_ (101)_(RYCB) Pipe_-_ (149)_(RYCB) Pipe_-_ (103)_(RYCB)

"Profile 043. Junction Maj-36 to Junction 126_(STM)" C46 OR37 CB-17

"Profile 044. Junction Maj-21 to Junction Maj-28" C56 C60 C27_2

"Profile 045. Junction Maj-13 to Junction 35_(CB)" C16 OR-50

"Profile 046. Junction Maj-45 to Junction 9_(1)_(RYCB)" C48 OR39

"Profile 047. Junction Maj-43 to Junction 11_(2)_(RYCB)" C40 OR31

"Profile 048. Outfall Maj-18 to Junction Maj-15_2" C18_8 C18_9

"Profile 049. Junction Maj-24 to Junction 144_(STM)" OR-14 CB-25

"Profile 050. Junction Slope1 to Junction 150_(STM)" OR-11 CB-32

"Profile 051. Junction Maj-12 to Junction 156_(STM)" OR7 CB-53

"Profile 052. Junction Maj-16 to Junction 158_(STM)" OR9 CB-36

"Profile 053. Junction Maj-10 to Junction 162_(STM)" OR6 CB-38

"Profile 054. Junction Maj-06_2 to Junction 164_(STM)" OR-03 CB-40

"Profile 055. Junction Maj-03 to Junction 170_(STM)" OR-02 CB-42

"Profile 056. Junction Maj-19 to Junction 146_(STM)" OR-12 CB-27(1)

"Profile 057. Junction Maj-21 to Junction 148_(STM)" OR47 CB-29

"Profile 058. Junction Maj-50 to Junction 106_(STM)" OR43 CB-2

"Profile 059. Junction Maj-54 to Junction 104_(STM)" OR45 CB-55

"Profile 060. Junction Maj-52 to Junction 104_(STM)" OR41 CB-4

"Profile 061. Junction Maj-46 to Junction 112_(STM)" OR38 CB-8

"Profile 062. Junction Maj-44 to Junction 114_(STM)" OR30 CB-10

"Profile 063. Junction Maj-42 to Junction 118_(STM)" OR29 CB-50

"Profile 064. Junction Maj-41 to Junction 120_(STM)" OR33 CB-12-C

"Profile 065. Junction Maj-39 to Junction 122_(STM)" OR35 CB-14

"Profile 066. Junction Maj-37 to Junction 126_(STM)" OR36 CB-16

"Profile 067. Junction Maj-35 to Junction 128_(STM)" OR26 CB-18

"Profile 068. Junction Maj-30 to Junction 130_(STM)" OR20 CB-48

"Profile 069. Junction Maj-32 to Junction 132_(STM)" OR22 CB-46

"Profile 070. Junction Maj-33 to Junction 142_(STM)" OR24 CB-44

"Profile 071. Junction Maj-28 to Junction 136_(STM)" OR18 CB-20

"Profile 072. Junction Maj-26 to Junction 140_(STM)" OR-17 CB-22

"Profile 073. Junction 104_(STM) to Junction 100_(STM)" 14_(STM) STM-34_(STM)

"Profile 074. Junction RYCB_6_(1)_(20)_(RYCB) to Junction Structure_-_ (29)_(RYCB)" Pipe_-_ (109)_(RYCB)

"Profile 075. Junction Maj-19_2 to Junction Maj-15_2" C18_5

"Profile 076. Junction RYCB_6_(1)_(40)_(RYCB) to Junction Structure_-_ (35)_(RYCB)" Pipe_-_ (131)_(RYCB)

"Profile 077. Junction RYCB_6_(1)_(30)_(RYCB) to Junction Structure_-_ (132)_(RYCB)" Pipe_-_ (122)_(RYCB)

"Profile 078. Storage B3_Stor to Junction 164_(STM)" B3-Out

"Profile 079. Storage B2_Stor to Junction 164_(STM)" B2-Out

"Profile 080. Storage B1_Stor to Junction 164_(STM)" B1-Out

"Profile 081. Junction RYCB_6_(1)_(25)_(2)_(RYCB) to Junction RYCB_10" Pipe_-_ (162)_(RYCB)

"Profile 082. Junction RYCB_6_(1)_(3)_(RYCB) to Junction TEE_3_(RYCB)" Pipe_-_ (89)_(RYCB)

"Profile 083. Storage B4_Stor to Junction 106_(STM)" B4-Out

"Profile 084. Junction Maj-55 to Junction Maj-54" C57

"Profile 085. Junction 134_(STM) to Junction 132_(STM)" STM-27_(STM)

"Profile 086. Junction Maj-27 to Junction Maj-60" C27_1

"Profile 087. Junction 31_(RYCB) to Junction Maj-18_2" C18

"Profile 088. Junction Slope1 to Junction 33_(RYCB)" OR48

"Profile 089. Junction Maj-15 to Junction Maj-14" C17

"Profile 090. Junction Structure_-_ (12)_(RYCB) to Junction Maj-14" C4_3 C4_4

"Profile 091. Junction Maj-14 to Junction 31a_(RYCB)" OR49

"Profile 092. Junction Maj-13 to Junction Maj-12" C14

"Profile 093. Junction Maj-15 to Junction Maj-16" C15

"Profile 094. Junction Maj-17 to Junction Maj-10" C10

"Profile 095. Junction Maj-11 to Junction Maj-09" C12

"Profile 096. Junction 52_(RYCB) to Junction Maj-08" C6

"Profile 097. Junction Maj-07 to Junction Maj-06_2" C6_1

"Profile 098. Storage B2_Stor to Junction Maj-06" B2-Outflow

"Profile 099. Junction Maj-04 to Junction Maj-03" C3

"Profile 100. Outfall Maj-22 to Junction Maj-21" C22

"Profile 101. Outfall Maj-49 to Junction Maj-50" C54

"Profile 102. Outfall Maj-48 to Junction Maj-48_2" C50_1
"Profile 103. Junction Maj-51 to Junction Maj-52" C52
"Profile 104. Junction Maj-53 to Junction Maj-46" C49
"Profile 105. Junction TEE_6_(RYCB) to Junction Maj-46"
C58_1 C58_2
"Profile 106. Junction Maj-45 to Junction Maj-44" C41
"Profile 107. Junction Maj-43 to Junction Maj-42" C39
"Profile 108. Junction Maj-45 to Junction Maj-41" C42
"Profile 109. Junction Maj-40 to Junction Maj-39" C44
"Profile 110. Junction Maj-38 to Junction Maj-37" C47
"Profile 111. Junction Maj-36 to Junction Maj-35" C37
"Profile 112. Junction Maj-29 to Junction Maj-30" C35
"Profile 113. Junction Maj-31 to Junction Maj-32" C33
"Profile 114. Junction 24_(RYCB) to Junction 142_(STM)"
RYCB-24
"Profile 115. Junction Maj-34 to Junction Maj-33" C30
"Profile 116. Junction Maj-29 to Junction Maj-28" C28
"Profile 117. Junction STM-Split to Junction Maj-60" C5
"Profile 118. Junction Structure _-(115)_(RYCB) to Junction
20_(CB)" Pipe_-(73)_(RYCB)
"Profile 119. Junction 144_(STM) to Junction 140_(STM)"
5_(STM)
"Profile 120. Junction 142_(STM) to Junction 140_(STM)"
STM-81_(STM)
"Profile 121. Junction Maj-27 to Junction Maj-26" C26
"Profile 122. Junction Maj-34_2 to Outfall Maj-57" C18_2
"Profile 123. Outfall Maj-59 to Junction Maj-58" C2

APPENDIX

C

Manhole Loss Coefficient Nomograph and Table

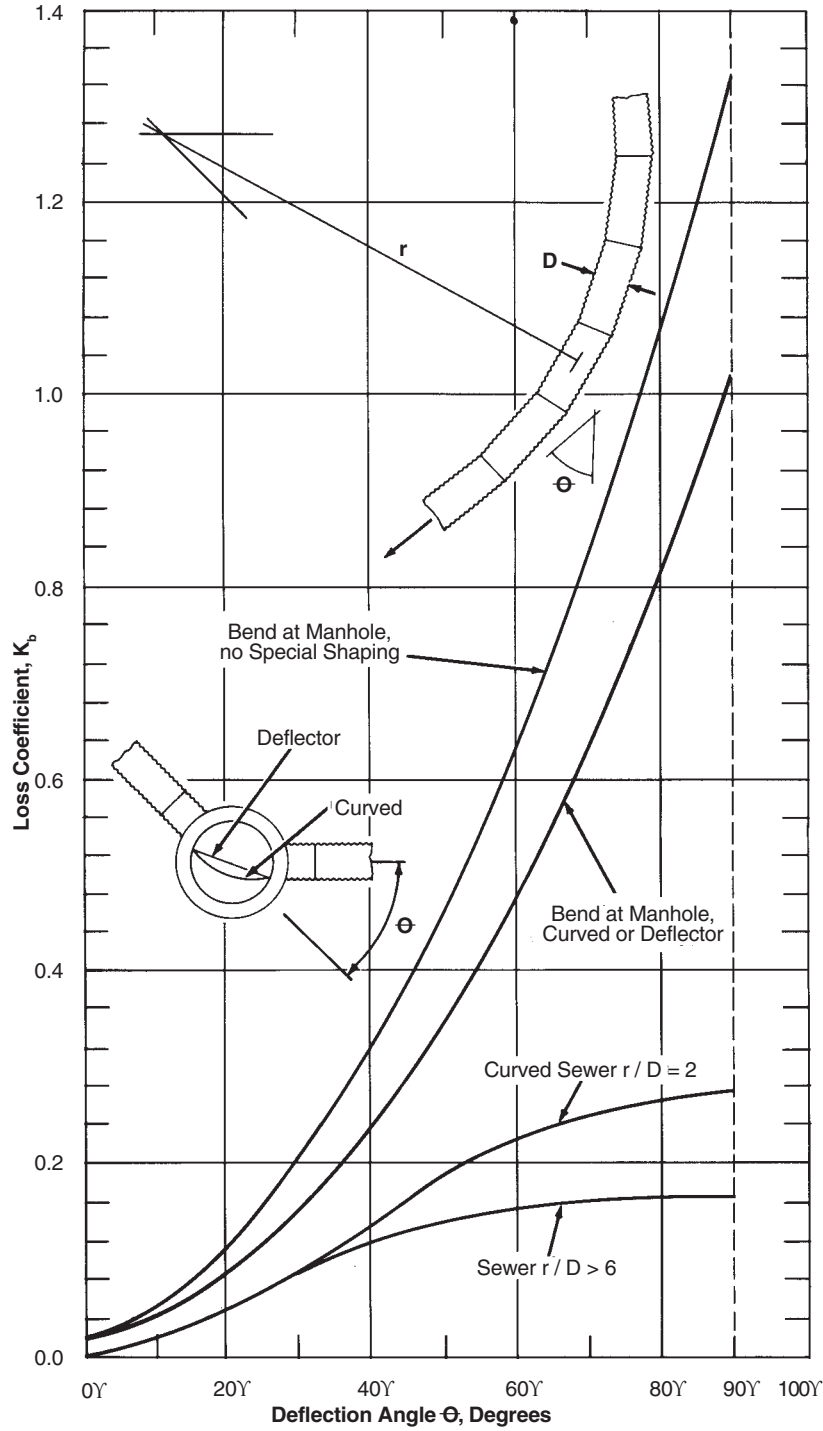
*Pipe Data and Hydraulic Simulation Results
(Ultimate and Interim Conditions)*

JFSA

Water Resources and
Environmental Consultants



MANHOLE LOSS COEFFICIENT NOMOGRAPH AND TABLE



Angle	Exit Loss
0	0.02
5	0.035
10	0.055
15	0.08
20	0.11
25	0.16
30	0.21
35	0.26
40	0.32
45	0.39
50	0.47
55	0.54
60	0.635
65	0.73
70	0.84
75	0.95
80	1.07
85	1.19
90	1.33

Figure 4.13 Sewer bend loss coefficient¹⁶

Table C-1A: Pipe Data and Hydraulic Simulation Results for the 100-Year, 3-Hour Chicago Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
102_(STM)	100_(STM)	81.610	81.598	1650	12.1	0.1	0.013	87.570	87.580	1.341	2.87	4.04	1.4	0.021	01:16	83.28	83.15	145	85.8	2.519			
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	87.570	1.348	2.88	4.04	1.4	0.110	01:15	83.44	83.28	139	85.7	2.257			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.11	0.8	-0.100	01:19	84.19	83.44	23	85.85	1.661			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.06	0.4	-0.170	01:17	84.20	84.19	28	86	1.804			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.06	1.4	0.080	01:16	84.57	84.20	26	86.1	1.534			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	3.76	1.3	0.260	01:14	83.81	83.44	18	85.95	2.136			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.30	1.2	-0.035	01:16	84.16	83.81	113	86.05	1.894			
116_(STM)	114_(STM)	83.801	83.741	450	11.9	0.5	0.013	88.174	88.000	1.271	0.20	0.23	1.1	0.020	01:15	84.27	84.16	108	86.5	2.229			
118_(STM)	116_(STM)	84.180	83.873	375	99.6	0.3	0.013	88.362	88.174	0.881	0.10	0.10	1.0	-0.015	01:19	84.54	84.27	104	86.35	1.810			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	3.40	1.3	0.350	01:14	84.66	83.81	9	86.1	1.436			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	3.30	1.2	0.400	01:14	84.79	84.66	46	86.35	1.564			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	3.30	0.9	0.440	01:14	84.92	84.79	49	86.5	1.576			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	3.30	1.2	0.600	01:14	85.22	84.92	3	86.5	1.276			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	3.24	1.2	0.700	01:14	85.52	85.22	56	86.7	1.180			
130_(STM)	128_(STM)	84.550	83.480	450	88.3	0.2	0.013	89.045	88.631	0.810	0.13	0.17	1.3	0.888	01:13	85.89	85.52	115	86.85	0.962			
132_(STM)	130_(STM)	84.720	84.642	375	37.4	0.2	0.013	89.181	89.045	0.726	0.08	0.11	1.4	0.939	01:13	86.03	85.89	122	87.3	1.266			
134_(STM)	132_(STM)	85.140	84.850	250	36.0	0.7	0.013	89.320	89.181	0.977	0.05	0.02	0.3	0.644	01:11	86.03	86.03	125	87.4	1.366			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	2.93	1.1	0.740	01:14	85.73	85.52	65	86.7	0.974			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	2.80	0.7	0.780	01:14	85.85	85.73	70	87.05	1.196			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	2.66	1.0	0.880	01:14	86.24	85.85	76	87.05	0.807			
142_(STM)	132_(STM)	85.197	84.850	250	53.4	0.6	0.013	89.160	89.181	0.976	0.05	0.05	1.1	1.050	01:13	86.50	86.03	113	87.35	0.853			
142_(STM)	140_(STM)	85.197	84.130	250	53.4	0.6	0.013	89.160	89.251	0.976	0.05	0.05	1.1	1.050	01:13	86.50	86.24	92	87.45	0.953			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	2.54	0.9	0.931	01:14	86.64	86.24	91	87.45	0.809			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.29	0.7	0.760	01:13	86.66	86.64	94	87.8	1.140			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	89.210	89.123	0.986	0.44	0.21	0.5	0.610	01:16	86.69	86.66	97	87.28	0.590			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	2.16	1.1	1.010	01:13	86.89	86.64	114	87.7	0.811			
152_(STM)	150_(STM)	85.562	84.829	525	59.4	0.4	0.013	90.000	89.798	1.175	0.25	0.21	0.8	0.925	01:28	87.01	86.89	115	87.9	0.888			
154_(STM)	152_(STM)	85.653	85.590	375	12.6	0.5	0.013	90.091	90.000	1.124	0.12	0.11	0.9	1.045	01:30	87.07	87.01	117	88.3	1.227			
156_(STM)	154_(STM)	86.028	85.680	375	100.7	0.3	0.013	89.939	90.091	0.934	0.10	0.11	1.0	1.005	01:29	87.41	87.07	118	88.2	0.792			
158_(STM)	150_(STM)	85.207	84.829	1050	108.0	0.4	0.013	90.066	89.798	1.866	1.62	1.79	1.1	1.380	01:13	87.64	86.89	103	88	0.363			
160_(STM)	158_(STM)	85.289	85.217	1050	14.3	0.5	0.013	90.162	90.066	2.239	1.94	1.69	0.9	1.430	01:13	87.77	87.64	106	88.4	0.631			
162_(STM)	160_(STM)	85.648	85.299	1050	106.3	0.3	0.013	90.303	90.162	1.806	1.56	1.69	1.1	1.580	01:13	88.28	87.77	107	88.4	0.122			
																		107	88.4	0.574	106.3	11.954	87.826
																		108	88.4	0.574	106.3	11.954	87.826
																		109	88.4	0.574	106.3	11.954	87.826

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-1B: Pipe Data and Hydraulic Simulation Results for the 100-Year, 24-Hour SCS Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
102_(STM)	100_(STM)	81.610	81.598	1650	12.1	0.1	0.013	87.570	87.580	1.341	2.87	3.89	1.4	0.031	12:03	83.29	83.17	145	85.8	2.509			
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	87.570	1.348	2.88	3.89	1.3	0.110	12:03	83.44	83.29	139	85.7	2.257			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.11	0.8	-0.110	12:04	84.18	83.44	23	85.85	1.671			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.05	0.4	-0.180	12:03	84.19	84.18	28	86	1.814			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.05	1.4	0.060	12:02	84.55	84.19	26	86.1	1.554			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	3.62	1.2	0.230	12:03	83.78	83.44	18	85.95	2.166			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.29	1.2	-0.055	12:02	84.14	83.78	113	86.05	1.914			
116_(STM)	114_(STM)	83.801	83.741	450	11.9	0.5	0.013	88.174	88.000	1.271	0.20	0.22	1.1	0.010	12:01	84.26	84.14	108	86.5	2.239			
118_(STM)	116_(STM)	84.180	83.873	375	99.6	0.3	0.013	88.362	88.174	0.881	0.10	0.10	1.0	-0.045	12:04	84.51	84.26	104	86.35	1.840			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	3.26	1.2	0.300	12:02	84.61	83.78	9	86.1	1.486			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	3.16	1.2	0.340	12:02	84.73	84.61	46	86.35	1.624			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	3.16	0.8	0.370	12:02	84.85	84.73	49	86.5	1.646			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	3.16	1.2	0.500	12:02	85.12	84.85	3	86.5	1.376			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	3.11	1.2	0.580	12:02	85.40	85.12	56	86.7	1.300			
130_(STM)	128_(STM)	84.550	83.480	450	88.3	0.2	0.013	89.045	88.631	0.810	0.13	0.16	1.3	0.748	12:01	85.75	85.40	115	86.85	1.102			
132_(STM)	130_(STM)	84.720	84.642	375	37.4	0.2	0.013	89.181	89.045	0.726	0.08	0.11	1.3	0.789	12:01	85.88	85.75	122	87.3	1.416			
134_(STM)	132_(STM)	85.140	84.850	250	36.0	0.7	0.013	89.320	89.181	0.977	0.05	0.02	0.3	0.494	12:10	85.88	85.88	125	87.4	1.516			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	2.81	1.1	0.600	12:02	85.59	85.40	65	86.7	1.114			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	2.68	0.7	0.620	12:02	85.69	85.59	70	87.05	1.356			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	2.56	1.0	0.680	12:02	86.04	85.69	76	87.05	1.007			
142_(STM)	132_(STM)	85.197	84.850	250	53.4	0.6	0.013	89.160	89.181	0.976	0.05	0.05	1.0	0.860	12:01	86.31	85.88	113	87.35	1.043			
142_(STM)	140_(STM)	85.197	84.130	250	53.4	0.6	0.013	89.160	89.251	0.976	0.05	0.05	1.0	0.860	12:01	86.31	86.04	92	87.45	1.143			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	2.43	0.8	0.691	12:02	86.40	86.04	91	87.45	1.049			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.27	0.6	0.550	12:09	86.45	86.40	94	87.8	1.350			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	89.210	89.123	0.986	0.44	0.22	0.5	0.400	12:07	86.48	86.45	97	87.28	0.800			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	2.06	1.1	0.750	12:02	86.63	86.40	114	87.7	1.071			
152_(STM)	150_(STM)	85.562	84.829	525	59.4	0.4	0.013	90.000	89.798	1.175	0.25	0.22	0.9	0.665	12:09	86.75	86.63	115	87.9	1.148			
154_(STM)	152_(STM)	85.653	85.590	375	12.6	0.5	0.013	90.091	90.000	1.124	0.12	0.11	0.9	0.785	12:11	86.81	86.75	117	88.3	1.487			
156_(STM)	154_(STM)	86.028	85.680	375	100.7	0.3	0.013	89.939	90.091	0.934	0.10	0.10	1.0	0.735	12:10	87.14	86.81	118	88.2	1.062			
158_(STM)	150_(STM)	85.207	84.829	1050	108.0	0.4	0.013	90.066	89.798	1.866	1.62	1.71	1.1	1.070	12:02	87.33	86.63	103	88	0.673			
160_(STM)	158_(STM)	85.289	85.217	1050	14.3	0.5	0.013	90.162	90.066	2.239	1.94	1.61	0.8	1.110	12:02	87.45	87.33	106	88.4	0.951			
162_(STM)	160_(STM)	85.648	85.299	1050	106.3	0.3	0.013	90.303	90.162	1.806	1.56	1.61	1.0	1.210	12:02	87.91	87.45	107	88.4	0.492			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-1C: Pipe Data and Hydraulic Simulation Results for the Historical July 1, 1979 Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S ⁽¹⁾ (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard ⁽²⁾ (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
102_(STM)	100_(STM)	81.610	81.598	1650	12.1	0.1	0.013	87.570	87.580	1.341	2.87	3.71	1.3	-0.039	01:36	83.22	83.13	145	85.8	2.579			
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	87.570	1.348	2.88	3.71	1.3	0.020	01:36	83.35	83.22	139	85.7	2.347			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.10	0.7	-0.120	01:37	84.17	83.35	23	85.85	1.681			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.05	0.3	-0.190	01:35	84.18	84.17	28	86	1.824			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.05	1.2	0.000	01:34	84.49	84.18	26	86.1	1.614			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	3.46	1.2	0.110	01:36	83.66	83.35	18	85.95	2.286			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.29	1.1	-0.065	01:36	84.13	83.66	113	86.05	1.924			
116_(STM)	114_(STM)	83.801	83.741	450	11.9	0.5	0.013	88.174	88.000	1.271	0.20	0.21	1.1	-0.010	01:35	84.24	84.13	108	86.5	2.259			
118_(STM)	116_(STM)	84.180	83.873	375	99.6	0.3	0.013	88.362	88.174	0.881	0.10	0.09	1.0	-0.065	01:39	84.49	84.24	104	86.35	1.860			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	3.08	1.2	0.210	01:36	84.52	83.66	9	86.1	1.576			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	2.98	1.1	0.240	01:36	84.63	84.52	46	86.35	1.724			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	2.98	0.8	0.250	01:36	84.73	84.63	49	86.5	1.766			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	2.98	1.1	0.350	01:36	84.97	84.73	3	86.5	1.526			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	2.93	1.1	0.380	01:36	85.20	84.97	56	86.7	1.500			
130_(STM)	128_(STM)	84.550	83.480	450	88.3	0.2	0.013	89.045	88.631	0.810	0.13	0.16	1.2	0.518	01:35	85.52	85.20	115	86.85	1.332			
132_(STM)	130_(STM)	84.720	84.642	375	37.4	0.2	0.013	89.181	89.045	0.726	0.08	0.10	1.3	0.549	01:35	85.64	85.52	122	87.3	1.656			
134_(STM)	132_(STM)	85.140	84.850	250	36.0	0.7	0.013	89.320	89.181	0.977	0.05	0.01	0.2	0.254	01:30	85.64	85.64	125	87.4	1.756			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	2.65	1.0	0.380	01:36	85.37	85.20	65	86.7	1.334			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	2.53	0.7	0.380	01:36	85.45	85.37	70	87.05	1.596			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	2.41	0.9	0.390	01:36	85.75	85.45	76	87.05	1.297			
142_(STM)	132_(STM)	85.197	84.850	250	53.4	0.6	0.013	89.160	89.181	0.976	0.05	0.04	0.9	0.520	01:22	85.97	85.64	113	87.35	1.383			
142_(STM)	140_(STM)	85.197	84.130	250	53.4	0.6	0.013	89.160	89.251	0.976	0.05	0.04	0.9	0.520	01:22	85.97	85.75	92	87.45	1.483			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	2.29	0.8	0.361	01:36	86.07	85.75	91	87.45	1.379			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.27	0.6	0.200	01:44	86.10	86.07	94	87.8	1.700			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	89.210	89.123	0.986	0.44	0.22	0.5	0.150	01:43	86.23	86.10	97	87.28	1.050			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.97	1.0	0.410	01:36	86.29	86.07	114	87.7	1.411			
152_(STM)	150_(STM)	85.562	84.829	525	59.4	0.4	0.013	90.000	89.798	1.175	0.25	0.21	0.8	0.315	01:43	86.40	86.29	115	87.9	1.498			
154_(STM)	152_(STM)	85.653	85.590	375	12.6	0.5	0.013	90.091	90.000	1.124	0.12	0.10	0.8	0.435	01:45	86.46	86.40	117	88.3	1.837			
156_(STM)	154_(STM)	86.028	85.680	375	100.7	0.3	0.013	89.939	90.091	0.934	0.10	0.10	1.0	0.385	01:32	86.79	86.46	118	88.2	1.412			
158_(STM)	150_(STM)	85.207	84.829	1050	108.0	0.4	0.013	90.066	89.798	1.866	1.62	1.66	1.0	0.720	01:30	86.98	86.29	103	88	1.023			
160_(STM)	158_(STM)	85.289	85.217	1050	14.3	0.5	0.013	90.162	90.066	2.239	1.94	1.56	0.8	0.750	01:36	87.09	86.98	106	88.4	1.311			
162_(STM)	160_(STM)	85.648	85.299	1050	106.3	0.3	0.013	90.303	90.162	1.806	1.56	1.56	1.0	0.860	01:36	87.56	87.09	107	88.4	0.842			

⁽²⁾ Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

⁽³⁾ Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-1D: Pipe Data and Hydraulic Simulation Results for the Historical August 4, 1988 Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
102_(STM)	100_(STM)	81.610	81.598	1650	12.1	0.1	0.013	87.570	87.580	1.341	2.87	3.45	1.2	0.071	02:06	83.33	83.25	145	85.8	2.469			
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	87.570	1.348	2.88	3.45	1.2	0.120	02:04	83.45	83.33	139	85.7	2.247			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.10	0.7	-0.130	02:06	84.16	83.45	23	85.85	1.691			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.04	0.3	-0.200	02:05	84.17	84.16	28	86	1.834			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.04	1.1	-0.020	02:04	84.47	84.17	26	86.1	1.634			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	3.23	1.1	0.160	02:06	83.71	83.45	18	85.95	2.236			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.28	1.1	-0.075	02:05	84.12	83.71	113	86.05	1.934			
116_(STM)	114_(STM)	83.801	83.741	450	11.9	0.5	0.013	88.174	88.000	1.271	0.20	0.21	1.0	-0.020	02:04	84.23	84.12	108	86.5	2.269			
118_(STM)	116_(STM)	84.180	83.873	375	99.6	0.3	0.013	88.362	88.174	0.881	0.10	0.09	1.0	-0.065	02:02	84.49	84.23	104	86.35	1.860			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.89	1.1	0.120	02:06	84.43	83.71	9	86.1	1.666			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	2.79	1.0	0.140	02:06	84.53	84.43	46	86.35	1.824			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	2.79	0.7	0.140	02:06	84.62	84.53	49	86.5	1.876			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	2.79	1.0	0.210	02:06	84.83	84.62	3	86.5	1.666			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	2.73	1.0	0.230	02:06	85.05	84.83	56	86.7	1.650			
130_(STM)	128_(STM)	84.550	83.480	450	88.3	0.2	0.013	89.045	88.631	0.810	0.13	0.15	1.2	0.358	02:00	85.36	85.05	115	86.85	1.492			
132_(STM)	130_(STM)	84.720	84.642	375	37.4	0.2	0.013	89.181	89.045	0.726	0.08	0.10	1.2	0.379	02:00	85.47	85.36	122	87.3	1.826			
134_(STM)	132_(STM)	85.140	84.850	250	36.0	0.7	0.013	89.320	89.181	0.977	0.05	0.02	0.3	0.084	02:08	85.47	85.47	125	87.4	1.926			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	2.47	0.9	0.210	02:06	85.20	85.05	65	86.7	1.504			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	2.35	0.6	0.200	02:06	85.27	85.20	70	87.05	1.776			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	2.25	0.8	0.180	02:09	85.54	85.27	76	87.05	1.507			
142_(STM)	132_(STM)	85.197	84.850	250	53.4	0.6	0.013	89.160	89.181	0.976	0.05	0.04	0.9	0.300	01:53	85.75	85.47	113	87.35	1.603			
142_(STM)	140_(STM)	85.197	84.130	250	53.4	0.6	0.013	89.160	89.251	0.976	0.05	0.04	0.9	0.300	01:53	85.75	85.54	92	87.45	1.703			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	2.23	0.8	0.091	02:02	85.80	85.54	91	87.45	1.649			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.26	0.6	-0.070	02:08	85.83	85.80	94	87.8	1.970			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	89.210	89.123	0.986	0.44	0.22	0.5	-0.220	02:07	85.86	85.83	97	87.28	1.420			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.98	1.0	0.100	02:03	85.98	85.80	114	87.7	1.721			
152_(STM)	150_(STM)	85.562	84.829	525	59.4	0.4	0.013	90.000	89.798	1.175	0.25	0.21	0.8	-0.025	02:07	86.06	85.98	115	87.9	1.838			
154_(STM)	152_(STM)	85.653	85.590	375	12.6	0.5	0.013	90.091	90.000	1.124	0.12	0.11	0.8	0.085	02:08	86.11	86.06	117	88.3	2.187			
156_(STM)	154_(STM)	86.028	85.680	375	100.7	0.3	0.013	89.939	90.091	0.934	0.10	0.10	1.0	-0.015	02:04	86.39	86.11	118	88.2	1.812			
158_(STM)	150_(STM)	85.207	84.829	1050	108.0	0.4	0.013	90.066	89.798	1.866	1.62	1.67	1.0	0.340	02:02	86.60	85.98	103	88	1.403			
160_(STM)	158_(STM)	85.289	85.217	1050	14.3	0.5	0.013	90.162	90.066	2.239	1.94	1.57	0.8	0.360	02:03	86.70	86.60	106	88.4	1.701			
162_(STM)	160_(STM)	85.648	85.299	1050	106.3	0.3	0.013	90.303	90.162	1.806	1.56	1.57	1.0	0.400	02:03	87.10	86.70	107	88.4	1.302			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-1E: Pipe Data and Hydraulic Simulation Results for the Historical August 8, 1996 Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
102_(STM)	100_(STM)	81.610	81.598	1650	12.1	0.1	0.013	87.570	87.580	1.341	2.87	3.24	1.1	-0.239	01:34	83.02	82.94	145	85.8	2.779			
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	87.570	1.348	2.88	3.23	1.1	-0.180	01:34	83.15	83.02	139	85.7	2.547			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.08	0.6	-0.170	01:34	84.12	83.15	23	85.85	1.731			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.03	0.2	-0.240	01:37	84.13	84.12	28	86	1.874			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.03	0.8	-0.090	01:34	84.40	84.13	26	86.1	1.704			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	3.02	1.0	-0.180	01:34	83.37	83.15	18	85.95	2.576			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.26	1.0	-0.105	01:33	84.09	83.37	113	86.05	1.964			
116_(STM)	114_(STM)	83.801	83.741	450	11.9	0.5	0.013	88.174	88.000	1.271	0.20	0.19	0.9	-0.070	01:33	84.18	84.09	108	86.5	2.319			
118_(STM)	116_(STM)	84.180	83.873	375	99.6	0.3	0.013	88.362	88.174	0.881	0.10	0.09	1.0	-0.065	01:28	84.49	84.18	104	86.35	1.860			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.71	1.0	0.040	01:34	84.35	83.37	9	86.1	1.746			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	2.61	1.0	0.050	01:34	84.44	84.35	46	86.35	1.914			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	2.61	0.7	0.030	01:34	84.51	84.44	49	86.5	1.986			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	2.61	1.0	0.070	01:34	84.69	84.51	3	86.5	1.806			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	2.56	1.0	0.060	01:34	84.88	84.69	56	86.7	1.820			
130_(STM)	128_(STM)	84.550	83.480	450	88.3	0.2	0.013	89.045	88.631	0.810	0.13	0.15	1.2	0.148	01:31	85.15	84.88	115	86.85	1.702			
132_(STM)	130_(STM)	84.720	84.642	375	37.4	0.2	0.013	89.181	89.045	0.726	0.08	0.10	1.2	0.149	01:31	85.24	85.15	122	87.3	2.056			
134_(STM)	132_(STM)	85.140	84.850	250	36.0	0.7	0.013	89.320	89.181	0.977	0.05	0.01	0.2	-0.126	01:34	85.26	85.24	125	87.4	2.136			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	2.36	0.9	0.010	01:36	85.00	84.88	65	86.7	1.704			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	2.26	0.6	0.000	01:36	85.07	85.00	70	87.05	1.976			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	2.20	0.8	-0.080	01:31	85.28	85.07	76	87.05	1.767			
142_(STM)	132_(STM)	85.197	84.850	250	53.4	0.6	0.013	89.160	89.181	0.976	0.05	0.05	0.9	0.030	01:25	85.48	85.24	113	87.35	1.873			
142_(STM)	140_(STM)	85.197	84.130	250	53.4	0.6	0.013	89.160	89.251	0.976	0.05	0.05	0.9	0.030	01:25	85.48	85.28	92	87.45	1.973			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	2.15	0.7	-0.159	01:31	85.55	85.28	91	87.45	1.899			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.17	0.4	-0.310	01:33	85.59	85.55	94	87.8	2.210			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	89.210	89.123	0.986	0.44	0.17	0.4	-0.410	01:34	85.67	85.59	97	87.28	1.610			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.91	1.0	-0.180	01:30	85.70	85.55	114	87.7	2.001			
152_(STM)	150_(STM)	85.562	84.829	525	59.4	0.4	0.013	90.000	89.798	1.175	0.25	0.19	0.7	-0.185	01:31	85.90	85.70	115	87.9	1.998			
154_(STM)	152_(STM)	85.653	85.590	375	12.6	0.5	0.013	90.091	90.000	1.124	0.12	0.10	0.8	-0.065	01:29	85.96	85.90	117	88.3	2.337			
156_(STM)	154_(STM)	86.028	85.680	375	100.7	0.3	0.013	89.939	90.091	0.934	0.10	0.10	0.9	-0.065	01:29	86.34	85.96	118	88.2	1.862			
158_(STM)	150_(STM)	85.207	84.829	1050	108.0	0.4	0.013	90.066	89.798	1.866	1.62	1.62	1.0	0.090	01:30	86.35	85.70	103	88	1.653			
160_(STM)	158_(STM)	85.289	85.217	1050	14.3	0.5	0.013	90.162	90.066	2.239	1.94	1.52	0.8	0.110	01:30	86.45	86.35	106	88.4	1.951			
162_(STM)	160_(STM)	85.648	85.299	1050	106.3	0.3	0.013	90.303	90.162	1.806	1.56	1.52	1.0	0.150	01:30	86.85	86.45	107	88.4	1.552			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-1F: Pipe Data and Hydraulic Simulation Results for the 100-Year, 3-Hour Chicago Storm + 20%

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m ³ /s)	Peak Pipe Flow (m ³ /s)	Peak / Design Flow	Surcharge U/S ⁽¹⁾ (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard ⁽²⁾ (m)	Interpolated HGL					
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)			
102_(STM)	100_(STM)	81.610	81.598	1650	12.1	0.1	0.013	87.570	87.580	1.341	2.87	4.30	1.5	0.261	01:13	83.52	83.46	145	85.8	2.279						
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	87.570	1.348	2.88	4.30	1.5	0.370	01:13	83.70	83.52	139	85.7	1.997						
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.12	0.8	-0.080	01:19	84.21	83.70	23	85.85	1.641						
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.06	0.4	-0.150	01:17	84.22	84.21	28	86	1.784						
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.06	1.6	0.140	01:16	84.63	84.22	26	86.1	1.474						
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	3.99	1.4	0.560	01:12	84.11	83.70	18	85.95	1.836						
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.32	1.2	0.265	01:16	84.46	84.11	113	86.05	1.594						
116_(STM)	114_(STM)	83.801	83.741	450	11.9	0.5	0.013	88.174	88.000	1.271	0.20	0.24	1.2	0.330	01:16	84.58	84.46	108	86.5	1.919						
118_(STM)	116_(STM)	84.180	83.873	375	99.6	0.3	0.013	88.362	88.174	0.881	0.10	0.10	1.0	0.345	01:29	84.90	84.58	104	86.35	1.450						
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	3.59	1.3	0.620	01:12	84.93	84.11	9	86.1	1.166						
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	3.49	1.3	0.680	01:12	85.07	84.93	46	86.35	1.284						
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	3.49	0.9	0.730	01:12	85.21	85.07	49	86.5	1.286						
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	3.49	1.3	0.910	01:12	85.53	85.21	3	86.5	0.966						
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	3.43	1.3	1.030	01:12	85.85	85.53	56	86.7	0.850						
130_(STM)	128_(STM)	84.550	83.480	450	88.3	0.2	0.013	89.045	88.631	0.810	0.13	0.17	1.3	1.238	01:11	86.24	85.85	115	86.85	0.612						
132_(STM)	130_(STM)	84.720	84.642	375	37.4	0.2	0.013	89.181	89.045	0.726	0.08	0.11	1.4	1.289	01:11	86.38	86.24	122	87.3	0.916						
134_(STM)	132_(STM)	85.140	84.850	250	36.0	0.7	0.013	89.320	89.181	0.977	0.05	0.02	0.4	0.994	01:10	86.38	86.38	125	87.4	1.016						
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	3.08	1.2	1.080	01:12	86.07	85.85	65	86.7	0.634						
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	2.95	0.8	1.120	01:12	86.19	86.07	70	87.05	0.856						
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	2.79	1.0	1.220	01:12	86.58	86.19	76	87.05	0.467						
142_(STM)	132_(STM)	85.197	84.850	250	53.4	0.6	0.013	89.160	89.181	0.976	0.05	0.06	1.1	1.450	01:11	86.90	86.38	113	87.35	0.453						
142_(STM)	140_(STM)	85.197	84.130	250	53.4	0.6	0.013	89.160	89.251	0.976	0.05	0.06	1.1	1.450	01:11	86.90	86.58	92	87.45	0.553						
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	2.66	0.9	1.291	01:12	87.00	86.58	91	87.45	0.449						
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.27	0.6	1.140	01:11	87.04	87.00	94	87.8	0.760						
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	89.210	89.123	0.986	0.44	0.33	0.8	0.990	01:11	87.07	87.04	97	87.28	0.210						
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	2.31	1.2	1.380	01:11	87.26	87.00	114	87.7	0.441						
152_(STM)	150_(STM)	85.562	84.829	525	59.4	0.4	0.013	90.000	89.798	1.175	0.25	0.21	0.8	1.295	01:36	87.38	87.26	115	87.9	0.518						
154_(STM)	152_(STM)	85.653	85.590	375	12.6	0.5	0.013	90.091	90.000	1.124	0.12	0.11	0.9	1.415	01:37	87.44	87.38	117	88.3	0.857						
156_(STM)	154_(STM)	86.028	85.680	375	100.7	0.3	0.013	89.939	90.091	0.934	0.10	0.11	1.0	1.385	01:36	87.79	87.44	118	88.2	0.412						
158_(STM)	150_(STM)	85.207	84.829	1050	108.0	0.4	0.013	90.066	89.798	1.866	1.62	1.88	1.2	1.780	01:11	88.04	87.26	103	88	-0.037						
																		103	88	0.661	108.0	11.099	87.339			
																		110	88	0.661	108.0	11.099	87.339			
																		104	88.1	0.761	108.0	11.099	87.339			
																		111	88.15	0.811	108.0	11.099	87.339			
																		112	88.3	0.961	108.0	11.099	87.339			
																		105	88.3	0.961	108.0	11.099	87.339			
160_(STM)	158_(STM)	85.289	85.217	1050	14.3	0.5	0.013	90.162	90.066	2.239	1.94	1.78	0.9	1.830	01:11	88.17	88.04	106	88.4	0.231						
162_(STM)	160_(STM)	85.648	85.299	1050	106.3	0.3	0.013	90.303	90.162	1.806	1.56	1.78	1.1	2.000	01:11	88.70	88.17	107	88.4	-0.298						
																		107	88.4	0.171	106.3	11.954	88.229			
																		108	88.4	0.171	106.3	11.954	88.229			
																		109	88.4	0.171	106.3	11.954	88.229			

⁽²⁾ Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

⁽³⁾ Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

 Interpolated HGL elevation
 Freeboard Less than 0.3m
 Freeboard Less than 0.0m

Table C-2A: Pipe Data and Hydraulic Simulation Results for the Interim Condition 100-Year, 3-Hour Chicago Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	67.400	1.348	2.88	2.48	0.9	-0.430	01:19	82.90	82.79	139	85.7	2.797			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.11	0.8	-0.100	01:19	84.19	82.90	23	85.85	1.661			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.06	0.4	-0.170	01:17	84.20	84.19	28	86	1.804			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.06	1.4	0.080	01:16	84.57	84.20	26	86.1	1.534			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	2.28	0.8	-0.440	01:18	83.11	82.90	18	85.95	2.836			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.08	0.3	-0.325	01:13	83.87	83.11	113	86.05	2.184			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.12	0.8	-0.210	01:18	84.10	83.11	9	86.1	1.996			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	2.02	0.8	-0.230	01:17	84.16	84.10	46	86.35	2.194			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	2.03	0.5	-0.280	01:17	84.20	84.16	49	86.5	2.296			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	2.03	0.8	-0.290	01:17	84.33	84.20	3	86.5	2.166			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	1.98	0.7	-0.380	01:16	84.44	84.33	56	86.7	2.260			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	1.81	0.7	-0.450	01:16	84.54	84.44	65	86.7	2.164			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	1.69	0.4	-0.460	01:16	84.61	84.54	70	87.05	2.436			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	1.55	0.6	-0.520	01:15	84.84	84.61	76	87.05	2.207			
142_(STM)	140_(STM)	85.244	84.130	250	20.7	0.6	0.013	89.160	89.251	0.975	0.05	0.07	1.4	0.223	01:11	85.72	84.84	92	87.45	1.733			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	1.42	0.5	-0.499	01:15	85.21	84.84	91	87.45	2.239			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.19	0.4	-0.360	01:13	85.54	85.21	94	87.8	2.260			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	88.492	89.123	0.986	0.44	0.17	0.4	-0.420	01:12	85.66	85.54	97	87.28	1.620			

(1) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-2B: Pipe Data and Hydraulic Simulation Results for the Interim Condition 100-Year, 24-Hour SCS Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	67.400	1.348	2.88	2.41	0.8	-0.460	12:05	82.87	82.76	139	85.7	2.827			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.11	0.8	-0.110	12:04	84.18	82.87	23	85.85	1.671			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.05	0.4	-0.180	12:03	84.19	84.18	28	86	1.814			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.05	1.4	0.060	12:02	84.55	84.19	26	86.1	1.554			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	2.22	0.8	-0.460	12:05	83.09	82.87	18	85.95	2.856			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.08	0.3	-0.325	12:02	83.87	83.09	113	86.05	2.184			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.05	0.8	-0.230	12:05	84.08	83.09	9	86.1	2.016			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	1.96	0.7	-0.260	12:04	84.13	84.08	46	86.35	2.224			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	1.96	0.5	-0.310	12:04	84.17	84.13	49	86.5	2.326			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	1.96	0.7	-0.320	12:04	84.30	84.17	3	86.5	2.196			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	1.91	0.7	-0.410	12:04	84.41	84.30	56	86.7	2.290			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	1.75	0.7	-0.480	12:03	84.51	84.41	65	86.7	2.194			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	1.63	0.4	-0.480	12:03	84.59	84.51	70	87.05	2.456			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	1.51	0.6	-0.540	12:03	84.82	84.59	76	87.05	2.227			
142_(STM)	132_(STM)	85.244	#N/A	250	20.7	0.6	0.013	89.160	#N/A	0.975	0.05	0.06	1.3	0.163	12:00	85.66	#N/A	113	87.35	1.693			
142_(STM)	140_(STM)	85.244	84.130	250	20.7	0.6	0.013	89.160	89.251	0.975	0.05	0.06	1.3	0.163	12:00	85.66	84.82	92	87.45	1.793			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	1.38	0.5	-0.519	12:03	85.19	84.82	91	87.45	2.259			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.18	0.4	-0.370	12:02	85.53	85.19	94	87.8	2.270			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	88.492	89.123	0.986	0.44	0.17	0.4	-0.420	12:01	85.66	85.53	97	87.28	1.620			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.11	0.6	-0.530	12:03	85.35	85.19	114	87.7	2.351			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-2C: Pipe Data and Hydraulic Simulation Results for the Interim Condition Historical July 1, 1979 Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	67.400	1.348	2.88	2.42	0.8	-0.450	01:39	82.88	82.77	139	85.7	2.817			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.10	0.7	-0.120	01:37	84.17	82.88	23	85.85	1.681			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.05	0.3	-0.190	01:35	84.18	84.17	28	86	1.824			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.05	1.2	0.000	01:34	84.49	84.18	26	86.1	1.614			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	2.23	0.8	-0.460	01:39	83.09	82.88	18	85.95	2.856			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.08	0.3	-0.325	01:40	83.87	83.09	113	86.05	2.184			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.06	0.8	-0.230	01:39	84.08	83.09	9	86.1	2.016			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	1.97	0.7	-0.260	01:38	84.13	84.08	46	86.35	2.224			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	1.97	0.5	-0.310	01:38	84.17	84.13	49	86.5	2.326			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	1.97	0.7	-0.320	01:37	84.30	84.17	3	86.5	2.196			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	1.92	0.7	-0.410	01:37	84.41	84.30	56	86.7	2.290			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	1.77	0.7	-0.470	01:37	84.52	84.41	65	86.7	2.184			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	1.65	0.4	-0.470	01:37	84.60	84.52	70	87.05	2.446			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	1.54	0.6	-0.530	01:36	84.83	84.60	76	87.05	2.217			
142_(STM)	132_(STM)	85.244	#N/A	250	20.7	0.6	0.013	89.160	#N/A	0.975	0.05	0.05	1.0	0.053	01:32	85.55	#N/A	113	87.35	1.803			
142_(STM)	140_(STM)	85.244	84.130	250	20.7	0.6	0.013	89.160	89.251	0.975	0.05	0.05	1.0	0.053	01:32	85.55	84.83	92	87.45	1.903			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	1.42	0.5	-0.499	01:36	85.21	84.83	91	87.45	2.239			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.17	0.4	-0.380	01:33	85.52	85.21	94	87.8	2.280			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	88.492	89.123	0.986	0.44	0.16	0.4	-0.430	01:32	85.65	85.52	97	87.28	1.630			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.16	0.6	-0.510	01:35	85.37	85.21	114	87.7	2.331			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-2D: Pipe Data and Hydraulic Simulation Results for the Interim Condition Historical August 4, 1988 Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	67.400	1.348	2.88	2.39	0.8	-0.460	02:07	82.87	82.76	139	85.7	2.827			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.10	0.7	-0.130	02:06	84.16	82.87	23	85.85	1.691			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.04	0.3	-0.200	02:05	84.17	84.16	28	86	1.834			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.04	1.1	-0.020	02:04	84.47	84.17	26	86.1	1.634			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	2.21	0.8	-0.470	02:07	83.08	82.87	18	85.95	2.866			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.08	0.3	-0.325	02:02	83.87	83.08	113	86.05	2.184			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.05	0.8	-0.240	02:07	84.07	83.08	9	86.1	2.026			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	1.95	0.7	-0.270	02:06	84.12	84.07	46	86.35	2.234			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	1.95	0.5	-0.310	02:06	84.17	84.12	49	86.5	2.326			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	1.96	0.7	-0.330	02:05	84.29	84.17	3	86.5	2.206			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	1.91	0.7	-0.410	02:05	84.41	84.29	56	86.7	2.290			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	1.77	0.7	-0.480	02:04	84.51	84.41	65	86.7	2.194			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	1.65	0.4	-0.480	02:04	84.59	84.51	70	87.05	2.456			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	1.54	0.6	-0.530	02:03	84.83	84.59	76	87.05	2.217			
142_(STM)	132_(STM)	85.244	#N/A	250	20.7	0.6	0.013	89.160	#N/A	0.975	0.05	0.05	1.1	0.063	02:02	85.56	#N/A	113	87.35	1.793			
142_(STM)	140_(STM)	85.244	84.130	250	20.7	0.6	0.013	89.160	89.251	0.975	0.05	0.05	1.1	0.063	02:02	85.56	84.83	92	87.45	1.893			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	1.43	0.5	-0.499	02:03	85.21	84.83	91	87.45	2.239			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.17	0.4	-0.380	02:03	85.52	85.21	94	87.8	2.280			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	88.492	89.123	0.986	0.44	0.16	0.4	-0.430	02:01	85.65	85.52	97	87.28	1.630			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.16	0.6	-0.510	02:03	85.37	85.21	114	87.7	2.331			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-2E: Pipe Data and Hydraulic Simulation Results for the Interim Condition Historical August 8, 1996 Storm

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	67.400	1.348	2.88	2.18	0.8	-0.530	01:34	82.80	82.69	139	85.7	2.897			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.08	0.6	-0.170	01:34	84.12	82.80	23	85.85	1.731			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.03	0.2	-0.240	01:37	84.13	84.12	28	86	1.874			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.03	0.8	-0.090	01:34	84.40	84.13	26	86.1	1.704			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	2.01	0.7	-0.520	01:34	83.03	82.80	18	85.95	2.916			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.07	0.3	-0.335	01:31	83.86	83.03	113	86.05	2.194			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	1.86	0.7	-0.310	01:34	84.00	83.03	9	86.1	2.096			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	1.77	0.7	-0.340	01:33	84.05	84.00	46	86.35	2.304			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	1.77	0.5	-0.390	01:33	84.09	84.05	49	86.5	2.406			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	1.78	0.7	-0.410	01:33	84.21	84.09	3	86.5	2.286			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	1.73	0.6	-0.490	01:32	84.33	84.21	56	86.7	2.370			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	1.60	0.6	-0.550	01:32	84.44	84.33	65	86.7	2.264			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	1.50	0.4	-0.540	01:33	84.53	84.44	70	87.05	2.516			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	1.41	0.5	-0.580	01:32	84.78	84.53	76	87.05	2.267			
142_(STM)	132_(STM)	85.244	#N/A	250	20.7	0.6	0.013	89.160	#N/A	0.975	0.05	0.04	0.8	-0.037	01:30	85.46	#N/A	113	87.35	1.893			
142_(STM)	140_(STM)	85.244	84.130	250	20.7	0.6	0.013	89.160	89.251	0.975	0.05	0.04	0.8	-0.037	01:30	85.46	84.78	92	87.45	1.993			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	1.31	0.5	-0.549	01:31	85.16	84.78	91	87.45	2.289			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.16	0.4	-0.390	01:32	85.51	85.16	94	87.8	2.290			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	88.492	89.123	0.986	0.44	0.16	0.4	-0.440	01:31	85.64	85.51	97	87.28	1.640			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.08	0.6	-0.550	01:32	85.33	85.16	114	87.7	2.371			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

Table C-2F: Pipe Data and Hydraulic Simulation Results for the Interim Condition 100-Year, 3-Hour Chicago Storm + 20%

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Time to Peak (hh:mm)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	USF (m)	Freeboard (2) (m)	Interpolated HGL		
																					Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
104_(STM)	102_(STM)	81.683	81.641	1650	41.9	0.1	0.013	87.617	67.400	1.348	2.88	2.62	0.9	-0.390	01:19	82.94	82.83	139	85.7	2.757			
106_(STM)	104_(STM)	83.839	81.983	450	97.6	0.3	0.013	87.663	87.617	0.896	0.14	0.12	0.8	-0.080	01:19	84.21	82.94	23	85.85	1.641			
108_(STM)	106_(STM)	83.916	83.850	450	26.2	0.3	0.013	87.503	87.663	0.900	0.14	0.06	0.4	-0.150	01:17	84.22	84.21	28	86	1.784			
110_(STM)	108_(STM)	84.236	84.114	250	29.1	0.4	0.013	87.749	87.503	0.784	0.04	0.06	1.6	0.140	01:16	84.63	84.22	26	86.1	1.474			
112_(STM)	104_(STM)	82.204	81.983	1350	73.8	0.3	0.013	87.915	87.617	2.039	2.92	2.40	0.8	-0.400	01:18	83.15	82.94	18	85.95	2.796			
114_(STM)	112_(STM)	83.666	82.735	525	64.6	0.4	0.013	88.000	87.915	1.175	0.25	0.08	0.3	-0.325	01:12	83.87	83.15	113	86.05	2.184			
120_(STM)	112_(STM)	82.964	82.735	1350	91.6	0.3	0.013	88.076	87.915	1.864	2.67	2.23	0.8	-0.160	01:18	84.15	83.15	9	86.1	1.946			
122_(STM)	120_(STM)	83.036	82.974	1350	24.6	0.3	0.013	88.231	88.076	1.872	2.68	2.14	0.8	-0.180	01:18	84.21	84.15	46	86.35	2.144			
124_(STM)	122_(STM)	83.134	83.050	1350	16.9	0.5	0.013	88.195	88.231	2.631	3.77	2.14	0.6	-0.230	01:17	84.25	84.21	49	86.5	2.246			
126_(STM)	124_(STM)	83.274	83.140	1350	53.4	0.3	0.013	88.465	88.195	1.868	2.67	2.14	0.8	-0.240	01:17	84.38	84.25	3	86.5	2.116			
128_(STM)	126_(STM)	83.470	83.280	1350	76.0	0.3	0.013	88.631	88.465	1.864	2.67	2.09	0.8	-0.330	01:16	84.49	84.38	56	86.7	2.210			
136_(STM)	128_(STM)	83.636	83.480	1350	62.5	0.3	0.013	88.646	88.631	1.864	2.67	1.90	0.7	-0.400	01:17	84.59	84.49	65	86.7	2.114			
138_(STM)	136_(STM)	83.724	83.650	1350	14.8	0.5	0.013	88.773	88.646	2.639	3.78	1.78	0.5	-0.410	01:17	84.66	84.59	70	87.05	2.386			
140_(STM)	138_(STM)	84.013	83.730	1350	113.1	0.3	0.013	89.251	88.773	1.864	2.67	1.61	0.6	-0.490	01:16	84.87	84.66	76	87.05	2.177			
142_(STM)	132_(STM)	85.244	#N/A	250	20.7	0.6	0.013	89.160	#N/A	0.975	0.05	0.07	1.5	0.303	01:10	85.80	#N/A	113	87.35	1.553			
142_(STM)	140_(STM)	85.244	84.130	250	20.7	0.6	0.013	89.160	89.251	0.975	0.05	0.07	1.5	0.303	01:10	85.80	84.87	92	87.45	1.653			
144_(STM)	140_(STM)	84.360	84.130	1350	77.3	0.3	0.013	89.454	89.251	2.032	2.91	1.48	0.5	-0.469	01:15	85.24	84.87	91	87.45	2.209			
146_(STM)	144_(STM)	85.150	85.030	750	78.7	0.2	0.013	89.123	89.454	0.986	0.44	0.20	0.5	-0.340	01:13	85.56	85.24	94	87.8	2.240			
148_(STM)	146_(STM)	85.330	85.210	750	78.5	0.2	0.013	88.492	89.123	0.986	0.44	0.19	0.4	-0.410	01:11	85.67	85.56	97	87.28	1.610			
150_(STM)	144_(STM)	84.679	85.030	1200	76.3	0.2	0.013	89.798	89.454	1.717	1.94	1.18	0.6	-0.500	01:14	85.38	85.24	114	87.7	2.321			

(2) Conservative estimate of freeboard based on U/S HGL and lowest USF connected to pipe. Actual HGL / freeboard at all connecting lots interpolated where conservative estimate does not meet freeboard requirements.

(3) Future USF elevations estimated as 1.8 m below the upstream top of manhole elevations.

	Interpolated HGL elevation
	Freeboard Less than 0.3m
	Freeboard Less than 0.0m

APPENDIX

D

Tables and Calculation Sheets

JFSA

Water Resources and
Environmental Consultants



Table D-1: Approach Flows and Captured Flows for the 100-Year Chicago Storm

Catch Basin ID	Approach Flow On The Road (m³/s)	Approach Flow at Catch Basin (m³/s)	Captured Flow Through ICD (m³/s)
02_(CB)	0.065	0.027	0.026
03_(CB)	0.065	0.031	0.031
04_(CB)	0.067	0.027	0.027
05_(CB)	0.067	0.027	0.027
06_(CB)	0.054	0.030	0.030
08_(CB)	0.053	0.032	0.032
09_(CB)	0.053	0.027	0.027
10_(CB)	0.086	0.031	0.031
11_(CB)	0.086	0.087	0.043
12_(CB)	0.110	0.050	0.050
13_(CB)	0.110	0.048	0.048
14_(CB)	0.062	0.028	0.027
15_(CB)	0.062	0.028	0.027
16_(CB)	0.055	0.021	0.021
17_(CB)	0.055	0.027	0.027
18_(CB)	0.093	0.085	0.055
19_(CB)	0.093	0.071	0.071
20_(CB)	0.092	0.036	0.036
21_(CB)	0.092	0.035	0.035
23_(CB)	0.072	0.049	0.049
24_(CB)	0.072	0.049	0.049
25_(CB)	0.011	0.009	0.009
26_(CB)	0.011	0.004	0.004
27_(CB)	0.136	0.069	0.068
28_(CB)	0.136	0.069	0.068
30_(CB)	0.118	0.086	0.086
31_(CB)	0.119	0.100	0.100
32_(CB)	0.117	0.106	0.039
33_(CB)	0.144	0.072	0.059
34_(CB)	0.116	0.049	0.049
35_(CB)	0.116	0.049	0.049
36_(CB)	0.081	0.036	0.036
37_(CB)	0.081	0.049	0.049
40_(CB)	0.097	0.048	0.048
41_(CB)	0.097	0.050	0.050
42_(CB)	0.083	0.032	0.032
43_(CB)	0.083	0.036	0.036
44_(CB)	0.052	0.032	0.032
45_(CB)	0.052	0.021	0.021
46_(CB)	0.060	0.032	0.032
47_(CB)	0.060	0.026	0.026
48_(CB)	0.066	0.028	0.028
49_(CB)	0.066	0.027	0.027
50_(CB)	0.097	0.048	0.048
51_(CB)	0.097	0.047	0.047
52_(CB)	0.099	0.043	0.044
53_(CB)	0.107	0.050	0.050
54_(CB)	0.107	0.049	0.049
55_(CB)	0.098	0.049	0.049
57_(CB)	0.106	0.050	0.050

Table D-2: Major System Flow Depths for the 100-Year Chicago Storm

Catch Basin ID	Depth (m)
02 (CB)	0.16
03 (CB)	0.16
04 (CB)	0.15
05 (CB)	0.15
06 (CB)	0.03
08 (CB)	0.16
09 (CB)	0.16
10 (CB)	0.28
11 (CB)	0.28
12 (CB)	0.21
13 (CB)	0.21
14 (CB)	0.20
15 (CB)	0.20
16 (CB)	0.17
17 (CB)	0.17
18 (CB)	0.22
19 (CB)	0.22
20 (CB)	0.20
21 (CB)	0.20
23 (CB)	0.14
24 (CB)	0.14
25 (CB)	0.02
26 (CB)	0.02
27 (CB)	0.22
28 (CB)	0.22
30 (CB)	0.10
31 (CB)	0.10
32 (CB)	0.21
33 (CB)	0.21
34 (CB)	0.18
35 (CB)	0.18
36 (CB)	0.14
37 (CB)	0.14
40 (CB)	0.20
41 (CB)	0.20
42 (CB)	0.18
43 (CB)	0.18
44 (CB)	0.15
45 (CB)	0.15
46 (CB)	0.18
47 (CB)	0.18
48 (CB)	0.20
49 (CB)	0.20
50 (CB)	0.17
51 (CB)	0.17
52 (CB)	0.07
53 (CB)	0.19
54 (CB)	0.19
55 (CB)	0.17
57 (CB)	0.27

Note: Depth calculated as per PCSWMM model

Table D-3A: PCSWMM Subcatchment Parameters

Name	Area (ha)	Width (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Subarea Routing	Percent Routed (%)	Infiltration Method	Max. Infil. Rate (mm/hr)	Min. Infil. Rate (mm/hr)	Decay Constant (1/hr)
A10	0.202	105	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A11	0.287	105	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A12i	0.194	76	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A12ii	0.090	76	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A13	0.226	76	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A14	0.319	75	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A15i	0.248	103	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A15ii	0.274	103	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A16i	0.060	24	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A16ii	0.067	25	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A17	0.091	68	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A17ii	0.093	77	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A18i	0.189	77	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A19	0.190	128	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A1i	0.157	149	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A1ii	0.202	149	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A20i	0.195	100	0.9	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A20ii	0.206	100	0.9	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A21	0.325	112	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A22	0.028	48	0.5	42.9	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A23	0.169	72	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A24i	0.110	90	0.9	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A24ii	0.237	130	0.9	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A25	0.294	102	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A26i	0.060	73	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A26ii	0.172	73	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A27i	0.088	48	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A27ii	0.181	85	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A28i	0.143	63	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A28ii	0.142	65	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A29	0.116	79	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A2i	0.120	120	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A2ii	0.118	120	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A3	0.154	111	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A30	0.014	18	0.5	42.9	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A31	0.187	129	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A32i	0.155	73	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A32ii	0.082	73	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A33i	0.110	164	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A33ii	0.157	76	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A34i	0.212	125	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A34ii	0.276	134	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A35i	0.228	116	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A35ii	0.203	117	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A36	0.294	99	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A37	0.029	47	0.5	42.9	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A38	0.239	95	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A39i	0.214	114	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A39ii	0.074	75	1.0	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A4	0.092	60	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A40	0.219	80	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A41	0.075	55	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A42i	0.146	72	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A42ii	0.083	72	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A43	0.236	81	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A44	0.199	72	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A45i	0.168	78	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A45ii	0.075	78	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A46i	0.157	73	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A46ii	0.136	87	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A47	0.136	93	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A48	0.205	57	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A49	0.074	58	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A50	0.066	32	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14

Table D-3A: PCSWMM Subcatchment Parameters

Name	Area (ha)	Width (m)	Slope (%)	Imperv. (%)	N Imperv	N Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Subarea Routing	Percent Routed (%)	Infiltration Method	Max. Infil. Rate (mm/hr)	Min. Infil. Rate (mm/hr)	Decay Constant (1/hr)
A51	0.186	73	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A52	0.021	24	1.2	42.9	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A53	0.182	121	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A54	0.165	80	0.5	50.0	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A5i	0.102	65	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A5ii	0.260	122	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A6	0.131	112	0.5	42.9	0.013	0.25	1.57	4.67	PERVIOUS	100	HORTON	76.2	13.2	4.14
A7i	0.228	120	0.7	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A7ii	0.282	130	0.7	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A8i	0.220	105	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A8ii	0.190	87	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A9i	0.188	85	0.7	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
A9ii	0.067	72	0.7	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B1	0.883	200	0.5	85.7	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B1ii	0.123	200	0.5	85.7	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B2	3.432	227	1.0	100.0	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B3i	0.965	87	0.5	85.7	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B3ii	0.046	70	0.5	85.7	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B4i	0.947	149	0.5	28.6	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B4ii	0.047	78	0.5	28.6	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
B4iii	0.008	14	0.5	28.6	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
C1	0.114	55	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14
C2	0.087	60	0.5	71.4	0.013	0.25	1.57	4.67	OUTLET	100	HORTON	76.2	13.2	4.14

Table D-4A: Capacity of Grates

Water Depth H (m)	Q _{captured} (L/s)	
	OPSD 400.01	
	SINGLE * (L/s)	TWIN * (L/s)
0.00	0	0
0.01	1	1
0.02	2	3
0.03	4	5
0.04	7	9
0.05	11	16
0.06	16	27
0.07	20	36
0.08	36	54
0.09	48	71
0.10	61	91
0.11	73	109
0.12	86	127
0.13	99	140
0.14	109	155
0.15	120	169
0.16	129	183
0.17	136	196
0.18	145	211
0.19	150	228
0.20	156	243
0.21	161	259
0.22	167	275
0.23	172	291
0.24	176	307
0.25	181	322
0.26	186	337
0.27	189	354
0.28	194	371
0.29	199	387
0.30	202	403

* From MTO Drainage Management Manual (1997), Design Chart 4.19

Table D-4B: Capacity of Side Inlet ⁽¹⁾

Water Depth (m)	SINGLE Capacity (L/s)	TWIN Capacity (L/s)
0.00	0	0
0.01	1	2
0.02	3	6
0.03	6	12
0.04	9	18
0.05	13	26
0.06	17	34
0.07	22	44
0.08	26	52
0.09	32	64
0.10	37	74
0.11	43	86
0.12	49	98
0.13	62	124
0.14	67	134
0.15	71	142
0.16	75	150
0.17	79	158
0.18	83	166
0.19	86	172
0.20	89	178
0.21	93	186
0.22	96	192
0.23	99	198
0.24	102	204
0.25	105	210
0.26	107	214
0.27	110	220
0.28	113	226
0.29	115	230
0.30	118	236

⁽¹⁾ As per $Q_{weir} = CLH^{3/2}$ where $C = 1.8$,
and $Q_{orifice} = CA \times (2gh)^{0.5}$ where $C = 0.65$
for a 13 cm high x 65 cm wide side inlet.

Table D-5: Capacity of Lead Pipes

Head (m)	Release Rate (L/s) by Pipe Diameter (mm)						
	100	150	200	250	300	375	450
0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.050	6.4	14.4	25.5	39.9	57.4	89.7	129.2
0.100	9.0	20.3	36.1	56.4	81.2	126.9	182.7
0.150	11.0	24.9	44.2	69.1	99.4	155.4	223.7
0.200	12.8	28.7	51.0	79.7	114.8	179.4	258.3
0.250	14.3	32.1	57.1	89.1	128.4	200.6	288.8
0.300	15.6	35.2	62.5	97.7	140.6	219.7	316.4
0.350	16.9	38.0	67.5	105.5	151.9	237.3	341.8
0.400	18.0	40.6	72.2	112.8	162.4	253.7	365.3
0.450	19.1	43.1	76.5	119.6	172.2	269.1	387.5
0.500	20.2	45.4	80.7	126.1	181.5	283.7	408.5
0.550	21.2	47.6	84.6	132.2	190.4	297.5	428.4
0.600	22.1	49.7	88.4	138.1	198.9	310.7	447.5
0.650	23.0	51.7	92.0	143.7	207.0	323.4	465.7
0.700	23.9	53.7	95.5	149.2	214.8	335.6	483.3
0.750	24.7	55.6	98.8	154.4	222.3	347.4	500.3
0.800	25.5	57.4	102.1	159.5	229.6	358.8	516.7
0.850	26.3	59.2	105.2	164.4	236.7	369.8	532.6
0.900	27.1	60.9	108.3	169.1	243.6	380.6	548.0
0.950	27.8	62.6	111.2	173.8	250.2	391.0	563.0
1.000	28.5	64.2	114.1	178.3	256.7	401.2	577.7
1.050	29.2	65.8	116.9	182.7	263.1	411.1	591.9
1.100	29.9	67.3	119.7	187.0	269.3	420.7	605.9
1.150	30.6	68.8	122.4	191.2	275.3	430.2	619.5
1.200	31.2	70.3	125.0	195.3	281.2	439.4	632.8
1.250	31.9	71.8	127.6	199.3	287.0	448.5	645.9
1.300	32.5	73.2	130.1	203.3	292.7	457.4	658.6
1.350	33.1	74.6	132.6	207.2	298.3	466.1	671.2
1.400	33.8	75.9	135.0	211.0	303.8	474.7	683.5
1.450	34.4	77.3	137.4	214.7	309.2	483.1	695.6
1.500	34.9	78.6	139.8	218.4	314.4	491.3	707.5
1.550	35.5	79.9	142.1	222.0	319.6	499.4	719.2
1.600	36.1	81.2	144.3	225.5	324.8	507.4	730.7

Short tube orifice coefficient = 0.82
Short tube release rate = $C\pi(\text{Dia}/1000)^2/4 \times (2 \times 9.81 \times H)^{0.5} \times 1000$

Table D-6: ICD Type and Inlet Capture Results for the 2-Year Chicago Storm ⁽¹⁾

Catch Basin ID	Peak Flow (m ³ /s)	Actual Capture (m ³ /s)	Max Depth (cm)	Flow Spread (m)	% of Total Travel Lane ⁽¹⁾	ICD Type	Comment
02_(CB)	0.019	0.019	6.0	1.96	23%	94 mm	Low Point CICB
03_(CB)	0.019	0.019	6.0	1.96	23%	102 mm	Low Point CICB
04_(CB)	0.021	0.021	6.0	1.96	23%	94 mm	Low Point CICB
05_(CB)	0.021	0.021	6.0	1.96	23%	94 mm	Low Point CICB
06_(CB)	0.008	0.008	2.0	0.65	8%	127 mm	Low Point CICB
08_(CB)	0.018	0.018	4.0	1.31	15%	102 mm	Low Point CB
09_(CB)	0.018	0.018	4.0	1.31	15%	94 mm	Low Point CB
10_(CB)	0.022	0.022	4.0	1.31	15%	108 mm	Low Point CB
11_(CB)	0.027	0.027	4.0	1.31	15%	127 mm	Low Point CB
12_(CB)	0.037	0.037	6.0	1.96	23%	127 mm	Low Point CB
13_(CB)	0.037	0.037	6.0	1.96	23%	127 mm	Low Point CB
14_(CB)	0.021	0.021	4.0	1.31	15%	94 mm	Low Point CB
15_(CB)	0.021	0.021	4.0	1.31	15%	94 mm	Low Point CB
16_(CB)	0.018	0.018	4.0	1.31	15%	83 mm	Low Point CB
17_(CB)	0.018	0.018	4.0	1.31	15%	94 mm	Low Point CB
18_(CB)	0.031	0.031	5.0	1.63	19%	152 mm	Low Point CB
19_(CB)	0.027	0.027	5.0	1.63	19%	152 mm	Low Point CB
20_(CB)	0.031	0.031	5.0	1.63	19%	108 mm	Low Point CB
21_(CB)	0.031	0.031	5.0	1.63	19%	108 mm	Low Point CB
23_(CB)	0.025	0.025	5.0	1.63	19%	127 mm	Low Point CB
24_(CB)	0.025	0.025	5.0	1.63	19%	127 mm	Low Point CB
25_(CB)	0.004	0.004	1.0	0.33	4%	250 mm	Low Point CB
26_(CB)	0.002	0.002	1.0	0.33	4%	250 mm	Low Point CICB
27_(CB)	0.047	0.047	5.0	1.63	19%	152 mm	Double Low Point CICB
28_(CB)	0.047	0.047	5.0	1.63	19%	152 mm	Double Low Point CICB
30_(CB)	0.032	0.032	5.0	1.63	19%	200 mm	Low Point CB
31_(CB)	0.022	0.022	5.0	1.63	19%	200 mm	Low Point CICB
32_(CB)	0.021	0.021	4.0	1.31	15%	127 mm	Low Point CB
33_(CB)	0.024	0.024	4.0	1.31	15%	152 mm	Low Point CB
34_(CB)	0.038	0.038	6.0	1.96	23%	127 mm	Low Point CB
35_(CB)	0.038	0.038	6.0	1.96	23%	127 mm	Low Point CB
36_(CB)	0.030	0.030	5.0	1.63	19%	108 mm	Low Point CB
37_(CB)	0.030	0.030	5.0	1.63	19%	127 mm	Low Point CB
40_(CB)	0.034	0.034	6.0	1.96	23%	127 mm	Low Point CB
41_(CB)	0.034	0.034	6.0	1.96	23%	127 mm	Low Point CB
42_(CB)	0.027	0.027	5.0	1.63	19%	102 mm	Low Point CB
43_(CB)	0.027	0.027	5.0	1.63	19%	108 mm	Low Point CB
44_(CB)	0.018	0.018	4.0	1.31	15%	102 mm	Low Point CB
45_(CB)	0.018	0.018	4.0	1.31	15%	83 mm	Low Point CB
46_(CB)	0.021	0.021	4.0	1.31	15%	102 mm	Low Point CB
47_(CB)	0.021	0.021	4.0	1.31	15%	94 mm	Low Point CB
48_(CB)	0.022	0.022	4.0	1.31	15%	94 mm	Low Point CB
49_(CB)	0.022	0.022	4.0	1.31	15%	94 mm	Low Point CB
50_(CB)	0.033	0.033	5.0	1.63	19%	127 mm	Low Point CB
51_(CB)	0.033	0.033	5.0	1.63	19%	127 mm	Low Point CB
52_(CB)	0.009	0.008	2.0	0.65	8%	178 mm	Low Point CB
53_(CB)	0.032	0.032	5.0	1.63	19%	127 mm	Low Point CB
54_(CB)	0.032	0.032	5.0	1.63	19%	127 mm	Low Point CB
55_(CB)	0.033	0.033	5.0	1.63	19%	127 mm	Low Point CB
57_(CB)	0.035	0.035	4.0	1.31	15%	127 mm	Double Low Point CB

⁽¹⁾Total travel lane width assumed to be 8.5 m (minimum road width in subdivision)

**Table D-7: Ponding at Major Low Points for the 100-Year Chicago Storm &
100-Year Chicago Storm +20%⁽¹⁾**

Catch Basin ID	Total Depth ⁽¹⁾		Water Surface Elevation ⁽¹⁾	
	100 Year 3 Hr Chi (m)	100 Year 3 Hr Chi+20% (m)	100 Year 3 Hr Chi (m)	100 Year 3 Hr Chi+20% (m)
02 (CB)	0.16	0.20	87.58	87.62
03 (CB)	0.16	0.20	87.58	87.62
04 (CB)	0.15	0.17	87.62	87.64
05 (CB)	0.15	0.17	87.62	87.64
06 (CB)	0.03	0.03	87.52	87.52
08 (CB)	0.16	0.23	87.57	87.64
09 (CB)	0.16	0.23	87.57	87.64
10 (CB)	0.28	0.32	87.82	87.86
11 (CB)	0.28	0.32	87.82	87.86
12 (CB)	0.21	0.24	87.83	87.86
13 (CB)	0.21	0.24	87.83	87.86
14 (CB)	0.20	0.23	88.19	88.22
15 (CB)	0.20	0.23	88.19	88.22
16 (CB)	0.17	0.22	88.32	88.37
17 (CB)	0.17	0.22	88.32	88.37
18 (CB)	0.22	0.31	88.47	88.56
19 (CB)	0.22	0.31	88.47	88.56
20 (CB)	0.20	0.25	88.81	88.85
21 (CB)	0.20	0.25	88.81	88.85
23 (CB)	0.14	0.19	89.05	89.10
24 (CB)	0.14	0.19	89.05	89.10
25 (CB)	0.02	0.03	89.41	89.41
26 (CB)	0.02	0.03	89.41	89.41
27 (CB)	0.22	0.27	88.81	88.87
28 (CB)	0.22	0.27	88.81	88.87
30 (CB)	0.10	0.12	89.17	89.19
31 (CB)	0.10	0.12	89.17	89.19
32 (CB)	0.21	0.24	89.69	89.72
33 (CB)	0.21	0.24	89.69	89.72
34 (CB)	0.18	0.23	89.60	89.65
35 (CB)	0.18	0.23	89.60	89.65
36 (CB)	0.14	0.15	89.92	89.93
37 (CB)	0.14	0.15	89.92	89.93
40 (CB)	0.20	0.23	90.30	90.32
41 (CB)	0.20	0.23	90.30	90.32
42 (CB)	0.18	0.22	90.46	90.49
43 (CB)	0.18	0.22	90.46	90.49
44 (CB)	0.15	0.18	89.07	89.10
45 (CB)	0.15	0.18	89.07	89.10
46 (CB)	0.18	0.20	89.06	89.08
47 (CB)	0.18	0.20	89.06	89.08
48 (CB)	0.20	0.23	88.59	88.63
49 (CB)	0.20	0.23	88.59	88.63
50 (CB)	0.17	0.21	88.06	88.09
51 (CB)	0.17	0.21	88.06	88.09
52 (CB)	0.07	0.08	89.91	89.92
53 (CB)	0.19	0.24	89.85	89.91
54 (CB)	0.19	0.24	89.85	89.91
55 (CB)	0.17	0.27	87.42	87.52
57 (CB)	0.27	0.34	87.43	87.50

⁽¹⁾ As per PCSWMM models for the 100-year, 3-hour Chicago storm and the 100-year, 3-hour Chicago storm + 20%.

Table D-8: Major System Flow Depths 100-Year 3-Hour Chicago Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max/Full Depth (m)	Depth x Velocity x 0.6m (m ² /s)
C1	18mROW-No-Sidewalk	0.170	0.24	0.02
C1_1	18mROW-DbI-Sidewalk	0.000	0.00	0.00
C1_2	18mROW-DbI-Sidewalk	0.000	0.00	0.00
C10	18mROWwSidewalk	0.000	0.12	0.00
C11	18mROWwSidewalk	0.000	0.15	0.00
C12	18mROW-No-Sidewalk	0.470	0.10	0.03
C13	18mROW-No-Sidewalk	0.090	0.20	0.01
C14	18mROW-No-Sidewalk	0.000	0.16	0.00
C15	18mROWwSidewalk	0.020	0.17	0.00
C16	18mROW-No-Sidewalk	0.000	0.17	0.00
C17	18mROW-No-Sidewalk	0.100	0.20	0.01
C18_2	18mROW-No-Sidewalk	0.000	0.00	0.00
C18_3	18mROWwSidewalk	0.190	0.09	0.01
C18_4	18mROWwSidewalk	0.180	0.11	0.01
C18_5	24mROW-DbI-Sidewalk	0.720	0.06	0.03
C18_6	24mROW-DbI-Sidewalk	0.550	0.05	0.02
C18_7	18mROW-No-Sidewalk	0.000	0.01	0.00
C18_8	24mROW-DbI-Sidewalk	0.000	0.00	0.00
C18_9	24mROW-DbI-Sidewalk	0.000	0.03	0.00
C19	18mROW-No-Sidewalk	0.510	0.05	0.02
C2	18mROW-No-Sidewalk	0.000	0.22	0.00
C2_1	18mROW-DbI-Sidewalk	0.000	0.03	0.00
C2_2	18mROW-DbI-Sidewalk	0.050	0.19	0.01
C20	24mROW-DbI-Sidewalk	0.060	0.09	0.00
C21	24mROW-DbI-Sidewalk	0.820	0.24	0.12
C22	24mROW-DbI-Sidewalk	0.000	0.18	0.00
C23	18mROW-No-Sidewalk	0.280	0.15	0.03
C24	18mROW-No-Sidewalk	0.000	0.12	0.00
C25	18mROW-No-Sidewalk	0.000	0.17	0.00
C26	18mROW-No-Sidewalk	0.000	0.17	0.00
C27_1	18mROW-No-Sidewalk	0.000	0.00	0.00
C27_2	18mROW-No-Sidewalk	0.000	0.18	0.00
C28	18mROW-No-Sidewalk	0.000	0.18	0.00
C29	18mROW-No-Sidewalk	0.000	0.13	0.00
C3	18mROW-DbI-Sidewalk	0.000	0.15	0.00
C30	18mROW-No-Sidewalk	0.040	0.13	0.00
C32	18mROW-No-Sidewalk	0.010	0.16	0.00
C33	18mROW-No-Sidewalk	0.100	0.18	0.01
C34	18mROW-No-Sidewalk	0.040	0.19	0.00
C35	18mROW-No-Sidewalk	0.000	0.16	0.00
C36	18mROW-No-Sidewalk	0.000	0.14	0.00
C37	18mROW-No-Sidewalk	0.000	0.14	0.00
C38	18mROW-No-Sidewalk	0.000	0.15	0.00
C39	18mROW-No-Sidewalk	0.000	0.15	0.00
C4_1	18mROW-DbI-Sidewalk	0.000	0.00	0.00
C4_2	18mROW-DbI-Sidewalk	0.000	0.00	0.00
C40	18mROW-No-Sidewalk	0.000	0.24	0.00
C41	18mROW-No-Sidewalk	0.010	0.24	0.00
C42	18mROW-No-Sidewalk	0.090	0.19	0.01
C43	18mROW-No-Sidewalk	0.000	0.18	0.00
C44	18mROW-No-Sidewalk	0.000	0.00	0.00
C45	18mROW-No-Sidewalk	0.000	0.00	0.00
C46	18mROW-No-Sidewalk	0.000	0.17	0.00
C47	18mROW-No-Sidewalk	0.010	0.17	0.00
C48	18mROW-No-Sidewalk	0.050	0.15	0.00

Table D-8: Major System Flow Depths 100-Year 3-Hour Chicago Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max/Full Depth (m)	Depth x Velocity x 0.6m (m ² /s)
C49	18mROW-No-Sidewalk	0.040	0.16	0.00
C5_1	18mROW-Dbl-Sidewalk	0.000	0.00	0.00
C5_2	18mROW-Dbl-Sidewalk	0.000	0.06	0.00
C50_1	18mROWwSidewalk	0.000	0.00	0.00
C50_3	18mROWwSidewalk	0.010	0.02	0.00
C50_4	18mROWwSidewalk	0.450	0.04	0.01
C51	18mROWwSidewalk	0.090	0.15	0.01
C52	18mROWwSidewalk	0.030	0.14	0.00
C53	18mROWwSidewalk	0.040	0.14	0.00
C54	18mROWwSidewalk	0.000	0.13	0.00
C55	18mROW-No-Sidewalk	0.050	0.16	0.00
C57	18mROW-No-Sidewalk	0.070	0.16	0.01
C6_1	18mROW-Dbl-Sidewalk	0.060	0.19	0.01
C6_2	18mROW-Dbl-Sidewalk	0.080	0.23	0.01
C7	18mROW-Dbl-Sidewalk	0.560	0.03	0.01
C8	18mROW-Dbl-Sidewalk	0.140	0.06	0.01
C9	18mROWwSidewalk	0.140	0.17	0.01
	Max	0.82	0.24	0.12

Note: Depth and velocity calculated by PCSWMM model.

Table D-9: Major System Flow Depths 100-Year 3 Hour Chicago + 20% Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max/Full Depth (m)	Depth x Velocity x 0.6m (m ² /s)
C1	18mROW-No-Sidewalk	0.180	0.30	0.03
C1_1	18mROW-Dbl-Sidewalk	0.000	0.00	0.00
C1_2	18mROW-Dbl-Sidewalk	0.000	0.00	0.00
C10	18mROWwSidewalk	0.000	0.13	0.00
C11	18mROWwSidewalk	0.000	0.19	0.00
C12	18mROW-No-Sidewalk	0.540	0.13	0.04
C13	18mROW-No-Sidewalk	0.100	0.28	0.02
C14	18mROW-No-Sidewalk	0.000	0.20	0.00
C15	18mROWwSidewalk	0.040	0.23	0.01
C16	18mROW-No-Sidewalk	0.000	0.20	0.00
C17	18mROW-No-Sidewalk	0.160	0.24	0.02
C18_2	18mROW-No-Sidewalk	0.000	0.00	0.00
C18_3	18mROWwSidewalk	0.310	0.13	0.02
C18_4	18mROWwSidewalk	0.180	0.13	0.01
C18_5	24mROW-Dbl-Sidewalk	0.750	0.07	0.03
C18_6	24mROW-Dbl-Sidewalk	0.580	0.06	0.02
C18_7	18mROW-No-Sidewalk	0.000	0.03	0.00
C18_8	24mROW-Dbl-Sidewalk	0.000	0.00	0.00
C18_9	24mROW-Dbl-Sidewalk	0.000	0.03	0.00
C19	18mROW-No-Sidewalk	0.540	0.06	0.02
C2	18mROW-No-Sidewalk	0.000	0.28	0.00
C2_1	18mROW-Dbl-Sidewalk	0.000	0.07	0.00
C2_2	18mROW-Dbl-Sidewalk	0.060	0.25	0.01
C20	24mROW-Dbl-Sidewalk	0.070	0.10	0.00
C21	24mROW-Dbl-Sidewalk	0.840	0.29	0.15
C22	24mROW-Dbl-Sidewalk	0.210	0.25	0.03
C23	18mROW-No-Sidewalk	0.280	0.19	0.03
C24	18mROW-No-Sidewalk	0.000	0.16	0.00
C25	18mROW-No-Sidewalk	0.000	0.20	0.00
C26	18mROW-No-Sidewalk	0.010	0.21	0.00
C27_1	18mROW-No-Sidewalk	0.070	0.01	0.00
C27_2	18mROW-No-Sidewalk	0.020	0.26	0.00
C28	18mROW-No-Sidewalk	0.020	0.28	0.00
C29	18mROW-No-Sidewalk	0.000	0.15	0.00
C3	18mROW-Dbl-Sidewalk	0.000	0.19	0.00
C30	18mROW-No-Sidewalk	0.090	0.18	0.01
C32	18mROW-No-Sidewalk	0.030	0.19	0.00
C33	18mROW-No-Sidewalk	0.120	0.21	0.02
C34	18mROW-No-Sidewalk	0.070	0.23	0.01
C35	18mROW-No-Sidewalk	0.110	0.22	0.01
C36	18mROW-No-Sidewalk	0.030	0.21	0.00
C37	18mROW-No-Sidewalk	0.000	0.18	0.00
C38	18mROW-No-Sidewalk	0.000	0.17	0.00
C39	18mROW-No-Sidewalk	0.080	0.19	0.01
C4_1	18mROW-Dbl-Sidewalk	0.000	0.00	0.00
C4_2	18mROW-Dbl-Sidewalk	0.000	0.00	0.00
C40	18mROW-No-Sidewalk	0.020	0.28	0.00
C41	18mROW-No-Sidewalk	0.070	0.31	0.01
C42	18mROW-No-Sidewalk	0.130	0.24	0.02
C43	18mROW-No-Sidewalk	0.030	0.22	0.00
C44	18mROW-No-Sidewalk	0.890	0.04	0.02
C45	18mROW-No-Sidewalk	0.490	0.06	0.02
C46	18mROW-No-Sidewalk	0.000	0.19	0.00
C47	18mROW-No-Sidewalk	0.060	0.22	0.01
C48	18mROW-No-Sidewalk	0.060	0.23	0.01

Table D-9: Major System Flow Depths 100-Year 3 Hour Chicago + 20% Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max/Full Depth (m)	Depth x Velocity x 0.6m (m ² /s)
C49	18mROW-No-Sidewalk	0.090	0.23	0.01
C5_1	18mROW-DbI-Sidewalk	0.000	0.00	0.00
C5_2	18mROW-DbI-Sidewalk	0.000	0.08	0.00
C50_1	18mROWwSidewalk	0.150	0.04	0.00
C50_3	18mROWwSidewalk	0.360	0.05	0.01
C50_4	18mROWwSidewalk	0.490	0.07	0.02
C51	18mROWwSidewalk	0.130	0.18	0.01
C52	18mROWwSidewalk	0.030	0.15	0.00
C53	18mROWwSidewalk	0.040	0.18	0.00
C54	18mROWwSidewalk	0.000	0.16	0.00
C55	18mROW-No-Sidewalk	0.080	0.26	0.01
C57	18mROW-No-Sidewalk	0.070	0.24	0.01
C6_1	18mROW-DbI-Sidewalk	0.080	0.23	0.01
C6_2	18mROW-DbI-Sidewalk	0.100	0.27	0.02
C7	18mROW-DbI-Sidewalk	0.700	0.08	0.03
C8	18mROW-DbI-Sidewalk	0.350	0.10	0.02
C9	18mROWwSidewalk	0.160	0.19	0.02
	Max	0.89	0.31	0.15

Note: Depth and velocity calculated by PCSWMM model.

Table D-10: Rear Yard Ponding Depths for the 100-Year Chicago Storm

Catch Basin ID	Depth (m)	Catch Basin ID	Depth (cm)
1 (RYCB)	0.00	Structure - (18) (RYCB)	0.00
22 (RYCB)	0.00	TEE_1 (RYCB)	0.20
29 (RYCB)	0.00	TEE_10 (RYCB)	0.00
38 (RYCB)	0.00	TEE_11 (RYCB)	0.00
39 (RYCB)	0.00	TEE_12 (RYCB)	0.25
ELB_1 (RYCB)	0.00	TEE_13 (RYCB)	0.14
ELB_10 (RYCB)	0.01	TEE_14 (RYCB)	0.00
ELB_11 (RYCB)	0.05	TEE_15 (RYCB)	0.00
ELB_12 (RYCB)	0.01	TEE_16 (RYCB)	0.00
ELB_13 (RYCB)	0.01	TEE_17 (RYCB)	0.00
ELB_14 (RYCB)	0.00	TEE_18 (RYCB)	0.00
ELB_15 (RYCB)	0.01	TEE_19 (RYCB)	0.02
ELB_16 (RYCB)	0.03	TEE_2 (RYCB)	0.16
ELB_17 (RYCB)	0.00	TEE_20 (RYCB)	0.11
ELB_18 (RYCB)	0.03	TEE_21 (RYCB)	0.12
ELB_19 (RYCB)	0.09	TEE_22 (RYCB)	0.00
ELB_2 (RYCB)	0.18	TEE_23 (RYCB)	0.09
ELB_21 (RYCB)	0.00	TEE_24 (RYCB)	0.00
ELB_22 (RYCB)	0.02	TEE_25 (RYCB)	0.00
ELB_23 (RYCB)	0.21	TEE_26 (RYCB)	0.19
ELB_24 (RYCB)	0.00	TEE_27 (RYCB)	0.27
ELB_25 (RYCB)	0.00	TEE_28 (RYCB)	0.02
ELB_3 (RYCB)	0.08	TEE_29 (RYCB)	0.01
ELB_4 (RYCB)	0.13	TEE_3 (RYCB)	0.00
ELB_5 (RYCB)	0.00	TEE_30 (RYCB)	0.04
ELB_7 (RYCB)	0.04	TEE_31 (RYCB)	0.12
ELB_8 (RYCB)	0.00	TEE_32 (RYCB)	0.04
ELB_9 (RYCB)	0.09	TEE_33 (RYCB)	0.00
RYCB_1 (RYCB)	0.22	TEE_34 (RYCB)	0.13
RYCB_10 (RYCB)	0.00	TEE_35 (RYCB)	0.02
RYCB_11 (RYCB)	0.00	TEE_36 (RYCB)	0.00
RYCB_12 (RYCB)	0.21	TEE_37 (RYCB)	0.00
RYCB_13 (RYCB)	0.00	TEE_38 (RYCB)	0.00
RYCB_14 (RYCB)	0.00	TEE_39 (RYCB)	0.02
RYCB_15 (RYCB)	0.00	TEE_4 (RYCB)	0.00
RYCB_18 (RYCB)	0.00	TEE_40 (RYCB)	0.00
RYCB_2 (RYCB)	0.30	TEE_41 (RYCB)	0.00
RYCB_3 (RYCB)	0.00	TEE_42 (RYCB)	0.00
RYCB_4 (RYCB)	0.22	TEE_43 (RYCB)	0.00
RYCB_5 (RYCB)	0.00	TEE_44 (RYCB)	0.00
RYCB_6 (RYCB)	0.00	TEE_5 (RYCB)	0.00
RYCB_7 (RYCB)	0.00	TEE_6 (RYCB)	0.05
RYCB_8 (RYCB)	0.28	TEE_7 (RYCB)	0.24
RYCB_9 (RYCB)	0.08	TEE_8 (RYCB)	0.23
StartNullStruct2	0.00	TEE_9 (RYCB)	0.17

Note: Depth calculated as per PCSWMM model

Table D-11: Rational Method Calculations

Name	CB	Area (ha)	Imperv. (%)	C	Tc (mins)	Minor System Capture	Intensity (mm/hr)	Design Flow -	Design Flow -	Difference (1) - (2) (L/s)	Theoretical Minimum ICD	Applied ICD Size
								Calculated (1) (L/s)	PCSWMM (2) (L/s)			
A45ii	02_(CB)	0.075	71.4	0.70	10	2-Year	76.81	11	10	1	0.083	0.094
B4ii	02_(CB)	0.047	28.6	0.40	10	2-Year	76.81	4	0	4	0.083	0.094
A45i	03_(CB)	0.168	71.4	0.70	10	2-Year	76.81	25	30	-5	0.102	0.102
A46ii	04_(CB)	0.136	71.4	0.70	10	2-Year	76.81	20	20	0	0.094	0.094
B4iii	04_(CB)	0.008	28.6	0.40	10	2-Year	76.81	1	0	1	0.094	0.094
A46i	05_(CB)	0.157	71.4	0.70	10	2-Year	76.81	23	20	3	0.094	0.094
A50	06_(CB)	0.066	71.4	0.70	10	2-Year	76.81	10	10	0	0.083	0.127
A42i	08_(CB)	0.146	71.4	0.70	10	2-Year	76.81	22	20	2	0.094	0.102
A42ii	09_(CB)	0.083	71.4	0.70	10	2-Year	76.81	12	10	2	0.083	0.094
A39i	10_(CB)	0.214	71.4	0.70	10	2-Year	76.81	32	30	2	0.108	0.108
A39ii	11_(CB)	0.074	71.4	0.70	10	2-Year	76.81	11	10	1	0.083	0.127
A34ii	12_(CB)	0.276	71.4	0.70	10	2-Year	76.81	41	40	1	0.127	0.127
A34i	13_(CB)	0.212	71.4	0.70	10	2-Year	76.81	32	30	2	0.108	0.127
A33i	14_(CB)	0.110	71.4	0.70	10	2-Year	76.81	16	20	-4	0.083	0.094
A33ii	15_(CB)	0.157	71.4	0.70	10	2-Year	76.81	23	20	3	0.094	0.094
A32ii	16_(CB)	0.082	71.4	0.70	10	2-Year	76.81	12	10	2	0.083	0.083
A32i	17_(CB)	0.155	71.4	0.70	10	2-Year	76.81	23	20	3	0.094	0.094
A24i	18_(CB)	0.110	71.4	0.70	10	2-Year	76.81	16	20	-4	0.083	0.152
A24ii	19_(CB)	0.237	71.4	0.70	10	2-Year	76.81	35	40	-5	0.127	0.152
A20ii	20_(CB)	0.206	71.4	0.70	10	2-Year	76.81	31	30	1	0.108	0.108
A20i	21_(CB)	0.195	71.4	0.70	10	2-Year	76.81	29	30	-1	0.102	0.108
A18i	23_(CB)	0.189	71.4	0.70	10	5-Year	104.19	38	40	-2	0.127	0.127
A17ii	24_(CB)	0.093	71.4	0.70	10	5-Year	104.19	19	20	-1	0.083	0.127
A16ii	25_(CB)	0.067	71.4	0.70	10	5-Year	104.19	14	10	4	0.083	0.250
A16i	26_(CB)	0.060	71.4	0.70	10	5-Year	104.19	12	10	2	0.083	0.250
A15ii	27_(CB)	0.274	71.4	0.70	10	5-Year	104.19	56	60	-4	0.152	0.152
A15i	28_(CB)	0.248	71.4	0.70	10	5-Year	104.19	50	60	-10	0.152	0.152
A12i	30_(CB)	0.194	71.4	0.70	10	5-Year	104.19	39	40	-1	0.127	0.200
A12ii	31_(CB)	0.090	71.4	0.70	10	5-Year	104.19	18	20	-2	0.083	0.200
A9i	32_(CB)	0.188	71.4	0.70	10	2-Year	76.81	28	30	-2	0.102	0.127
A9ii	33_(CB)	0.067	71.4	0.70	10	2-Year	76.81	10	10	0	0.083	0.152
A7ii	34_(CB)	0.282	71.4	0.70	10	2-Year	76.81	42	40	2	0.127	0.127
A7i	35_(CB)	0.228	71.4	0.70	10	2-Year	76.81	34	30	4	0.127	0.127
A5i	36_(CB)	0.102	71.4	0.70	10	2-Year	76.81	15	20	-5	0.083	0.108
A5ii	37_(CB)	0.260	71.4	0.70	10	2-Year	76.81	39	40	-1	0.127	0.127
A2i	40_(CB)	0.120	71.4	0.70	10	2-Year	76.81	18	20	-2	0.102	0.127
B3ii	40_(CB)	0.046	85.7	0.80	10	2-Year	76.81	8	10	-2	0.102	0.127
A2ii	41_(CB)	0.118	71.4	0.70	10	2-Year	76.81	18	20	-2	0.127	0.127
B1ii	41_(CB)	0.123	85.7	0.80	10	2-Year	76.81	21	20	1	0.127	0.127
A1i	42_(CB)	0.157	71.4	0.70	10	2-Year	76.81	23	20	3	0.094	0.102
A1ii	43_(CB)	0.202	71.4	0.70	10	2-Year	76.81	30	30	0	0.108	0.108
A26ii	44_(CB)	0.172	71.4	0.70	10	2-Year	76.81	26	30	-4	0.102	0.102
A26i	45_(CB)	0.060	71.4	0.70	10	2-Year	76.81	9	10	-1	0.083	0.083
A27ii	46_(CB)	0.181	71.4	0.70	10	2-Year	76.81	27	30	-3	0.102	0.102
A27i	47_(CB)	0.088	71.4	0.70	10	2-Year	76.81	13	10	3	0.083	0.094
A28ii	48_(CB)	0.142	71.4	0.70	10	2-Year	76.81	21	20	1	0.094	0.094
A28i	49_(CB)	0.143	71.4	0.70	10	2-Year	76.81	21	20	1	0.094	0.094
A35ii	50_(CB)	0.203	71.4	0.70	10	2-Year	76.81	30	30	0	0.108	0.127
A35i	51_(CB)	0.228	71.4	0.70	10	2-Year	76.81	34	30	4	0.127	0.127
A4	52_(CB)	0.092	71.4	0.70	10	2-Year	76.81	14	10	4	0.083	0.178
A8i	53_(CB)	0.220	71.4	0.70	10	2-Year	76.81	33	30	3	0.108	0.127
A8ii	54_(CB)	0.190	71.4	0.70	10	2-Year	76.81	28	30	-2	0.102	0.127
A48	55_(CB)	0.205	71.4	0.70	10	2-Year	76.81	31	30	1	0.108	0.127
A51	57_(CB)	0.186	71.4	0.70	10	2-Year	76.81	28	30	-2	0.102	0.127
A49	RYCB-01	0.074	50	0.55	10	2-Year	76.81	9	10	-1	0.083	0.127
A43	RYCB-02	0.236	50	0.55	10	2-Year	76.81	28	10	18	0.083	0.127
A44	RYCB-03	0.199	50	0.55	10	2-Year	76.81	23	10	13	0.083	0.152
A47	RYCB-04	0.136	50	0.55	10	2-Year	76.81	16	10	6	0.083	0.152
A21	RYCB-07	0.325	50	0.55	10	2-Year	76.81	38	20	18	-	-
A23	RYCB-10	0.169	50	0.55	10	2-Year	76.81	20	10	10	0.083	0.178
A14	RYCB-10	0.319	42.9	0.50	10	2-Year	76.81	34	10	24	0.083	0.178
A36	RYCB-18	0.294	50	0.55	10	2-Year	76.81	35	20	15	-	-
A38	RYCB-18	0.239	50	0.55	10	2-Year	76.81	28	20	8	-	-
A19	RYCB-22	0.190	42.9	0.50	10	2-Year	76.81	20	10	10	0.083	0.152
A17	RYCB-29	0.091	42.9	0.50	10	2-Year	76.81	10	10	0	0.083	0.152
A6	RYCB-38	0.131	42.9	0.50	10	2-Year	76.81	14	10	4	0.083	0.152
A3	RYCB-39	0.154	42.9	0.50	10	2-Year	76.81	16	10	6	0.083	0.152

Notes: All applied ICD sizes are equal or greater than the theoretically calculated ICD sizes.
 -RYCB-06 is not included because it was designed for the 100-year level of service and therefore does not require an ICD,
 -RYCB-07 and RYCB-18 are both direct STM connections and therefore do not require ICD's.

Table D-12: Time Series for Downstream Boundary Condition at STM-111

Time	Depth (m)								
	2-Yr 3-Hr Chicago	5-Yr 3-Hr Chicago	10-Yr 3-Hr Chicago	100-Yr 3-Hr Chicago	100-Yr 24-Hr SCS	100-Yr 3-Hr Chi + 20%	4-Aug-88	8-Aug-96	1-Jul-79
0:00	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57
0:05	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57
0:10	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57
0:15	80.57	80.57	80.57	80.57	80.57	80.58	80.57	80.64	80.57
0:20	80.57	80.57	80.57	80.60	80.57	80.63	80.57	80.75	80.58
0:25	80.57	80.58	80.59	80.66	80.57	80.70	80.57	80.84	80.62
0:30	80.58	80.62	80.64	80.72	80.57	80.78	80.78	80.97	80.68
0:35	80.61	80.67	80.70	80.79	80.57	80.94	81.04	80.95	80.81
0:40	80.66	80.73	80.78	80.87	80.57	81.05	81.42	80.89	81.02
0:45	80.73	80.86	80.94	80.96	80.57	81.15	81.36	80.87	81.28
0:50	80.87	81.02	81.07	81.07	80.57	81.29	81.28	80.89	81.39
0:55	81.10	81.22	81.28	81.22	80.57	81.52	81.17	81.00	81.42
1:00	81.37	81.52	81.60	81.39	80.57	81.80	81.03	81.06	81.44
1:05	81.64	81.85	81.90	81.51	80.57	82.06	80.96	81.06	81.45
1:10	81.61	81.88	81.98	81.56	80.57	82.26	80.98	81.02	81.48
1:15	81.45	81.72	81.86	81.60	80.57	82.29	81.13	81.04	81.54
1:20	81.32	81.52	81.72	81.72	80.57	82.42	81.25	81.25	81.63
1:25	81.21	81.39	81.63	81.91	80.57	82.53	81.28	81.59	81.75
1:30	81.14	81.36	81.57	82.12	80.58	82.62	81.30	81.82	81.91
1:35	81.10	81.40	81.69	82.31	80.59	82.84	81.56	81.95	82.05
1:40	81.09	81.48	81.75	82.44	80.60	82.92	81.78	81.89	82.22
1:45	81.11	81.54	81.86	82.50	80.61	83.07	81.78	81.71	82.41
1:50	81.14	81.61	81.90	82.57	80.62	83.06	81.81	81.61	82.59
1:55	81.18	81.66	81.97	82.63	80.63	83.09	81.96	81.68	82.74
2:00	81.21	81.70	81.99	82.69	80.64	83.10	82.18	81.77	82.90
2:05	81.25	81.74	82.04	82.71	80.67	83.15	82.48	81.85	83.01
2:10	81.27	81.77	82.05	82.74	80.71	83.15	82.71	81.90	83.02
2:15	81.30	81.80	82.09	82.76	80.72	83.17	82.75	81.94	83.03
2:20	81.32	81.82	82.10	82.78	80.73	83.16	82.75	81.97	83.08
2:25	81.34	81.84	82.13	82.79	80.73	83.18	82.77	81.99	83.11
2:30	81.36	81.86	82.13	82.80	80.73	83.16	82.81	82.00	83.12
2:35	81.38	81.88	82.16	82.80	80.74	83.17	82.87	82.02	83.12
2:40	81.39	81.89	82.16	82.81	80.74	83.15	82.89	82.03	83.12
2:45	81.41	81.90	82.18	82.81	80.74	83.16	82.88	82.04	83.12
2:50	81.42	81.92	82.18	82.81	80.74	83.14	82.88	82.05	83.11
2:55	81.43	81.93	82.20	82.81	80.74	83.14	82.89	82.07	83.10
3:00	81.44	81.94	82.20	82.82	80.74	83.12	82.89	82.16	83.09
3:05	81.45	81.94	82.22	82.81	80.74	83.12	82.90	82.34	83.08
3:10	81.46	81.95	82.22	82.81	80.74	83.10	82.90	82.47	83.07
3:15	81.47	81.96	82.23	82.81	80.74	83.09	82.92	82.58	83.06
3:20	81.48	81.97	82.23	82.81	80.74	83.09	82.92	82.66	83.05
3:25	81.49	81.97	82.23	82.80	80.74	83.07	82.90	82.67	83.03
3:30	81.49	81.98	82.23	82.79	80.74	83.05	82.90	82.69	83.02
3:35	81.50	81.98	82.24	82.79	80.74	83.04	82.91	82.73	83.00
3:40	81.50	81.98	82.24	82.78	80.74	83.03	82.90	82.76	82.99
3:45	81.51	81.98	82.24	82.77	80.74	83.01	82.88	82.79	82.97
3:50	81.51	81.99	82.24	82.76	80.74	82.99	82.87	82.80	82.96
3:55	81.52	81.98	82.24	82.76	80.74	82.98	82.88	82.81	82.94
4:00	81.52	81.99	82.24	82.75	80.74	82.97	82.86	82.81	82.93
4:05	81.52	81.99	82.24	82.74	80.74	82.96	82.85	82.81	82.92
4:10	81.52	81.99	82.24	82.73	80.74	82.94	82.84	82.81	82.90
4:15	81.53	81.99	82.24	82.73	80.74	82.93	82.83	82.81	82.89
4:20	81.53	81.99	82.24	82.72	80.74	82.92	82.82	82.81	82.88
4:25	81.53	81.99	82.24	82.71	80.75	82.91	82.81	82.80	82.86
4:30	81.53	81.99	82.23	82.70	80.75	82.90	82.80	82.80	82.85
4:35	81.53	81.99	82.24	82.70	80.75	82.89	82.79	82.79	82.84
4:40	81.53	81.99	82.23	82.69	80.75	82.88	82.78	82.78	82.83
4:45	81.53	81.98	82.23	82.69	80.76	82.87	82.77	82.77	82.82
4:50	81.53	81.99	82.23	82.68	80.76	82.85	82.76	82.77	82.81
4:55	81.53	81.98	82.23	82.67	80.76	82.85	82.76	82.76	82.79
5:00	81.53	81.99	82.22	82.67	80.76	82.84	82.74	82.75	82.78
5:05	81.53	81.98	82.22	82.66	80.76	82.83	82.74	82.74	82.77
5:10	81.53	81.98	82.22	82.65	80.76	82.82	82.74	82.73	82.76
5:15	81.53	81.98	82.22	82.65	80.76	82.81	82.74	82.73	82.75
5:20	81.53	81.98	82.22	82.64	80.76	82.80	82.73	82.72	82.74
5:25	81.53	81.98	82.22	82.64	80.76	82.79	82.73	82.71	82.74
5:30	81.53	81.98	82.21	82.63	80.76	82.78	82.73	82.70	82.73
5:35	81.53	81.97	82.21	82.62	80.76	82.77	82.73	82.69	82.72
5:40	81.53	81.98	82.21	82.62	80.76	82.77	82.72	82.68	82.71
5:45	81.53	81.97	82.21	82.62	80.76	82.76	82.72	82.67	82.70
5:50	81.53	81.97	82.20	82.61	80.76	82.75	82.72	82.67	82.69
5:55	81.53	81.97	82.20	82.60	80.76	82.74	82.71	82.66	82.68
6:00	81.53	81.97	82.20	82.60	80.76	82.74	82.70	82.65	82.67
6:05	81.53	81.96	82.20	82.60	80.76	82.73	82.70	82.64	82.67

6:10	81.53	81.97	82.20	82.59	80.76	82.72	82.69	82.63	82.66
6:15	81.53	81.96	82.19	82.59	80.76	82.71	82.69	82.63	82.65
6:20	81.53	81.96	82.19	82.58	80.76	82.71	82.68	82.62	82.64
6:25	81.52	81.96	82.19	82.58	80.76	82.70	82.67	82.61	82.64
6:30	81.52	81.96	82.19	82.57	80.76	82.69	82.67	82.60	82.63
6:35	81.52	81.96	82.19	82.57	80.76	82.69	82.66	82.60	82.63
6:40	81.52	81.96	82.18	82.56	80.77	82.68	82.65	82.59	82.62
6:45	81.52	81.95	82.18	82.56	80.77	82.68	82.64	82.58	82.61
6:50	81.52	81.95	82.18	82.56	80.77	82.67	82.64	82.58	82.60
6:55	81.52	81.95	82.18	82.55	80.77	82.66	82.63	82.57	82.60
7:00	81.52	81.95	82.18	82.55	80.77	82.66	82.63	82.56	82.59
7:05	81.52	81.94	82.17	82.54	80.77	82.65	82.62	82.56	82.59
7:10	81.51	81.95	82.17	82.54	80.77	82.65	82.61	82.55	82.58
7:15	81.51	81.94	82.17	82.54	80.77	82.64	82.61	82.54	82.58
7:20	81.51	81.94	82.17	82.53	80.77	82.64	82.60	82.54	82.57
7:25	81.51	81.94	82.17	82.53	80.78	82.63	82.60	82.53	82.56
7:30	81.51	81.94	82.16	82.53	80.78	82.63	82.59	82.53	82.56
7:35	81.51	81.93	82.16	82.52	80.78	82.62	82.59	82.52	82.55
7:40	81.51	81.93	82.16	82.52	80.78	82.62	82.58	82.52	82.55
7:45	81.51	81.93	82.16	82.52	80.78	82.62	82.57	82.51	82.54
7:50	81.51	81.93	82.15	82.51	80.78	82.61	82.57	82.50	82.54
7:55	81.50	81.93	82.15	82.51	80.78	82.61	82.57	82.50	82.53
8:00	81.50	81.93	82.15	82.51	80.78	82.60	82.56	82.49	82.53
8:05	81.50	81.92	82.15	82.50	80.79	82.60	82.56	82.49	82.52
8:10	81.50	81.92	82.15	82.50	80.79	82.59	82.55	82.48	82.52
8:15	81.50	81.92	82.15	82.50	80.79	82.59	82.55	82.48	82.51
8:20	81.50	81.92	82.14	82.50	80.79	82.58	82.54	82.47	82.51
8:25	81.50	81.92	82.14	82.49	80.80	82.58	82.54	82.47	82.51
8:30	81.50	81.92	82.14	82.49	80.80	82.58	82.53	82.46	82.50
8:35	81.49	81.91	82.14	82.49	80.80	82.57	82.53	82.46	82.50
8:40	81.49	81.91	82.13	82.48	80.80	82.57	82.52	82.45	82.49
8:45	81.49	81.91	82.13	82.48	80.80	82.57	82.52	82.45	82.49
8:50	81.49	81.91	82.13	82.48	80.81	82.56	82.51	82.44	82.48
8:55	81.49	81.91	82.13	82.47	80.81	82.56	82.51	82.44	82.48
9:00	81.49	81.91	82.13	82.47	80.81	82.56	82.51	82.43	82.48
9:05	81.49	81.90	82.12	82.47	80.81	82.55	82.51	82.43	82.47
9:10	81.48	81.90	82.12	82.47	80.81	82.55	82.50	82.42	82.47
9:15	81.48	81.90	82.12	82.46	80.81	82.55	82.50	82.42	82.47
9:20	81.48	81.90	82.12	82.46	80.82	82.54	82.49	82.42	82.46
9:25	81.48	81.90	82.12	82.46	80.82	82.54	82.49	82.41	82.46
9:30	81.48	81.90	82.11	82.46	80.82	82.54	82.48	82.41	82.45
9:35	81.48	81.89	82.11	82.45	80.83	82.53	82.48	82.40	82.45
9:40	81.48	81.89	82.11	82.45	80.83	82.53	82.48	82.40	82.45
9:45	81.48	81.89	82.11	82.45	80.83	82.53	82.48	82.39	82.44
9:50	81.47	81.89	82.11	82.45	80.84	82.52	82.47	82.39	82.44
9:55	81.47	81.89	82.10	82.44	80.84	82.52	82.47	82.39	82.44
10:00	81.47	81.88	82.10	82.44	80.84	82.52	82.46	82.38	82.43
10:05	81.47	81.88	82.10	82.44	80.85	82.52	82.46	82.38	82.43
10:10	81.47	81.88	82.10	82.44	80.85	82.51	82.46	82.37	82.43
10:15	81.47	81.88	82.10	82.44	80.86	82.51	82.46	82.37	82.42
10:20	81.47	81.88	82.09	82.43	80.87	82.51	82.45	82.37	82.42
10:25	81.46	81.88	82.09	82.43	80.88	82.51	82.45	82.36	82.42
10:30	81.46	81.88	82.09	82.43	80.88	82.50	82.45	82.36	82.41
10:35	81.46	81.87	82.09	82.43	80.89	82.50	82.44	82.35	82.41
10:40	81.46	81.87	82.09	82.43	80.90	82.50	82.44	82.35	82.41
10:45	81.46	81.87	82.09	82.42	80.91	82.50	82.44	82.35	82.41
10:50	81.46	81.87	82.08	82.42	80.93	82.49	82.44	82.34	82.40
10:55	81.46	81.87	82.08	82.42	80.94	82.49	82.43	82.34	82.40
11:00	81.45	81.86	82.08	82.42	80.95	82.49	82.43	82.34	82.40
11:05	81.45	81.86	82.08	82.41	80.97	82.49	82.43	82.33	82.39
11:10	81.45	81.86	82.07	82.41	80.98	82.48	82.43	82.33	82.39
11:15	81.45	81.86	82.07	82.41	81.00	82.48	82.42	82.32	82.39
11:20	81.45	81.86	82.07	82.41	81.04	82.48	82.42	82.32	82.38
11:25	81.45	81.85	82.07	82.41	81.06	82.48	82.42	82.32	82.38
11:30	81.45	81.85	82.07	82.41	81.07	82.48	82.41	82.31	82.38
11:35	81.44	81.85	82.07	82.40	81.11	82.47	82.41	82.31	82.38
11:40	81.44	81.85	82.06	82.40	81.19	82.47	82.41	82.31	82.37
11:45	81.44	81.85	82.06	82.40	81.39	82.47	82.40	82.30	82.37
11:50	81.44	81.85	82.06	82.40	81.64	82.47	82.40	82.30	82.37
11:55	81.44	81.85	82.06	82.40	81.87	82.46	82.40	82.29	82.36
12:00	81.44	81.84	82.06	82.39	82.06	82.46	82.40	82.29	82.36
12:05	81.44	81.84	82.05	82.39	82.27	82.46	82.39	82.29	82.36
12:10	81.43	81.84	82.05	82.39	82.49	82.46	82.39	82.28	82.36
12:15	81.43	81.84	82.05	82.39	82.58	82.46	82.39	82.28	82.35
12:20	81.43	81.84	82.05	82.39	82.69	82.46	82.39	82.28	82.35
12:25	81.43	81.84	82.05	82.39	82.79	82.45	82.39	82.27	82.35
12:30	81.43	81.83	82.05	82.38	82.82	82.45	82.38	82.27	82.35
12:35	81.43	81.83	82.04	82.38	82.86	82.45	82.38	82.27	82.34
12:40	81.43	81.83	82.04	82.38	82.90	82.45	82.38	82.26	82.34
12:45	81.42	81.83	82.04	82.38	82.93	82.45	82.38	82.26	82.34
12:50	81.42	81.83	82.04	82.38	82.97	82.45	82.38	82.26	82.33

12:55	81.42	81.83	82.04	82.37	82.98	82.44	82.37	82.25	82.33
13:00	81.42	81.82	82.03	82.37	82.99	82.44	82.37	82.25	82.33
13:05	81.42	81.82	82.03	82.37	82.99	82.44	82.37	82.25	82.33
13:10	81.42	81.82	82.03	82.37	83.00	82.44	82.37	82.24	82.32
13:15	81.42	81.82	82.03	82.37	82.99	82.44	82.36	82.24	82.32
13:20	81.41	81.82	82.03	82.37	83.00	82.44	82.36	82.24	82.32
13:25	81.41	81.82	82.03	82.36	82.99	82.43	82.36	82.23	82.32
13:30	81.41	81.81	82.02	82.36	82.99	82.43	82.36	82.23	82.31
13:35	81.41	81.81	82.02	82.36	82.98	82.43	82.36	82.23	82.31
13:40	81.41	81.81	82.02	82.36	82.98	82.43	82.35	82.22	82.31
13:45	81.41	81.81	82.02	82.36	82.97	82.43	82.35	82.22	82.31
13:50	81.41	81.81	82.02	82.36	82.97	82.43	82.35	82.22	82.30
13:55	81.40	81.81	82.01	82.35	82.96	82.42	82.35	82.21	82.30
14:00	81.40	81.80	82.01	82.35	82.96	82.42	82.35	82.21	82.30
14:05	81.40	81.80	82.01	82.35	82.95	82.42	82.34	82.21	82.30
14:10	81.40	81.80	82.01	82.35	82.95	82.42	82.34	82.20	82.29
14:15	81.40	81.80	82.01	82.35	82.94	82.42	82.34	82.20	82.29
14:20	81.40	81.80	82.01	82.35	82.94	82.42	82.34	82.20	82.29
14:25	81.40	81.80	82.00	82.34	82.93	82.41	82.33	82.19	82.29
14:30	81.39	81.79	82.00	82.34	82.92	82.41	82.33	82.19	82.28
14:35	81.39	81.79	82.00	82.34	82.91	82.41	82.33	82.19	82.28
14:40	81.39	81.79	82.00	82.34	82.91	82.41	82.33	82.18	82.28
14:45	81.39	81.79	82.00	82.34	82.90	82.41	82.33	82.18	82.28
14:50	81.39	81.79	82.00	82.34	82.90	82.41	82.33	82.18	82.27
14:55	81.39	81.79	81.99	82.33	82.89	82.40	82.32	82.18	82.27
15:00	81.38	81.78	81.99	82.33	82.89	82.41	82.32	82.17	82.27
15:05	81.38	81.78	81.99	82.33	82.88	82.40	82.32	82.17	82.27
15:10	81.38	81.78	81.99	82.33	82.87	82.40	82.32	82.17	82.26
15:15	81.38	81.78	81.99	82.33	82.86	82.40	82.31	82.16	82.26
15:20	81.38	81.78	81.99	82.33	82.86	82.40	82.31	82.16	82.26
15:25	81.38	81.78	81.98	82.32	82.85	82.40	82.31	82.16	82.26
15:30	81.38	81.77	81.98	82.32	82.85	82.40	82.31	82.15	82.25
15:35	81.37	81.77	81.98	82.32	82.84	82.39	82.31	82.15	82.25
15:40	81.37	81.77	81.98	82.32	82.84	82.39	82.31	82.15	82.25
15:45	81.37	81.77	81.98	82.32	82.83	82.39	82.30	82.14	82.25
15:50	81.37	81.77	81.98	82.32	82.83	82.39	82.30	82.14	82.25
15:55	81.37	81.77	81.97	82.31	82.82	82.39	82.30	82.14	82.24
16:00	81.37	81.77	81.97	82.31	82.82	82.39	82.30	82.14	82.24
16:05	81.37	81.76	81.97	82.31	82.81	82.39	82.30	82.13	82.24
16:10	81.36	81.76	81.97	82.31	82.81	82.39	82.29	82.13	82.24
16:15	81.36	81.76	81.97	82.31	82.80	82.38	82.29	82.13	82.23
16:20	81.36	81.76	81.97	82.31	82.80	82.38	82.29	82.12	82.23
16:25	81.36	81.76	81.96	82.31	82.80	82.38	82.29	82.12	82.23
16:30	81.36	81.76	81.96	82.30	82.79	82.38	82.29	82.12	82.23
16:35	81.36	81.75	81.96	82.30	82.78	82.38	82.29	82.11	82.22
16:40	81.36	81.75	81.96	82.30	82.78	82.38	82.28	82.11	82.22
16:45	81.35	81.75	81.96	82.30	82.77	82.38	82.28	82.11	82.22
16:50	81.35	81.75	81.96	82.30	82.77	82.38	82.28	82.11	82.22
16:55	81.35	81.75	81.95	82.30	82.76	82.37	82.28	82.10	82.22
17:00	81.35	81.75	81.95	82.29	82.76	82.37	82.28	82.10	82.21
17:05	81.35	81.75	81.95	82.29	82.76	82.37	82.27	82.10	82.21
17:10	81.35	81.74	81.95	82.29	82.75	82.37	82.27	82.09	82.21
17:15	81.35	81.74	81.95	82.29	82.75	82.37	82.27	82.09	82.21

APPENDIX

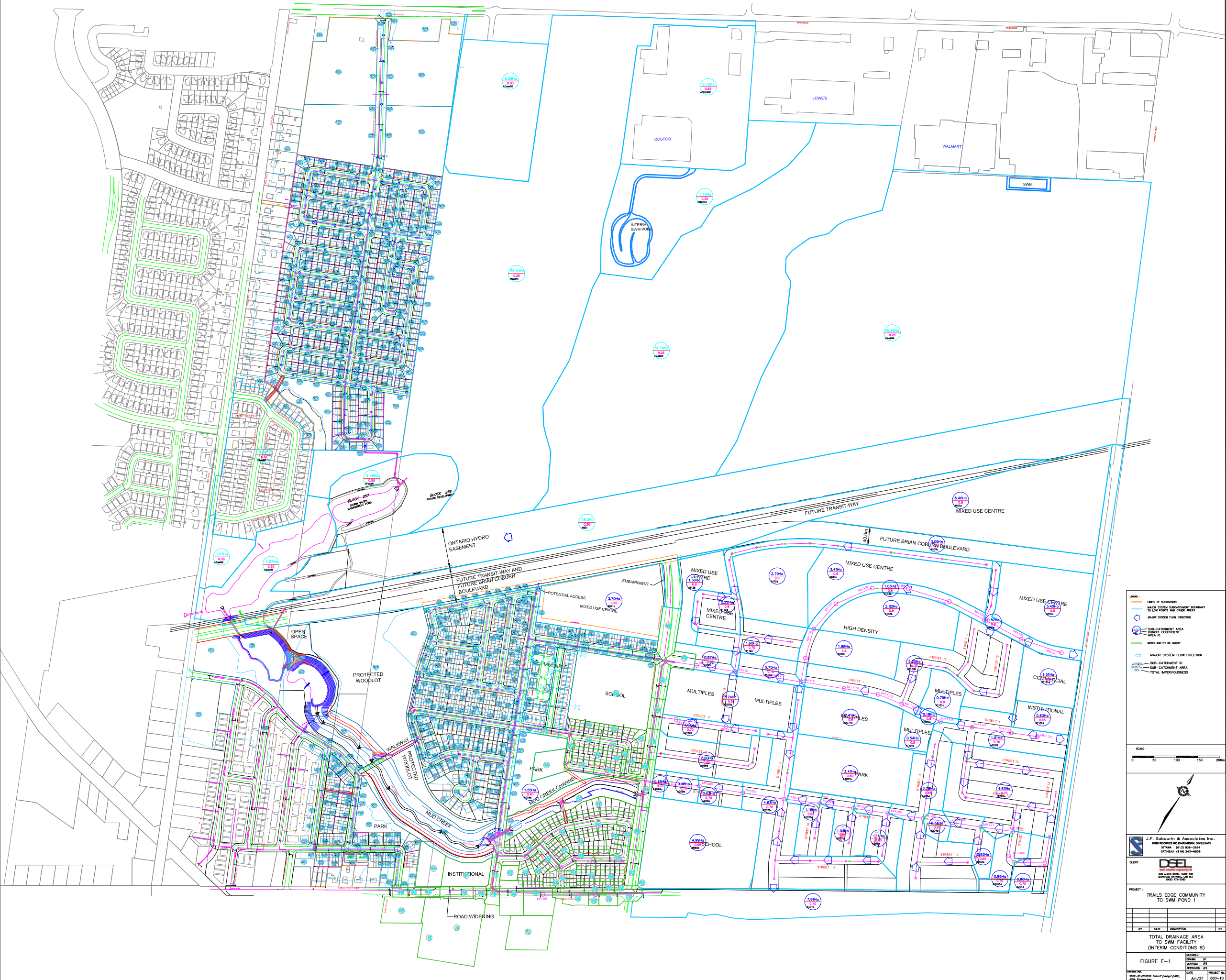
E

Interim Condition and EUC Pond 1 Analysis

JFSA

Water Resources and
Environmental Consultants





LEGEND

- LIMITS OF SUBDIVISION
- MAJOR SYSTEM SUBCATCHMENT BOUNDARY TO LUMP POINTS AND OTHER AREAS
- MAJOR SYSTEM FLOW DIRECTION
- SUB-CATCHMENT AREA - RUNOFF COEFFICIENT
- SUB-CATCHMENT AREA - MODULUS BY @ GROUP
- MAJOR SYSTEM FLOW DIRECTION
- SUB-CATCHMENT ID
- SUB-CATCHMENT AREA
- TOTAL IMPERVIOUSNESS

SCALE

0 50 100 150 200m

ORIENTATION

J.F. Sabourin & Associates Inc.
 WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
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 TEL: (514) 384-3844
 FAX: (514) 384-3848

PROJECT: TRAILS EDGE COMMUNITY TO SWM POND 1

BY	DATE	DESCRIPTION	BY

TOTAL DRAINAGE AREA TO SWM FACILITY (INTERIM CONDITIONS B)

FIGURE E-1

DESIGNED	DATE
J.F.	06/21/2018
CHECKED	DATE
J.F.	06/21/2018
APPROVED	DATE
J.F.	06/21/2018

PROJECT NO.: 2018-21-02108 Sabourin/Design/CAO, J.F.A. 883-10
DATE: Jun/21

Table E-1: Criteria for Required Storage Volumes Under Interim B Conditions

Pond	Area (ha)	Imperviousness (%)	Storage Volume for Impervious Level ⁽¹⁾ (m ³ /ha)
N/A	N/A	35	90
SWM Pond 1	372.298	42	97.00
N/A	N/A	55	110

⁽¹⁾ Protection Level for Wet Pond: Normal 70% long-term S.S. removal.
SWM Planning & Design Manual, Table 3.2, p.3-10 (March 2003).

Table E-2: Required Storage Volumes for SWM Facility Under Interim B Conditions

Pond Component	Required Volume (m ³)	Provided Volume ⁽⁴⁾ (m ³)	Volume Ratio	Provided Area ⁽⁵⁾ (m ²)	Provided Elevation (m)
Permanent Pool (PP) ⁽¹⁾	21221	36400	1.72	35421	Variable ⁽⁷⁾
Quality Control ⁽²⁾	14892	14892	1.00	N/A	80.684
Extended Detention ⁽³⁾	33922	43988	1.30	N/A	81.650
Forebay (20% PP)	N/A	N/A	N/A	11212.4	Variable ⁽⁷⁾
PP - Forebay	N/A	N/A	N/A	24208	Variable ⁽⁷⁾
Area Ratio (%) ⁽⁶⁾ =				32	

⁽¹⁾ Required PP volume based on Table E-1 (97.00 - 40 = 57.00 m³/ha).

⁽²⁾ Required quality control volume based on 40 m³/ha.

⁽³⁾ Required extended detention volume based on the detention of the 25 mm storm for a 24 to 48 hour drawdown time.

⁽⁴⁾ Provided volume based on stage-storage curve and extended detention (refer to Tables E-3 and E-4).

⁽⁵⁾ Based on grading plan provided by DSEL (refer to Figure 2).

⁽⁶⁾ As per MOE, Maximum Forebay Area: 33% of Total Permanent Pool.

⁽⁷⁾ Permanent pool elevations are 80.10 m in the main cell, 81.60 m in the north forebay and 81.50 m in the south forebay.

Table E-3: Extended Detention Parameters for SWM Facility Under Interim B Conditions

		Quality Orifice Parameters	
Area (C3)	24208.20 m ²	Diameter	0.400 m
Volume	36400.40 m ³		
PP Elev	80.100 m	Area	0.126 m ²
QC Elev	80.684 m	Invert	80.100 m
h (m)	0.584 m	C _o	0.62

- Notes:
- C3 is the intercept from the area-depth linear regression.
 - PP Elev indicates the elevation of the permanent pool.
 - QC Elev indicates the elevation of the storage volume required by MOE for quality control.
 - h is the maximum water elevation above the orifice (m).

Table E-4: Extended Detention Drawdown Time for SWM Facility Under Interim B Conditions (Existing Controls)

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)	Flow (m ³ /s)	Demarkation Point
	V (m ³)	A (m ²)	depth (m)					
80.100	0.0	24208.2	0.00				0.000	PP Elev (Main)
80.150	1219.2	24453.2	0.05	4900	8.73	0.36	0.019	
80.200	2448.4	24672.4	0.10	4642	12.38	0.52	0.038	
80.250	3687.2	24882.3	0.15	4494	15.21	0.63	0.057	
80.300	4931.9	25091.0	0.20	4414	17.61	0.73	0.075	
80.350	6196.0	25302.1	0.25	4376	19.75	0.82	0.094	
80.400	7507.8	25553.4	0.30	4484	21.71	0.90	0.112	
80.450	8742.2	25921.8	0.35	4896	23.56	0.98	0.130	
80.500	10038.4	25925.1	0.40	4292	25.19	1.05	0.147	
80.550	11335.4	25939.8	0.45	3848	26.72	1.11	0.165	
80.600	12653.7	26378.5	0.50	4341	28.33	1.18	0.181	
80.650	13983.1	26657.4	0.55	4453	29.83	1.24	0.195	
80.684	14892.0	26831.1	0.58	4492	30.80	1.28	0.204	
80.700	15323.5	26913.6	0.60	4509	31.26	1.30	0.209	
80.750	16675.6	27152.6	0.65	4530	32.64	1.36	0.221	
80.800	18031.5	27386.6	0.70	4541	33.97	1.42	0.233	
80.850	19415.8	27631.9	0.75	4565	35.28	1.47	0.245	
80.900	20845.4	27913.0	0.80	4631	36.57	1.52	0.255	
80.950	22194.0	28324.5	0.85	4843	37.89	1.58	0.266	
81.000	23610.8	28336.7	0.90	4587	39.00	1.62	0.276	
81.050	25028.8	28361.2	0.95	4372	40.08	1.67	0.286	
81.100	26464.1	28707.0	1.00	4499	41.30	1.72	0.295	
81.150	27908.4	28942.1	1.05	4508	42.45	1.77	0.304	
81.200	29360.8	29142.3	1.10	4486	43.56	1.82	0.313	
81.250	30815.5	29338.0	1.15	4461	44.65	1.86	0.321	
81.300	32295.1	29535.6	1.20	4439	45.73	1.91	0.330	
81.350	33777.2	29736.9	1.25	4423	46.79	1.95	0.338	
81.400	35307.4	29972.4	1.30	4434	47.86	1.99	0.346	
81.450	36764.7	30324.9	1.35	4531	48.99	2.04	0.354	
81.500	38275.7	35486.6	1.40	8056	53.13	2.21	0.361	PP Elev (SFore)
81.550	40062.1	35627.9	1.45	7876	54.16	2.26	0.369	
81.600	41866.2	42142.6	1.50	11956	59.32	2.47	0.376	PP Elev (NFore)
81.650	43987.5	42516.9	1.55	11812	60.54	2.52	0.383	
81.700	46121.5	42829.6	1.60	11638	61.72	2.57	0.390	Ext. Det.
81.750	48270.9	43143.8	1.65	11476	62.89	2.62	0.397	

Table E-4: Extended Detention Drawdown Time for SWM Facility Under Interim B Conditions (Existing Controls)

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)	Flow (m ³ /s)	Demarkation Point
	V (m ³)	A (m ²)	depth (m)					
81.800	50436.7	43457.5	1.70	11323	64.06	2.67	0.404	
81.850	52614.8	43779.8	1.75	11184	65.22	2.72	0.411	
81.900	54874.0	44141.0	1.80	11074	66.40	2.77	0.417	
81.950	57016.8	44692.9	1.85	11073	67.72	2.82	0.424	
82.000	59250.7	44700.3	1.90	10785	68.63	2.86	0.430	
82.050	61533.8	45651.1	1.95	10996	70.23	2.93	0.436	
82.100	63847.2	46277.0	2.00	11034	71.60	2.98	0.442	

- Notes:
- C2 is the slope coefficient from the area-depth linear regression.
 - PP Elev indicates the elevation of the permanent pool.
 - QC Elev indicates the elevation of the storage volume required by MOE for quality control.
 - Ext. Det. indicates the elevation of extended detention provided based on the detention of the 25 mm storm for a 24 to 48 hour drawdown time.

Table E-5: Stage-Storage-Outflow Curve for SWM Facility Under Interim B Conditions (Existing Controls)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4			
			Vertical Orifice		Rectangular Weir		Rectangular Weir		Rectangular Weir		Rectangular Weir			
			Dia (m)	0.400	L (m)	1.000	L (m)	3.000	L (m)	1.500	L (m)	1.500		
			Area (m ²)	0.126										
			Invert (m)	80.10	C _w	1.800	C _w	1.800	C _w	1.800	C _w	1.800		
			C _o	0.62	Invert (m)	81.65	Invert (m)	82.35	Invert (m)	82.35	Invert (m)	82.35		
			Q @ D	0.154	n contr.	2	n contr.	2	n contr.	2	n contr.	2		
Elevation (m)	Active Sto. (m ³)	Demarcation Points	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Outflow (m ³ /s)	Storage (ha·m)
80.100	0	PP Elev (Main)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
80.150	1219		0.050	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.122
80.200	2448		0.100	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.245
80.250	3687		0.150	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057	0.369
80.300	4932		0.200	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.493
80.350	6196		0.250	0.094	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.094	0.620
80.400	7508		0.300	0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.112	0.751
80.450	8742		0.350	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.130	0.874
80.500	10038		0.400	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147	1.004
80.550	11335		0.450	0.165	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.165	1.134
80.600	12654		0.500	0.181	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.181	1.265
80.650	13983		0.550	0.195	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.195	1.398
80.684	14892	QC Elev	0.584	0.204	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.204	1.489
80.700	15324		0.600	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.209	1.532
80.750	16676		0.650	0.221	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.221	1.668
80.800	18032		0.700	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.233	1.803
80.850	19416		0.750	0.245	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.245	1.942
80.900	20845		0.800	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.255	2.085
80.950	22194		0.850	0.266	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.266	2.219
81.000	23611		0.900	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.276	2.361
81.050	25029		0.950	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.286	2.503
81.100	26464		1.000	0.295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.295	2.646
81.150	27908		1.050	0.304	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.304	2.791
81.200	29361		1.100	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.313	2.936
81.250	30816		1.150	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.321	3.082
81.300	32295		1.200	0.330	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.330	3.230
81.350	33777		1.250	0.338	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.338	3.378
81.400	35307		1.300	0.346	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.346	3.531
81.450	36765		1.350	0.354	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.354	3.676
81.500	38276	PP Elev (South)	1.400	0.361	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.361	3.828
81.550	40062		1.450	0.369	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.369	4.006
81.600	41866	PP Elev (North)	1.500	0.376	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	4.187
81.650	43988	Ext. Det.	1.550	0.383	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.383	4.399

Table E-5: Stage-Storage-Outflow Curve for SWM Facility Under Interim B Conditions (Existing Controls)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4			
			Vertical Orifice		Rectangular Weir		Rectangular Weir		Rectangular Weir		Rectangular Weir			
			Dia (m)	0.400	L (m)	1.000	L (m)	3.000	L (m)	1.500	L (m)	1.500		
			Area (m ²)	0.126	C _w	1.800	C _w	1.800	C _w	1.800	C _w	1.800		
			Invert (m)	80.10	Invert (m)	81.65	Invert (m)	82.35	Invert (m)	82.35	Invert (m)	82.35		
			C _o	0.62	Invert (m)	81.65	Invert (m)	82.35	Invert (m)	82.35	Invert (m)	82.35		
			Q @ D	0.154	n contr.	2	n contr.	2	n contr.	2	n contr.	2		
Elevation (m)	Active Sto. (m ³)	Demarcation Points	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Outflow (m ³ /s)	Storage (ha·m)
81.700	46122		1.600	0.390	0.050	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.410	4.612
81.750	48271		1.650	0.397	0.100	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.453	4.827
81.800	50437		1.700	0.404	0.150	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.505	5.044
81.850	52615		1.750	0.411	0.200	0.155	0.000	0.000	0.000	0.000	0.000	0.000	0.565	5.261
81.900	54874		1.800	0.417	0.250	0.214	0.000	0.000	0.000	0.000	0.000	0.000	0.631	5.487
81.950	57017		1.850	0.424	0.300	0.278	0.000	0.000	0.000	0.000	0.000	0.000	0.702	5.702
82.000	59251		1.900	0.430	0.350	0.347	0.000	0.000	0.000	0.000	0.000	0.000	0.777	5.925
82.050	61534		1.950	0.436	0.400	0.419	0.000	0.000	0.000	0.000	0.000	0.000	0.855	6.153
82.100	63847		2.000	0.442	0.450	0.494	0.000	0.000	0.000	0.000	0.000	0.000	0.937	6.385
82.150	66177		2.050	0.449	0.500	0.573	0.000	0.000	0.000	0.000	0.000	0.000	1.021	6.618
82.200	68518		2.100	0.455	0.550	0.653	0.000	0.000	0.000	0.000	0.000	0.000	1.108	6.852
82.250	70885		2.150	0.460	0.600	0.736	0.000	0.000	0.000	0.000	0.000	0.000	1.197	7.089
82.300	73266		2.200	0.466	0.650	0.821	0.000	0.000	0.000	0.000	0.000	0.000	1.287	7.327
82.350	75666		2.250	0.472	0.700	0.907	0.000	0.000	0.000	0.000	0.000	0.000	1.379	7.567
82.400	78151		2.300	0.478	0.750	0.907	0.050	0.060	0.050	0.030	0.050	0.030	1.505	7.815
82.450	80507		2.350	0.484	0.800	0.907	0.100	0.170	0.100	0.084	0.100	0.084	1.728	8.051
82.500	82968		2.400	0.489	0.850	0.907	0.150	0.311	0.150	0.154	0.150	0.154	2.014	8.297
82.550	85443		2.450	0.495	0.900	0.907	0.200	0.477	0.200	0.235	0.200	0.235	2.348	8.544
82.600	87947		2.500	0.500	0.950	0.907	0.250	0.664	0.250	0.326	0.250	0.326	2.723	8.795
82.650	90467		2.550	0.506	1.000	0.907	0.300	0.870	0.300	0.426	0.300	0.426	3.133	9.047
82.700	92991		2.600	0.511	1.050	0.907	0.350	1.092	0.350	0.533	0.350	0.533	3.575	9.299
82.750	95541		2.650	0.516	1.100	0.907	0.400	1.330	0.400	0.647	0.400	0.647	4.046	9.554
82.800	98121		2.700	0.521	1.150	0.907	0.450	1.581	0.450	0.766	0.450	0.766	4.541	9.812
82.850	100710		2.750	0.527	1.200	0.907	0.500	1.846	0.500	0.891	0.500	0.891	5.061	10.071
82.900	103374		2.800	0.532	1.250	0.907	0.550	2.122	0.550	1.021	0.550	1.021	5.601	10.337
82.950	105922		2.850	0.537	1.300	0.907	0.600	2.409	0.600	1.154	0.600	1.154	6.162	10.592
83.000	108567	100-Year	2.900	0.542	1.350	0.907	0.650	2.707	0.650	1.292	0.650	1.292	6.740	10.857
83.050	111257		2.950	0.547	1.400	0.907	0.700	3.015	0.700	1.434	0.700	1.434	7.336	11.126
83.100	113981		3.000	0.552	1.450	0.907	0.750	3.332	0.750	1.578	0.750	1.578	7.947	11.398
83.150	115245		3.050	0.557	1.500	0.907	0.800	3.658	0.800	1.726	0.800	1.726	8.573	11.525
83.200	116522		3.100	0.562	1.550	0.907	0.850	3.992	0.850	1.876	0.850	1.876	9.212	11.652
83.250	117806		3.150	0.566	1.600	0.907	0.900	4.334	0.900	2.029	0.900	2.029	9.864	11.781
83.300	119098		3.200	0.571	1.650	0.907	0.950	4.683	0.950	2.183	0.950	2.183	10.528	11.910

Table E-5: Stage-Storage-Outflow Curve for SWM Facility Under Interim B Conditions (Existing Controls)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4			
			Vertical Orifice		Rectangular Weir		Rectangular Weir		Rectangular Weir		Rectangular Weir			
			Dia (m)	0.400	L (m)	1.000	L (m)	3.000	L (m)	1.500	L (m)	1.500		
			Area (m ²)	0.126										
			Invert (m)	80.10	C _w	1.800	C _w	1.800	C _w	1.800	C _w	1.800		
			C _o	0.62	Invert (m)	81.65	Invert (m)	82.35	Invert (m)	82.35	Invert (m)	82.35		
			Q @ D	0.154	n contr.	2	n contr.	2	n contr.	2	n contr.	2		
Elevation (m)	Active Sto. (m ³)	Demarkation Points	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Head (m)	Outflow (m ³ /s)	Outflow (m ³ /s)	Storage (ha·m)
83.350	120419		3.250	0.576	1.700	0.907	1.000	5.040	1.000	2.340	1.000	2.340	11.202	12.042
83.400	130762		3.300	0.581	1.750	0.907	1.050	5.403	1.050	2.498	1.050	2.498	11.887	13.076
83.450	133548		3.350	0.585	1.800	0.907	1.100	5.773	1.100	2.658	1.100	2.658	12.581	13.355
83.500	136424	Top of Berm	3.400	0.590	1.850	0.907	1.150	6.149	1.150	2.819	1.150	2.819	13.284	13.642

Notes :

- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- Ext. Det. indicates the elevation of extended detention provided based on the detention of the 25 mm storm for a 24 to 48 hour drawdown time.
- 100-Year indicates the elevation of the maximum allowable 100-year water level in the main pond cell.
- Top of Berm indicates the elevation at the top of the berm.
- Head losses for reverse grade pipe included in quality control outflow calculations.

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
To SWM Facility 1			
A101a	0.820	86	70.520
A101b	3.090	86	265.740
A101c	3.400	86	292.400
A103a	1.050	86	90.300
A103b	2.820	86	242.520
A103c	3.410	86	293.260
A108a	1.880	86	161.680
A110a	0.750	71	53.250
A112a	0.570	71	40.470
A112b	1.300	86	111.800
A112c	1.600	71	113.600
A112d	2.220	86	190.920
A112e	2.790	86	239.940
A201a	0.900	71	63.900
A202a	4.630	71	328.730
A203a	0.920	64	58.880
A204a	0.340	64	21.760
A205a	3.780	64	241.920
A206a	1.110	64	71.040
A207a	1.040	64	66.560
A208a	0.630	71	44.730
A209a	0.480	71	34.080
A1101a	0.180	86	15.480
A1101b	0.540	86	46.440
A1101c	0.790	86	67.940
A1101d	0.830	64	53.120
A1101e	1.510	64	96.640
A1101f	1.910	71	135.610
A1102a	5.200	71	369.200
A2001a	0.890	71	63.190
A2070a	1.160	64	74.240
A2071a	2.410	86	207.260
A2071b	3.410	29	98.890
A2071c	4.830	71	342.930
A2090a	0.180	71	12.780
ABLK246	2.890	64	184.960
AR114	0.110	49	5.390
AR113	0.130	49	6.370
AR112A	0.170	49	8.330
AS112A	0.140	73	10.220
AS113	0.340	73	24.820
AS112B	0.060	73	4.380
AS101	0.200	73	14.600
AS102	0.180	73	13.140
AP104	0.420	0	0.000
AS106	0.150	73	10.950
AS114	0.290	73	21.170
AS104	0.100	73	7.300
AR112B	0.090	49	4.410
AR104	0.220	49	10.780
AS3901E	0.270	86	23.220
AS3900B	0.220	86	18.920
AS54E	0.170	86	14.620
AS55AE	0.120	86	10.320

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
AS55BE	0.110	86	9.460
AS55C	0.080	86	6.880
AS56E	0.170	86	14.620
AS3901W	0.190	86	16.340
AS54W	0.110	86	9.460
AS55AW	0.096	86	8.256
AS55BW	0.096	86	8.256
AS56W	0.097	86	8.342
AEXT2A	1.516	100	151.600
AEXT2B	0.720	49	35.280
AS500C	0.310	86	26.660
AS500	0.260	86	22.360
AS307	0.250	73	18.250
AS311	0.430	73	31.390
AS312	0.350	73	25.550
AS306	0.390	73	28.470
AR301B	0.160	49	7.840
AS301	0.360	73	26.280
AS303	0.310	73	22.630
AS304	0.280	73	20.440
AR312A	0.330	49	16.170
AR312B	0.110	49	5.390
AR301A	0.150	49	7.350
AR301C	0.120	49	5.880
AR301D	0.100	49	4.900
AS314	0.170	73	12.410
AR305	0.170	49	8.330
AR402B	0.130	49	6.370
AR402A	0.130	49	6.370
AS400e	0.030	71	2.130
AS400A	0.100	71	7.100
AS400B	0.100	71	7.100
AS400C	0.120	71	8.520
AS400D	0.070	71	4.970
AS401A	0.060	71	4.260
AS401B	0.110	71	7.810
AS401C	0.290	71	20.590
AS401E	0.020	71	1.420
AS402A	0.510	71	36.210
AS402C	0.340	71	24.140
AS402G	0.110	71	7.810
AS404	0.160	70	11.200
A21	0.630	86	54.180
AS410A	0.210	86	18.060
AS410B	0.090	86	7.740
AR410A	1.830	42	76.860
AR410B	0.480	42	20.160
A402I	0.760	63	47.880
A055a	2.200	64	140.800
A101d	8.400	86	722.400
A401b	7.910	71	561.610
A560b	4.990	64	319.360
A2110a	1.040	71	73.840
A2110b	3.240	86	278.640
A039NE	0.017	75	1.275

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A039NW	0.046	74	3.404
A039SE	0.021	84	1.764
A039SW	0.023	57	1.311
A019a	1.550	29	44.950
A001N1	0.038	47	1.786
A001N2	0.047	36	1.692
A001NE	0.029	48	1.392
A001NW	0.017	47	0.799
A001R1	0.034	18	0.612
A001S1	0.057	54	3.078
A001S2	0.011	55	0.605
A001SE	0.047	62	2.914
A001SW	0.039	64	2.496
A003R1	0.040	20	0.800
A003R2	0.176	15	2.640
A004NE	0.098	66	6.468
A004NW	0.054	46	2.484
A004SW	0.024	42	1.008
A005NE	0.030	47	1.410
A005NW	0.018	50	0.900
A005SE	0.186	71	13.206
A005SW	0.130	80	10.400
A005W1	0.039	41	1.599
A006NE	0.105	71	7.455
A006NW	0.031	77	2.387
A006SE	0.142	76	10.792
A006SW	0.127	81	10.287
A007E1	0.117	74	8.658
A007E2	0.131	76	9.956
A007N1	0.063	84	5.292
A007NE	0.023	48	1.104
A007NW	0.045	62	2.790
A007R1	0.183	17	3.111
A007R2	0.036	19	0.684
A007S1	0.020	90	1.800
A007SE	0.021	52	1.092
A007SW	0.064	55	3.520
A008NE	0.039	33	1.287
A008NW	0.045	42	1.890
A008R1	0.027	19	0.513
A008R2	0.178	19	3.382
A008R3	0.153	18	2.754
A008SE	0.021	33	0.693
A008SW	0.026	42	1.092
A009E1	0.090	70	6.300
A009E2	0.039	72	2.808
A009N1	0.018	50	0.900
A009N2	0.027	48	1.296
A009N3	0.028	29	0.812
A009NE	0.054	70	3.780
A009NW	0.027	63	1.701
A009SE	0.049	84	4.116
A009SW	0.044	70	3.080
A009W1	0.086	74	6.364
A009W2	0.037	70	2.590

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A010NE	0.080	66	5.280
A010NW	0.080	71	5.680
A010S1	0.151	75	11.325
A010S2	0.151	75	11.325
A010SE	0.052	83	4.316
A010SW	0.052	75	3.900
A010W1	0.035	69	2.415
A011NE	0.076	82	6.232
A011NW	0.036	69	2.484
A011SW	0.189	77	14.553
A012NE	0.033	58	1.914
A012NW	0.055	65	3.575
A012SE	0.089	74	6.586
A012SW	0.040	80	3.200
A013N1	0.031	39	1.209
A013N2	0.029	86	2.494
A013NE	0.073	78	5.694
A013NW	0.037	78	2.886
A013S1	0.058	38	2.204
A013S2	0.062	79	4.898
A013SE	0.068	72	4.896
A013SW	0.042	74	3.108
A015N1	0.019	47	0.893
A015N2	0.010	40	0.400
A015NE	0.063	51	3.213
A015NW	0.057	70	3.990
A015S1	0.029	31	0.899
A015S2	0.007	43	0.301
A015SE	0.028	68	1.904
A015SW	0.081	74	5.994
A017NE	0.021	76	1.596
A017NW	0.168	76	12.768
A017SE	0.021	71	1.491
A017SW	0.048	73	3.504
A018DV1	0.621	74	45.954
A018NE	0.040	70	2.800
A018NW	0.045	56	2.520
A018R1	0.153	20	3.060
A018R2	0.114	21	2.394
A018R3	0.082	21	1.722
A018SE	0.021	71	1.491
A018SW	0.026	50	1.300
A019b	0.073	73	5.329
A019DV1	0.084	59	4.956
A019E1	0.040	70	2.800
A019E2	0.022	73	1.606
A019N1	0.035	69	2.415
A019N2	0.064	77	4.928
A019N3	0.027	63	1.701
A019N4	0.082	76	6.232
A019NE	0.040	85	3.400
A019NW	0.023	61	1.403
A019R1	0.198	22	4.356
A019R2	0.080	16	1.280
A019S1	0.035	77	2.695

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A019S2	0.066	70	4.620
A019S3	0.029	72	2.088
A019S4	0.083	72	5.976
A019SE	0.020	70	1.400
A019SW	0.026	50	1.300
A019W1	0.071	83	5.893
A019W2	0.065	72	4.680
A020E1	0.042	71	2.982
A020N1	0.066	52	3.432
A020N2	0.040	70	2.800
A020N3	0.049	57	2.793
A020NE	0.059	68	4.012
A020NW	0.064	67	4.288
A020S1	0.046	72	3.312
A020S2	0.022	68	1.496
A020SE	0.068	82	5.576
A020SW	0.068	75	5.100
A020W1	0.086	74	6.364
A020W2	0.047	66	3.102
A021NE	0.076	71	5.396
A021NW	0.122	67	8.174
A021SE	0.054	75	4.050
A021SW	0.073	63	4.599
A023N1	0.024	83	1.992
A023N2	0.059	73	4.307
A023NE	0.060	73	4.380
A023NW	0.032	84	2.688
A023R1	0.048	17	0.816
A023R2	0.130	18	2.340
A023R3	0.147	17	2.499
A023R4	0.116	20	2.320
A023S1	0.022	41	0.902
A023S2	0.048	46	2.208
A023SE	0.066	67	4.422
A023SW	0.026	81	2.106
A025NE	0.042	55	2.310
A025NW	0.094	55	5.170
A025SE	0.030	83	2.490
A025SW	0.020	45	0.900
A028R1	0.478	8	3.824
A029NE	0.050	66	3.300
A029NW	0.015	53	0.795
A029R1	0.129	11	1.419
A029R2	0.156	18	2.808
A029R3	0.028	23	0.644
A029R4	0.110	21	2.310
A029R5	0.211	20	4.220
A029R6	0.048	10	0.480
A029S1	0.074	42	3.108
A029S2	0.108	60	6.480
A029SE	0.155	72	11.160
A029SW	0.186	71	13.206
A031NE	0.071	62	4.402
A031NW	0.034	74	2.516
A031SE	0.061	80	4.880

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A031SW	0.027	37	0.999
A032NE	0.059	59	3.481
A032NW	0.024	29	0.696
A032R1	0.061	20	1.220
A032SE	0.054	78	4.212
A032SW	0.036	67	2.412
A034NE	0.024	71	1.704
A034NW	0.016	44	0.704
A034SE	0.021	48	1.008
A034SW	0.110	55	6.050
A039N1	0.042	88	3.696
A039N2	0.069	87	6.003
A039S1	0.021	57	1.197
A039S2	0.034	59	2.006
A040N1	0.032	81	2.592
A040N2	0.068	75	5.100
A040NE	0.082	84	6.888
A040NW	0.029	83	2.407
A040R1	0.050	19	0.950
A040R2	0.056	17	0.952
A040R3	0.076	20	1.520
A040R4	0.062	22	1.364
A040R5	0.040	13	0.520
A040S1	0.021	57	1.197
A040S2	0.035	60	2.100
A040SE	0.035	60	2.100
A040SW	0.021	57	1.197
A041a	3.700	86	318.200
A041DV1	0.631	66	41.646
A041DV2	0.018	49	0.882
A041DV3	0.048	40	1.920
A041DV4	0.144	46	6.624
A041DV5	0.129	46	5.934
A041DV6	0.070	36	2.520
A041N1	0.139	77	10.703
A041N2	0.030	73	2.190
A041NE	0.053	81	4.293
A041NW	0.044	77	3.388
A041S1	0.067	61	4.087
A041SE	0.035	60	2.100
A041SW	0.021	57	1.197
A047E1	0.015	73	1.095
A047E2	0.027	74	1.998
A047PK1	0.375	7	2.625
A047W1	0.036	22	0.792
A047W2	0.074	62	4.588
A049NE	0.039	69	2.691
A049NW	0.018	72	1.296
A049R1	0.082	16	1.312
A049R2	0.052	16	0.832
A049R3	0.116	16	1.856
A049R4	0.023	20	0.460
A049R5	0.039	22	0.858
A049SE	0.072	69	4.968
A049SW	0.045	76	3.420

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A100NE	3.234	65	210.210
A101E1	0.017	82	1.394
A101E2	0.150	57	8.550
A101E3	0.054	48	2.592
A101N1	0.151	64	9.664
A101N2	0.142	76	10.792
A101W1	0.033	64	2.112
A101W2	0.153	64	9.792
A107NW	0.087	72	6.264
A107SW	0.125	64	8.000
A140R1	0.054	22	1.188
A140R2	0.150	20	3.000
A140R3	0.125	20	2.500
A140R4	0.133	20	2.660
A140WK1	0.084	24	2.016
A170DV1	0.130	41	5.330
A170NE	0.040	70	2.800
A170NW	0.090	81	7.290
A170S1	0.038	71	2.698
A170S2	0.022	68	1.496
A170SE	0.020	70	1.400
A170SW	0.046	72	3.312
A200NE	0.035	34	1.190
A200NW	0.034	35	1.190
A200R1	0.026	13	0.338
A200R2	0.041	18	0.738
A200R3	0.049	18	0.882
A200R4	0.030	18	0.540
A250NE	0.051	67	3.417
A250NW	0.033	42	1.386
A250SE	0.071	73	5.183
A250SW	0.044	50	2.200
AChan2	2.658	100	265.800
AChan3	1.162	100	116.200
AForeS	1.859	37	68.783
ARes2	1.385	33	45.705
AWood1	0.847	7	5.929
AWood2	5.699	7	39.893
A21	0.630	86	54.180
A410F	0.520	64	33.280
AForeN	4.460	43	191.780
AMainN	4.070	43	175.010
AMainS	1.902	43	81.786
ARes1	1.212	24	29.088
AResN1	5.840	44	256.960
AResN2	1.070	26	27.820
AHE1b	18.300	14	256.200
ATW1b	3.100	7	21.700
ATW2b	6.100	7	42.700
ATW3b	5.100	86	438.600
B001N1	0.096	78	7.488
B001N2	0.090	78	7.020
B002NE	0.092	73	6.716
B002NW	0.101	77	7.777
B002R1	0.042	22	0.924

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
B002R2	0.056	22	1.232
B002R3	0.092	15	1.380
B002R4	0.033	9	0.297
B002R5	0.037	22	0.814
B002SE	0.048	44	2.112
B002SW	0.128	75	9.600
B002WK1	0.019	32	0.608
B004NE	0.067	72	4.824
B004NW	0.083	70	5.810
B004PK1	0.654	29	18.966
B004R1	0.067	13	0.871
B004R2	0.062	16	0.992
B004SE	0.032	72	2.304
B004SW	0.044	68	2.992
B004WK1	0.025	50	1.250
B005N1	0.080	73	5.840
B005N2	0.043	81	3.483
B005N3	0.030	63	1.890
B005NE	0.058	71	4.118
B005NW	0.156	70	10.920
B005R1	0.059	14	0.826
B005R2	0.119	22	2.618
B005R3	0.063	20	1.260
B005R4	0.121	22	2.662
B005S1	0.080	71	5.680
B005S2	0.043	77	3.311
B005SE	0.063	71	4.473
B005SW	0.075	68	5.100
B008NE	0.049	71	3.479
B008NW	0.076	63	4.788
B008R1	0.132	22	2.904
B008SE	0.024	75	1.800
B008SW	0.106	74	7.844
B009NE	0.043	79	3.397
B009NW	0.090	73	6.570
B009PK1	0.711	29	20.619
B009R1	0.057	23	1.311
B009R2	0.128	21	2.688
B009SE	0.029	62	1.798
B009SW	0.043	74	3.182
B010N1	0.041	78	3.198
B010N2	0.048	79	3.792
B010NE	0.055	69	3.795
B010NW	0.050	68	3.400
B010R1	0.116	22	2.552
B010S1	0.052	79	4.108
B010S2	0.049	76	3.724
B010SE	0.058	71	4.118
B010SW	0.048	75	3.600
B010W1	0.021	48	1.008
B010W2	0.025	48	1.200
B011NE	0.031	55	1.705
B011NW	0.097	72	6.984
B011R1	0.074	21	1.554
B011R2	0.113	22	2.486

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
B011S1	0.034	87	2.958
B011SE	0.030	53	1.590
B011SW	0.097	72	6.984
B012EX1	0.054	29	1.566
B012EX2	0.522	39	20.358
B012NE	0.082	63	5.166
B012NW	0.100	63	6.300
B012SE	0.074	63	4.662
B012SW	0.091	63	5.733
B013DV1	2.860	93	265.980
B013DV2	2.535	7	17.745
B013EX1	0.084	29	2.436
B013EX2	0.074	51	3.774
B013NE	0.080	62	4.960
B013NW	0.099	62	6.138
B015NE	0.085	63	5.355
B015NW	0.102	63	6.426
B015RE1	2.173	79	171.667
B015RE2	2.165	7	15.155
B015SE	0.049	63	3.087
B015SW	0.059	63	3.717
B016NE	0.135	68	9.180
B016NW	0.073	64	4.672
B016R1	0.065	24	1.560
B016R2	0.031	23	0.713
B016R3	0.056	11	0.616
B016R4	0.015	23	0.345
B016S1	0.061	68	4.148
B016S2	0.062	68	4.216
B016S3	0.029	61	1.769
B016SE	0.048	73	3.504
B016SW	0.052	76	3.952
B018NE	0.110	67	7.370
B018NW	0.049	72	3.528
B018R1	0.060	23	1.380
B018R2	0.044	23	1.012
B018R3	0.051	15	0.765
B018SE	0.023	48	1.104
B018SW	0.047	55	2.585
B019N1	0.070	64	4.480
B019N2	0.051	73	3.723
B019NE	0.067	70	4.690
B019NW	0.141	72	10.152
B019R1	0.045	12	0.540
B019R2	0.045	23	1.035
B019R3	0.032	22	0.704
B019R4	0.025	22	0.550
B019R5	0.052	23	1.196
B019S1	0.070	70	4.900
B019S2	0.064	73	4.672
B019SE	0.066	65	4.290
B019SW	0.074	61	4.514
B021R1	0.056	21	1.176
B021R2	0.128	23	2.944
B022N1	0.072	68	4.896

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
B022N2	0.050	72	3.600
B022N3	0.056	58	3.248
B022NE	0.055	69	3.795
B022NW	0.056	66	3.696
B022S1	0.073	68	4.964
B022S2	0.050	72	3.600
B022SE	0.055	68	3.740
B022SW	0.063	67	4.221
B022W1	0.045	71	3.195
B022W2	0.023	83	1.909
B022W3	0.024	46	1.104
B024NE	0.127	70	8.890
B024NW	0.021	62	1.302
B024R1	0.109	23	2.507
B024R2	0.051	22	1.122
B024R3	0.034	24	0.816
B024SE	0.057	72	4.104
B024SW	0.049	61	2.989
B026R1	0.120	23	2.760
B028N1	0.084	68	5.712
B028N2	0.048	83	3.984
B028NE	0.062	73	4.526
B028NW	0.092	58	5.336
B028R1	0.108	22	2.376
B028R2	0.056	21	1.176
B028R3	0.139	22	3.058
B028S1	0.085	72	6.120
B028S2	0.056	67	3.752
B028SE	0.062	65	4.030
B028SW	0.184	62	11.408
B031N1	0.062	71	4.402
B031N2	0.025	56	1.400
B031N3	0.070	82	5.740
B031NE	0.077	74	5.698
B031NW	0.171	73	12.483
B031R1	0.052	13	0.676
B031R2	0.135	21	2.835
B031R3	0.062	23	1.426
B031R4	0.094	21	1.974
B031R5	0.015	23	0.345
B031S1	0.063	70	4.410
B031S2	0.032	53	1.696
B031SE	0.077	74	5.698
B031SW	0.092	58	5.336
B033NE	0.131	71	9.301
B033NW	0.034	76	2.584
B033R1	0.041	22	0.902
B033R2	0.063	21	1.323
B033R3	0.142	21	2.982
B033SE	0.105	70	7.350
B033SW	0.045	84	3.780
B036NE	0.061	70	4.270
B036NW	0.047	77	3.619
B036R1	0.126	21	2.646
B036SE	0.059	71	4.189

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
B036SW	0.048	75	3.600
B036W1	0.025	48	1.200
B036W2	0.025	52	1.300
B037N1	0.045	78	3.510
B037NE	0.025	56	1.400
B037NW	0.094	73	6.862
B037R1	0.060	22	1.320
B037R2	0.113	21	2.373
B037R3	0.014	23	0.322
B037R4	0.012	25	0.300
B037SE	0.025	52	1.300
B037SW	0.095	73	6.935
B038NE	0.104	70	7.280
B038NW	0.032	78	2.496
B038SE	0.047	77	3.619
B038SW	0.047	81	3.807
B040NE	0.034	59	2.006
B040NW	0.028	58	1.624
B040R1	0.031	23	0.713
B040SE	0.129	70	9.030
B040SW	0.051	81	4.131
B041NE	0.034	59	2.006
B041NW	0.030	59	1.770
B041R1	0.031	23	0.713
B041SE	0.036	61	2.196
B041SW	0.043	74	3.182
B042N1	0.112	70	7.840
B042N2	0.044	73	3.212
B042N3	0.027	48	1.296
B042NE	0.116	72	8.352
B042NW	0.044	73	3.212
B042R1	0.090	21	1.890
B042R2	0.142	20	2.840
B042R3	0.077	16	1.232
B042S1	0.094	72	6.768
B042S2	0.094	71	6.674
B042SE	0.053	66	3.498
B042SW	0.027	48	1.296
B044NE	0.081	70	5.670
B044NW	0.082	71	5.822
B044R1	0.043	20	0.860
B044R2	0.088	22	1.936
B044SE	0.121	71	8.591
B044SW	0.053	70	3.710
B046NE	0.023	48	1.104
B046NW	0.055	63	3.465
B046R2	0.052	20	1.040
B046R3	0.080	27	2.160
B046S1	0.022	50	1.100
B046SE	0.038	79	3.002
B046SW	0.119	73	8.687
B047NE	0.112	71	7.952
B047NW	0.026	50	1.300
B047R1	0.125	22	2.750
B047R2	0.060	21	1.260

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
B047R3	0.053	23	1.219
B047R4	0.014	18	0.252
B047R5	0.048	21	1.008
B047R6	0.065	20	1.300
B047SE	0.111	73	8.103
B047SW	0.055	69	3.795
B048N1	0.027	48	1.296
B048NE	0.075	75	5.625
B048NW	0.064	70	4.480
B048R1	0.062	21	1.302
B048R2	0.082	20	1.640
B048R3	0.138	16	2.208
B048SE	0.076	79	6.004
B048SW	0.065	68	4.420
B048W1	0.032	47	1.504
B048W2	0.036	83	2.988
B048W3	0.024	50	1.200
B050N1	0.088	72	6.336
B050N2	0.033	52	1.716
B050NE	0.065	75	4.875
B050NW	0.070	64	4.480
B050R1	0.128	21	2.688
B050R2	0.068	22	1.496
B050R3	0.103	22	2.266
B050S1	0.087	72	6.264
B050S2	0.039	85	3.315
B050S3	0.023	61	1.403
B050SE	0.057	68	3.876
B050SW	0.153	72	11.016
B055N1	0.030	47	1.410
B055NE	0.096	69	6.624
B055NW	0.046	72	3.312
B055R1	0.118	21	2.478
B055SE	0.093	72	6.696
B055SW	0.048	71	3.408
B056NE	0.029	48	1.392
B056NW	0.028	61	1.708
B056SE	0.025	48	1.200
B056SW	0.025	64	1.600
B058NE	0.039	72	2.808
B058NW	0.046	72	3.312
B058R1	0.117	21	2.457
B058R2	0.102	22	2.244
B058SE	0.021	62	1.302
B058SW	0.031	61	1.891
B180N1	0.060	68	4.080
B180N2	0.060	68	4.080
B180N3	0.038	46	1.748
B180NE	0.065	71	4.615
B180NW	0.067	70	4.690
B180R1	0.117	23	2.691
B180R2	0.075	23	1.725
B180SE	0.050	72	3.600
B180SW	0.047	73	3.431
B410NE	0.025	56	1.400

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
B410NW	0.037	78	2.886
B590NE	0.103	74	7.622
B590NW	0.105	76	7.980
B590R1	0.067	22	1.474
B590R2	0.172	22	3.784
B590R3	0.120	21	2.520
B590R4	0.080	10	0.800
B590SE	0.108	69	7.452
B590SW	0.071	73	5.183
C001R1	0.084	9	0.756
C001R2	0.705	9	6.345
C002R1	0.200	11	2.200
C003R1	0.155	5	0.775
C004R1	0.381	6	2.286
C005R1	0.297	9	2.673
C006R1	0.319	9	2.871
C007R1	0.342	6	2.052
C008R1	0.385	7	2.695
C009R1	0.460	9	4.140
C010R1	0.334	10	3.340
C011R1	0.130	13	1.690
C012R1	0.092	13	1.196
C012WK1	0.028	66	1.848
C013PK1	0.428	29	12.412
C013R1	0.295	39	11.505
C013R2	0.151	40	6.040
NCOM2	8.720	90	784.800
NNAT1	21.420	7	149.940
NNAT2	7.160	7	50.120
NNAT3	31.740	7	222.180
NNAT4	45.990	7	321.930
To SWM Facility 1 (BMR Phase 1 Interim)			
A11	0.063	69.915	4.370
A12	0.155	50.168	7.751
A13	0.148	41.86	6.179
A14	0.423	70.28	29.714
A15	0.096	70.28	6.747
A17	0.242	61.404	14.854
A18	0.166	52.344	8.710
A19	0.035	69.048	2.430
A20	0.250	62.8	15.713
A21	0.480	55.324	26.528
A22	0.028	28.571	0.811
A23	0.227	60.987	13.838
A24	0.223	61.111	13.609
A25	0.239	56.478	13.493
A29	0.184	60.326	11.118
A30	0.014	50	0.705
A31	0.289	61.938	17.894
A32	0.162	61.875	10.005
A33	0.159	62.581	9.932
A34	0.090	59.756	5.402
A35	0.225	63.556	14.326
A41	0.297	57.229	17.008
A42	0.238	58.242	13.867

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A43	0.347	58.205	20.185
A44	0.288	61.716	17.774
A45	0.195	60.112	11.722
A46	0.209	63.587	13.258
A47	0.145	56.757	8.213
A54	0.816	7	5.714
A9	3.038	7	21.265
B1	1.681	7	11.764
B2	3.432	100	343.220
B3	1.007	86	86.611
B4	1.002	7	7.014
C2	0.069	67.606	4.651
S6	0.044	25	1.098
S7	0.049	25	1.215
S8	0.083	25	2.080
S9	2.319	7	16.230
To SWM Facility 3			
A043R1	0.226	8	1.808
A043R2	0.017	18	0.306
A043R3	0.076	32	2.432
A043R4	0.078	32	2.496
A043SE	0.064	64	4.096
A043SW	0.048	64	3.072
A044R1	0.173	12	2.076
A045N1	0.049	71	3.479
A045N2	0.081	77	6.237
A045NE	0.251	69	17.319
A045NW	0.043	84	3.612
A045S1	0.048	73	3.504
A045S2	0.081	78	6.318
A045SE	0.118	61	7.198
A045SW	0.043	86	3.698
A046NE	0.058	69	4.002
A046R1	0.170	21	3.570
A046R2	0.145	12	1.740
A046R3	0.280	14	3.920
A046SE	0.095	76	7.220
A046SW	0.039	77	3.003
A047NE	0.009	78	0.702
A047NW	0.025	76	1.900
A047R1	0.144	17	2.448
A047R2	0.098	16	1.568
A047SE	0.040	73	2.920
A047SW	0.115	66	7.590
A101NE	0.073	73	5.329
A101NW	0.046	64	2.944
A101S1	0.107	64	6.848
A101S2	0.113	63	7.119
A101SE	0.084	70	5.880
A101SW	0.076	64	4.864
A102R1	0.087	32	2.784
A410F	0.520	64	33.280
A460NE	0.059	61	3.599
A460NW	0.090	57	5.130
A460PK1	0.355	7	2.485

Table E-6: Drainage Area to SWM Facility (Interim B Conditions)

Segment ID ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
A460R1	0.071	20	1.420
A460R2	0.057	19	1.083
A460R3	0.030	23	0.690
A460SE	0.041	85	3.485
AR410C	0.550	64	35.200
AS410C	0.110	86	9.460
AS410D	0.080	86	6.880
AS410E	0.100	86	8.600
Total	377.561	42	15965.636

⁽¹⁾ Refer to Figure 2

Weighted Average Imperviousness = S(Area x Imp) / Total Area = 15965.636 / 377.561 = 42 %

Table E-7: Summary of Total Drainage Area (Interim B Conditions)

Land Use ⁽¹⁾	Area (ha)	Imperviousness (%)	Area x Imp.
To SWM Facility 1	372.298	42	15710.322
To SWM Facility 3	5.263	49	255.314
Total	377.561	42	15965.636

⁽¹⁾ Refer to Figure 2

Weighted Average Imperviousness = $S(\text{Area} \times \text{Imp}) / \text{Total Area} = 15965.636 / 377.561 = 42 \%$

Table E-8: Target Release Rates for SWM Facility ⁽¹⁾

Event	Pre-Development Release Rate (m ³ /s/ha)	Target Release Rate (m ³ /s)
2-Year, 24-Hour SCS	1.600	1.000
5-Year, 24-Hour SCS	2.900	2.300
10-Year, 24-Hour SCS	3.900	3.800
25-Year, 24-Hour SCS	5.500	5.600
50-Year, 24-Hour SCS	6.600	6.700
100-Year, 24-Hour SCS	7.800	8.000

⁽¹⁾ As per the April 2008 "East Urban Community Pond No. 1 Design Brief" by Stantec.

CALCULATION SHEET E-1: EXISTING CONTROLS (INTERIM B CONDITIONS)

Quality Control 1			Quantity Control 1			Quantity Control 2			Quantity Control 3			Quantity Control 4		
Vertical Circular Orifice			Rectangular Weir			Rectangular Weir			Rectangular Weir			Rectangular Weir		
Diameter	(m)	0.400	L	(m)	1.000	L	(m)	3.000	L	(m)	1.500	L	(m)	1.500
A_o	(m ²)	0.126												
invert	(m)	80.10	C_w		1.80	C_w		1.80	C_w		1.80	C_w		1.80
C_o		0.62	Crest Elev.	(m)	81.65	Crest Elev.	(m)	82.35	Crest Elev.	(m)	82.35	Crest Elev.	(m)	82.35
			n		2	n		2	n		2	n		2
Max Water Level	(m)	83.009	Max Water Level	(m)	83.009	Max Water Level	(m)	83.009	Max Water Level	(m)	83.009	Max Water Level	(m)	83.009
Head of Water	(m)	2.909	Head of Water	(m)	1.359	Head of Water	(m)	0.659	Head of Water	(m)	0.659	Head of Water	(m)	0.659
Q_o	(m ³ /s)	0.568	Q_w	(m ³ /s)	2.077	Q_w	(m ³ /s)	2.762	Q_w	(m ³ /s)	1.317	Q_w	(m ³ /s)	1.317
Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$ Not including outlet pipe losses Q_o is the orifice flow C_o is the orifice coefficient A_o is the orifice flow area g is the gravitational constant h is the head of water			Weir Equation: $Qw = C_w (L - 0.1nh) h^{1.5}$ Qw is the weir flow Cw is the weir coefficient L is the weir length h is the weir height n is the # of side contractions			Weir Equation: $Qw = C_w (L - 0.1nh) h^{1.5}$ Qw is the weir flow Cw is the weir coefficient L is the weir length h is the weir height n is the # of side contractions			Weir Equation: $Qw = C_w (L - 0.1nh) h^{1.5}$ Qw is the weir flow Cw is the weir coefficient L is the weir length h is the weir height n is the # of side contractions			Weir Equation: $Qw = C_w (L - 0.1nh) h^{1.5}$ Qw is the weir flow Cw is the weir coefficient L is the weir length h is the weir height n is the # of side contractions		

CALCULATION SHEET E-2: FOREBAY SIZING FOR SWM FACILITY

Trails Edge Subdivision SWM Facility 1 - Interim B Conditions City of Ottawa Calculation of North Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{\min} = \left(\frac{r Q_p}{V_s} \right)^{0.5}$$

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

Input: $r = 3.47$ 149 m / 43 m
 $Q_p = 0.383 \text{ m}^3/\text{s}$ (at elevation 81.65 m)
 $V_s = 0.0003 \text{ m/s}$

$$L_{\min} = 66.52 \text{ m}$$

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Table B-5 of Appendix B)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{\min} = \frac{8Q}{d V_f}$$

where: Q = Inlet flowrate (10-Year, 24-Hour SCS Type II Storm)
 d = depth of pond during peak 10-year inflow (12h:00min)
 V_f = desired final velocity

Input: $Q = 5.579 \text{ m}^3/\text{s}$
 $d = 2.51 \text{ m}$
 $V_f = 0.5 \text{ m/s}$

$$L_{\min} = 35.55 \text{ m}$$

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required 66.52 m
Length of Forebay Provided 149.00 m (at elevation 81.6 m)

Average Forebay Velocity

From the SWMP Manual, the maximum allowable average velocity is 0.15 m/s:

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

where: Q = Inlet flowrate (10-Year, 24-Hour SCS Type II Storm)
 d = depth of pond during peak 10-year inflow (12h:05min)
 W_{avg} = average width of forebay

Input: $Q = 5.579 \text{ m}^3/\text{s}$
 $d = 2.51 \text{ m}$
 $W_{\text{avg}} = 40 \text{ m}$ (36 m bottom, 43 m permanent pool)

$$V = 0.06 \text{ m/s} < 0.15 \text{ m/s}$$

CALCULATION SHEET E-3: FOREBAY SIZING FOR SWM FACILITY

Trails Edge Subdivision SWM Facility 1 - Interim B Conditions City of Ottawa Calculation of South Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{\min} = \left(\frac{r Q_p}{V_s} \right)^{0.5}$$

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

Input: r = 3.18 143 m / 45 m
 Q_p = 0.383 m³/s (at elevation 81.65 m)
 V_s = 0.0003 m/s

$$L_{\min} = 63.71 \text{ m}$$

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Table B-5 of Appendix B)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{\min} = \frac{8Q}{d V_f}$$

where: Q = Inlet flowrate (10-Year, 24-Hour SCS Type II Storm)
 d = depth of pond during peak 10-year inflow (12h:10min)
 V_f = desired final velocity

Input: Q = 15.601 m³/s
 d = 2.08 m
 V_f = 0.5 m/s

$$L_{\min} = 120.30 \text{ m}$$

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required 120.30 m
Length of Forebay Provided 143.00 m (at elevation 81.5 m)

Average Forebay Velocity

From the SWMP Manual, the maximum allowable average velocity is 0.15 m/s:

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

where: Q = Inlet flowrate (10-Year, 24-Hour SCS Type II Storm)
 d = depth of pond during peak 10-year inflow (12h:10min)
 W_{avg} = average width of forebay

Input: Q = 15.601 m³/s
 d = 2.08 m
 W_{avg} = 38 m (31 m bottom, 45 m permanent pool)

$$V = 0.20 \text{ m/s} > 0.15 \text{ m/s}$$

MEMORANDUM

DATE: APRIL 3, 2023
REVISED JANUARY 17, 2024

TO: MICHAEL PETEPIECE
BASSAM BAHIA

FROM: VAHID MEHDIPOUR

RE: BMR – THE COMMONS PHASE 2 & 3
PCSWMM MODEL UPDATE
118124

BACKGROUND

This memo serves as a support document for updating the PCSWMM model submitted by JFSA along with the Stormwater Management Report for BMR The Commons Phase 1 in May 2022. The aim of this update is to reflect the as-built conditions of the development.

The as-built drawings for Phase 1 were provided to the City of Ottawa as a part of the subdivision conformance package for Phase 1 of the Commons subdivision, and the PCSWMM model was updated to reflect the as-built elevations. It should be noted that the previous model completed by JFSA had considered Phase 2 and 3 in the ultimate buildout, and no changes were made to the design of Phase 2 and 3 in the model updated by Novatech.

The BMR - The Commons subdivision is situated in Orleans, within the city of Ottawa, covering an area of 19.19 hectares, including a 0.95-hectare park block, 13.61 hectares of residential development, 1.85 hectares of medium-density development, and a 3.43-hectare existing U-Haul site. The proposed development outlets to the East Urban Community (EUC) Pond 1. For further details, please refer to the following pertinent reports.

- JFSA Stormwater Management Report BMR – The Commons Subdivision Phase 1 May 2022 (SWMR Ph 1)
- DSEL & JFSA Pond 1 East Urban Community North Main Cell and North Forebay Modifications October 2022, Revised February 2023 (PDR)

METHODOLOGY

The scope of work involved updating the ultimate SWM scenario model to align with the as-built profiles of Phase 1 and the proposed modifications to the north main cell and north forebay of Pond 1. The updated model was created using PCSWMM software with a 1.015 SWM engine.

The model's pipes and manholes inverts were revised to conform to the as-built profiles. Updated hydraulic grade lines (HGLs) are compared with minimum underside of footing (USF) elevation for 100 year and stress test events to make sure that there are enough clearances.

The ultimate SWM scenario model outlets to the East Urban Community (EUC) Pond 1 where a boundary condition is considered for the original model. The model was cross-checked against the SWMR Ph1 and the upcoming proposed pond modification documented within the PDR to ensure that the boundary conditions are updated. Boundary condition data are attached.

The major system of the model was further checked to be consistent with the Phase and 3 detailed drawings. A "Modified" Table 2 Summary of Major System Results for the 100-year-3-Hour Chicago Storm of the Phase 1 SWMR has been appended to this memorandum.

RESULTS

The revised PCSWMM model has been run for 3-hour Chicago and 24-hour SCS Type II storm distributions with a 100-year return period and stress test (100-year + 20%). As there is no stress test time series boundary condition for 24-hour SCS Type II available in the original model/report, the model is stress tested only under the 3-hour Chicago storm.

Updated HGL tables and a summary table of major system flow depths, extracted from the revised ultimate scenario model are added to the appendices.

CONCLUSION

The following items are found to be the results of updating the PCSWMM model:

- The updated model results in slight increases to the 100yr HGL elevations compared to the original JFSA model. For all 100yr profiles, all USF elevations have enough clearance (more than 0.3m) from HGLs. No HGL under stress test reaches the USF elevation.
- Table 1 from the JFSA SWM report provides target release rates and corresponding storage volumes for areas B1, B2 and B3i. The release rates have not been changed from the JFSA model. The storage required to meet the target release rates will need to be confirmed as part of the individual site plan designs for these areas.
- Major system flow depths are lower than 0.35 m in all places.

APPENDICES & ATTACHMENTS

APPENDIX A: HGL tables

APPENDIX B: Summary of Major System Flow Depths

APPENDIX C: Boundary Condition in MH-111

3 hr Chicago - 100 yr

MH ID	Obvert Elevation (m)	T/G Elevation (m)	Invert Elevation (m)	HGL Elevation (m)	Surcharge (m)	Lot Number	Design USF (m)	Clearance (m)
100_(STM)	83.16	87.58	81.27	83.10	0.00	Ph3 - 7	85.80	2.70
102_(STM)	83.22	87.57	81.34	83.24	0.02	Ph3 - 1	85.70	2.46
104_(STM)	83.33	87.62	81.38	83.41	0.08	Ph3 - 1	85.70	2.29
106_(STM)	84.29	87.66	83.54	84.19	0.00	23	85.85	1.66
108_(STM)	84.37	87.50	83.62	84.20	0.00	28	86.00	1.80
110_(STM)	84.49	87.75	83.94	84.58	0.09	26	86.10	1.52
112_(STM)	83.53	87.92	81.90	83.78	0.25	18	85.95	2.17
114_(STM)	84.20	88.00	83.37	84.15	0.00	Ph2 - 22	86.05	1.90
116_(STM)	84.25	88.17	83.50	84.27	0.02	Ph2 - 31	86.35	2.08
118_(STM)	84.56	88.36	83.88	84.54	0.00	Ph2 - 31	86.35	1.81
120_(STM)	84.28	88.08	82.66	84.67	0.39	46	86.35	1.68
122_(STM)	84.37	88.23	82.74	84.79	0.42	46	86.35	1.56
124_(STM)	84.46	88.20	82.83	84.93	0.47	3	86.50	1.57
126_(STM)	84.61	88.47	82.97	85.23	0.62	3	86.50	1.27
128_(STM)	84.82	88.63	83.17	85.53	0.71	56	86.70	1.17
130_(STM)	85.00	89.05	84.27	85.77	0.77	Ph2 - 38	86.85	1.08
132_(STM)	85.10	89.18	84.48	85.91	0.81	Ph2 - 45	87.30	1.39
134_(STM)	85.39	89.32	84.80	85.91	0.52	65	86.70	0.79
136_(STM)	84.96	88.65	83.34	85.73	0.77	65	86.70	0.97
138_(STM)	85.07	88.77	83.42	85.85	0.78	70	87.05	1.20
140_(STM)	85.37	89.25	83.71	86.22	0.85	76	87.05	0.83
142_(STM)	85.45	89.16	84.91	86.50	1.05	92	87.45	0.95
144_(STM)	85.74	89.45	84.13	86.61	0.87	91	87.45	0.84
146_(STM)	85.91	89.12	85.00	86.65	0.74	94	87.80	1.15
148_(STM)	86.05	89.21	85.14	86.67	0.62	97	87.28	0.61
150_(STM)	85.88	89.80	84.38	86.85	0.97	Blk 65	87.70	0.85
152_(STM)	86.09	90.00	85.26	86.97	0.88	Blk 66	87.90	0.93
154_(STM)	86.03	90.09	85.35	87.03	1.00	Blk 69	88.20	1.17
156_(STM)	86.40	89.94	85.73	87.37	0.97	Blk 69	88.20	0.83
158_(STM)	86.26	90.07	84.91	87.59	1.33	Blk 78	88.00	0.41
160_(STM)	86.34	90.16	84.99	87.72	1.38	Blk 75	88.40	0.68
162_(STM)	86.70	90.30	85.35	88.21	1.51	Blk 74	88.40	0.19
164_(STM)	86.95	90.28	85.60	88.42	1.47			
166_(STM)	87.07	90.42	86.17	88.42	1.36			
168_(STM)	87.40	90.39	86.50	88.43	1.03			
170_(STM)	87.73	91.06	87.06	88.57	0.84			

82.841

Interpolated HGL Calcs					
Lot Number	Design USF (m)	Clearance (m)	Length (m)	Dist. From D/S MH (m)	HGL (m)
Blk 74	88.40	0.62	106.3	9.089	87.77
Blk 73	88.45	0.51	106.3	45.684	87.94
Blk 72	88.60	0.52	106.3	74.955	88.08

24Hour SCS Type II - 100 Year

MH ID	Obvert Elevation (m)	T/G Elevation (m)	Invert Elevation (m)	HGL Elevation (m)	Surcharge (m)	Lot Number	Design USF (m)	Clearance (m)
100_(STM)	83.16	87.58	81.27	83.14	0.00	Ph3 - 7	85.80	2.66
102_(STM)	83.22	87.57	81.34	83.26	0.04	Ph3 - 1	85.70	2.44
104_(STM)	83.33	87.62	81.38	83.42	0.09	Ph3 - 1	85.70	2.28
106_(STM)	84.29	87.66	83.54	84.19	0.00	23	85.85	1.66
108_(STM)	84.37	87.50	83.62	84.20	0.00	28	86.00	1.80
110_(STM)	84.49	87.75	83.94	84.56	0.07	26	86.10	1.54
112_(STM)	83.53	87.92	81.90	83.78	0.25	18	85.95	2.17
114_(STM)	84.20	88.00	83.37	84.14	0.00	Ph2 - 22	86.05	1.91
116_(STM)	84.25	88.17	83.50	84.26	0.01	Ph2 - 31	86.35	2.09
118_(STM)	84.56	88.36	83.88	84.52	0.00	Ph2 - 31	86.35	1.83
120_(STM)	84.28	88.08	82.66	84.62	0.34	46	86.35	1.73
122_(STM)	84.37	88.23	82.74	84.73	0.36	46	86.35	1.62
124_(STM)	84.46	88.20	82.83	84.87	0.41	3	86.50	1.63
126_(STM)	84.61	88.47	82.97	85.14	0.53	3	86.50	1.36
128_(STM)	84.82	88.63	83.17	85.42	0.60	56	86.70	1.28
130_(STM)	85.00	89.05	84.27	85.77	0.77	Ph2 - 38	86.85	1.08
132_(STM)	85.10	89.18	84.48	85.91	0.81	Ph2 - 45	87.30	1.39
134_(STM)	85.39	89.32	84.80	85.91	0.52	65	86.70	0.79
136_(STM)	84.96	88.65	83.34	85.61	0.65	65	86.70	1.09
138_(STM)	85.07	88.77	83.42	85.72	0.65	70	87.05	1.33
140_(STM)	85.37	89.25	83.71	86.07	0.70	76	87.05	0.98
142_(STM)	85.45	89.16	84.91	86.35	0.90	92	87.45	1.10
144_(STM)	85.74	89.45	84.13	86.45	0.71	91	87.45	1.00
146_(STM)	85.91	89.12	85.00	86.48	0.57	94	87.80	1.32
148_(STM)	86.05	89.21	85.14	86.51	0.46	97	87.28	0.77
150_(STM)	85.88	89.80	84.38	86.66	0.78	Blk 65	87.70	1.04
152_(STM)	86.09	90.00	85.26	86.78	0.69	Blk 66	87.90	1.12
154_(STM)	86.03	90.09	85.35	86.84	0.81	Blk 69	88.20	1.36
156_(STM)	86.40	89.94	85.73	87.18	0.78	Blk 69	88.20	1.02
158_(STM)	86.26	90.07	84.91	87.35	1.09	Blk 78	88.00	0.65
160_(STM)	86.34	90.16	84.99	87.48	1.14	Blk 75	88.40	0.92
162_(STM)	86.70	90.30	85.35	87.94	1.24	Blk 74	88.40	0.46
164_(STM)	86.95	90.28	85.60	88.13	1.18			
166_(STM)	87.07	90.42	86.17	88.13	1.07			
168_(STM)	87.40	90.39	86.50	88.14	0.74			
170_(STM)	87.73	91.06	87.06	88.28	0.55			

3-Hour Chicago - 100-Year+20% (Stress Test)

MH ID	Obvert Elevation (m)	T/G Elevation (m)	Invert Elevation (m)	HGL Elevation (m)	Surcharge (m)	Lot Number	Design USF (m)	Clearance (m)
100_(STM)	83.16	87.58	81.27	83.41	0.25	Ph3 - 7	85.80	2.39
102_(STM)	83.22	87.57	81.34	83.53	0.31	Ph3 - 1	85.70	2.17
104_(STM)	83.33	87.62	81.38	83.73	0.40	Ph3 - 1	85.70	1.97
106_(STM)	84.29	87.66	83.54	84.21	0.00	23	85.85	1.64
108_(STM)	84.37	87.50	83.62	84.22	0.00	28	86.00	1.78
110_(STM)	84.49	87.75	83.94	84.63	0.14	26	86.10	1.47
112_(STM)	83.53	87.92	81.90	84.14	0.61	18	85.95	1.81
114_(STM)	84.20	88.00	83.37	84.50	0.30	Ph2 - 22	86.05	1.55
116_(STM)	84.25	88.17	83.50	84.63	0.38	Ph2 - 31	86.35	1.72
118_(STM)	84.56	88.36	83.88	84.94	0.38	Ph2 - 31	86.35	1.41
120_(STM)	84.28	88.08	82.66	84.98	0.70	46	86.35	1.37
122_(STM)	84.37	88.23	82.74	85.11	0.74	46	86.35	1.24
124_(STM)	84.46	88.20	82.83	85.26	0.80	3	86.50	1.24
126_(STM)	84.61	88.47	82.97	85.58	0.97	3	86.50	0.92
128_(STM)	84.82	88.63	83.17	85.91	1.09	56	86.70	0.79
130_(STM)	85.00	89.05	84.27	86.29	1.29	Ph2 - 38	86.85	0.56
132_(STM)	85.10	89.18	84.48	86.45	1.36	Ph2 - 45	87.30	0.85
134_(STM)	85.39	89.32	84.80	86.44	1.05	65	86.70	0.26
136_(STM)	84.96	88.65	83.34	86.12	1.16	65	86.70	0.58
138_(STM)	85.07	88.77	83.42	86.25	1.18	70	87.05	0.80
140_(STM)	85.37	89.25	83.71	86.64	1.27	76	87.05	0.41
142_(STM)	85.45	89.16	84.91	86.97	1.52	92	87.45	0.48
144_(STM)	85.74	89.45	84.13	87.06	1.32	91	87.45	0.39
146_(STM)	85.91	89.12	85.00	87.13	1.22	94	87.80	0.67
148_(STM)	86.05	89.21	85.14	87.15	1.10	97	87.28	0.13
150_(STM)	85.88	89.80	84.38	87.31	1.43	Blk 65	87.70	0.39
152_(STM)	86.09	90.00	85.26	87.43	1.34	Blk 66	87.90	0.47
154_(STM)	86.03	90.09	85.35	87.50	1.47	Blk 69	88.20	0.70
156_(STM)	86.40	89.94	85.73	87.82	1.42	Blk 69	88.20	0.38
158_(STM)	86.26	90.07	84.91	88.08	1.82	Blk 78	88.00	-0.08
160_(STM)	86.34	90.16	84.99	88.21	1.87	Blk 75	88.40	0.19
162_(STM)	86.70	90.30	85.35	88.72	2.02	Blk 74	88.40	-0.32
164_(STM)	86.95	90.28	85.60	89.93	2.98			
166_(STM)	87.07	90.42	86.17	89.93	2.87			
168_(STM)	87.40	90.39	86.50	89.37	1.97			
170_(STM)	87.73	91.06	87.06	89.17	1.44			

Interpolated HGL Calcs					
Lot Number	Design USF (m)	Clearance (m)	Length (m)	Dist. From D/S MH (m)	HGL (m)
Blk 78	88.00	0.45	108	30.592	87.55
Blk 79	88.00	0.45	108	30.592	87.55
Blk 77	88.10	0.30	108	60.320	87.80
Blk 80	88.15	0.35	108	60.320	87.80
Blk 81	88.30	0.34	108	89.650	87.96
Blk 76	88.30	0.25	108	101.582	88.05
Blk 74	88.40	0.13	106.3	9.809	88.27
Blk 73	88.45	0.03	106.3	45.684	88.42
Blk 72	88.60	0.04	106.3	74.955	88.56

Table 2: Summary of Major System Results for the 100-Year 3-Hour Chicago Storm

Catch	Flow Depth	Approach Flow On	Approach Flow at	Captured Flow
02 (CB)	0.15	0.065	0.027	0.026
03 (CB)	0.15	0.065	0.031	0.031
04 (CB)	0.15	0.067	0.027	0.027
05 (CB)	0.15	0.067	0.027	0.027
06 (CB)	0.03	0.054	0.030	0.030
08 (CB)	0.16	0.062	0.032	0.032
09 (CB)	0.16	0.062	0.027	0.027
10 (CB)	0.28	0.086	0.031	0.031
11 (CB)	0.28	0.086	0.087	0.043
12 (CB)	0.21	0.110	0.050	0.050
13 (CB)	0.21	0.110	0.048	0.048
14 (CB)	0.20	0.062	0.028	0.027
15 (CB)	0.20	0.062	0.028	0.027
16 (CB)	0.17	0.055	0.021	0.021
17 (CB)	0.17	0.055	0.027	0.027
18 (CB)	0.22	0.097	0.085	0.055
19 (CB)	0.22	0.097	0.071	0.071
20 (CB)	0.20	0.092	0.036	0.036
21 (CB)	0.20	0.092	0.035	0.035
23 (CB)	0.14	0.072	0.049	0.049
24 (CB)	0.14	0.072	0.049	0.049
25 (CB)	0.02	0.011	0.009	0.009
26 (CB)	0.02	0.011	0.004	0.004
27 (CB)	0.22	0.136	0.069	0.068
28 (CB)	0.22	0.136	0.069	0.068
30 (CB)	0.10	0.071	0.086	0.086
31 (CB)	0.10	0.071	0.100	0.100
32 (CB)	0.21	0.068	0.106	0.039
33 (CB)	0.21	0.068	0.072	0.059
34 (CB)	0.18	0.116	0.049	0.049
35 (CB)	0.18	0.116	0.049	0.049
36 (CB)	0.14	0.081	0.036	0.036
37 (CB)	0.14	0.081	0.049	0.049
40 (CB)	0.20	0.097	0.048	0.048
41 (CB)	0.20	0.097	0.050	0.050
42 (CB)	0.18	0.083	0.032	0.032
43 (CB)	0.18	0.083	0.036	0.036
44 (CB)	0.15	0.052	0.032	0.032
45 (CB)	0.15	0.052	0.021	0.021
46 (CB)	0.18	0.060	0.032	0.032
47 (CB)	0.18	0.060	0.026	0.026
48 (CB)	0.19	0.066	0.028	0.028
49 (CB)	0.19	0.066	0.027	0.027
50 (CB)	0.17	0.097	0.048	0.048
51 (CB)	0.17	0.097	0.047	0.047
52 (CB)	0.07	0.104	0.043	0.044
53 (CB)	0.18	0.111	0.050	0.050
54 (CB)	0.18	0.111	0.049	0.049
55 (CB)	0.07	0.051	0.046	0.046
56 (CB)	0.07	0.051	0.046	0.046
57 (CB)	0.26	0.106	0.050	0.050
59 (CB)	0.03	0.012	0.006	0.006

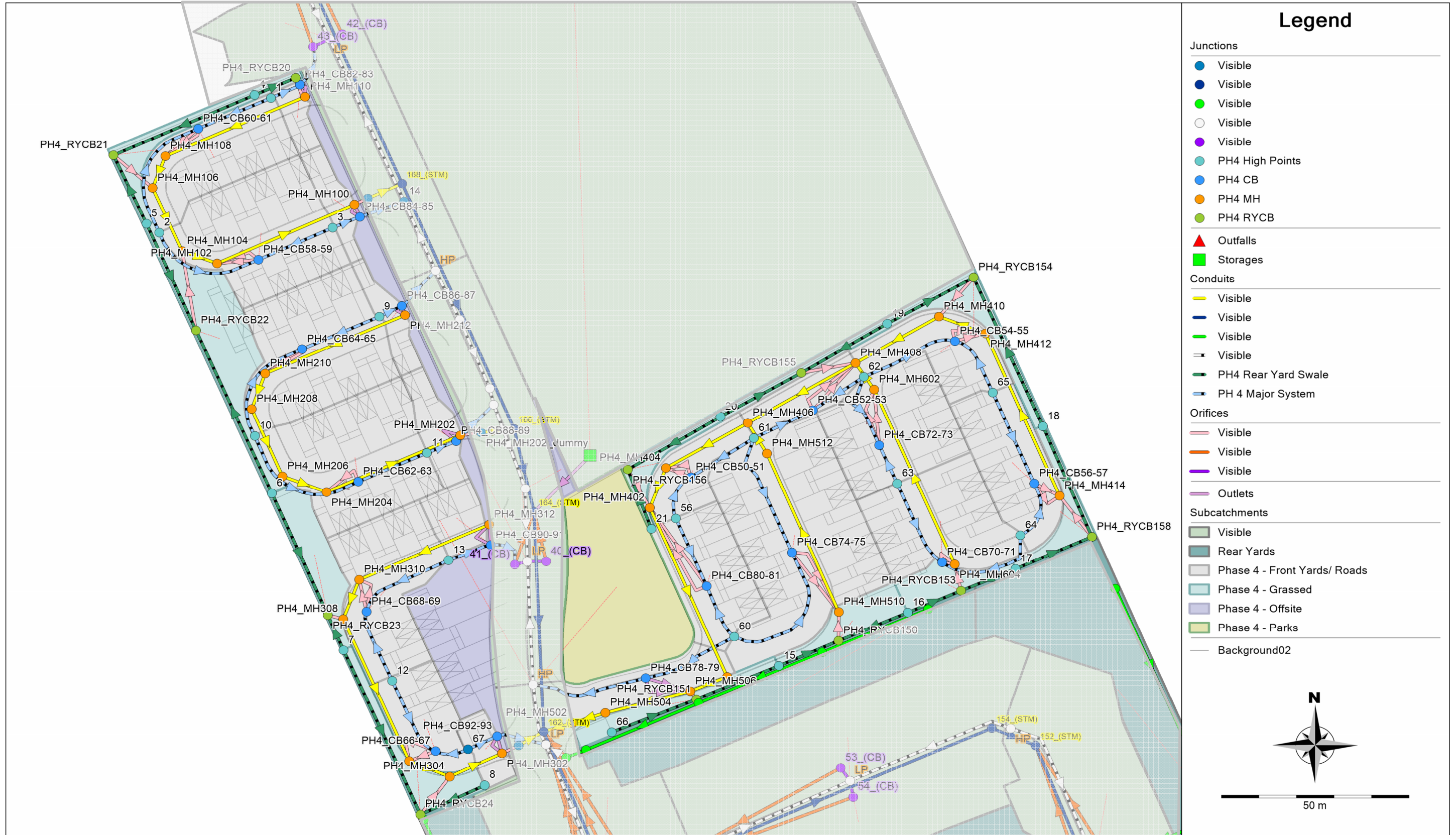
Table D-12: Time Series for Downstream Boundary Condition at STM-111

Time	Depth (m)								
	2-Yr 3-Hr Chicago	5-Yr 3-Hr Chicago	10-Yr 3-Hr Chicago	100-Yr 3-Hr Chicago	100-Yr 24-Hr SCS	100-Yr 3-Hr Chi + 20%	4-Aug-88	8-Aug-96	1-Jul-79
0:00	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57
0:05	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57
0:10	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57	80.57
0:15	80.57	80.57	80.57	80.57	80.57	80.58	80.57	80.64	80.57
0:20	80.57	80.57	80.57	80.60	80.57	80.63	80.57	80.75	80.58
0:25	80.57	80.58	80.59	80.66	80.57	80.70	80.57	80.84	80.62
0:30	80.58	80.62	80.64	80.72	80.57	80.78	80.78	80.97	80.68
0:35	80.61	80.67	80.70	80.79	80.57	80.94	81.04	80.95	80.81
0:40	80.66	80.73	80.78	80.87	80.57	81.05	81.42	80.89	81.02
0:45	80.73	80.86	80.94	80.96	80.57	81.15	81.36	80.87	81.28
0:50	80.87	81.02	81.07	81.07	80.57	81.29	81.28	80.89	81.39
0:55	81.10	81.22	81.28	81.22	80.57	81.52	81.17	81.00	81.42
1:00	81.37	81.52	81.60	81.39	80.57	81.80	81.03	81.06	81.44
1:05	81.64	81.85	81.90	81.51	80.57	82.06	80.96	81.06	81.45
1:10	81.61	81.88	81.98	81.56	80.57	82.26	80.98	81.02	81.48
1:15	81.45	81.72	81.86	81.60	80.57	82.29	81.13	81.04	81.54
1:20	81.32	81.52	81.72	81.72	80.57	82.42	81.25	81.25	81.63
1:25	81.21	81.39	81.63	81.91	80.57	82.53	81.28	81.59	81.75
1:30	81.14	81.36	81.57	82.12	80.58	82.62	81.30	81.82	81.91
1:35	81.10	81.40	81.69	82.31	80.59	82.84	81.56	81.95	82.05
1:40	81.09	81.48	81.75	82.44	80.60	82.92	81.78	81.89	82.22
1:45	81.11	81.54	81.86	82.50	80.61	83.07	81.78	81.71	82.41
1:50	81.14	81.61	81.90	82.57	80.62	83.06	81.81	81.61	82.59
1:55	81.18	81.66	81.97	82.63	80.63	83.09	81.96	81.68	82.74
2:00	81.21	81.70	81.99	82.69	80.64	83.10	82.18	81.77	82.90
2:05	81.25	81.74	82.04	82.71	80.67	83.15	82.48	81.85	83.01
2:10	81.27	81.77	82.05	82.74	80.71	83.15	82.71	81.90	83.02
2:15	81.30	81.80	82.09	82.76	80.72	83.17	82.75	81.94	83.03
2:20	81.32	81.82	82.10	82.78	80.73	83.16	82.75	81.97	83.08
2:25	81.34	81.84	82.13	82.79	80.73	83.18	82.77	81.99	83.11
2:30	81.36	81.86	82.13	82.80	80.73	83.16	82.81	82.00	83.12
2:35	81.38	81.88	82.16	82.80	80.74	83.17	82.87	82.02	83.12
2:40	81.39	81.89	82.16	82.81	80.74	83.15	82.89	82.03	83.12
2:45	81.41	81.90	82.18	82.81	80.74	83.16	82.88	82.04	83.12
2:50	81.42	81.92	82.18	82.81	80.74	83.14	82.88	82.05	83.11
2:55	81.43	81.93	82.20	82.81	80.74	83.14	82.89	82.07	83.10
3:00	81.44	81.94	82.20	82.82	80.74	83.12	82.89	82.16	83.09
3:05	81.45	81.94	82.22	82.81	80.74	83.12	82.90	82.34	83.08
3:10	81.46	81.95	82.22	82.81	80.74	83.10	82.90	82.47	83.07
3:15	81.47	81.96	82.23	82.81	80.74	83.09	82.92	82.58	83.06
3:20	81.48	81.97	82.23	82.81	80.74	83.09	82.92	82.66	83.05
3:25	81.49	81.97	82.23	82.80	80.74	83.07	82.90	82.67	83.03
3:30	81.49	81.98	82.23	82.79	80.74	83.05	82.90	82.69	83.02
3:35	81.50	81.98	82.24	82.79	80.74	83.04	82.91	82.73	83.00
3:40	81.50	81.98	82.24	82.78	80.74	83.03	82.90	82.76	82.99
3:45	81.51	81.98	82.24	82.77	80.74	83.01	82.88	82.79	82.97
3:50	81.51	81.99	82.24	82.76	80.74	82.99	82.87	82.80	82.96
3:55	81.52	81.98	82.24	82.76	80.74	82.98	82.88	82.81	82.94
4:00	81.52	81.99	82.24	82.75	80.74	82.97	82.86	82.81	82.93
4:05	81.52	81.99	82.24	82.74	80.74	82.96	82.85	82.81	82.92
4:10	81.52	81.99	82.24	82.73	80.74	82.94	82.84	82.81	82.90
4:15	81.53	81.99	82.24	82.73	80.74	82.93	82.83	82.81	82.89
4:20	81.53	81.99	82.24	82.72	80.74	82.92	82.82	82.81	82.88
4:25	81.53	81.99	82.24	82.71	80.75	82.91	82.81	82.80	82.86
4:30	81.53	81.99	82.23	82.70	80.75	82.90	82.80	82.80	82.85
4:35	81.53	81.99	82.24	82.70	80.75	82.89	82.79	82.79	82.84
4:40	81.53	81.99	82.23	82.69	80.75	82.88	82.78	82.78	82.83
4:45	81.53	81.98	82.23	82.69	80.76	82.87	82.77	82.77	82.82
4:50	81.53	81.99	82.23	82.68	80.76	82.85	82.76	82.77	82.81
4:55	81.53	81.98	82.23	82.67	80.76	82.85	82.76	82.76	82.79
5:00	81.53	81.99	82.22	82.67	80.76	82.84	82.74	82.75	82.78
5:05	81.53	81.98	82.22	82.66	80.76	82.83	82.74	82.74	82.77
5:10	81.53	81.98	82.22	82.65	80.76	82.82	82.74	82.73	82.76
5:15	81.53	81.98	82.22	82.65	80.76	82.81	82.74	82.73	82.75
5:20	81.53	81.98	82.22	82.64	80.76	82.80	82.73	82.72	82.74
5:25	81.53	81.98	82.22	82.64	80.76	82.79	82.73	82.71	82.74
5:30	81.53	81.98	82.21	82.63	80.76	82.78	82.73	82.70	82.73
5:35	81.53	81.97	82.21	82.62	80.76	82.77	82.73	82.69	82.72
5:40	81.53	81.98	82.21	82.62	80.76	82.77	82.72	82.68	82.71
5:45	81.53	81.97	82.21	82.62	80.76	82.76	82.72	82.67	82.70
5:50	81.53	81.97	82.20	82.61	80.76	82.75	82.72	82.67	82.69
5:55	81.53	81.97	82.20	82.60	80.76	82.74	82.71	82.66	82.68
6:00	81.53	81.97	82.20	82.60	80.76	82.74	82.70	82.65	82.67
6:05	81.53	81.96	82.20	82.60	80.76	82.73	82.70	82.64	82.67

6:10	81.53	81.97	82.20	82.59	80.76	82.72	82.69	82.63	82.66
6:15	81.53	81.96	82.19	82.59	80.76	82.71	82.69	82.63	82.65
6:20	81.53	81.96	82.19	82.58	80.76	82.71	82.68	82.62	82.64
6:25	81.52	81.96	82.19	82.58	80.76	82.70	82.67	82.61	82.64
6:30	81.52	81.96	82.19	82.57	80.76	82.69	82.67	82.60	82.63
6:35	81.52	81.96	82.19	82.57	80.76	82.69	82.66	82.60	82.63
6:40	81.52	81.96	82.18	82.56	80.77	82.68	82.65	82.59	82.62
6:45	81.52	81.95	82.18	82.56	80.77	82.68	82.64	82.58	82.61
6:50	81.52	81.95	82.18	82.56	80.77	82.67	82.64	82.58	82.60
6:55	81.52	81.95	82.18	82.55	80.77	82.66	82.63	82.57	82.60
7:00	81.52	81.95	82.18	82.55	80.77	82.66	82.63	82.56	82.59
7:05	81.52	81.94	82.17	82.54	80.77	82.65	82.62	82.56	82.59
7:10	81.51	81.95	82.17	82.54	80.77	82.65	82.61	82.55	82.58
7:15	81.51	81.94	82.17	82.54	80.77	82.64	82.61	82.54	82.58
7:20	81.51	81.94	82.17	82.53	80.77	82.64	82.60	82.54	82.57
7:25	81.51	81.94	82.17	82.53	80.78	82.63	82.60	82.53	82.56
7:30	81.51	81.94	82.16	82.53	80.78	82.63	82.59	82.53	82.56
7:35	81.51	81.93	82.16	82.52	80.78	82.62	82.59	82.52	82.55
7:40	81.51	81.93	82.16	82.52	80.78	82.62	82.58	82.52	82.55
7:45	81.51	81.93	82.16	82.52	80.78	82.62	82.57	82.51	82.54
7:50	81.51	81.93	82.15	82.51	80.78	82.61	82.57	82.50	82.54
7:55	81.50	81.93	82.15	82.51	80.78	82.61	82.57	82.50	82.53
8:00	81.50	81.93	82.15	82.51	80.78	82.60	82.56	82.49	82.53
8:05	81.50	81.92	82.15	82.50	80.79	82.60	82.56	82.49	82.52
8:10	81.50	81.92	82.15	82.50	80.79	82.59	82.55	82.48	82.52
8:15	81.50	81.92	82.15	82.50	80.79	82.59	82.55	82.48	82.51
8:20	81.50	81.92	82.14	82.50	80.79	82.58	82.54	82.47	82.51
8:25	81.50	81.92	82.14	82.49	80.80	82.58	82.54	82.47	82.51
8:30	81.50	81.92	82.14	82.49	80.80	82.58	82.53	82.46	82.50
8:35	81.49	81.91	82.14	82.49	80.80	82.57	82.53	82.46	82.50
8:40	81.49	81.91	82.13	82.48	80.80	82.57	82.52	82.45	82.49
8:45	81.49	81.91	82.13	82.48	80.80	82.57	82.52	82.45	82.49
8:50	81.49	81.91	82.13	82.48	80.81	82.56	82.51	82.44	82.48
8:55	81.49	81.91	82.13	82.47	80.81	82.56	82.51	82.44	82.48
9:00	81.49	81.91	82.13	82.47	80.81	82.56	82.51	82.43	82.48
9:05	81.49	81.90	82.12	82.47	80.81	82.55	82.51	82.43	82.47
9:10	81.48	81.90	82.12	82.47	80.81	82.55	82.50	82.42	82.47
9:15	81.48	81.90	82.12	82.46	80.81	82.55	82.50	82.42	82.47
9:20	81.48	81.90	82.12	82.46	80.82	82.54	82.49	82.42	82.46
9:25	81.48	81.90	82.12	82.46	80.82	82.54	82.49	82.41	82.46
9:30	81.48	81.90	82.11	82.46	80.82	82.54	82.48	82.41	82.45
9:35	81.48	81.89	82.11	82.45	80.83	82.53	82.48	82.40	82.45
9:40	81.48	81.89	82.11	82.45	80.83	82.53	82.48	82.40	82.45
9:45	81.48	81.89	82.11	82.45	80.83	82.53	82.48	82.39	82.44
9:50	81.47	81.89	82.11	82.45	80.84	82.52	82.47	82.39	82.44
9:55	81.47	81.89	82.10	82.44	80.84	82.52	82.47	82.39	82.44
10:00	81.47	81.88	82.10	82.44	80.84	82.52	82.46	82.38	82.43
10:05	81.47	81.88	82.10	82.44	80.85	82.52	82.46	82.38	82.43
10:10	81.47	81.88	82.10	82.44	80.85	82.51	82.46	82.37	82.43
10:15	81.47	81.88	82.10	82.44	80.86	82.51	82.46	82.37	82.42
10:20	81.47	81.88	82.09	82.43	80.87	82.51	82.45	82.37	82.42
10:25	81.46	81.88	82.09	82.43	80.88	82.51	82.45	82.36	82.42
10:30	81.46	81.88	82.09	82.43	80.88	82.50	82.45	82.36	82.41
10:35	81.46	81.87	82.09	82.43	80.89	82.50	82.44	82.35	82.41
10:40	81.46	81.87	82.09	82.43	80.90	82.50	82.44	82.35	82.41
10:45	81.46	81.87	82.09	82.42	80.91	82.50	82.44	82.35	82.41
10:50	81.46	81.87	82.08	82.42	80.93	82.49	82.44	82.34	82.40
10:55	81.46	81.87	82.08	82.42	80.94	82.49	82.43	82.34	82.40
11:00	81.45	81.86	82.08	82.42	80.95	82.49	82.43	82.34	82.40
11:05	81.45	81.86	82.08	82.41	80.97	82.49	82.43	82.33	82.39
11:10	81.45	81.86	82.07	82.41	80.98	82.48	82.43	82.33	82.39
11:15	81.45	81.86	82.07	82.41	81.00	82.48	82.42	82.32	82.39
11:20	81.45	81.86	82.07	82.41	81.04	82.48	82.42	82.32	82.38
11:25	81.45	81.85	82.07	82.41	81.06	82.48	82.42	82.32	82.38
11:30	81.45	81.85	82.07	82.41	81.07	82.48	82.41	82.31	82.38
11:35	81.44	81.85	82.07	82.40	81.11	82.47	82.41	82.31	82.38
11:40	81.44	81.85	82.06	82.40	81.19	82.47	82.41	82.31	82.37
11:45	81.44	81.85	82.06	82.40	81.39	82.47	82.40	82.30	82.37
11:50	81.44	81.85	82.06	82.40	81.64	82.47	82.40	82.30	82.37
11:55	81.44	81.85	82.06	82.40	81.87	82.46	82.40	82.29	82.36
12:00	81.44	81.84	82.06	82.39	82.06	82.46	82.40	82.29	82.36
12:05	81.44	81.84	82.05	82.39	82.27	82.46	82.39	82.29	82.36
12:10	81.43	81.84	82.05	82.39	82.49	82.46	82.39	82.28	82.36
12:15	81.43	81.84	82.05	82.39	82.58	82.46	82.39	82.28	82.35
12:20	81.43	81.84	82.05	82.39	82.69	82.46	82.39	82.28	82.35
12:25	81.43	81.84	82.05	82.39	82.79	82.45	82.39	82.27	82.35
12:30	81.43	81.83	82.05	82.38	82.82	82.45	82.38	82.27	82.35
12:35	81.43	81.83	82.04	82.38	82.86	82.45	82.38	82.27	82.34
12:40	81.43	81.83	82.04	82.38	82.90	82.45	82.38	82.26	82.34
12:45	81.42	81.83	82.04	82.38	82.93	82.45	82.38	82.26	82.34
12:50	81.42	81.83	82.04	82.38	82.97	82.45	82.38	82.26	82.33

12:55	81.42	81.83	82.04	82.37	82.98	82.44	82.37	82.25	82.33
13:00	81.42	81.82	82.03	82.37	82.99	82.44	82.37	82.25	82.33
13:05	81.42	81.82	82.03	82.37	82.99	82.44	82.37	82.25	82.33
13:10	81.42	81.82	82.03	82.37	83.00	82.44	82.37	82.24	82.32
13:15	81.42	81.82	82.03	82.37	82.99	82.44	82.36	82.24	82.32
13:20	81.41	81.82	82.03	82.37	83.00	82.44	82.36	82.24	82.32
13:25	81.41	81.82	82.03	82.36	82.99	82.43	82.36	82.23	82.32
13:30	81.41	81.81	82.02	82.36	82.99	82.43	82.36	82.23	82.31
13:35	81.41	81.81	82.02	82.36	82.98	82.43	82.36	82.23	82.31
13:40	81.41	81.81	82.02	82.36	82.98	82.43	82.35	82.22	82.31
13:45	81.41	81.81	82.02	82.36	82.97	82.43	82.35	82.22	82.31
13:50	81.41	81.81	82.02	82.36	82.97	82.43	82.35	82.22	82.30
13:55	81.40	81.81	82.01	82.35	82.96	82.42	82.35	82.21	82.30
14:00	81.40	81.80	82.01	82.35	82.96	82.42	82.35	82.21	82.30
14:05	81.40	81.80	82.01	82.35	82.95	82.42	82.34	82.21	82.30
14:10	81.40	81.80	82.01	82.35	82.95	82.42	82.34	82.20	82.29
14:15	81.40	81.80	82.01	82.35	82.94	82.42	82.34	82.20	82.29
14:20	81.40	81.80	82.01	82.35	82.94	82.42	82.34	82.20	82.29
14:25	81.40	81.80	82.00	82.34	82.93	82.41	82.33	82.19	82.29
14:30	81.39	81.79	82.00	82.34	82.92	82.41	82.33	82.19	82.28
14:35	81.39	81.79	82.00	82.34	82.91	82.41	82.33	82.19	82.28
14:40	81.39	81.79	82.00	82.34	82.91	82.41	82.33	82.18	82.28
14:45	81.39	81.79	82.00	82.34	82.90	82.41	82.33	82.18	82.28
14:50	81.39	81.79	82.00	82.34	82.90	82.41	82.33	82.18	82.27
14:55	81.39	81.79	81.99	82.33	82.89	82.40	82.32	82.18	82.27
15:00	81.38	81.78	81.99	82.33	82.89	82.41	82.32	82.17	82.27
15:05	81.38	81.78	81.99	82.33	82.88	82.40	82.32	82.17	82.27
15:10	81.38	81.78	81.99	82.33	82.87	82.40	82.32	82.17	82.26
15:15	81.38	81.78	81.99	82.33	82.86	82.40	82.31	82.16	82.26
15:20	81.38	81.78	81.99	82.33	82.86	82.40	82.31	82.16	82.26
15:25	81.38	81.78	81.98	82.32	82.85	82.40	82.31	82.16	82.26
15:30	81.38	81.77	81.98	82.32	82.85	82.40	82.31	82.15	82.25
15:35	81.37	81.77	81.98	82.32	82.84	82.39	82.31	82.15	82.25
15:40	81.37	81.77	81.98	82.32	82.84	82.39	82.31	82.15	82.25
15:45	81.37	81.77	81.98	82.32	82.83	82.39	82.30	82.14	82.25
15:50	81.37	81.77	81.98	82.32	82.83	82.39	82.30	82.14	82.25
15:55	81.37	81.77	81.97	82.31	82.82	82.39	82.30	82.14	82.24
16:00	81.37	81.77	81.97	82.31	82.82	82.39	82.30	82.14	82.24
16:05	81.37	81.76	81.97	82.31	82.81	82.39	82.30	82.13	82.24
16:10	81.36	81.76	81.97	82.31	82.81	82.39	82.29	82.13	82.24
16:15	81.36	81.76	81.97	82.31	82.80	82.38	82.29	82.13	82.23
16:20	81.36	81.76	81.97	82.31	82.80	82.38	82.29	82.12	82.23
16:25	81.36	81.76	81.96	82.31	82.80	82.38	82.29	82.12	82.23
16:30	81.36	81.76	81.96	82.30	82.79	82.38	82.29	82.12	82.23
16:35	81.36	81.75	81.96	82.30	82.78	82.38	82.29	82.11	82.22
16:40	81.36	81.75	81.96	82.30	82.78	82.38	82.28	82.11	82.22
16:45	81.35	81.75	81.96	82.30	82.77	82.38	82.28	82.11	82.22
16:50	81.35	81.75	81.96	82.30	82.77	82.38	82.28	82.11	82.22
16:55	81.35	81.75	81.95	82.30	82.76	82.37	82.28	82.10	82.22
17:00	81.35	81.75	81.95	82.29	82.76	82.37	82.28	82.10	82.21
17:05	81.35	81.75	81.95	82.29	82.76	82.37	82.27	82.10	82.21
17:10	81.35	81.74	81.95	82.29	82.75	82.37	82.27	82.09	82.21
17:15	81.35	81.74	81.95	82.29	82.75	82.37	82.27	82.09	82.21

**he Commons - Medium Density (Phase 4)
Post-Development Model Schematic**



STORM SEWER DESIGN SHEET



Novatech Project #: 118224-MD
 Project Name: The Commons- Phase 4
 Date: 10/18/2024
 Input By: C.Visser/B. Smith
 Reviewed By: M. Savic
 Drawing Reference: 118224-GP-MD

Legend: Design Input by User
 As-Built Input by User
 Cumulative Cell
 Calculated Design Cell Output
 Calculated Uncontrolled Peak Flow Cell Output
 Design Input Restricted Peak Flow Cell
Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
 MOE - Design Guidelines for Sewage Works (2008)

Storm Design Event = 2 Year

Location				Flow							Design Capacity								
Street	Area ID	From MH	To MH	Area A (ha.)	Runoff Coefficient C	Indivi. 2.78 AC	Accum. 2.78 AC	Time of Conc. Tc (min.)	Rain Intensity I (mm/hr)	Total Uncontrolled Peak Flow Q (L/s)	Proposed Sewer Pipe Sizing / Design								
											Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Time of Flow (min.)	Q / Qfull
Street One	A-2	110	108	0.004	0.20	0.00	0.00	10.00	76.81	0.2	42.1	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.87	0.3%
Street One	A-3	110	108	0.013	0.79	0.03	0.03	10.87	73.62	2.3	42.1	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.87	3.9%
Street One	A-4	110	108	0.079	0.81	0.18	0.21	11.74	70.71	14.8	42.1	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.87	25.1%
Street One	A-5	108	106	0.024	0.20	0.01	0.22	12.61	68.05	15.1	9.4	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.16	21.2%
Street One	-	106	104	0.000	0.00	0.00	0.22	12.77	67.58	15.0	19.2	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.40	25.5%
Street One	A-6	104	102	0.066	0.36	0.07	0.29	13.17	66.46	19.1	10.0	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.17	26.8%
Street One	A-7	102	100	0.120	0.80	0.27	0.55	13.34	65.99	36.6	39.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.82	62.3%
Street One	A-8	102	100	0.020	0.73	0.04	0.60	14.16	63.81	38.0	39.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.82	64.6%
Street One	-	100	EX	0.000	0.00	0.00	0.60	14.99	61.79	36.8	12.5	375 PVC	0.381	0.013	0.28	96.8	0.85	0.25	38.0%
Street Two	A-9	212	210	0.019	0.68	0.04	0.04	10.00	76.81	2.8	42.0	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.87	4.7%
Street Two	A-10	212	210	0.124	0.80	0.28	0.31	10.87	73.62	22.9	42.0	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.87	39.0%
Street Two	-	210	208	0.000	0.00	0.00	0.31	11.74	70.72	22.0	10.4	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.18	30.9%
Street Two	-	208	206	0.000	0.00	0.00	0.31	11.91	70.16	21.9	20.3	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.42	37.2%
Street Two	A-11	206	204	0.000	0.22	0.00	0.31	12.33	68.87	21.5	12.4	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.21	30.1%
Street Two	A-12	204	202	0.125	0.76	0.26	0.58	12.54	68.24	39.3	38.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.80	66.8%
Street Two	A-13	204	202	0.027	0.74	0.06	0.63	13.35	65.96	41.6	38.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.80	70.8%
Street Two	-	202	EX	0.000	0.00	0.00	0.63	13.35	65.96	41.6	14.4	375 PVC	0.381	0.013	0.25	91.5	0.80	0.30	45.5%
Street Three	A-14	312	310	0.025	0.85	0.06	0.06	10.00	76.81	4.5	38.0	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.79	7.7%
Street Three	A-15	310	308	0.096	0.78	0.21	0.27	10.79	73.91	19.8	11.7	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.20	27.7%
Street Three	A-11	310	308	0.036	0.22	0.02	0.29	10.99	73.22	21.2	11.7	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.20	29.7%
Street Three	-	308	306	0.000	0.00	0.00	0.29	11.18	72.54	21.0	43.0	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.89	35.7%
Street Three	A-16	306	304	0.050	0.79	0.11	0.40	10.99	73.22	29.2	11.5	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.24	49.7%
Street Three	A-17	306	304	0.031	0.20	0.02	0.42	11.18	72.54	30.2	11.5	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.24	51.3%
Street Three	A-18	304	302	0.017	0.60	0.03	0.44	12.07	69.67	31.0	15.3	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.32	52.7%
Street Three	-	302	EX	0.000	0.00	0.00	0.44	11.22	72.41	32.2	12.4	375 PVC	0.381	0.013	0.29	98.5	0.86	0.24	32.7%
Street Four	B-1	414	412	0.021	0.20	0.01	0.01	10.00	76.81	0.9	49.1	300 PVC	0.3048	0.013	0.34	58.8	0.81	1.02	1.5%
Street Four	B-2	414	412	0.075	0.81	0.17	0.18	11.02	73.12	13.2	49.1	300 PVC	0.3048	0.013	0.34	58.8	0.81	1.02	22.4%
Street Four	B-3	412	410	0.029	0.20	0.02	0.20	12.03	69.80	13.7	13.2	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.23	19.2%
Street Four	B-4	412	410	0.061	0.83	0.14	0.34	12.26	69.11	23.3	25.7	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.53	39.6%
Street Six	B-5	604	602	0.022	0.20	0.01	0.01	10.00	76.81	0.9	52.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	1.09	1.6%
Street Six	B-6	604	602	0.094	0.75	0.20	0.21	11.09	72.85	15.2	52.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	1.09	25.8%
Street Six	B-7	604	602	0.097	0.78	0.21	0.42	12.19	69.32	29.0	52.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	1.09	49.3%
Street Six	-	602	408	0.000	0.00	0.00	0.42	13.28	66.15	27.7	8.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.18	47.1%
Street Four	B-8	408	406	0.015	0.20	0.01	0.76	13.46	65.65	50.2	32.9	375 PVC	0.381	0.013	0.25	91.5	0.80	0.68	54.9%
Street Four	B-9	408	406	0.035	0.84	0.08	0.85	14.15	63.85	54.0	32.9	375 PVC	0.381	0.013	0.25	91.5	0.80	0.68	59.1%
Street Five	B-10	510	512	0.025	0.20	0.01	0.01	10.00	76.81	1.1	47.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.99	1.8%
Street Five	B-11	510	512	0.195	0.76	0.41	0.43	10.99	73.20	31.2	47.9	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.99	53.0%
Street Five	-	512	406	0.000	0.00	0.00	0.43	11.98	69.95	29.8	10.0	300 PVC	0.3048	0.013	0.34	58.8	0.81	0.21	50.6%

STORM SEWER DESIGN SHEET



Location				Flow							Design Capacity								
Street	Area ID	From MH	To MH	Area A (ha.)	Runoff Coefficient C	Indivi. 2.78 AC	Accum. 2.78 AC	Time of Conc. Tc (min.)	Rain Intensity I (mm/hr)	Total Uncontrolled Peak Flow Q (L/s)	Proposed Sewer Pipe Sizing / Design								
											Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Time of Flow (min.)	Q / Qfull
Street Four	B-12	406	404	0.065	0.84	0.15	1.31	14.83	62.17	81.3	25.3	450 CONC	0.4572	0.013	0.20	133.0	0.81	0.52	61.1%
Street Four	B-13	404	402	0.016	0.20	0.01	1.32	15.35	60.95	80.3	11.6	450 CONC	0.4572	0.013	0.50	210.3	1.28	0.15	38.2%
Street Four	B-14	402	508	0.072	0.80	0.16	1.48	15.50	60.60	89.5	51.2	450 CONC	0.4572	0.013	0.20	133.0	0.81	1.05	67.3%
Street Four	B-15	508	506	0.025	0.20	0.01	1.49	16.56	58.32	87.0	10.6	450 CONC	0.4572	0.013	0.20	133.0	0.81	0.22	65.4%
Street Five	B-16	508	506	0.045	0.79	0.10	1.58	16.56	58.32	91.9	10.6	450 CONC	0.4572	0.013	0.20	133.0	0.81	0.22	69.1%
Street Five	-	506	504	0.000	0.00	0.00	1.58	16.77	57.87	91.2	23.5	450 CONC	0.4572	0.013	0.20	133.0	0.81	0.48	68.6%
Street Five	-	504	502	0.000	0.00	0.00	1.58	17.26	56.91	89.7	8.8	450 CONC	0.4572	0.013	0.20	133.0	0.81	0.18	67.4%
Street Five	-	502	EX	0.000	0.00	0.00	1.58	17.44	56.55	89.1	8.5	450 CONC	0.4572	0.013	0.20	133.0	0.81	0.17	67.0%
PARK	B-17			0.016	0.20	0.01	0.01	10.00	76.81	1.1	7.8	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.13	1.5%
PARK	B-18	404	402	0.143	0.20	0.08	0.09	10.13	76.30	7.1	7.8	300 PVC	0.3048	0.013	0.50	71.3	0.98	0.13	10.0%
Totals				1.927							969.2								

Demand Equation / Parameters

1. $Q = 2.78 ACI$

Definitions

- Q = Peak flow in litres per second (L/s)
- A = Area in hectares (ha)
- C = Weighted runoff coefficient (increased by 25% for 100-year)
- I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

Capacity Equation

$Q_{full} = 1000 * (1/n) * A_p * R^{2/3} * So^{0.5}$

Definitions

- Q full = Capacity (L/s)
- n = Manning coefficient of roughness (0.013)
- A_p = Pipe flow area (m²)
- R = Hydraulic Radius of wetted area (dia./4 for full pipes)
- So = Pipe slope/gradient

The Commons - Medium Density (Phase 4)

Allowable Release Rate Calculations

Block ID	Total Release Rate (cms)	Area (ha)	Per ha Release Rate (cms/ha)
B1 (A)	0.228	0.990	0.230
B3i (B)	0.245	1.014	0.242

AREA A FLOWS

Uncontrolled area - 100 year uncontrolled flow

Area A01 0.114 ha = 0.046 cms
remaining allowable = 0.182 cms

remaining area = 0.876 ha
flow rate per area = 0.2077626

Split into 3 loops

Street 1

Areas A02-A08 = 0.326
allowable flow = 0.068

Street 2

Areas A09, 10, 12, 13 = 0.295
allowable flow = 0.061

Street 3

Areas A11, A14-A18 = 0.255
allowable flow = 0.053

AREA B FLOWS

Uncontrolled area - 100 year uncontrolled flow

Area B17 0.143 ha = 0.026 cms

Area B18 0.003 ha = 0.001 cms
remaining allowable = 0.218 cms

The Commons - Medium Density (Phase 4)
Peak Flows (cms)



Storm Distribution->		4hr Chi.	3hr Chicago				12hr SCS		
Return Period->		25mm	2yr	5yr	100yr	100yr+20%	2yr	5yr	100yr
Area A Uncontrolled (A01)		0.003	0.004	0.016	0.046	0.060	0.009	0.019	0.037
Street 1	<i>minor flows</i>	0.032	0.040	0.048	0.064	0.067	0.036	0.048	0.062
	<i>major flows</i>	0	0	0	0	0	0	0	0
Street 2	<i>minor flows</i>	0.034	0.045	0.052	0.059	0.061	0.037	0.050	0.055
	<i>major flows</i>	0	0	0	0	0	0	0	0
Street 3	<i>minor flows</i>	0.023	0.028	0.037	0.053	0.055	0.027	0.037	0.052
	<i>major flows</i>	0	0	0	0	0	0	0	0
Area A TOTAL		0.092	0.117	0.153	0.222	0.243	0.109	0.154	0.206
Area B Uncontrolled (B17, 18)		0.001	0.001	0.005	0.027	0.041	0.003	0.010	0.033
Street 4	<i>minor flows</i>	0.090	0.118	0.150	0.185	0.216	0.104	0.150	0.191
	<i>major flows</i>	0	0	0	0	0	0	0	0
Area B TOTAL		0.091	0.119	0.155	0.212	0.257	0.107	0.160	0.224

The Commons - Medium Density (Phase 4)

Inlet Control Device Parameters

Structure	ICD Size & Inlet Rate					Approach Flow** (L/s)
	Diameter 1 (mm)	Diameter 2* (mm)	Max Head (m)	Calculated 2-yr Capture Rate (L/s)	2-yr Capture Rate** (L/s)	
CB50-51	IPEX LMF 65	IPEX LMF 65	2.06	12.53	7.60	8.04
CB52-53	IPEX LMF 70	IPEX LMF 70	2.03	12.44	6.20	6.47
CB54-55	IPEX LMF 75	IPEX LMF 65	2.04	13.96	11.00	11.88
CB56-57	IPEX LMF 75	IPEX LMF 65	2.05	13.99	12.80	14.15
CB58-59	IPEX LMF 100	IPEX LMF 100	1.73	23.96	21.60	22.31
CB60-61	IPEX LMF 75	IPEX LMF 85	1.69	15.51	14.10	14.89
CB62-63	IPEX LMF 95	IPEX LMF 95	1.76	24.16	20.20	21.63
CB64-65	IPEX LMF 95	IPEX LMF 95	1.76	24.16	22.00	23.04
CB66-67	IPEX LMF 70	IPEX LMF 70	1.74	12.86	8.70	9.10
CB68-69	IPEX LMF 95	IPEX LMF 95	1.73	20.43	16.80	17.30
CB70-71	IPEX LMF 80	IPEX LMF 80	1.95	15.04	14.80	16.09
CB72-73	IPEX LMF 85	IPEX LMF 85	2.00	18.47	16.60	17.46
CB74-75	83	83	1.97	41.70	33.40	33.90
CB78-79	83	83	1.69	38.62	8.02	8.04
CB80-81	IPEX LMF 75	IPEX LMF 75	2.04	13.92	12.30	13.42
CB82-83	83	83	1.70	38.73	2.40	23.53
CB84-85	83	83	1.66	38.27	3.20	3.28
CB86-87	83	83	1.66	38.27	2.80	2.83
CB88-89	83	83	1.68	38.50	4.40	4.49
CB90-91	83	83	1.82	40.08	3.60	3.66
CB92-93	83	83	1.72	38.96	2.00	2.00
Rear Yards						
RYCB20	83	-	1.11	15.64	0.18	0.22
RYCB21	83	-	1.16	15.99	0.10	0.55
RYCB22	83	-	1.46	17.94	3.00	0.33
RYCB23	83	-	1.46	17.94	0.27	0.36
RYCB24	83	-	1.16	15.99	0.24	0.34
RYCB150	83	-	1.96	20.79	0.18	0.26
RYCB151	83	-	1.96	20.79	0.21	0.31
RYCB153	83	-	1.96	20.79	0.16	0.21
RYCB154	83	-	1.96	20.79	0.21	0.27
RYCB155	83	-	1.46	17.94	0.19	0.30
RYCB156	83	-	1.96	20.79	0.13	0.17
RYCB158	83	-	1.96	20.79	0.03	0.07

The Commons - Medium Density (Phase 4)

Inlet Control Device Parameters

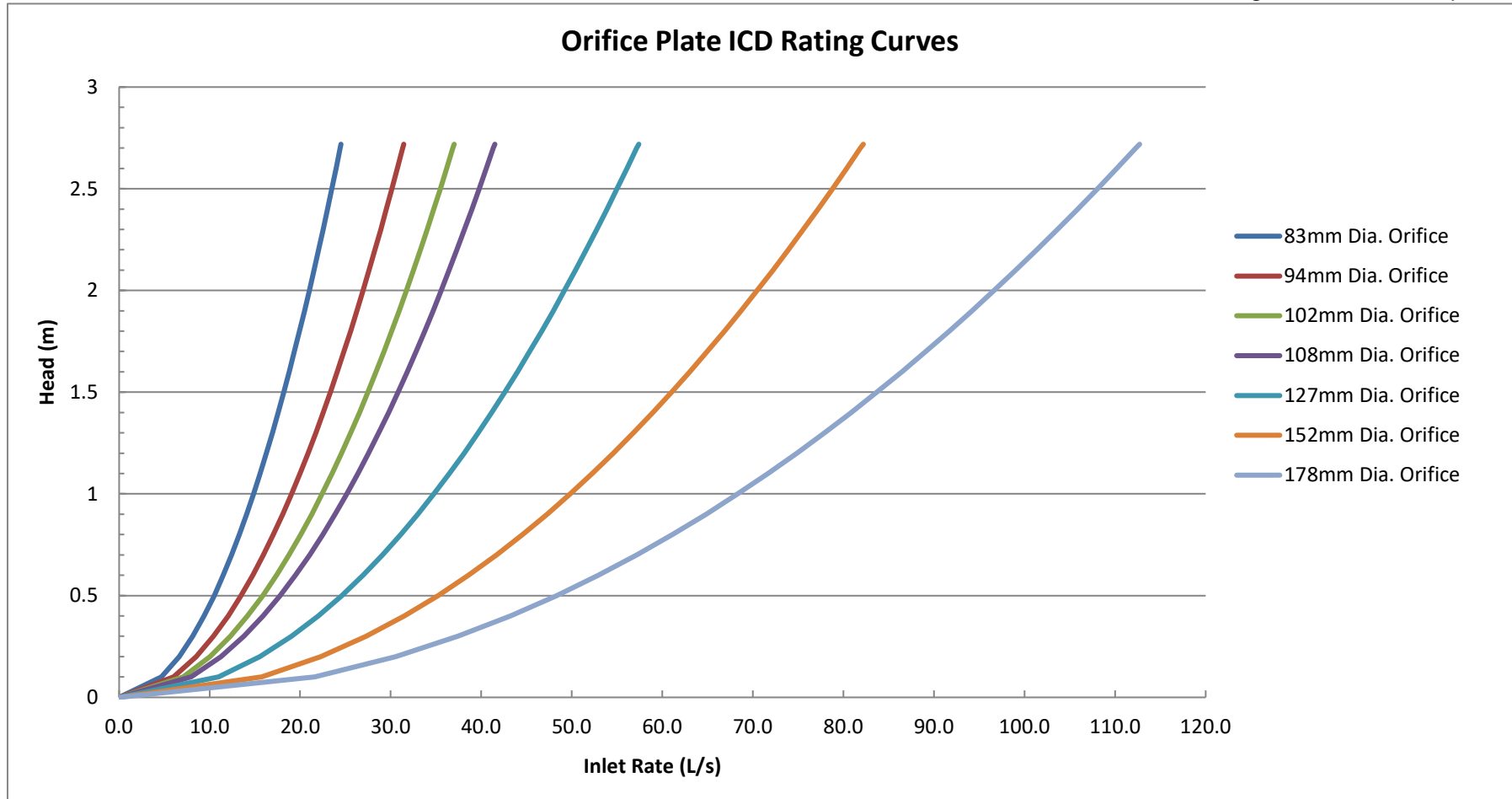
Structure	ICD Size & Inlet Rate					Approach Flow** (L/s)
	Diameter 1 (mm)	Diameter 2* (mm)	Max Head (m)	Calculated 2-yr Capture Rate (L/s)	2-yr Capture Rate** (L/s)	
Manholes - Outlets from Phase 4						
MH100	178	-	2.29	103.44	40.13	40.13
MH202	152	-	2.35	76.46	43.23	43.23
MH302	127	-	4.06	70.07	28.34	28.34

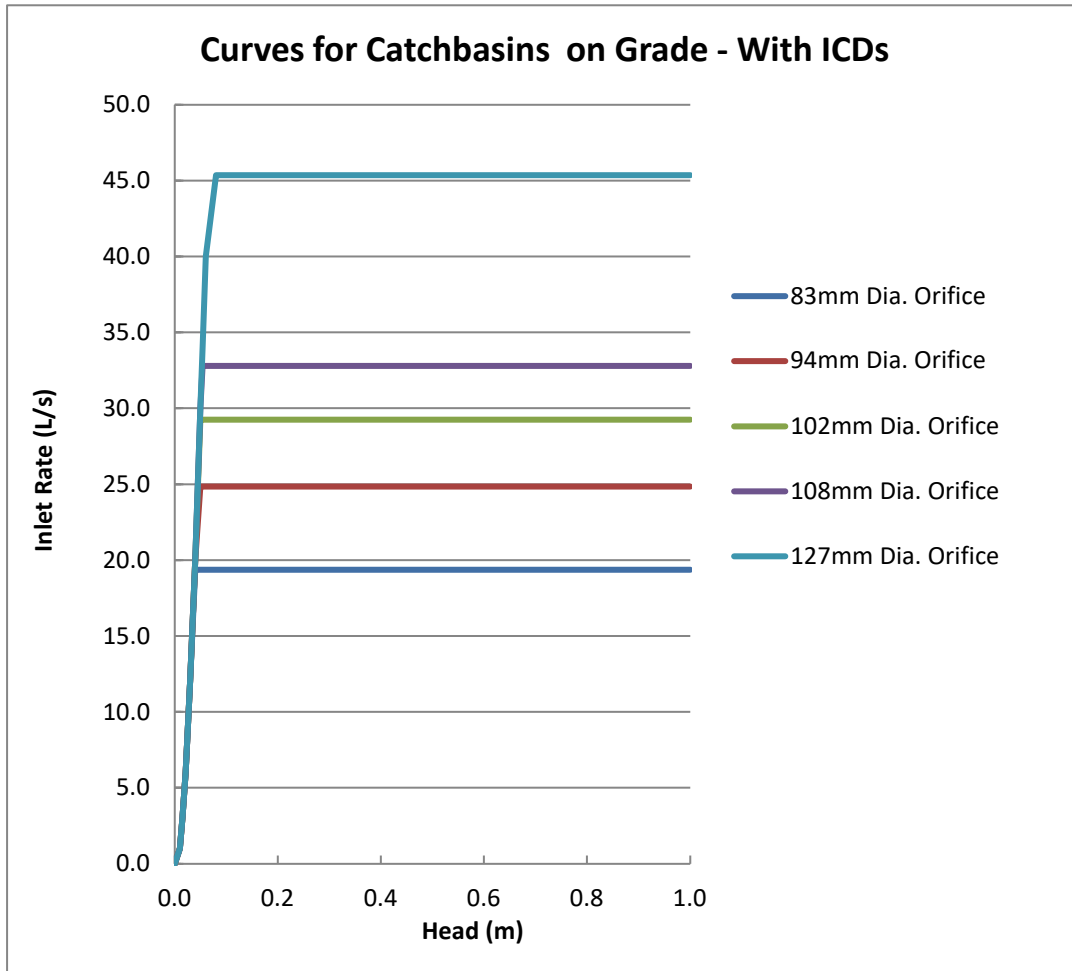
*Diameter 2 only specified where catchbasins are not interconnected

**From PCSWMM Model, 2-year 3-hour Chicago storm distribution

The Commons - Medium Density (Phase 4)

ICD Rating Curves





Curb Inlet Catchbasins on Continuous Grade

Depth vs. Captured Flow Curve

A standard depth vs. captured flow curve for catch basins on a continuous grade was provided to Novatech by City staff for use in a dual-drainage model of an existing residential neighbourhood. This standard curve was derived using the inlet curves in Appendix 7A of the Ottawa Sewer Design Guidelines.

Novatech reviewed the methodology used to create this standard curve (described below) and determined that it was suitable for general use in other dual-drainage models.

- MTO Design Chart 4.04 provides the relationship between the gutter flow rate (Q_g) and flow spread (T) for Barrier Curb.
- MTO Design Chart 4.12 provides the relationship between flow spread (T) and flow depth (D).
- The relationship between the gutter flow rate (Q_g) and flow depth (D) was determined for different road slopes using the above charts and Manning's equation (refer to pages 58-60 of the MTO Drainage Management Manual – Part 2);
- The relationship between approach flow (Q_a) and captured flow (Q_c) was determined for different road slopes using the design chart for Barrier Curb with Gutter (Appendix 7-A.2).
- Using the above information, a family of curves was developed to characterize the relationship between flow depth and captured flow for curb inlet catchbasins on different road slopes. The results of this exercise can be summarized as follows:
 - For a given flow depth, the gutter flow rate (Q_g) increases as the road slope increases.
 - The capture efficiency (Q_c) of curb inlet catchbasins decrease as the road slope increases.
 - The net result is that the relationship between flow depth and capture rate is largely independent of road slope: While approach flow vs. captured flow (Q_a vs. Q_c) varies significantly with road grade, flow depth vs. captured flow (D vs. Q_c) does not.

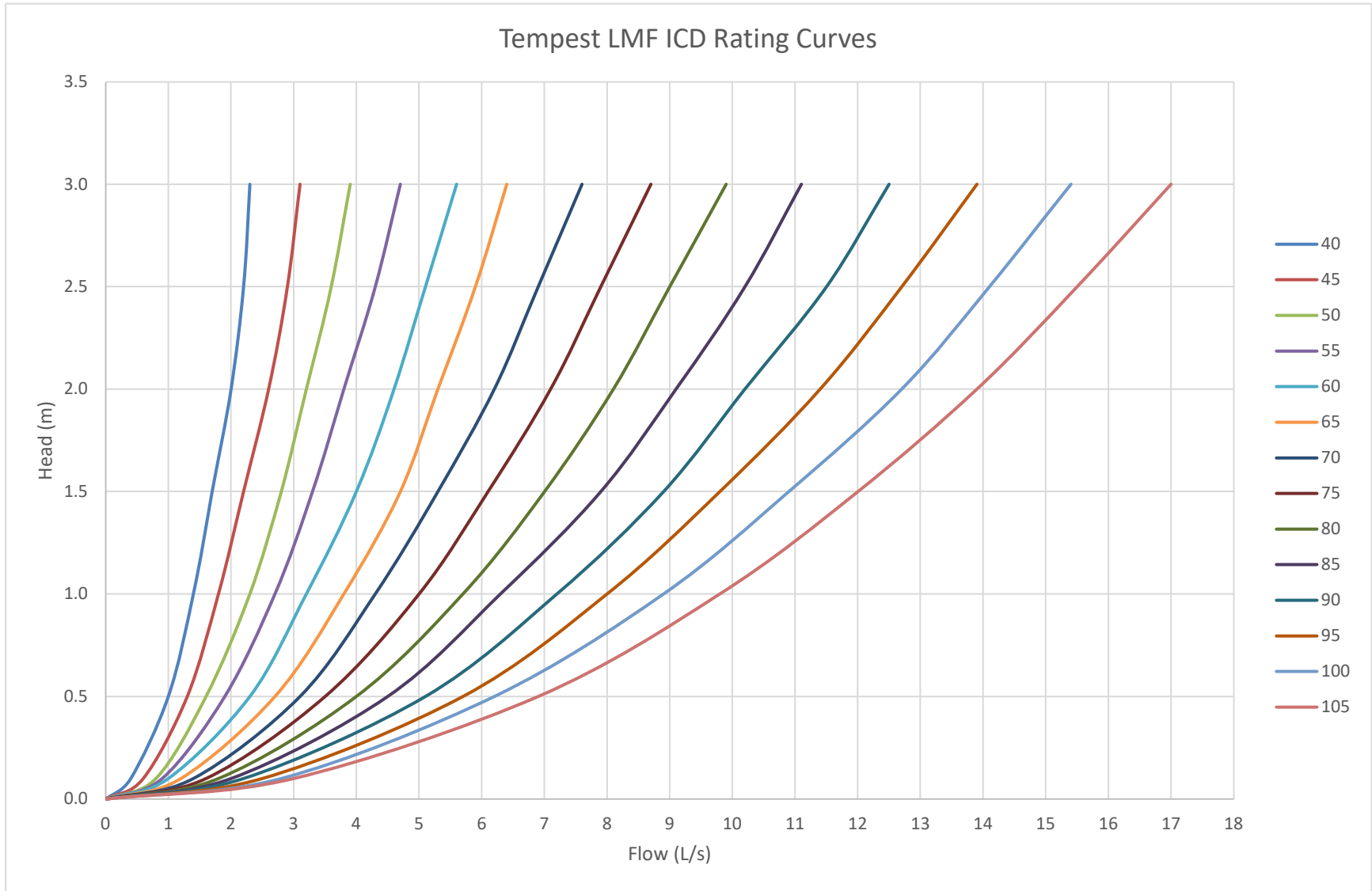
Since there was very little difference in the flow depth vs. captured flow curves for different road slopes, this family of curves was averaged to create a single standard curve for use in dual-drainage models.

Inlet Control Devices

The standard depth vs. capture flow curve was modified to account for the installation of ICDs in curb inlet catchbasins on continuous grade. Separate inlet curves were created for each standard ICD orifice size by capping the inlet rate on the depth vs. capture flow curve at the maximum flow rate through the ICD at a head of 1.2m (depth from centerline of CB lead to top of CICB frame).

The Commons - Medium Density (Phase 4)

ICD Rating Curves - Tempest LMF



The Commons - Medium Density (Phase 4)
ROW Ponding Depths

Structure	T/G (m)	Max. Static Ponding (Spill Depth)		2-yr Event (4hr)				5-yr Event (4hr)				100-yr Event (4hr)				100-yr Event (+20%) (4hr)			
		Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)
CB50-51	90.42	90.74	0.32	89.12	0.00	N	0.00	89.74	0.00	N	0.00	90.50	0.08	N	0.00	90.53	0.11	N	0.00
CB52-53	90.46	90.75	0.29	88.94	0.00	N	0.00	89.38	0.00	N	0.00	90.50	0.04	N	0.00	90.54	0.08	N	0.00
CB54-55	90.50	90.77	0.27	89.73	0.00	N	0.00	90.52	0.02	N	0.00	90.62	0.12	N	0.00	90.65	0.15	N	0.00
CB56-57	90.59	90.86	0.27	90.26	0.00	N	0.00	90.57	0.00	N	0.00	90.66	0.07	N	0.00	90.70	0.11	N	0.00
CB58-59	90.82	91.06	0.24	90.52	0.00	N	0.00	90.89	0.07	N	0.00	91.00	0.18	N	0.00	91.04	0.22	N	0.00
CB60-61	90.81	91.10	0.29	90.51	0.00	N	0.00	90.86	0.05	N	0.00	90.95	0.14	N	0.00	90.89	0.08	N	0.00
CB62-63	90.74	90.95	0.21	90.43	0.00	N	0.00	90.81	0.07	N	0.00	90.93	0.19	N	0.00	90.96	0.22	Y	0.01
CB64-65	90.84	91.07	0.23	90.64	0.00	N	0.00	90.92	0.08	N	0.00	91.03	0.19	N	0.00	91.07	0.23	N	0.00
CB66-67	90.40	90.69	0.29	89.46	0.00	N	0.00	90.18	0.00	N	0.00	90.53	0.13	N	0.00	90.57	0.17	N	0.00
CB68-69	90.52	90.73	0.21	89.96	0.00	N	0.00	90.57	0.05	N	0.00	90.69	0.17	N	0.00	90.73	0.21	N	0.00
CB70-71	90.54	90.83	0.29	90.46	0.00	N	0.00	90.61	0.07	N	0.00	90.70	0.16	N	0.00	90.74	0.20	N	0.00
CB72-73	90.48	90.77	0.29	90.09	0.00	N	0.00	90.55	0.07	N	0.00	90.68	0.20	N	0.00	90.72	0.24	N	0.00
CB74-75	90.36	90.61	0.25	89.66	0.00	N	0.00	90.41	0.05	N	0.00	90.54	0.18	N	0.00	90.58	0.22	N	0.00
CB80-81	90.41	90.61	0.20	89.95	0.00	N	0.00	90.47	0.06	N	0.00	90.57	0.16	N	0.00	90.61	0.20	N	0.00

The Commons - Medium Density (Phase 4)
HGL Elevations

Manhole ID	MH Invert Elevation (m)	T/G Elevation (m)	HGL Elevation - 100yr4hr (m)	HGL Elevation - 100yr4hr+20% (m)	Min USF (m)	Clearance from T/G (100yr) (m)	Clearance from T/G (100yr+20%) (m)
MH100	88.48	90.86	89.68	89.76	89.98	-1.18	-1.10
MH102	88.69	91.02	89.81	89.90	90.11	-1.21	-1.12
MH104	88.78	91.12	89.83	89.92	90.13	-1.29	-1.20
MH106	88.90	91.07	89.84	89.93	90.14	-1.23	-1.14
MH108	89.00	90.99	89.85	89.94	90.15	-1.14	-1.05
MH110	89.19	90.79	89.85	89.95	90.15	-0.94	-0.84
MH202	88.25	90.68	89.84	89.97	90.14	-0.84	-0.71
MH204	88.46	90.85	89.92	90.06	90.22	-0.93	-0.79
MH206	88.57	91.01	89.94	90.08	90.24	-1.07	-0.93
MH208	88.69	91.08	89.96	90.10	90.26	-1.12	-0.98
MH210	88.79	90.99	89.97	90.11	90.27	-1.02	-0.88
MH212	88.98	90.96	89.97	90.12	90.27	-0.99	-0.84
MH302	86.34	90.46	89.13	89.47	89.43	-1.33	-0.99
MH304	86.46	90.60	89.16	89.49	89.46	-1.44	-1.11
MH306	86.95	90.54	89.20	89.53	89.50	-1.34	-1.01
MH308	87.15	90.55	89.28	89.62	89.58	-1.27	-0.93
MH310	87.26	90.60	89.30	89.64	89.60	-1.30	-0.96
MH312	87.44	90.38	89.30	89.64	89.60	-1.08	-0.74
MH402	87.13	90.67	87.80	88.48	88.10	-2.87	-2.19
MH404	87.24	90.54	87.85	88.52	88.15	-2.69	-2.02
MH406	87.34	90.81	88.04	88.69	88.34	-2.77	-2.12
MH408	87.50	90.87	88.13	88.77	88.43	-2.74	-2.10
MH410	87.66	90.58	88.14	88.78	88.44	-2.44	-1.80
MH412	87.78	90.62	88.15	88.78	88.45	-2.47	-1.84
MH414	88.00	90.69	88.13	88.79	88.43	-2.56	-1.90
MH502	86.87	90.20	87.36	88.09	87.66	-2.84	-2.11
MH504	86.88	90.29	87.40	88.12	87.70	-2.89	-2.17
MH506	86.93	90.64	87.51	88.21	87.81	-3.13	-2.43
MH508	86.98	90.79	87.56	88.25	87.86	-3.23	-2.54
MH510	87.71	90.62	88.08	88.74	88.38	-2.54	-1.88
MH512	87.52	90.56	88.06	88.71	88.36	-2.50	-1.85
MH602	87.60	90.69	88.14	88.78	88.44	-2.55	-1.91
MH604	87.81	90.65	88.15	88.79	88.45	-2.50	-1.86

The Commons - Medium Density (Phase 4)

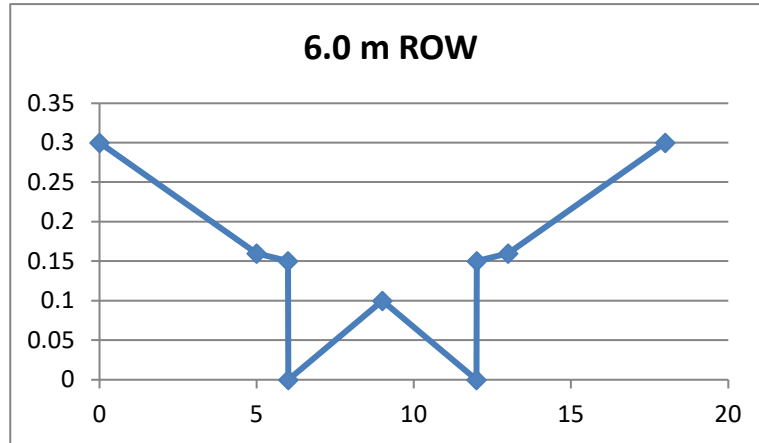
HGL Elevations - Model Comparison

Manhole ID	MH Invert Elevation (m)	T/G Elevation (m)	HGL Elevation - Original Model (m)	HGL Elevation - With Phase 4 (m)	Change (m)
100 (STM)	81.27	87.58	83.10	83.00	-0.10
102 (STM)	81.34	87.57	83.24	83.13	-0.11
104 (STM)	81.38	87.62	83.41	83.28	-0.13
106 (STM)	83.54	87.66	84.19	84.19	0.00
108 (STM)	83.62	87.50	84.20	84.20	0.00
110 (STM)	83.94	87.75	84.58	84.58	0.00
112 (STM)	81.90	87.92	83.78	83.57	-0.21
114 (STM)	83.37	88.00	84.15	84.15	0.00
116 (STM)	83.50	88.17	84.27	84.27	0.00
118 (STM)	83.88	88.36	84.54	84.54	0.00
120 (STM)	82.66	88.08	84.77	84.53	-0.24
122 (STM)	82.74	88.23	84.94	84.63	-0.31
124 (STM)	82.83	88.20	85.10	84.74	-0.36
126 (STM)	82.97	88.47	85.45	84.98	-0.47
128 (STM)	83.17	88.63	85.85	85.22	-0.63
130 (STM)	84.27	89.05	86.26	85.56	-0.70
132 (STM)	84.48	89.18	86.43	85.75	-0.68
134 (STM)	84.80	89.32	86.82	86.31	-0.51
136 (STM)	83.34	88.65	86.13	85.38	-0.75
138 (STM)	83.42	88.77	86.25	85.47	-0.78
140 (STM)	83.71	89.25	86.70	85.76	-0.94
142 (STM)	84.91	89.16	86.97	86.07	-0.90
144 (STM)	84.13	89.45	87.13	86.06	-1.07
146 (STM)	85.00	89.12	87.77	86.55	-1.22
148 (STM)	85.14	89.21	88.62	86.74	-1.88
150 (STM)	84.38	89.80	87.32	86.55	-0.77
152 (STM)	85.26	90.00	88.16	86.47	-1.69
154 (STM)	85.35	90.09	87.96	86.53	-1.43
156 (STM)	85.73	89.94	88.51	87.88	-0.63
158 (STM)	84.91	90.07	87.94	86.98	-0.96
160 (STM)	84.99	90.16	88.05	87.06	-0.99
162 (STM)	85.35	90.30	88.50	87.22	-1.28
164 (STM)	85.60	90.28	88.69	87.33	-1.36
166 (STM)	86.17	90.42	88.69	87.36	-1.33
168 (STM)	86.50	90.39	88.75	87.41	-1.34
170 (STM)	87.06	91.06	89.91	87.59	-2.32
2121 (STM)	80.23	87.49	82.82	82.82	0.00
2142 (STM)	80.10	87.37	82.82	82.83	0.01
2143 (STM)	79.93	86.32	82.82	82.82	0.00
2144 (STM)	79.85	86.00	82.82	82.82	0.00
98 (STM)	81.17	87.50	83.01	82.92	-0.09
StartNullStruct3	84.09	87.80	84.59	84.59	0.00
STM-251 (STM)	85.31	89.64	87.19	86.26	-0.93

The Commons - Medium Density (Phase 4) Roadway Cross-Sections



6.0m Roadway	
0	0.3
5	0.16
6	0.15
6.01	0
9	0.1
11.99	0
12	0.15
13	0.16
18	0.3



The Commons - Medium Density (Phase 4)
Design Storm Time Series Data
3-hour Chicago Design Storms



C25mm-3.stm		C2-3.stm		C5-3.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0	0:00	0	0:00	0
0:10	2.21	0:10	2.81	0:10	3.68
0:20	2.75	0:20	3.5	0:20	4.58
0:30	3.68	0:30	4.69	0:30	6.15
0:40	5.73	0:40	7.3	0:40	9.61
0:50	14.29	0:50	18.21	0:50	24.17
1:00	60.28	1:00	76.81	1:00	104.19
1:10	18.9	1:10	24.08	1:10	32.04
1:20	9.7	1:20	12.36	1:20	16.34
1:30	6.53	1:30	8.32	1:30	10.96
1:40	4.94	1:40	6.3	1:40	8.29
1:50	3.99	1:50	5.09	1:50	6.69
2:00	3.37	2:00	4.29	2:00	5.63
2:10	2.92	2:10	3.72	2:10	4.87
2:20	2.58	2:20	3.29	2:20	4.3
2:30	2.32	2:30	2.95	2:30	3.86
2:40	2.1	2:40	2.68	2:40	3.51
2:50	1.93	2:50	2.46	2:50	3.22
3:00	1.79	3:00	2.28	3:00	2.98

The Commons - Medium Density (Phase 4)
Design Storm Time Series Data
3-hour Chicago Design Storms



C100-3.stm		C100-3+20%.stm	
Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr
0:00	0	0:00	0
0:10	6.05	0:10	6.14
0:20	7.54	0:20	9.05
0:30	10.16	0:30	12.19
0:40	15.97	0:40	19.16
0:50	40.65	0:50	48.78
1:00	178.56	1:00	214.27
1:10	54.05	1:10	64.86
1:20	27.32	1:20	32.78
1:30	18.24	1:30	21.89
1:40	13.74	1:40	16.49
1:50	11.06	1:50	13.27
2:00	9.29	2:00	11.15
2:10	8.02	2:10	9.62
2:20	7.08	2:20	8.5
2:30	6.35	2:30	7.62
2:40	5.76	2:40	6.91
2:50	5.28	2:50	6.34
3:00	4.88	3:00	5.86

The Commons - Medium Density (Phase 4)
Design Storm Time Series Data
SCS Design Storms



S2-12.stm		S5-12.stm		S100-12.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0.00	0:00	0	0:00	0
0:30	1.27	0:30	1.69	0:30	2.82
1:00	0.59	1:00	0.79	1:00	1.31
1:30	1.10	1:30	1.46	1:30	2.44
2:00	1.10	2:00	1.46	2:00	2.44
2:30	1.44	2:30	1.91	2:30	3.19
3:00	1.27	3:00	1.69	3:00	2.82
3:30	1.69	3:30	2.25	3:30	3.76
4:00	1.69	4:00	2.25	4:00	3.76
4:30	2.29	4:30	3.03	4:30	5.07
5:00	2.88	5:00	3.82	5:00	6.39
5:30	4.57	5:30	6.07	5:30	10.14
6:00	36.24	6:00	48.08	6:00	80.38
6:30	9.23	6:30	12.25	6:30	20.47
7:00	4.06	7:00	5.39	7:00	9.01
7:30	2.71	7:30	3.59	7:30	6.01
8:00	2.37	8:00	3.15	8:00	5.26
8:30	1.86	8:30	2.47	8:30	4.13
9:00	1.95	9:00	2.58	9:00	4.32
9:30	1.27	9:30	1.69	9:30	2.82
10:00	1.02	10:00	1.35	10:00	2.25
10:30	1.44	10:30	1.91	10:30	3.19
11:00	0.93	11:00	1.24	11:00	2.07
11:30	0.85	11:30	1.12	11:30	1.88
12:00	0.85	12:00	1.12	12:00	1.88

The Commons - Medium Density (Phase 4)
Design Storm Time Series Data
SCS Design Storms



S2-24.stm		S5-24.stm		S100-24.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0.00	0:00	0	0:00	0
1:00	0.72	1:00	0.44	1:00	0.6
2:00	0.34	2:00	0.44	2:00	0.75
3:00	0.63	3:00	0.81	3:00	1.39
4:00	0.63	4:00	0.81	4:00	1.39
5:00	0.81	5:00	1.06	5:00	1.81
6:00	0.72	6:00	0.94	6:00	1.6
7:00	0.96	7:00	1.25	7:00	2.13
8:00	0.96	8:00	1.25	8:00	2.13
9:00	1.30	9:00	1.68	9:00	2.88
10:00	1.63	10:00	2.12	10:00	3.63
11:00	2.59	11:00	3.37	11:00	5.76
12:00	20.55	12:00	26.71	12:00	45.69
13:00	5.23	13:00	6.8	13:00	11.64
14:00	2.30	14:00	2.99	14:00	5.12
15:00	1.54	15:00	2	15:00	3.42
16:00	1.34	16:00	1.75	16:00	2.99
17:00	1.06	17:00	1.37	17:00	2.35
18:00	1.11	18:00	1.44	18:00	2.46
19:00	0.72	19:00	0.94	19:00	1.6
20:00	0.58	20:00	0.75	20:00	1.28
21:00	0.81	21:00	1.06	21:00	1.81
22:00	0.53	22:00	0.68	22:00	1.17
23:00	0.48	23:00	0.63	23:00	1.07
0:00	0.48	0:00	0.63	0:00	1.07

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

 Base_Model_v1.5 from the Model Build (GIS) folder.
 20220413 - Additional CB added, minor changes to drainage areas
 20230406 - Revised inverts as as-built profiles + CB56 added. Memo provided
 (Vahid Mehdipour).

WARNING 03: negative offset ignored for Link 14
 WARNING 03: negative offset ignored for Link 39
 WARNING 03: negative offset ignored for Link 48
 WARNING 03: negative offset ignored for Link C2
 WARNING 03: negative offset ignored for Link OR-52
 WARNING 10: crest elevation raised to downstream invert for regulator Link
 PH4_ICD21
 WARNING 10: crest elevation raised to downstream invert for regulator Link
 PH4_ICD22
 WARNING 03: negative offset ignored for Link PH4_ICD90
 WARNING 03: negative offset ignored for Link PH4_ICD91
 WARNING 02: maximum depth increased for Node 29 (RYCB)
 WARNING 02: maximum depth increased for Node 38 (RYCB)
 WARNING 02: maximum depth increased for Node ELB_20 (RYCB)
 WARNING 02: maximum depth increased for Node ELB_6 (RYCB)
 WARNING 02: maximum depth increased for Node Maj-12
 WARNING 02: maximum depth increased for Node Maj-14
 WARNING 02: maximum depth increased for Node Maj-23
 WARNING 02: maximum depth increased for Node Maj-30
 WARNING 02: maximum depth increased for Node Maj-33
 WARNING 02: maximum depth increased for Node Maj-34
 WARNING 02: maximum depth increased for Node Maj-35
 WARNING 02: maximum depth increased for Node Maj-39
 WARNING 02: maximum depth increased for Node Maj-52
 WARNING 02: maximum depth increased for Node PH4_CB52-53
 WARNING 02: maximum depth increased for Node PH4_CB60-61
 WARNING 02: maximum depth increased for Node PH4_CB64-65
 WARNING 02: maximum depth increased for Node PH4_CB70-71
 WARNING 02: maximum depth increased for Node PH4_CB74-75
 WARNING 02: maximum depth increased for Node PH4_RYCB151
 WARNING 02: maximum depth increased for Node PH4_RYCB155
 WARNING 02: maximum depth increased for Node PH4_RYCB21
 WARNING 02: maximum depth increased for Node PH4_RYCB23
 WARNING 02: maximum depth increased for Node RYCB_1 (RYCB)
 WARNING 02: maximum depth increased for Node Structure_ (18) (RYCB)
 WARNING 02: maximum depth increased for Node TEE_14 (RYCB)

 Element Count

 Number of rain gages 1
 Number of subcatchments ... 120
 Number of nodes 371
 Number of links 503
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	100yrChicago3hr	INTENSITY	10 min.

 Subcatchment Summary

Name Outlet	Area	Width	%Imperv	%Slope	Rain Gage
A10	0.20	105.00	42.90	0.5000	Raingage
RYCB_14_ (RYCB)					
A11	0.29	105.00	42.90	0.5000	Raingage
RYCB_12_ (RYCB)					
A12i	0.19	76.00	71.40	0.5000	Raingage
Slope1					
A12ii	0.09	76.00	71.40	0.5000	Raingage
Slope1					
A13	0.23	76.00	42.90	0.5000	Raingage
RYCB_11_ (RYCB)					
A14	0.32	75.00	42.90	0.5000	Raingage
TEE_23_ (RYCB)					
A15i	0.25	103.00	71.40	0.5000	Raingage
Maj-20					
A15ii	0.27	103.00	71.40	0.5000	Raingage
Maj-20					
A16i	0.06	24.00	71.40	0.5000	Raingage
Maj-19_2					
A16ii	0.07	25.00	71.40	0.5000	Raingage
Maj-19_2					
A17	0.09	68.00	42.90	0.5000	Raingage
TEE_39_ (RYCB)					
A17ii	0.09	77.00	71.40	0.5000	Raingage
Maj-24					
A18i	0.19	77.00	71.40	0.5000	Raingage
Maj-24					
A19	0.19	128.00	42.90	0.5000	Raingage
RYCB_9_ (RYCB)					
A1i	0.16	148.99	71.40	0.5000	Raingage
Maj-03					
A1ii	0.20	148.98	71.40	0.5000	Raingage
Maj-03					
A20i	0.20	99.80	71.40	0.9000	Raingage
Maj-26					
A20ii	0.21	99.80	71.40	0.9000	Raingage
Maj-26					
A21	0.33	112.00	50.00	0.5000	Raingage
RYCB_7_ (RYCB)					
A22	0.03	47.70	42.90	0.5000	Raingage
TEE_14_ (RYCB)					
A23	0.17	72.00	50.00	0.5000	Raingage
TEE_14_ (RYCB)					
A24i	0.11	90.00	71.40	0.9000	Raingage
Maj-28					

A24ii	0.24	130.00	71.40	0.9000	Raingage
Maj-28					
A25	0.29	102.00	50.00	0.5000	Raingage
RYCB_8_(RYCB)					
A26i	0.06	73.00	71.40	0.5000	Raingage
Maj-33					
A26ii	0.17	73.00	71.40	0.5000	Raingage
Maj-33					
A27i	0.09	47.78	71.40	0.5000	Raingage
Maj-32					
A27ii	0.18	84.80	71.40	0.5000	Raingage
Maj-32					
A28i	0.14	63.18	71.40	1.0000	Raingage
Maj-30					
A28ii	0.14	65.08	71.40	1.0000	Raingage
Maj-30					
A29	0.12	78.57	50.00	0.5000	Raingage
TEE_11_(RYCB)					
A2i	0.12	119.74	71.40	0.5000	Raingage
Maj-06_2					
A2ii	0.12	119.74	71.40	0.5000	Raingage
Maj-06_2					
A3	0.15	110.55	42.90	0.5000	Raingage
ELB_23_(RYCB)					
A30	0.01	17.98	42.90	0.5000	Raingage
RYCB_6_(RYCB)					
A31	0.19	128.81	50.00	0.5000	Raingage
TEE_5_(RYCB)					
A32i	0.15	73.09	71.40	1.0000	Raingage
Maj-35					
A32ii	0.08	72.69	71.40	1.0000	Raingage
Maj-35					
A33i	0.11	163.52	71.40	1.0000	Raingage
Maj-37					
A33ii	0.16	75.74	71.40	1.0000	Raingage
Maj-37					
A34i	0.21	124.53	71.40	0.5000	Raingage
Maj-41					
A34ii	0.28	133.75	71.40	0.5000	Raingage
Maj-41					
A35i	0.23	116.15	71.40	0.5000	Raingage
Maj-42					
A35ii	0.20	117.20	71.40	0.5000	Raingage
Maj-42					
A36	0.29	98.91	50.00	0.5000	Raingage
TEE_32_(RYCB)					
A37	0.03	47.34	42.90	0.5000	Raingage
RYCB_18_(RYCB)					
A38	0.24	95.00	50.00	0.5000	Raingage
TEE_34_(RYCB)					
A39i	0.21	113.59	71.40	1.0000	Raingage
Maj-44					
A39ii	0.07	74.54	71.40	1.0000	Raingage
Maj-44					
A4	0.09	60.00	71.40	0.5000	Raingage
Maj-09					
A40	0.22	80.06	50.00	0.5000	Raingage
RYCB_5_(RYCB)					
A41	0.07	54.99	50.00	0.5000	Raingage
TEE_7_(RYCB)					

A42i	0.15	72.33	71.40	0.5000	Raingage
Maj-46					
A42ii	0.08	72.44	71.40	0.5000	Raingage
Maj-46					
A42iii	0.03	30.00	71.40	0.5000	Raingage
Maj-48_3					
A43	0.24	80.93	50.00	0.5000	Raingage
RYCB_2_(RYCB)					
A44	0.20	72.05	50.00	0.5000	Raingage
RYCB_3_(RYCB)					
A45i	0.17	77.61	71.40	0.5000	Raingage
Maj-50					
A45ii	0.07	77.67	71.40	0.5000	Raingage
Maj-50					
A46i	0.16	73.07	71.40	0.5000	Raingage
Maj-52					
A46ii	0.14	87.03	71.40	0.5000	Raingage
Maj-52					
A47	0.14	93.00	50.00	0.5000	Raingage
RYCB_4_(RYCB)					
A48	0.20	57.13	71.40	0.5000	Raingage
Maj-54					
A49	0.07	57.99	50.00	0.5000	Raingage
RYCB_1_(RYCB)					
A50	0.07	32.22	71.40	0.5000	Raingage
Maj-55					
A51	0.19	72.72	71.40	0.5000	Raingage
Maj-58					
A52	0.02	23.67	42.90	1.2000	Raingage
Maj-58					
A53	0.18	121.36	50.00	0.5000	Raingage
ELB_25_(RYCB)					
A54	0.17	80.07	50.00	0.5000	Raingage
TEE_43_(RYCB)					
A5i	0.10	65.00	71.40	0.5000	Raingage
Maj-10					
A5ii	0.26	121.97	71.40	0.5000	Raingage
Maj-10					
A6	0.13	112.31	42.90	0.5000	Raingage
RYCB_13_(RYCB)					
A7i	0.23	120.00	71.40	0.7000	Raingage
Maj-16					
A7ii	0.28	130.00	71.40	0.7000	Raingage
Maj-16					
A8i	0.22	105.00	71.40	0.5000	Raingage
Maj-12					
A8ii	0.19	87.00	71.40	0.5000	Raingage
Maj-12					
A9i	0.19	85.00	71.40	0.7000	Raingage
Maj-14					
A9ii	0.07	72.00	71.40	0.7000	Raingage
Maj-14					
B2	3.43	226.89	100.00	1.0000	Raingage
B2_Stor					
B4i	0.95	148.99	28.60	0.5000	Raingage
58_(CB)					
B4ii	0.05	77.57	28.60	0.5000	Raingage
Maj-50					
B4iii	0.01	14.24	28.60	0.5000	Raingage
Maj-51					

C1	0.11	54.68	71.40	0.5000	Raingage
Maj-01					
C2	0.09	60.00	71.40	0.5000	Raingage
Maj-21					
PH4_A01	0.11	130.43	16.00	3.0000	Raingage
Maj-07					
PH4_A02	0.00	15.34	3.00	1.5000	Raingage
PH4_RYCB20					
PH4_A03	0.01	7.76	84.00	1.5000	Raingage
PH4_CB82-83					
PH4_A04	0.08	49.00	87.00	4.4000	Raingage
PH4_CB60-61					
PH4_A05	0.02	25.05	3.00	1.5000	Raingage
PH4_RYCB21					
PH4_A06	0.07	48.66	23.00	1.5000	Raingage
PH4_RYCB22					
PH4_A07	0.12	65.62	86.00	3.8500	Raingage
PH4_CB58-59					
PH4_A08	0.02	10.47	76.00	2.2000	Raingage
PH4_CB84-85					
PH4_A09	0.02	10.00	69.00	2.0000	Raingage
PH4_CB86-87					
PH4_A10	0.12	66.16	86.00	3.5000	Raingage
PH4_CB64-65					
PH4_A11	0.04	42.68	3.00	1.5000	Raingage
PH4_RYCB23					
PH4_A12	0.13	67.05	80.00	3.5000	Raingage
PH4_CB62-63					
PH4_A13	0.03	14.45	77.00	2.5000	Raingage
PH4_CB88-89					
PH4_A14	0.03	15.02	67.00	5.6000	Raingage
PH4_CB90-91					
PH4_A15	0.10	56.59	83.00	5.5000	Raingage
PH4_CB68-69					
PH4_A16	0.05	29.48	84.00	4.2500	Raingage
PH4_CB66-67					
PH4_A17	0.03	47.99	3.00	1.5000	Raingage
PH4_RYCB24					
PH4_A18	0.02	13.64	53.00	4.0000	Raingage
PH4_CB92-93					
PH4_B01	0.02	23.79	0.00	1.5000	Raingage
PH4_RYCB158					
PH4_B02	0.07	47.54	87.00	4.5000	Raingage
PH4_CB56-57					
PH4_B03	0.03	27.58	3.00	1.5000	Raingage
PH4_RYCB154					
PH4_B04	0.06	38.17	90.00	3.9000	Raingage
PH4_CB54-55					
PH4_B05	0.02	25.51	3.00	1.5000	Raingage
PH4_RYCB153					
PH4_B06	0.09	58.85	79.00	3.0000	Raingage
PH4_CB70-71					
PH4_B07	0.10	59.42	83.00	4.2000	Raingage
PH4_CB72-73					
PH4_B08	0.01	71.86	3.00	1.5000	Raingage
PH4_RYCB155					
PH4_B09	0.03	40.85	91.00	0.5000	Raingage
PH4_CB52-53					
PH4_B10	0.03	33.42	3.00	1.5000	Raingage
PH4_RYCB150					

PH4_B11	0.20	131.54	80.00	4.0000	Raingage
PH4_CB74-75					
PH4_B12	0.04	29.35	91.00	1.6000	Raingage
PH4_CB50-51					
PH4_B13	0.02	24.85	3.00	1.5000	Raingage
PH4_RYCB156					
PH4_B14	0.07	45.22	86.00	4.1000	Raingage
PH4_CB80-81					
PH4_B15	0.03	49.94	3.00	1.5000	Raingage
PH4_RYCB151					
PH4_B16	0.04	55.81	84.00	1.5000	Raingage
PH4_CB78-79					
PH4_B17	0.14	44.24	3.00	1.4000	Raingage
Maj-07					
PH4_B18	0.00	13.81	3.00	0.5000	Raingage
Maj-06					

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
02_(CB)	JUNCTION	85.60	2.60	0.0	
03_(CB)	JUNCTION	85.60	2.60	0.0	
04_(CB)	JUNCTION	85.53	2.60	0.0	
05_(CB)	JUNCTION	85.53	2.60	0.0	
06_(CB)	JUNCTION	85.39	2.60	0.0	
08_(CB)	JUNCTION	85.44	2.60	0.0	
09_(CB)	JUNCTION	85.42	2.60	0.0	
1	JUNCTION	91.15	0.35	0.0	
1_(RYCB)	JUNCTION	85.42	2.99	1.0	
10	JUNCTION	91.07	0.35	0.0	
10_(CB)	JUNCTION	86.17	2.00	0.0	
100_(STM)	JUNCTION	81.27	6.31	0.0	
102_(STM)	JUNCTION	81.34	6.23	0.0	
104_(STM)	JUNCTION	81.38	6.23	0.0	
106_(STM)	JUNCTION	83.54	4.12	0.0	
108_(STM)	JUNCTION	83.62	3.89	0.0	
11	JUNCTION	90.95	0.35	0.0	
11_(CB)	JUNCTION	86.02	2.13	0.0	
110_(STM)	JUNCTION	83.94	3.81	0.0	
112_(STM)	JUNCTION	81.90	6.01	0.0	
114_(STM)	JUNCTION	83.37	4.63	0.0	
116_(STM)	JUNCTION	83.50	4.67	0.0	
118_(STM)	JUNCTION	83.88	4.48	0.0	
12	JUNCTION	90.73	0.35	0.0	
12_(CB)	JUNCTION	85.64	2.60	0.0	
120_(STM)	JUNCTION	82.66	5.41	0.0	
122_(STM)	JUNCTION	82.74	5.50	0.0	
124_(STM)	JUNCTION	82.83	5.36	0.0	
126_(STM)	JUNCTION	82.97	5.49	0.0	
128_(STM)	JUNCTION	83.17	5.46	0.0	
13	JUNCTION	90.78	0.35	0.0	
13_(CB)	JUNCTION	85.79	2.44	0.0	
130_(STM)	JUNCTION	84.27	4.78	0.0	
132_(STM)	JUNCTION	84.48	4.70	0.0	

134_(STM)	JUNCTION	84.80	4.52	1.0	37_(CB)	JUNCTION	87.79	2.60	0.0
136_(STM)	JUNCTION	83.34	5.31	0.0	38_(RYCB)	JUNCTION	87.38	3.08	1.0
138_(STM)	JUNCTION	83.42	5.35	0.0	39_(RYCB)	JUNCTION	88.67	2.28	1.0
14	JUNCTION	90.51	0.61	0.0	4	JUNCTION	90.53	0.30	0.0
14_(CB)	JUNCTION	86.01	2.60	0.0	40_(CB)	JUNCTION	88.23	2.50	0.0
140_(STM)	JUNCTION	83.71	5.54	0.0	41_(CB)	JUNCTION	88.13	2.60	0.0
142_(STM)	JUNCTION	84.91	4.25	0.0	42_(CB)	JUNCTION	88.30	2.60	0.0
144_(STM)	JUNCTION	84.13	5.32	0.0	43_(CB)	JUNCTION	88.29	2.60	0.0
146_(STM)	JUNCTION	85.00	4.12	0.0	44_(CB)	JUNCTION	86.92	2.60	0.0
148_(STM)	JUNCTION	85.14	4.07	1.0	45_(CB)	JUNCTION	86.92	2.60	0.0
15	JUNCTION	90.55	0.30	0.0	46_(CB)	JUNCTION	86.88	2.60	0.0
15_(CB)	JUNCTION	86.02	2.60	0.0	47_(CB)	JUNCTION	87.03	2.45	0.0
15_RYCB	JUNCTION	86.59	2.18	1.0	48_(CB)	JUNCTION	86.37	2.60	0.0
150_(STM)	JUNCTION	84.38	5.42	0.0	49_(CB)	JUNCTION	86.52	2.45	0.0
152_(STM)	JUNCTION	85.26	4.74	0.0	5	JUNCTION	90.56	0.30	0.0
154_(STM)	JUNCTION	85.35	4.74	0.0	50_(CB)	JUNCTION	86.03	2.44	0.0
156_(STM)	JUNCTION	85.73	4.21	0.0	51_(CB)	JUNCTION	86.06	2.41	0.0
158_(STM)	JUNCTION	84.91	5.16	0.0	52_(CB)	JUNCTION	85.21	5.20	0.0
16	JUNCTION	90.58	0.30	0.0	53_(CB)	JUNCTION	87.66	2.60	0.0
16_(CB)	JUNCTION	86.17	2.60	0.0	54_(CB)	JUNCTION	87.71	2.55	0.0
160_(STM)	JUNCTION	84.99	5.17	0.0	55_(CB)	JUNCTION	85.27	2.60	0.0
162_(STM)	JUNCTION	85.35	4.96	0.0	56	JUNCTION	90.74	0.35	0.0
164_(STM)	JUNCTION	85.60	4.67	0.0	56_(CB)	JUNCTION	85.27	2.60	0.0
166_(STM)	JUNCTION	86.17	4.26	0.0	57_(CB)	JUNCTION	85.21	2.79	0.0
168_(STM)	JUNCTION	86.50	3.89	1.0	58_(CB)	JUNCTION	85.40	2.60	0.0
17	JUNCTION	90.58	0.30	0.0	59_(CB)	JUNCTION	85.85	2.40	0.0
17_(CB)	JUNCTION	86.18	2.60	0.0	6	JUNCTION	90.80	0.30	0.0
170_(STM)	JUNCTION	87.06	4.00	0.0	60	JUNCTION	90.61	0.35	0.0
18	JUNCTION	90.79	0.30	0.0	61	JUNCTION	90.75	0.35	0.0
18_(CB)	JUNCTION	86.97	1.91	0.0	62	JUNCTION	90.77	0.35	0.0
19	JUNCTION	90.34	0.30	0.0	63	JUNCTION	90.83	0.35	0.0
19_(CB)	JUNCTION	86.28	2.60	0.0	64	JUNCTION	90.91	0.35	0.0
2	JUNCTION	91.10	0.35	0.0	65	JUNCTION	90.86	0.35	0.0
20	JUNCTION	90.35	0.30	0.0	66	JUNCTION	90.55	0.30	0.0
20_(CB)	JUNCTION	86.62	2.60	0.0	67	JUNCTION	90.69	0.35	0.0
21	JUNCTION	90.00	0.30	0.0	7	JUNCTION	90.46	0.30	0.0
21_(CB)	JUNCTION	86.77	2.45	0.0	8	JUNCTION	89.84	0.30	0.0
2121_(STM)	JUNCTION	80.23	7.26	0.0	9	JUNCTION	91.15	0.35	0.0
2142_(STM)	JUNCTION	80.10	7.27	0.0	98_(STM)	JUNCTION	81.17	6.33	0.0
2143_(STM)	JUNCTION	79.93	6.39	0.0	ELB_1_(RYCB)	JUNCTION	86.51	1.14	1.0
2144_(STM)	JUNCTION	79.85	6.15	0.0	ELB_10_(RYCB)	JUNCTION	87.65	1.31	1.0
22_(RYCB)	JUNCTION	87.08	2.82	1.0	ELB_11_(RYCB)	JUNCTION	87.60	1.30	1.0
23_(CB)	JUNCTION	86.92	2.60	0.0	ELB_12_(RYCB)	JUNCTION	88.00	1.45	1.0
24_(CB)	JUNCTION	86.92	2.60	0.0	ELB_13_(RYCB)	JUNCTION	87.56	1.30	1.0
25_(CB)	JUNCTION	86.78	3.21	0.0	ELB_14_(RYCB)	JUNCTION	87.78	1.30	1.0
26_(CB)	JUNCTION	86.78	3.33	0.0	ELB_15_(RYCB)	JUNCTION	87.20	1.26	1.0
27_(CB)	JUNCTION	86.78	2.38	0.0	ELB_16_(RYCB)	JUNCTION	88.68	1.30	1.0
28_(CB)	JUNCTION	86.78	2.46	0.0	ELB_17_(RYCB)	JUNCTION	87.55	1.30	1.0
29_(RYCB)	JUNCTION	85.31	5.13	1.0	ELB_18_(RYCB)	JUNCTION	87.58	1.30	1.0
3	JUNCTION	91.06	0.35	0.0	ELB_19_(RYCB)	JUNCTION	86.97	1.33	1.0
30_(CB)	JUNCTION	86.93	2.74	0.0	ELB_2_(RYCB)	JUNCTION	86.27	1.41	1.0
31_(CB)	JUNCTION	86.90	2.77	0.0	ELB_20_(RYCB)	JUNCTION	86.38	1.91	1.0
32_(CB)	JUNCTION	88.28	1.92	0.0	ELB_21_(RYCB)	JUNCTION	88.06	1.54	1.0
33_(CB)	JUNCTION	87.47	2.60	0.0	ELB_22_(RYCB)	JUNCTION	88.54	1.30	1.0
34_(CB)	JUNCTION	87.51	2.60	0.0	ELB_23_(RYCB)	JUNCTION	88.99	1.31	1.0
35_(CB)	JUNCTION	87.51	2.60	0.0	ELB_24_(RYCB)	JUNCTION	86.55	1.00	1.0
36_(CB)	JUNCTION	87.79	2.60	0.0	ELB_25_(RYCB)	JUNCTION	86.43	1.00	1.0

ELB_3_(RYCB)	JUNCTION	86.48	1.32	1.0	Maj-44	JUNCTION	87.54	0.61	0.0
ELB_4_(RYCB)	JUNCTION	86.53	1.22	1.0	Maj-45	JUNCTION	87.81	0.69	0.0
ELB_5_(RYCB)	JUNCTION	86.53	1.17	1.0	Maj-46	JUNCTION	87.41	0.61	0.0
ELB_6_(RYCB)	JUNCTION	86.55	1.91	1.0	Maj-48_2	JUNCTION	87.74	0.64	0.0
ELB_7_(RYCB)	JUNCTION	86.80	1.31	1.0	Maj-48_3	JUNCTION	87.65	0.62	0.0
ELB_8_(RYCB)	JUNCTION	86.93	1.00	1.0	Maj-50	JUNCTION	87.42	0.61	0.0
ELB_9_(RYCB)	JUNCTION	87.05	1.30	1.0	Maj-51	JUNCTION	87.71	0.63	0.0
J1	JUNCTION	88.48	0.60	0.0	Maj-52	JUNCTION	87.47	0.60	0.0
Maj-01_2	JUNCTION	90.90	0.62	0.0	Maj-53	JUNCTION	87.59	0.61	0.0
Maj-02	JUNCTION	90.67	0.61	0.0	Maj-54	JUNCTION	87.25	0.61	0.0
Maj-02_2	JUNCTION	90.42	0.62	0.0	Maj-55	JUNCTION	87.49	0.63	0.0
Maj-03	JUNCTION	90.27	0.62	0.0	Maj-56	JUNCTION	88.80	0.60	0.0
Maj-04	JUNCTION	90.61	0.61	0.0	Maj-58	JUNCTION	87.16	0.61	0.0
Maj-04_2	JUNCTION	90.51	0.62	0.0	Maj-59	JUNCTION	87.53	0.72	0.0
Maj-05	JUNCTION	90.40	0.61	0.0	Maj-60	JUNCTION	88.62	0.68	0.0
Maj-05_2	JUNCTION	90.37	0.62	0.0	Maj-61	JUNCTION	88.70	0.60	0.0
Maj-06	JUNCTION	90.23	0.61	0.0	Maj-62	JUNCTION	89.85	0.60	0.0
Maj-06_2	JUNCTION	90.09	0.63	0.0	Maj-63	JUNCTION	87.72	1.09	0.0
Maj-07	JUNCTION	90.28	0.61	0.0	Maj-64	JUNCTION	88.80	0.60	0.0
Maj-08	JUNCTION	90.15	0.60	0.0	Maj-65	JUNCTION	87.80	1.18	0.0
Maj-09	JUNCTION	89.85	0.60	0.0	Maj-66	JUNCTION	87.65	0.60	0.0
Maj-10	JUNCTION	89.78	0.60	0.0	Maj-67	JUNCTION	87.95	0.60	0.0
Maj-11	JUNCTION	89.82	0.90	0.0	Maj-Park	JUNCTION	86.50	0.60	0.0
Maj-12	JUNCTION	89.66	0.60	0.0	PH4_CB50-51	JUNCTION	88.34	2.43	0.0
Maj-13	JUNCTION	89.97	0.64	0.0	PH4_CB52-53	JUNCTION	88.41	2.40	0.0
Maj-14	JUNCTION	89.48	0.60	0.0	PH4_CB54-55	JUNCTION	88.43	2.42	0.0
Maj-15	JUNCTION	89.67	0.70	0.0	PH4_CB56-57	JUNCTION	88.51	2.43	0.0
Maj-15_2	JUNCTION	89.36	0.65	0.0	PH4_CB58-59	JUNCTION	89.06	2.11	0.0
Maj-16	JUNCTION	89.42	0.60	0.0	PH4_CB60-61	JUNCTION	89.09	2.07	0.0
Maj-17	JUNCTION	90.06	0.62	0.0	PH4_CB62-63	JUNCTION	88.95	2.14	0.0
Maj-18_2	JUNCTION	89.51	0.64	0.0	PH4_CB64-65	JUNCTION	89.05	2.14	0.0
Maj-19	JUNCTION	89.39	0.60	0.0	PH4_CB66-67	JUNCTION	88.64	2.11	0.0
Maj-19_2	JUNCTION	89.53	0.69	0.0	PH4_CB68-69	JUNCTION	88.76	2.11	0.0
Maj-20	JUNCTION	89.17	0.60	0.0	PH4_CB70-71	JUNCTION	88.57	2.32	0.0
Maj-21	JUNCTION	88.59	0.61	0.0	PH4_CB72-73	JUNCTION	88.45	2.38	0.0
Maj-23	JUNCTION	89.24	0.60	0.0	PH4_CB74-75	JUNCTION	88.35	2.36	0.0
Maj-24	JUNCTION	88.90	0.62	0.0	PH4_CB78-79	JUNCTION	90.43	0.35	0.0
Maj-25	JUNCTION	89.15	0.62	0.0	PH4_CB80-81	JUNCTION	88.35	2.41	0.0
Maj-26	JUNCTION	88.61	0.61	0.0	PH4_CB82-83	JUNCTION	90.88	0.35	0.0
Maj-27	JUNCTION	88.85	0.63	0.0	PH4_CB84-85	JUNCTION	90.86	0.35	0.0
Maj-28	JUNCTION	88.25	0.69	0.0	PH4_CB86-87	JUNCTION	90.96	0.35	0.0
Maj-29	JUNCTION	88.59	0.61	0.0	PH4_CB88-89	JUNCTION	90.69	0.35	0.0
Maj-30	JUNCTION	88.40	0.60	0.0	PH4_CB90-91	JUNCTION	90.52	0.35	0.0
Maj-31	JUNCTION	89.03	0.60	0.0	PH4_CB92-93	JUNCTION	90.41	0.35	0.0
Maj-32	JUNCTION	88.87	0.62	0.0	PH4_MH100	JUNCTION	88.48	2.38	0.0
Maj-33	JUNCTION	88.92	0.60	0.0	PH4_MH100_dummy	JUNCTION	88.48	2.38	0.0
Maj-34	JUNCTION	89.07	0.60	0.0	PH4_MH102	JUNCTION	88.69	2.33	0.0
Maj-34_2	JUNCTION	89.16	0.64	0.0	PH4_MH104	JUNCTION	88.78	2.34	0.0
Maj-35	JUNCTION	88.15	0.60	0.0	PH4_MH106	JUNCTION	88.90	2.17	0.0
Maj-36	JUNCTION	88.41	0.67	0.0	PH4_MH108	JUNCTION	89.00	1.99	0.0
Maj-37	JUNCTION	87.99	0.62	0.0	PH4_MH110	JUNCTION	89.19	1.60	0.0
Maj-38	JUNCTION	88.19	0.62	0.0	PH4_MH202	JUNCTION	88.25	2.43	0.0
Maj-39	JUNCTION	88.07	0.60	0.0	PH4_MH202_dummy	JUNCTION	88.25	2.43	0.0
Maj-40	JUNCTION	87.97	0.63	0.0	PH4_MH204	JUNCTION	88.46	2.39	0.0
Maj-41	JUNCTION	87.62	0.62	0.0	PH4_MH206	JUNCTION	88.57	2.44	0.0
Maj-42	JUNCTION	87.88	0.62	0.0	PH4_MH208	JUNCTION	88.69	2.39	0.0
Maj-43	JUNCTION	88.07	0.64	0.0	PH4_MH210	JUNCTION	88.79	2.20	0.0

PH4_MH212	JUNCTION	88.98	1.98	0.0
PH4_MH302	JUNCTION	86.34	4.12	0.0
PH4_MH302_dummy	JUNCTION	86.34	4.12	0.0
PH4_MH304	JUNCTION	86.46	4.14	0.0
PH4_MH306	JUNCTION	86.95	3.59	0.0
PH4_MH308	JUNCTION	87.15	3.40	0.0
PH4_MH310	JUNCTION	87.26	3.34	0.0
PH4_MH312	JUNCTION	87.44	2.94	0.0
PH4_MH402	JUNCTION	87.13	3.54	0.0
PH4_MH404	JUNCTION	87.24	3.30	0.0
PH4_MH406	JUNCTION	87.34	3.47	0.0
PH4_MH408	JUNCTION	87.50	3.37	0.0
PH4_MH410	JUNCTION	87.66	2.92	0.0
PH4_MH412	JUNCTION	87.78	2.84	0.0
PH4_MH414	JUNCTION	88.00	2.69	0.0
PH4_MH502	JUNCTION	86.87	3.33	0.0
PH4_MH504	JUNCTION	86.88	3.41	0.0
PH4_MH506	JUNCTION	86.93	3.71	0.0
PH4_MH508	JUNCTION	86.98	3.81	0.0
PH4_MH510	JUNCTION	87.71	2.91	0.0
PH4_MH512	JUNCTION	87.52	3.04	0.0
PH4_MH602	JUNCTION	87.60	3.09	0.0
PH4_MH604	JUNCTION	87.81	2.84	0.0
PH4_RYCB150	JUNCTION	88.29	2.30	0.0
PH4_RYCB151	JUNCTION	88.20	2.30	0.0
PH4_RYCB153	JUNCTION	88.35	2.30	0.0
PH4_RYCB154	JUNCTION	87.95	2.30	0.0
PH4_RYCB155	JUNCTION	88.44	1.80	0.0
PH4_RYCB156	JUNCTION	87.93	2.30	0.0
PH4_RYCB158	JUNCTION	88.25	2.30	0.0
PH4_RYCB20	JUNCTION	89.20	1.45	0.0
PH4_RYCB21	JUNCTION	88.72	1.50	0.0
PH4_RYCB22	JUNCTION	88.59	1.80	0.0
PH4_RYCB23	JUNCTION	88.79	1.80	0.0
PH4_RYCB24	JUNCTION	87.65	1.50	0.0
RYCB_1_(RYCB)	JUNCTION	86.00	2.10	1.0
RYCB_10_(RYCB)	JUNCTION	87.02	2.38	1.0
RYCB_11_(RYCB)	JUNCTION	87.35	2.55	1.0
RYCB_12_(RYCB)	JUNCTION	88.00	2.28	1.0
RYCB_13_(RYCB)	JUNCTION	87.54	2.11	1.0
RYCB_14_(RYCB)	JUNCTION	88.14	2.31	1.0
RYCB_15_(RYCB)	JUNCTION	88.70	2.15	1.0
RYCB_18_(RYCB)	JUNCTION	85.76	2.34	1.0
RYCB_2_(RYCB)	JUNCTION	86.01	3.14	1.0
RYCB_3_(RYCB)	JUNCTION	86.18	2.27	1.0
RYCB_4_(RYCB)	JUNCTION	86.12	3.11	1.0
RYCB_5_(RYCB)	JUNCTION	86.04	2.29	1.0
RYCB_6_(RYCB)	JUNCTION	85.72	3.21	1.0
RYCB_7_(RYCB)	JUNCTION	86.49	2.90	1.0
RYCB_8_(RYCB)	JUNCTION	86.97	2.23	1.0
RYCB_9_(RYCB)	JUNCTION	87.54	1.54	1.0
Slope1	JUNCTION	89.07	1.10	0.0
StartNullStruct2	JUNCTION	86.62	1.40	1.0
StartNullStruct3	JUNCTION	84.09	3.71	0.0
STM-251_(STM)	JUNCTION	85.31	4.33	0.0
Structure_-_18_(RYCB)	JUNCTION	85.58	3.21	1.0
TEE_1_(RYCB)	JUNCTION	86.21	1.44	1.0

TEE_10_(RYCB)	JUNCTION	86.80	1.01	1.0
TEE_11_(RYCB)	JUNCTION	86.59	1.46	1.0
TEE_12_(RYCB)	JUNCTION	86.85	1.33	1.0
TEE_13_(RYCB)	JUNCTION	87.00	1.29	1.0
TEE_14_(RYCB)	JUNCTION	86.86	2.64	1.0
TEE_15_(RYCB)	JUNCTION	87.38	1.98	1.0
TEE_16_(RYCB)	JUNCTION	87.27	1.61	1.0
TEE_17_(RYCB)	JUNCTION	87.39	1.45	1.0
TEE_18_(RYCB)	JUNCTION	87.54	1.41	1.0
TEE_19_(RYCB)	JUNCTION	87.44	1.34	1.0
TEE_2_(RYCB)	JUNCTION	86.35	1.36	1.0
TEE_20_(RYCB)	JUNCTION	87.29	1.33	1.0
TEE_21_(RYCB)	JUNCTION	87.17	1.44	1.0
TEE_22_(RYCB)	JUNCTION	87.78	1.42	1.0
TEE_23_(RYCB)	JUNCTION	87.40	1.38	1.0
TEE_24_(RYCB)	JUNCTION	87.69	1.32	1.0
TEE_25_(RYCB)	JUNCTION	87.53	1.55	1.0
TEE_26_(RYCB)	JUNCTION	88.39	1.32	1.0
TEE_27_(RYCB)	JUNCTION	88.23	1.40	1.0
TEE_28_(RYCB)	JUNCTION	87.47	1.32	1.0
TEE_29_(RYCB)	JUNCTION	86.87	1.44	1.0
TEE_3_(RYCB)	JUNCTION	86.25	1.37	1.0
TEE_30_(RYCB)	JUNCTION	86.75	1.48	1.0
TEE_31_(RYCB)	JUNCTION	86.62	1.53	1.0
TEE_32_(RYCB)	JUNCTION	86.78	1.45	1.0
TEE_33_(RYCB)	JUNCTION	86.13	2.09	1.0
TEE_34_(RYCB)	JUNCTION	85.98	2.08	1.0
TEE_35_(RYCB)	JUNCTION	86.04	2.10	1.0
TEE_36_(RYCB)	JUNCTION	88.30	1.52	1.0
TEE_37_(RYCB)	JUNCTION	88.65	1.30	1.0
TEE_38_(RYCB)	JUNCTION	88.52	1.30	1.0
TEE_39_(RYCB)	JUNCTION	88.28	1.38	1.0
TEE_4_(RYCB)	JUNCTION	86.02	1.86	1.0
TEE_40_(RYCB)	JUNCTION	88.83	1.49	1.0
TEE_41_(RYCB)	JUNCTION	88.64	1.67	1.0
TEE_42_(RYCB)	JUNCTION	86.35	1.40	1.0
TEE_43_(RYCB)	JUNCTION	86.11	1.64	1.0
TEE_44_(RYCB)	JUNCTION	86.04	1.71	1.0
TEE_5_(RYCB)	JUNCTION	86.09	1.93	1.0
TEE_6_(RYCB)	JUNCTION	86.35	1.52	1.0
TEE_7_(RYCB)	JUNCTION	86.46	1.43	1.0
TEE_8_(RYCB)	JUNCTION	86.34	1.52	1.0
TEE_9_(RYCB)	JUNCTION	86.22	1.66	1.0
Maj-01	OUTFALL	91.06	0.60	0.0
Maj-18	OUTFALL	89.55	0.60	0.0
Maj-22	OUTFALL	88.83	0.60	0.0
Maj-48	OUTFALL	87.75	0.60	0.0
Maj-49	OUTFALL	87.67	0.60	0.0
Maj-57	OUTFALL	89.06	0.60	0.0
OF1	OUTFALL	85.00	0.60	0.0
STM-111_(STM)	OUTFALL	80.14	1.80	0.0
B2_Stor	STORAGE	90.50	1.50	0.0

Link Summary

Name	Slope	Roughness	From Node	To Node	Type	Length	%
1			1	PH4_CB82-83	CONDUIT	8.7	
3.0946	0.0160		1	PH4_CB82-83	CONDUIT	8.7	
1_(STM)			156_(STM)	154_(STM)	CONDUIT	100.7	
0.3456	0.0130		156_(STM)	154_(STM)	CONDUIT	100.7	
10			10	PH4_CB64-65	CONDUIT	31.8	
0.7222	0.0160		10	PH4_CB64-65	CONDUIT	31.8	
10_(STM)			124_(STM)	122_(STM)	CONDUIT	16.9	
0.4734	0.0130		124_(STM)	122_(STM)	CONDUIT	16.9	
11			10	PH4_CB62-63	CONDUIT	36.7	
0.9003	0.0160		10	PH4_CB62-63	CONDUIT	36.7	
11_(STM)			122_(STM)	120_(STM)	CONDUIT	24.6	
0.2439	0.0130		122_(STM)	120_(STM)	CONDUIT	24.6	
12			11	PH4_CB62-63	CONDUIT	19.9	
1.0545	0.0160		11	PH4_CB62-63	CONDUIT	19.9	
12_(STM)			120_(STM)	112_(STM)	CONDUIT	91.6	
0.2293	0.0130		120_(STM)	112_(STM)	CONDUIT	91.6	
13			11	PH4_CB88-89	CONDUIT	8.3	
3.1186	0.0160		11	PH4_CB88-89	CONDUIT	8.3	
13_(STM)			112_(STM)	104_(STM)	CONDUIT	73.8	
0.2710	0.0130		112_(STM)	104_(STM)	CONDUIT	73.8	
14			13	PH4_CB90-91	CONDUIT	12.0	
2.1614	0.0160		13	PH4_CB90-91	CONDUIT	12.0	
14_(STM)			104_(STM)	102_(STM)	CONDUIT	41.9	
0.1672	0.0130		104_(STM)	102_(STM)	CONDUIT	41.9	
15			13	PH4_CB68-69	CONDUIT	24.6	
1.0590	0.0160		13	PH4_CB68-69	CONDUIT	24.6	
15_(10)_ (STM)			138_(STM)	136_(STM)	CONDUIT	14.8	
0.4730	0.0130		138_(STM)	136_(STM)	CONDUIT	14.8	
15_(11)_ (STM)			136_(STM)	128_(STM)	CONDUIT	62.5	
0.2128	0.0130		136_(STM)	128_(STM)	CONDUIT	62.5	
15_(12)_ (STM)			148_(STM)	146_(STM)	CONDUIT	78.5	
0.1273	0.0130		148_(STM)	146_(STM)	CONDUIT	78.5	
15_(13)_ (STM)			146_(STM)	144_(STM)	CONDUIT	78.7	
0.1653	0.0130		146_(STM)	144_(STM)	CONDUIT	78.7	
15_(14)_ (STM)			162_(STM)	160_(STM)	CONDUIT	106.3	
0.3284	0.0130		162_(STM)	160_(STM)	CONDUIT	106.3	
15_(15)_ (STM)			160_(STM)	158_(STM)	CONDUIT	14.3	
0.5036	0.0130		160_(STM)	158_(STM)	CONDUIT	14.3	
15_(16)_ (STM)			158_(STM)	150_(STM)	CONDUIT	108.0	
0.3499	0.0130		158_(STM)	150_(STM)	CONDUIT	108.0	
15_(19)_ (STM)			170_(STM)	168_(STM)	CONDUIT	93.9	
0.3504	0.0130		170_(STM)	168_(STM)	CONDUIT	93.9	
15_(20)_ (STM)			168_(STM)	166_(STM)	CONDUIT	101.1	
0.3253	0.0130		168_(STM)	166_(STM)	CONDUIT	101.1	
15_(21)_ (STM)			166_(STM)	164_(STM)	CONDUIT	29.2	
0.3830	0.0130		166_(STM)	164_(STM)	CONDUIT	29.2	
15_(22)_ (STM)			164_(STM)	162_(STM)	CONDUIT	60.1	
0.4074	0.0130		164_(STM)	162_(STM)	CONDUIT	60.1	
15_(3)_ (STM)			118_(STM)	116_(STM)	CONDUIT	99.6	
0.3081	0.0130		118_(STM)	116_(STM)	CONDUIT	99.6	
15_(4)_ (STM)			116_(STM)	114_(STM)	CONDUIT	11.9	
0.5026	0.0130		116_(STM)	114_(STM)	CONDUIT	11.9	
15_(5)_ (STM)			114_(STM)	112_(STM)	CONDUIT	64.6	
0.3713	0.0130		114_(STM)	112_(STM)	CONDUIT	64.6	
15_(9)_ (STM)			140_(STM)	138_(STM)	CONDUIT	113.1	
0.2564	0.0130		140_(STM)	138_(STM)	CONDUIT	113.1	

16			12	PH4_CB68-69	CONDUIT	20.2	
1.0375	0.0160		12	PH4_CB68-69	CONDUIT	20.2	
17			12	PH4_CB66-67	CONDUIT	16.0	
2.0623	0.0160		12	PH4_CB66-67	CONDUIT	16.0	
18			PH4_CB78-79	Maj-07	CONDUIT	31.2	
0.4961	0.0160		PH4_CB78-79	Maj-07	CONDUIT	31.2	
18_1			67	PH4_CB66-67	CONDUIT	12.6	
2.2951	0.0160		67	PH4_CB66-67	CONDUIT	12.6	
18_2			67	PH4_CB92-93	CONDUIT	12.1	
2.3206	0.0160		67	PH4_CB92-93	CONDUIT	12.1	
19			60	PH4_CB78-79	CONDUIT	26.5	
0.6786	0.0160		60	PH4_CB78-79	CONDUIT	26.5	
2			1	PH4_CB60-61	CONDUIT	21.1	
1.6123	0.0160		1	PH4_CB60-61	CONDUIT	21.1	
2_(STM)			154_(STM)	152_(STM)	CONDUIT	12.6	
0.5011	0.0130		154_(STM)	152_(STM)	CONDUIT	12.6	
20			60	PH4_CB80-81	CONDUIT	15.9	
1.2557	0.0160		60	PH4_CB80-81	CONDUIT	15.9	
21			56	PH4_CB80-81	CONDUIT	20.4	
1.6142	0.0160		56	PH4_CB80-81	CONDUIT	20.4	
22			56	PH4_CB50-51	CONDUIT	13.3	
2.3991	0.0160		56	PH4_CB50-51	CONDUIT	13.3	
23			61	PH4_CB50-51	CONDUIT	19.9	
1.6566	0.0160		61	PH4_CB50-51	CONDUIT	19.9	
24			61	PH4_CB52-53	CONDUIT	17.5	
1.6582	0.0160		61	PH4_CB52-53	CONDUIT	17.5	
25			62	PH4_CB52-53	CONDUIT	16.3	
1.8971	0.0160		62	PH4_CB52-53	CONDUIT	16.3	
26			62	PH4_CB54-55	CONDUIT	26.7	
1.0104	0.0160		62	PH4_CB54-55	CONDUIT	26.7	
27			65	PH4_CB54-55	CONDUIT	18.2	
1.9821	0.0160		65	PH4_CB54-55	CONDUIT	18.2	
28			65	PH4_CB56-57	CONDUIT	27.4	
1.2783	0.0160		65	PH4_CB56-57	CONDUIT	27.4	
29			64	PH4_CB56-57	CONDUIT	17.0	
2.3589	0.0160		64	PH4_CB56-57	CONDUIT	17.0	
3			2	PH4_CB60-61	CONDUIT	37.0	
0.7831	0.0160		2	PH4_CB60-61	CONDUIT	37.0	
3_(STM)			152_(STM)	150_(STM)	CONDUIT	59.4	
0.3505	0.0130		152_(STM)	150_(STM)	CONDUIT	59.4	
30			64	PH4_CB70-71	CONDUIT	28.5	
1.2984	0.0160		64	PH4_CB70-71	CONDUIT	28.5	
31			63	PH4_CB70-71	CONDUIT	25.3	
1.1465	0.0160		63	PH4_CB70-71	CONDUIT	25.3	
32			63	PH4_CB72-73	CONDUIT	11.6	
3.0291	0.0160		63	PH4_CB72-73	CONDUIT	11.6	
33			62	PH4_CB72-73	CONDUIT	21.5	
1.3491	0.0160		62	PH4_CB72-73	CONDUIT	21.5	
34			61	PH4_CB74-75	CONDUIT	35.7	
1.0930	0.0160		61	PH4_CB74-75	CONDUIT	35.7	
35			PH4_CB82-83	43_(CB)	CONDUIT	11.7	
5.0596	0.0160		PH4_CB82-83	43_(CB)	CONDUIT	11.7	
36			PH4_CB84-85	14	CONDUIT	12.5	
2.8202	0.0160		PH4_CB84-85	14	CONDUIT	12.5	
37			PH4_CB86-87	Maj-04	CONDUIT	13.4	
2.6203	0.0160		PH4_CB86-87	Maj-04	CONDUIT	13.4	
38			PH4_CB88-89	Maj-05_2	CONDUIT	12.5	
2.5748	0.0160		PH4_CB88-89	Maj-05_2	CONDUIT	12.5	
39			PH4_CB90-91	41_(CB)	CONDUIT	7.3	
5.3849	0.0160		PH4_CB90-91	41_(CB)	CONDUIT	7.3	

4		2	PH4_CB58-59	CONDUIT	32.3
0.8663	0.0160				
4 (STM)		150_ (STM)	144_ (STM)	CONDUIT	76.3
0.2477	0.0130				
40		PH4_CB92-93	Maj-08	CONDUIT	13.4
1.9434	0.0160				
41		4	PH4_RYCB21	CONDUIT	41.0
1.4866	0.0350				
42		5	PH4_RYCB21	CONDUIT	21.0
3.0552	0.0350				
43		5	PH4_RYCB22	CONDUIT	32.4
1.4511	0.0350				
44		6	PH4_RYCB22	CONDUIT	49.3
1.4398	0.0350				
45		6	PH4_RYCB23	CONDUIT	36.9
1.3805	0.0350				
46		7	PH4_RYCB23	CONDUIT	10.6
1.6070	0.0350				
47		7	PH4_RYCB24	CONDUIT	49.5
3.2549	0.0350				
48		8	PH4_RYCB24	CONDUIT	18.8
5.2874	0.0350				
49		66	PH4_RYCB151	CONDUIT	24.4
1.4370	0.0350				
5		3	PH4_CB58-59	CONDUIT	21.5
1.1141	0.0160				
5 (STM)		144_ (STM)	140_ (STM)	CONDUIT	77.3
0.2845	0.0130				
50		15	PH4_RYCB151	CONDUIT	23.7
1.4748	0.0350				
51		15	PH4_RYCB150	CONDUIT	17.4
1.4965	0.0350				
52		16	PH4_RYCB150	CONDUIT	20.0
1.4481	0.0350				
53		16	PH4_RYCB153	CONDUIT	15.4
1.4955	0.0350				
54		17	PH4_RYCB153	CONDUIT	15.7
1.4678	0.0350				
55		17	PH4_RYCB158	CONDUIT	22.2
1.4889	0.0350				
56		18	PH4_RYCB158	CONDUIT	33.3
1.6213	0.0350				
57		18	PH4_RYCB154	CONDUIT	45.2
1.8600	0.0350				
58		19	PH4_RYCB154	CONDUIT	26.3
1.4831	0.0350				
59		19	PH4_RYCB155	CONDUIT	26.7
1.5007	0.0350				
6		3	PH4_CB84-85	CONDUIT	7.9
2.5476	0.0160				
6 (STM)		142_ (STM)	132_ (STM)	CONDUIT	53.4
0.6550	0.0130				
60		20	PH4_RYCB155	CONDUIT	24.6
1.6652	0.0350				
61		20	PH4_RYCB156	CONDUIT	28.7
1.4632	0.0350				
62		21	PH4_RYCB156	CONDUIT	17.6
0.3978	0.0350				
63		60	PH4_CB74-75	CONDUIT	39.8
0.6276	0.0160				

7		4	PH4_RYCB20	CONDUIT	11.9
1.5151	0.0350				
7_ (1)_ (STM)		130_ (STM)	128_ (STM)	CONDUIT	88.3
0.2038	0.0130				
7_ (STM)		132_ (STM)	130_ (STM)	CONDUIT	37.4
0.2085	0.0130				
8		9	PH4_CB86-87	CONDUIT	6.6
2.8600	0.0160				
8 (STM)		128_ (STM)	126_ (STM)	CONDUIT	76.0
0.2501	0.0130				
9		9	PH4_CB64-65	CONDUIT	22.4
1.3824	0.0160				
9_ (STM)		126_ (STM)	124_ (STM)	CONDUIT	53.4
0.2622	0.0130				
C1		Maj-55	Maj-58	CONDUIT	15.7
2.1103	0.0130				
C1_1		Maj-01	Maj-01_2	CONDUIT	15.3
1.0526	0.0130				
C1_2		Maj-01_2	Maj-02	CONDUIT	24.8
0.9309	0.0130				
C10		Maj-17	Maj-10	CONDUIT	54.7
0.5249	0.0130				
C11		Maj-17	Maj-16	CONDUIT	86.7
0.7437	0.0130				
C12		Maj-11	Maj-09	CONDUIT	11.0
0.2457	0.0130				
C13		Maj-11	Maj-12	CONDUIT	60.3
0.2570	0.0130				
C14		Maj-13	Maj-12	CONDUIT	46.5
0.6647	0.0130				
C15		Maj-15	Maj-16	CONDUIT	38.8
0.6360	0.0130				
C16		Maj-13	Maj-14	CONDUIT	44.2
1.1056	0.0130				
C17		Maj-15	Maj-14	CONDUIT	29.3
0.6217	0.0130				
C18		29_ (RYCB)	Maj-18_2	CONDUIT	4.8
6.0833	0.0350				
C18_2		Maj-34_2	Maj-57	CONDUIT	7.8
1.3458	0.0130				
C18_3		Maj-15	Slope1	CONDUIT	36.4
1.6479	0.0130				
C18_4		Slope1	Maj-15_2	CONDUIT	37.3
0.7872	0.0130				
C18_5		Maj-19_2	Maj-15_2	CONDUIT	13.8
1.2091	0.0130				
C18_6		Maj-19_2	Maj-19	CONDUIT	27.3
0.5101	0.0130				
C18_7		Maj-34_2	Maj-34	CONDUIT	28.1
0.3306	0.0130				
C18_8		Maj-18	Maj-18_2	CONDUIT	5.0
0.7400	0.0130				
C18_9		Maj-18_2	Maj-15_2	CONDUIT	31.9
0.4696	0.0130				
C19		Maj-15_2	Maj-23	CONDUIT	11.3
1.0645	0.0130				
C2		Maj-59	Maj-58	CONDUIT	9.1
4.0326	0.0130				
C2_1		Maj-02	Maj-02_2	CONDUIT	25.4
0.9936	0.0130				

C2_2		Maj-02_2	Maj-03	CONDUIT	14.6	C4_3		RYCB_12_(RYCB)	Maj-62	CONDUIT	9.6	-
0.9862	0.0130					2.8017	0.0350					
C20		Maj-19	Maj-20	CONDUIT	24.9	C4_4		Maj-62	Maj-14	CONDUIT	10.9	
0.8796	0.0130					3.3554	0.0350					
C21		Maj-20	Maj-21	CONDUIT	64.3	C40		Maj-43	Maj-44	CONDUIT	41.6	
0.8922	0.0130					1.2848	0.0130					
C22		Maj-22	Maj-21	CONDUIT	13.5	C41		Maj-45	Maj-44	CONDUIT	34.0	
1.7746	0.0130					0.8025	0.0130					
C23		Maj-23	Maj-24	CONDUIT	31.3	C42		Maj-45	Maj-41	CONDUIT	33.0	
1.0747	0.0130					0.5816	0.0130					
C24		Maj-25	Maj-24	CONDUIT	35.9	C43		Maj-40	Maj-41	CONDUIT	55.3	
0.6904	0.0130					0.6334	0.0130					
C25		Maj-25	Maj-26	CONDUIT	59.9	C44		Maj-40	Maj-39	CONDUIT	14.4	-
0.9129	0.0130					0.7013	0.0130					
C26		Maj-27	Maj-26	CONDUIT	40.5	C45		Maj-38	Maj-39	CONDUIT	19.6	
0.6006	0.0130					0.6075	0.0130					
C27		22_(RYCB)	Maj-25	CONDUIT	17.8	C46		Maj-36	Maj-37	CONDUIT	37.6	
0.8302	0.0350					1.1043	0.0130					
C27_1		Maj-27	Maj-60	CONDUIT	20.3	C47		Maj-38	Maj-37	CONDUIT	23.7	
1.1335	0.0130					0.8322	0.0130					
C27_2		Maj-60	Maj-28	CONDUIT	39.6	C48		Maj-45	Maj-46	CONDUIT	39.5	
0.9257	0.0130					1.0246	0.0130					
C28		Maj-29	Maj-28	CONDUIT	31.3	C49		Maj-53	Maj-46	CONDUIT	33.6	
1.0998	0.0130					0.5385	0.0130					
C29		Maj-25	Maj-33	CONDUIT	47.2	C5		58_(CB)	Maj-Park	CONDUIT	30.0	
0.4959	0.0130					0.7000	0.0350					
C3_1		Maj-04	14	CONDUIT	20.9	C5_1		Maj-05	Maj-05_2	CONDUIT	4.7	
0.4832	0.0130					0.6217	0.0130					
C3_2		14	Maj-03	CONDUIT	49.1	C5_2		Maj-05_2	Maj-06	CONDUIT	24.6	
0.4822	0.0130					0.5766	0.0130					
C30		Maj-34	Maj-33	CONDUIT	24.6	C50		ELB_20_(RYCB)	ELB_6_(RYCB)	CONDUIT	31.3	-
0.6061	0.0130					0.5375	0.0130					
C31		Maj-Park	OF1	CONDUIT	47.7	C50_1		Maj-48	Maj-48_2	CONDUIT	5.0	
3.1494	0.0350					0.1200	0.0130					
C31_1		RYCB_8_(RYCB)	Maj-61	CONDUIT	1.8	C50_3		Maj-48_2	Maj-48_3	CONDUIT	19.5	
5.6975	0.0350					0.4974	0.0130					
C31_2		Maj-61	Maj-28	CONDUIT	17.4	C50_4		Maj-48_3	Maj-53	CONDUIT	11.9	
2.5837	0.0350					0.4944	0.0130					
C32		Maj-34	Maj-32	CONDUIT	25.9	C51		Maj-53	Maj-52	CONDUIT	34.0	
0.7460	0.0130					0.3413	0.0130					
C33		Maj-31	Maj-32	CONDUIT	23.0	C52		Maj-51	Maj-52	CONDUIT	53.4	
0.6567	0.0130					0.4456	0.0130					
C34		Maj-31	Maj-30	CONDUIT	47.5	C53		Maj-51	Maj-50	CONDUIT	33.6	
1.3196	0.0130					0.8492	0.0130					
C35		Maj-29	Maj-30	CONDUIT	27.9	C54		Maj-49	Maj-50	CONDUIT	43.8	
0.7064	0.0130					0.5667	0.0130					
C36		Maj-29	Maj-35	CONDUIT	35.2	C55		Maj-53	Maj-54	CONDUIT	22.8	
1.2672	0.0130					1.4769	0.0130					
C37		Maj-36	Maj-35	CONDUIT	37.3	C56		Maj-21	Maj-56	CONDUIT	22.0	-
0.6936	0.0130					0.9301	0.0350					
C38		Maj-36	Maj-42	CONDUIT	75.8	C57		Maj-55	Maj-54	CONDUIT	42.1	
0.6952	0.0130					0.5769	0.0130					
C39		Maj-43	Maj-42	CONDUIT	39.8	C58		TEE_14_(RYCB)	Maj-60	CONDUIT	43.0	
0.4850	0.0130					0.6565	0.0350					
C4		Maj-59	Maj-Park	CONDUIT	148.1	C58_1		RYCB_2_(RYCB)	Maj-63	CONDUIT	5.1	-
0.6954	0.0350					2.7515	0.0350					
C4_1		Maj-04	Maj-04_2	CONDUIT	15.1	C58_2		Maj-63	Maj-46	CONDUIT	12.1	
0.6839	0.0130					2.5842	0.0350					
C4_2		Maj-04_2	Maj-05	CONDUIT	20.6	C59_1		RYCB_4_(RYCB)	Maj-65	CONDUIT	3.5	-
0.5281	0.0130					0.2868	0.0350					

C59_2		Maj-65	Maj-48_2	CONDUIT	8.2	PH4_208-206	PH4_MH208	PH4_MH206	CONDUIT	20.3
0.6860	0.0350					0.3450	0.0130			
C6		39_(RYCB)	Maj-08	CONDUIT	6.4	PH4_210-208	PH4_MH210	PH4_MH208	CONDUIT	10.4
3.1110	0.0350					0.4808	0.0130			
C6_1		Maj-07	Maj-06_2	CONDUIT	34.1	PH4_212-210	PH4_MH212	PH4_MH210	CONDUIT	42.0
0.5273	0.0130					0.3332	0.0130			
C6_2		Maj-06	Maj-06_2	CONDUIT	20.2	PH4_302-162	PH4_MH302_dummy	162_(STM)	CONDUIT	12.4
0.6523	0.0130					0.1613	0.0130			
C60		Maj-56	TEE_14_(RYCB)	CONDUIT	23.6	PH4_304-302	PH4_MH304	PH4_MH302	CONDUIT	15.3
0.4232	0.0350					0.3274	0.0130			
C61_1		RYCB_1_(RYCB)	Maj-66	CONDUIT	2.4	PH4_306-304	PH4_MH306	PH4_MH304	CONDUIT	11.5
6.2833	0.0350					0.3466	0.0130			
C61_2		Maj-66	Maj-55	CONDUIT	19.9	PH4_308-306	PH4_MH308	PH4_MH306	CONDUIT	43.0
0.7849	0.0350					0.3488	0.0130			
C62		1_(RYCB)	Maj-50	CONDUIT	27.0	PH4_310-308	PH4_MH310	PH4_MH308	CONDUIT	11.7
1.4347	0.0350					0.5133	0.0130			
C63_1		RYCB_5_(RYCB)	Maj-67	CONDUIT	3.6	PH4_312-310	PH4_MH312	PH4_MH310	CONDUIT	38.0
5.9357	0.0350					0.3417	0.0130			
C63_2		Maj-67	Maj-44	CONDUIT	7.2	PH4_402-508	PH4_MH402	PH4_MH508	CONDUIT	51.2
5.7272	0.0350					0.1952	0.0130			
C64		Structure_-_ (18)_(RYCB)	Maj-43	CONDUIT	5.0	PH4_404-402	PH4_MH404	PH4_MH402	CONDUIT	11.6
2.3206	0.0350					0.5172	0.0130			
C65_1		RYCB_6_(RYCB)	J1	CONDUIT	22.2	PH4_406-404	PH4_MH406	PH4_MH404	CONDUIT	25.3
0.6802	0.0350					0.1978	0.0130			
C65_2		J1	Maj-35	CONDUIT	15.7	PH4_410-408	PH4_MH410	PH4_MH408	CONDUIT	25.7
2.1144	0.0350					0.3498	0.0130			
C66_1		RYCB_10_(RYCB)	Maj-64	CONDUIT	14.5	PH4_412-410	PH4_MH412	PH4_MH410	CONDUIT	13.2
0.4885	0.0350					0.5291	0.0130			
C66_2		Maj-64	Maj-21	CONDUIT	36.9	PH4_414-412	PH4_MH414	PH4_MH412	CONDUIT	49.1
0.5557	0.0350					0.3464	0.0130			
C67		RYCB_11_(RYCB)	Slope1	CONDUIT	10.4	PH4_502-162	PH4_MH502	162_(STM)	CONDUIT	8.1
0.5471	0.0350					0.2481	0.0130			
C68		38_(RYCB)	Maj-09	CONDUIT	5.0	PH4_504-502	PH4_MH504	PH4_MH502	CONDUIT	9.2
0.2600	0.0350					0.1089	0.0130			
C69		32_(CB)	Maj-14	CONDUIT	5.0	PH4_506-504	PH4_MH506	PH4_MH504	CONDUIT	23.5
2.3206	0.0350					0.2129	0.0130			
C7		Maj-07	Maj-08	CONDUIT	17.2	PH4_508-506	PH4_MH508	PH4_MH506	CONDUIT	10.6
0.7280	0.0130					0.1885	0.0130			
C8		Maj-08	Maj-09	CONDUIT	40.6	PH4_510-512	PH4_MH510	PH4_MH512	CONDUIT	47.9
0.7482	0.0130					0.3340	0.0130			
C9		Maj-09	Maj-10	CONDUIT	9.0	PH4_512-406	PH4_MH512	PH4_MH406	CONDUIT	10.0
0.7689	0.0130					0.2991	0.0130			
PH4_100-168		PH4_MH100_dummy	168_(STM)	CONDUIT	12.5	PH4_602-408	PH4_MH602	PH4_MH408	CONDUIT	8.9
0.4000	0.0130					0.3363	0.0130			
PH4_102-100		PH4_MH102	PH4_MH100	CONDUIT	41.4	PH4_604-602	PH4_MH604	PH4_MH602	CONDUIT	52.9
0.3383	0.0130					0.3402	0.0130			
PH4_104-102		PH4_MH104	PH4_MH102	CONDUIT	10.0	PH4_STM-71_(STM)	PH4_MH408	PH4_MH406	CONDUIT	32.9
0.5005	0.0130					0.2429	0.0130			
PH4_106-104		PH4_MH106	PH4_MH104	CONDUIT	19.2	Pipe_-_ (1)_(RYCB)_1	TEE_43_(RYCB)	98_(STM)	CONDUIT	40.7
0.3653	0.0130					1.0001	0.0130			
PH4_108-106		PH4_MH108	PH4_MH106	CONDUIT	9.4	Pipe_-_ (10)_(RYCB)_1	TEE_32_(RYCB)	RYCB_18_(RYCB)	CONDUIT	4.0
0.5297	0.0130					0.4964	0.0130			
PH4_110-108		PH4_MH110	PH4_MH108	CONDUIT	42.1	Pipe_-_ (100)_(RYCB)_1	TEE_6_(RYCB)	RYCB_4_(RYCB)	CONDUIT	43.1
0.3329	0.0130					0.5011	0.0130			
PH4_202-166		PH4_MH202_dummy	166_(STM)	CONDUIT	14.4	Pipe_-_ (101)_(RYCB)_1	ELB_20_(RYCB)	TEE_35_(RYCB)	CONDUIT	58.1
0.2079	0.0130					0.5006	0.0130			
PH4_204-202		PH4_MH204	PH4_MH202	CONDUIT	38.9	Pipe_-_ (103)_(1)_(RYCB)_1	TEE_33_(RYCB)	RYCB_18_(RYCB)	CONDUIT	4.0
0.3344	0.0130					0.5015	0.0130			
PH4_206-204		PH4_MH206	PH4_MH204	CONDUIT	12.4	Pipe_-_ (103)_(RYCB)_1	TEE_34_(RYCB)	TEE_33_(RYCB)	CONDUIT	29.3
0.4819	0.0130					0.4983	0.0130			

Pipe_-_ (109) (RYCB) ELB_21_ (RYCB)	RYCB_9_ (RYCB)	CONDUIT	42.6	Pipe_-_ (143) (RYCB) TEE_20_ (RYCB)	TEE_21_ (RYCB)	CONDUIT	22.1
0.4999 0.0130				0.4981 0.0130			
Pipe_-_ (111) (RYCB) RYCB_18_ (RYCB)	Structure_-_ (18) (RYCB)	CONDUIT		Pipe_-_ (144) (RYCB) TEE_21_ (RYCB)	RYCB_8_ (RYCB)	CONDUIT	33.3
37.0 0.4998 0.0130				0.4992 0.0130			
Pipe_-_ (110) (RYCB) ELB_12_ (RYCB)	TEE_22_ (RYCB)	CONDUIT	42.8	Pipe_-_ (145) (RYCB) ELB_19_ (RYCB)	TEE_29_ (RYCB)	CONDUIT	18.5
0.5001 0.0130				0.4974 0.0130			
Pipe_-_ (111) (RYCB) TEE_22_ (RYCB)	RYCB_9_ (RYCB)	CONDUIT	36.1	Pipe_-_ (146) (RYCB) TEE_29_ (RYCB)	TEE_30_ (RYCB)	CONDUIT	21.9
0.5009 0.0130				0.5017 0.0130			
Pipe_-_ (114) (RYCB) ELB_10_ (RYCB)	TEE_18_ (RYCB)	CONDUIT	20.2	Pipe_-_ (147) (RYCB) TEE_30_ (RYCB)	TEE_31_ (RYCB)	CONDUIT	23.1
0.5010 0.0130				0.5011 0.0130			
Pipe_-_ (117) (RYCB) ELB_14_ (RYCB)	TEE_24_ (RYCB)	CONDUIT	14.2	Pipe_-_ (148) (RYCB) TEE_31_ (RYCB)	TEE_32_ (RYCB)	CONDUIT	26.3
0.5007 0.0130				0.5011 0.0130			
Pipe_-_ (118) (RYCB) TEE_24_ (RYCB)	TEE_25_ (RYCB)	CONDUIT	29.7	Pipe_-_ (149) (RYCB) TEE_35_ (RYCB)	TEE_34_ (RYCB)	CONDUIT	12.1
0.4989 0.0130				0.4953 0.0130			
Pipe_-_ (119) (RYCB) ELB_13_ (RYCB)	TEE_23_ (RYCB)	CONDUIT	29.5	Pipe_-_ (151) (RYCB) RYCB_7_ (RYCB)	15_RYCB	CONDUIT	39.0
0.5010 0.0130				0.4999 0.0130			
Pipe_-_ (120) (RYCB) ELB_17_ (RYCB)	TEE_28_ (RYCB)	CONDUIT	13.5	Pipe_-_ (150) (RYCB) TEE_18_ (RYCB)	TEE_17_ (RYCB)	CONDUIT	22.0
0.4968 0.0130				0.5004 0.0130			
Pipe_-_ (121) (RYCB) TEE_28_ (RYCB)	RYCB_13_ (RYCB)	CONDUIT	35.7	Pipe_-_ (151) (RYCB) TEE_17_ (RYCB)	TEE_16_ (RYCB)	CONDUIT	22.1
0.4987 0.0130				0.5019 0.0130			
Pipe_-_ (122) (RYCB) ELB_18_ (RYCB)	RYCB_13_ (RYCB)	CONDUIT	34.9	Pipe_-_ (152) (RYCB) TEE_16_ (RYCB)	TEE_15_ (RYCB)	CONDUIT	36.0
0.4990 0.0130				0.4996 0.0130			
Pipe_-_ (123) (RYCB) ELB_16_ (RYCB)	TEE_26_ (RYCB)	CONDUIT	27.7	Pipe_-_ (153) (RYCB) ELB_8_ (RYCB)	TEE_10_ (RYCB)	CONDUIT	17.2
1.0006 0.0130				0.7563 0.0130			
Pipe_-_ (124) (RYCB) TEE_26_ (RYCB)	TEE_27_ (RYCB)	CONDUIT	29.4	Pipe_-_ (154) (RYCB) ELB_9_ (RYCB)	TEE_12_ (RYCB)	CONDUIT	38.1
0.4999 0.0130				0.4987 0.0130			
Pipe_-_ (125) (RYCB) TEE_27_ (RYCB)	RYCB_12_ (RYCB)	CONDUIT	39.4	Pipe_-_ (155) (RYCB) TEE_12_ (RYCB)	TEE_13_ (RYCB)	CONDUIT	17.9
0.5000 0.0130				0.5020 0.0130			
Pipe_-_ (126) (RYCB) ELB_23_ (RYCB)	TEE_40_ (RYCB)	CONDUIT	30.5	Pipe_-_ (156) (1) (RYCB) TEE_14_ (RYCB)	RYCB_7_ (RYCB)	CONDUIT	3.2
0.5011 0.0130				0.4937 0.0130			
Pipe_-_ (127) (RYCB) TEE_40_ (RYCB)	TEE_41_ (RYCB)	CONDUIT	35.8	Pipe_-_ (156) (RYCB) TEE_13_ (RYCB)	TEE_14_ (RYCB)	CONDUIT	27.8
0.5005 0.0130				0.5002 0.0130			
Pipe_-_ (128) (RYCB) TEE_41_ (RYCB)	RYCB_15_ (RYCB)	CONDUIT	32.6	Pipe_-_ (157) (RYCB) ELB_25_ (RYCB)	TEE_44_ (RYCB)	CONDUIT	64.5
0.5000 0.0130				0.4992 0.0130			
Pipe_-_ (129) (RYCB) ELB_22_ (RYCB)	TEE_36_ (RYCB)	CONDUIT	47.1	Pipe_-_ (159) (RYCB) ELB_24_ (RYCB)	TEE_42_ (RYCB)	CONDUIT	38.3
0.4992 0.0130				0.4987 0.0130			
Pipe_-_ (130) (RYCB) TEE_36_ (RYCB)	RYCB_14_ (RYCB)	CONDUIT	21.1	Pipe_-_ (16) (RYCB) TEE_5_ (RYCB)	RYCB_6_ (RYCB)	CONDUIT	3.1
0.5020 0.0130				0.4854 0.0130			
Pipe_-_ (131) (RYCB) TEE_37_ (RYCB)	RYCB_14_ (RYCB)	CONDUIT	21.2	Pipe_-_ (160) (RYCB) TEE_42_ (RYCB)	TEE_43_ (RYCB)	CONDUIT	36.9
0.4993 0.0130				0.5014 0.0130			
Pipe_-_ (132) (RYCB) TEE_37_ (RYCB)	TEE_38_ (RYCB)	CONDUIT	21.0	Pipe_-_ (161) (RYCB) ELB_1_ (RYCB)	RYCB_1_ (RYCB)	CONDUIT	36.5
0.4993 0.0130				0.5008 0.0130			
Pipe_-_ (133) (RYCB) TEE_38_ (RYCB)	TEE_39_ (RYCB)	CONDUIT	46.6	Pipe_-_ (162) (RYCB) ELB_15_ (RYCB)	RYCB_10_ (RYCB)	CONDUIT	33.0
0.5000 0.0130				0.5149 0.0130			
Pipe_-_ (134) (RYCB) TEE_10_ (RYCB)	TEE_11_ (RYCB)	CONDUIT	40.4	Pipe_-_ (164) (RYCB) TEE_23_ (RYCB)	RYCB_10_ (RYCB)	CONDUIT	28.6
0.5202 0.0130				0.5007 0.0130			
Pipe_-_ (137) (RYCB) TEE_7_ (RYCB)	TEE_8_ (RYCB)	CONDUIT	22.5	Pipe_-_ (165) (RYCB) TEE_25_ (RYCB)	RYCB_11_ (RYCB)	CONDUIT	31.0
0.4982 0.0130				0.5007 0.0130			
Pipe_-_ (138) (RYCB) TEE_8_ (RYCB)	TEE_9_ (RYCB)	CONDUIT	22.0	Pipe_-_ (17) (RYCB) TEE_11_ (RYCB)	RYCB_6_ (RYCB)	CONDUIT	5.4
0.5003 0.0130				0.5545 0.0130			
Pipe_-_ (139) (RYCB) ELB_3_ (RYCB)	TEE_2_ (RYCB)	CONDUIT	20.2	Pipe_-_ (19) (RYCB) RYCB_9_ (RYCB)	22_ (RYCB)	CONDUIT	31.3
0.4894 0.0130				0.5010 0.0130			
Pipe_-_ (14) (RYCB) TEE_15_ (RYCB)	RYCB_7_ (RYCB)	CONDUIT	4.8	Pipe_-_ (2) (RYCB) TEE_44_ (RYCB)	98_ (STM)	CONDUIT	58.2
0.5045 0.0130				1.0001 0.0130			
Pipe_-_ (140) (RYCB) TEE_2_ (RYCB)	RYCB_3_ (RYCB)	CONDUIT	20.8	Pipe_-_ (22) (RYCB) RYCB_14_ (RYCB)	32_ (CB)	CONDUIT	31.3
0.5102 0.0130				0.5013 0.0130			
Pipe_-_ (141) (RYCB) ELB_11_ (RYCB)	TEE_19_ (RYCB)	CONDUIT	18.5	Pipe_-_ (23) (RYCB) RYCB_12_ (RYCB)	33_ (CB)	CONDUIT	11.4
0.7995 0.0130				0.5002 0.0130			
Pipe_-_ (142) (RYCB) TEE_19_ (RYCB)	TEE_20_ (RYCB)	CONDUIT	27.4	Pipe_-_ (24) (RYCB) TEE_39_ (RYCB)	29_ (RYCB)	CONDUIT	8.2
0.5004 0.0130				0.5008 0.0130			

Pipe_-(25)_ (RYCB)	RYCB_11_ (RYCB)	31_ (CB)	CONDUIT	6.0	CB-02	02_ (CB)	106_ (STM)	ORIFICE
0.4959	0.0130				CB-03	03_ (CB)	106_ (STM)	ORIFICE
Pipe_-(27)_ (RYCB)	RYCB_3_ (RYCB)	1_ (RYCB)	CONDUIT	30.6	CB-04	04_ (CB)	104_ (STM)	ORIFICE
0.5000	0.0130				CB-05	05_ (CB)	104_ (STM)	ORIFICE
Pipe_-(73)_ (RYCB)	RYCB_8_ (RYCB)	18_ (CB)	CONDUIT	9.7	CB-06	06_ (CB)	104_ (STM)	ORIFICE
0.4970	0.0130				CB-08	08_ (CB)	112_ (STM)	ORIFICE
Pipe_-(74)_ (RYCB)	RYCB_15_ (RYCB)	39_ (RYCB)	CONDUIT	5.7	CB-09	09_ (CB)	112_ (STM)	ORIFICE
0.5049	0.0130				CB-10	10_ (CB)	114_ (STM)	ORIFICE
Pipe_-(77)_ (RYCB)	RYCB_13_ (RYCB)	38_ (RYCB)	CONDUIT	32.4	CB-11	11_ (CB)	114_ (STM)	ORIFICE
0.4995	0.0130				CB-12	12_ (CB)	120_ (STM)	ORIFICE
Pipe_-(87)_ (RYCB)	StartNullStruct2	TEE_1_ (RYCB)	CONDUIT	21.1	CB-13	13_ (CB)	120_ (STM)	ORIFICE
0.4968	0.0130				CB-14	14_ (CB)	126_ (STM)	ORIFICE
Pipe_-(88)_ (RYCB)	TEE_1_ (RYCB)	RYCB_2_ (RYCB)	CONDUIT	36.1	CB-15	15_ (CB)	126_ (STM)	ORIFICE
0.4991	0.0130				CB-16	16_ (CB)	128_ (STM)	ORIFICE
Pipe_-(89)_ (RYCB)	ELB_4_ (RYCB)	RYCB_3_ (RYCB)	CONDUIT	30.5	CB-17	17_ (CB)	128_ (STM)	ORIFICE
0.4914	0.0130				CB-18	18_ (CB)	136_ (STM)	ORIFICE
Pipe_-(9)_ (RYCB)	RYCB_5_ (RYCB)	11_ (CB)	CONDUIT	5.8	CB-19	19_ (CB)	136_ (STM)	ORIFICE
0.5044	0.0130				CB-20	20_ (CB)	140_ (STM)	ORIFICE
Pipe_-(90)_ (RYCB)	StartNullStruct2	ELB_2_ (RYCB)	CONDUIT	11.0	CB-21	21_ (CB)	140_ (STM)	ORIFICE
0.4993	0.0130				CB-23	23_ (CB)	144_ (STM)	ORIFICE
Pipe_-(93)_ (RYCB)	ELB_5_ (RYCB)	TEE_3_ (RYCB)	CONDUIT	39.7	CB-24	24_ (CB)	144_ (STM)	ORIFICE
0.4788	0.0130				CB-25	25_ (CB)	146_ (STM)	ORIFICE
Pipe_-(94)_ (RYCB)	TEE_3_ (RYCB)	TEE_4_ (RYCB)	CONDUIT	44.0	CB-26	26_ (CB)	146_ (STM)	ORIFICE
0.5001	0.0130				CB-27	27_ (CB)	148_ (STM)	ORIFICE
Pipe_-(95)_ (RYCB)	TEE_4_ (RYCB)	TEE_5_ (RYCB)	CONDUIT	43.2	CB-28	28_ (CB)	148_ (STM)	ORIFICE
0.4995	0.0130				CB-30	30_ (CB)	150_ (STM)	ORIFICE
Pipe_-(96)_ (RYCB)	ELB_7_ (RYCB)	TEE_7_ (RYCB)	CONDUIT	25.1	CB-31	31_ (CB)	150_ (STM)	ORIFICE
1.1149	0.0130				CB-32	32_ (CB)	152_ (STM)	ORIFICE
Pipe_-(98)_ (RYCB)	TEE_9_ (RYCB)	RYCB_5_ (RYCB)	CONDUIT	35.1	CB-33	33_ (CB)	152_ (STM)	ORIFICE
0.5012	0.0130				CB-34	34_ (CB)	158_ (STM)	ORIFICE
Pipe_-(99)_ (RYCB)	ELB_6_ (RYCB)	TEE_6_ (RYCB)	CONDUIT	39.0	CB-35	35_ (CB)	158_ (STM)	ORIFICE
0.5004	0.0130				CB-36	36_ (CB)	162_ (STM)	ORIFICE
STM-23_ (STM)	106_ (STM)	104_ (STM)	CONDUIT	97.6	CB-37	37_ (CB)	162_ (STM)	ORIFICE
0.2500	0.0130				CB-40	40_ (CB)	164_ (STM)	ORIFICE
STM-24_ (STM)	108_ (STM)	106_ (STM)	CONDUIT	26.2	CB-41	41_ (CB)	164_ (STM)	ORIFICE
0.2515	0.0130				CB-42	42_ (CB)	170_ (STM)	ORIFICE
STM-27_ (STM)	134_ (STM)	132_ (STM)	CONDUIT	36.0	CB-43	43_ (CB)	170_ (STM)	ORIFICE
0.6498	0.0130				CB-44	44_ (CB)	142_ (STM)	ORIFICE
STM-28_ (STM)	110_ (STM)	108_ (STM)	CONDUIT	29.1	CB-45	45_ (CB)	142_ (STM)	ORIFICE
0.4192	0.0130				CB-46	46_ (CB)	132_ (STM)	ORIFICE
STM-34_ (1)_ (1)_ (STM)	98_ (STM)	2121_ (STM)	CONDUIT	40.0	CB-47	47_ (CB)	132_ (STM)	ORIFICE
0.1250	0.0130				CB-48	48_ (CB)	130_ (STM)	ORIFICE
STM-34_ (1)_ (STM)	100_ (STM)	98_ (STM)	CONDUIT	39.5	CB-49	49_ (CB)	130_ (STM)	ORIFICE
0.1013	0.0130				CB-50	50_ (CB)	118_ (STM)	ORIFICE
STM-34_ (STM)	102_ (STM)	100_ (STM)	CONDUIT	12.1	CB-51	51_ (CB)	118_ (STM)	ORIFICE
0.0826	0.0130				CB-52	52_ (CB)	162_ (STM)	ORIFICE
STM-35_ (STM)	2121_ (STM)	2142_ (STM)	CONDUIT	84.0	CB-53	53_ (CB)	156_ (STM)	ORIFICE
0.1190	0.0130				CB-54	54_ (CB)	156_ (STM)	ORIFICE
STM-36_ (STM)	2142_ (STM)	2143_ (STM)	CONDUIT	17.7	CB-55	55_ (CB)	104_ (STM)	ORIFICE
0.1695	0.0130				CB-56	56_ (CB)	104_ (STM)	ORIFICE
STM-37_ (STM)	2143_ (STM)	2144_ (STM)	CONDUIT	20.1	CB-57	57_ (CB)	100_ (STM)	ORIFICE
0.0994	0.0130				OR-02	Maj-50	02_ (CB)	ORIFICE
STM-38_ (STM)	2144_ (STM)	STM-111_ (STM)	CONDUIT	17.2	OR-03	Maj-50	03_ (CB)	ORIFICE
0.0990	0.0130				OR-04	Maj-52	04_ (CB)	ORIFICE
STM-81_ (STM)	142_ (STM)	140_ (STM)	CONDUIT	20.7	OR-05	Maj-52	05_ (CB)	ORIFICE
0.4350	0.0130				OR-06	Maj-55	06_ (CB)	ORIFICE
STM-82_ (STM)	StartNullStruct3	104_ (STM)	CONDUIT	37.6	OR-08	Maj-46	08_ (CB)	ORIFICE
0.5001	0.0130							
STM-83_ (STM)	STM-251_ (STM)	144_ (STM)	CONDUIT	37.8				
1.0167	0.0130							

OR-09	Maj-46	09_(CB)	ORIFICE	PH4_ICD23	PH4_RYCB23	PH4_MH308	ORIFICE
OR1	59_(CB)	112_(STM)	ORIFICE	PH4_ICD24	PH4_RYCB24	PH4_MH304	ORIFICE
OR-10	Maj-44	10_(CB)	ORIFICE	PH4_ICD50	PH4_CB50-51	PH4_MH404	ORIFICE
OR-11	Maj-44	11_(CB)	ORIFICE	PH4_ICD51	PH4_CB50-51	PH4_MH404	ORIFICE
OR-12	Maj-41	12_(CB)	ORIFICE	PH4_ICD52	PH4_CB52-53	PH4_MH408	ORIFICE
OR-13	Maj-41	13_(CB)	ORIFICE	PH4_ICD53	PH4_CB52-53	PH4_MH408	ORIFICE
OR-14	Maj-37	14_(CB)	ORIFICE	PH4_ICD54	PH4_CB54-55	PH4_MH412	ORIFICE
OR-15	Maj-37	15_(CB)	ORIFICE	PH4_ICD55	PH4_CB54-55	PH4_MH412	ORIFICE
OR-16	Maj-35	16_(CB)	ORIFICE	PH4_ICD56	PH4_CB56-57	PH4_MH414	ORIFICE
OR-17	Maj-35	17_(CB)	ORIFICE	PH4_ICD57	PH4_CB56-57	PH4_MH414	ORIFICE
OR-18	Maj-28	18_(CB)	ORIFICE	PH4_ICD58	PH4_CB58-59	PH4_MH102	ORIFICE
OR-19	Maj-28	19_(CB)	ORIFICE	PH4_ICD59	PH4_CB58-59	PH4_MH102	ORIFICE
OR2	Maj-48_3	59_(CB)	ORIFICE	PH4_ICD60	PH4_CB60-61	PH4_MH108	ORIFICE
OR-20	Maj-26	20_(CB)	ORIFICE	PH4_ICD61	PH4_CB60-61	PH4_MH108	ORIFICE
OR-21	Maj-26	21_(CB)	ORIFICE	PH4_ICD62	PH4_CB62-63	PH4_MH204	ORIFICE
OR-23	Maj-24	23_(CB)	ORIFICE	PH4_ICD63	PH4_CB62-63	PH4_MH204	ORIFICE
OR-24	Maj-24	24_(CB)	ORIFICE	PH4_ICD64	PH4_CB64-65	PH4_MH210	ORIFICE
OR-25	Maj-19	25_(CB)	ORIFICE	PH4_ICD65	PH4_CB64-65	PH4_MH210	ORIFICE
OR-26	Maj-19	26_(CB)	ORIFICE	PH4_ICD66	PH4_CB66-67	PH4_MH306	ORIFICE
OR-27	Maj-21	27_(CB)	ORIFICE	PH4_ICD67	PH4_CB66-67	PH4_MH306	ORIFICE
OR-28	Maj-21	28_(CB)	ORIFICE	PH4_ICD68	PH4_CB68-69	PH4_MH310	ORIFICE
OR-30	Slope1	30_(CB)	ORIFICE	PH4_ICD69	PH4_CB68-69	PH4_MH310	ORIFICE
OR-31	Slope1	31_(CB)	ORIFICE	PH4_ICD70	PH4_CB70-71	PH4_MH604	ORIFICE
OR-32	Maj-14	32_(CB)	ORIFICE	PH4_ICD71	PH4_CB70-71	PH4_MH604	ORIFICE
OR-33	Maj-14	33_(CB)	ORIFICE	PH4_ICD72	PH4_CB72-73	PH4_MH602	ORIFICE
OR-34	Maj-16	34_(CB)	ORIFICE	PH4_ICD73	PH4_CB72-73	PH4_MH602	ORIFICE
OR-35	Maj-16	35_(CB)	ORIFICE	PH4_ICD74	PH4_CB74-75	PH4_MH510	ORIFICE
OR-36	Maj-10	36_(CB)	ORIFICE	PH4_ICD75	PH4_CB74-75	PH4_MH510	ORIFICE
OR-37	Maj-10	37_(CB)	ORIFICE	PH4_ICD80	PH4_CB80-81	PH4_MH402	ORIFICE
OR-40	Maj-06_2	40_(CB)	ORIFICE	PH4_ICD81	PH4_CB80-81	PH4_MH402	ORIFICE
OR-41	Maj-06_2	41_(CB)	ORIFICE	PH4_ST1	PH4_MH100	PH4_MH100_dummy	ORIFICE
OR-42	Maj-03	42_(CB)	ORIFICE	PH4_ST2	PH4_MH202	PH4_MH202_dummy	ORIFICE
OR-43	Maj-03	43_(CB)	ORIFICE	PH4_ST3	PH4_MH302	PH4_MH302_dummy	ORIFICE
OR-44	Maj-33	44_(CB)	ORIFICE	RYCB-01	RYCB_1_(RYCB)	06_(CB)	ORIFICE
OR-45	Maj-33	45_(CB)	ORIFICE	RYCB-02	RYCB_2_(RYCB)	112_(STM)	ORIFICE
OR-46	Maj-32	46_(CB)	ORIFICE	RYCB-03	1_(RYCB)	110_(STM)	ORIFICE
OR-47	Maj-32	47_(CB)	ORIFICE	RYCB-04	RYCB_4_(RYCB)	StartNullStruct3	ORIFICE
OR-48	Maj-30	48_(CB)	ORIFICE	RYCB-06	RYCB_6_(RYCB)	128_(STM)	ORIFICE
OR-49	Maj-30	49_(CB)	ORIFICE	RYCB-07	15_RYCB	138_(STM)	ORIFICE
OR-50	Maj-42	50_(CB)	ORIFICE	RYCB-10	RYCB_10_(RYCB)	148_(STM)	ORIFICE
OR-51	Maj-42	51_(CB)	ORIFICE	RYCB-18	Structure_-(18)_(RYCB)	116_(STM)	ORIFICE
OR-52	Maj-09	52_(CB)	ORIFICE	RYCB-22	22_(RYCB)	142_(STM)	ORIFICE
OR-53	Maj-12	53_(CB)	ORIFICE	RYCB-29	29_(RYCB)	STM-251_(STM)	ORIFICE
OR-54	Maj-12	54_(CB)	ORIFICE	RYCB-38	38_(RYCB)	162_(STM)	ORIFICE
OR-55	Maj-54	55_(CB)	ORIFICE	RYCB-39	39_(RYCB)	162_(STM)	ORIFICE
OR-56	Maj-54	56_(CB)	ORIFICE	B2-Out	B2_Stor	164_(STM)	OUTLET
OR-57	Maj-58	57_(CB)	ORIFICE	B4-Out	58_(CB)	2142_(STM)	OUTLET
PH4_ICD150	PH4_RYCB150	PH4_MH510	ORIFICE	PH4_ICD78	PH4_CB78-79	PH4_MH506	OUTLET
PH4_ICD151	PH4_RYCB151	PH4_MH506	ORIFICE	PH4_ICD79	PH4_CB78-79	PH4_MH506	OUTLET
PH4_ICD153	PH4_RYCB153	PH4_MH604	ORIFICE	PH4_ICD82	PH4_CB82-83	PH4_MH110	OUTLET
PH4_ICD154	PH4_RYCB154	PH4_MH410	ORIFICE	PH4_ICD83	PH4_CB82-83	PH4_MH110	OUTLET
PH4_ICD155	PH4_RYCB155	PH4_MH408	ORIFICE	PH4_ICD84	PH4_CB84-85	PH4_MH100	OUTLET
PH4_ICD156	PH4_RYCB156	PH4_MH402	ORIFICE	PH4_ICD85	PH4_CB84-85	PH4_MH100	OUTLET
PH4_ICD158	PH4_RYCB158	PH4_MH414	ORIFICE	PH4_ICD86	PH4_CB86-87	PH4_MH212	OUTLET
PH4_ICD20	PH4_RYCB20	PH4_MH110	ORIFICE	PH4_ICD87	PH4_CB86-87	PH4_MH212	OUTLET
PH4_ICD21	PH4_RYCB21	PH4_MH106	ORIFICE	PH4_ICD88	PH4_CB88-89	PH4_MH202	OUTLET
PH4_ICD22	PH4_RYCB22	PH4_MH104	ORIFICE	PH4_ICD89	PH4_CB88-89	PH4_MH202	OUTLET

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels
PH4_ICD90	PH4_CB90-91	PH4_MH312	OUTLET			
PH4_ICD91	PH4_CB90-91	PH4_MH312	OUTLET			
PH4_ICD92	PH4_CB92-93	PH4_MH302	OUTLET			
PH4_ICD93	PH4_CB92-93	PH4_MH302	OUTLET			

Cross Section Summary						

11.04	6.0mROW	0.35	3.20	0.18	18.00	1
0.10	1_(STM) CIRCULAR	0.38	0.11	0.09	0.38	1
5.34	10 6.0mROW	0.35	3.20	0.18	18.00	1
3.67	10_(STM) CIRCULAR	1.35	1.43	0.34	1.35	1
5.96	11 6.0mROW	0.35	3.20	0.18	18.00	1
2.64	11_(STM) CIRCULAR	1.35	1.43	0.34	1.35	1
6.45	12 6.0mROW	0.35	3.20	0.18	18.00	1
2.56	12_(STM) CIRCULAR	1.35	1.43	0.34	1.35	1
11.09	13 6.0mROW	0.35	3.20	0.18	18.00	1
2.78	13_(STM) CIRCULAR	1.35	1.43	0.34	1.35	1
9.23	14 6.0mROW	0.35	3.20	0.18	18.00	1
3.73	14_(STM) CIRCULAR	1.65	2.14	0.41	1.65	1
6.46	15 6.0mROW	0.35	3.20	0.18	18.00	1
3.67	15_(10)_ (STM) CIRCULAR	1.35	1.43	0.34	1.35	1
2.46	15_(11)_ (STM) CIRCULAR	1.35	1.43	0.34	1.35	1
0.40	15_(12)_ (STM) CIRCULAR	0.75	0.44	0.19	0.75	1
0.45	15_(13)_ (STM) CIRCULAR	0.75	0.44	0.19	0.75	1
1.57	15_(14)_ (STM) CIRCULAR	1.05	0.87	0.26	1.05	1
1.94	15_(15)_ (STM) CIRCULAR	1.05	0.87	0.26	1.05	1
1.62	15_(16)_ (STM) CIRCULAR	1.05	0.87	0.26	1.05	1
0.10	15_(19)_ (STM) CIRCULAR	0.38	0.11	0.09	0.38	1
0.35	15_(20)_ (STM) CIRCULAR	0.60	0.28	0.15	0.60	1

15_(21)_ (STM)	CIRCULAR	0.60	0.28	0.15	0.60	1
0.38						
15_(22)_ (STM)	CIRCULAR	1.05	0.87	0.26	1.05	1
1.74						
15_(3)_ (STM)	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
15_(4)_ (STM)	CIRCULAR	0.45	0.16	0.11	0.45	1
0.20						
15_(5)_ (STM)	CIRCULAR	0.53	0.22	0.13	0.53	1
0.26						
15_(9)_ (STM)	CIRCULAR	1.35	1.43	0.34	1.35	1
2.70						
16	6.0mROW	0.35	3.20	0.18	18.00	1
6.39						
17	6.0mROW	0.35	3.20	0.18	18.00	1
9.02						
18	6.0mROW	0.35	3.20	0.18	18.00	1
4.42						
18_1	6.0mROW	0.35	3.20	0.18	18.00	1
9.51						
18_2	6.0mROW	0.35	3.20	0.18	18.00	1
9.56						
19	6.0mROW	0.35	3.20	0.18	18.00	1
5.17						
2	6.0mROW	0.35	3.20	0.18	18.00	1
7.97						
2_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1
0.12						
20	6.0mROW	0.35	3.20	0.18	18.00	1
7.04						
21	6.0mROW	0.35	3.20	0.18	18.00	1
7.98						
22	6.0mROW	0.35	3.20	0.18	18.00	1
9.72						
23	6.0mROW	0.35	3.20	0.18	18.00	1
8.08						
24	6.0mROW	0.35	3.20	0.18	18.00	1
8.08						
25	6.0mROW	0.35	3.20	0.18	18.00	1
8.65						
26	6.0mROW	0.35	3.20	0.18	18.00	1
6.31						
27	6.0mROW	0.35	3.20	0.18	18.00	1
8.84						
28	6.0mROW	0.35	3.20	0.18	18.00	1
7.10						
29	6.0mROW	0.35	3.20	0.18	18.00	1
9.64						
3	6.0mROW	0.35	3.20	0.18	18.00	1
5.56						
3_(STM)	CIRCULAR	0.53	0.22	0.13	0.53	1
0.25						
30	6.0mROW	0.35	3.20	0.18	18.00	1
7.15						
31	6.0mROW	0.35	3.20	0.18	18.00	1
6.72						
32	6.0mROW	0.35	3.20	0.18	18.00	1
10.93						
33	6.0mROW	0.35	3.20	0.18	18.00	1
7.29						

34	6.0mROW	0.35	3.20	0.18	18.00	1
6.56						
35	6.0mROW	0.35	3.20	0.18	18.00	1
14.12						
36	6.0mROW	0.35	3.20	0.18	18.00	1
10.54						
37	6.0mROW	0.35	3.20	0.18	18.00	1
10.16						
38	6.0mROW	0.35	3.20	0.18	18.00	1
10.07						
39	6.0mROW	0.35	3.20	0.18	18.00	1
14.57						
4	6.0mROW	0.35	3.20	0.18	18.00	1
5.84						
4_ (STM)	CIRCULAR	1.20	1.13	0.30	1.20	1
1.94						
40	6.0mROW	0.35	3.20	0.18	18.00	1
8.75						
41	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
42	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.37						
43	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
44	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
45	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
46	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.27						
47	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.38						
48	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.48						
49	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
5	6.0mROW	0.35	3.20	0.18	18.00	1
6.63						
5_ (STM)	CIRCULAR	1.35	1.43	0.34	1.35	1
2.85						
50	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
51	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
52	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
53	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
54	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
55	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
56	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.27						
57	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.29						
58	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
59	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						

6	6.0mROW	0.35	3.20	0.18	18.00	1
10.02						
6_ (STM)	CIRCULAR	0.25	0.05	0.06	0.25	1
0.05						
60	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.27						
61	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.25						
62	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.13						
63	6.0mROW	0.35	3.20	0.18	18.00	1
4.97						
7	TRIANGULAR	0.30	0.27	0.14	1.80	1
0.26						
7_ (1)_ (STM)	CIRCULAR	0.45	0.16	0.11	0.45	1
0.13						
7_ (STM)	CIRCULAR	0.38	0.11	0.09	0.38	1
0.08						
8	6.0mROW	0.35	3.20	0.18	18.00	1
10.62						
8_ (STM)	CIRCULAR	1.35	1.43	0.34	1.35	1
2.67						
9	6.0mROW	0.35	3.20	0.18	18.00	1
7.38						
9_ (STM)	CIRCULAR	1.35	1.43	0.34	1.35	1
2.73						
C1	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
46.46						
C1_1	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
41.73						
C1_2	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
39.24						
C10	18mROWsSidewalk	0.60	13.69	0.26	39.25	1
30.78						
C11	18mROWsSidewalk	0.60	13.69	0.26	39.25	1
36.64						
C12	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
15.85						
C13	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
16.21						
C14	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
26.07						
C15	18mROWsSidewalk	0.60	13.69	0.26	39.25	1
33.88						
C16	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
33.63						
C17	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
25.22						
C18	TRIANGULAR	0.60	1.08	0.28	3.60	1
3.29						
C18_2	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
37.10						
C18_3	18mROWsSidewalk	0.60	13.69	0.26	39.25	1
54.54						
C18_4	18mROWsSidewalk	0.60	13.69	0.26	39.25	1
37.69						
C18_5	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
50.22						
C18_6	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
32.62						

C18_7	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
18.39						
C18_8	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
39.29						
C18_9	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
31.30						
C19	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
33.00						
C2	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
64.23						
C2_1	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
40.54						
C2_2	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
40.39						
C20	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
42.83						
C21	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
43.14						
C22	24mROW-Db1-Sidewalk	0.60	14.13	0.27	42.60	1
60.84						
C23	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
33.16						
C24	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
26.57						
C25	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
30.56						
C26	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
24.79						
C27	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.22						
C27_1	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
34.05						
C27_2	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
30.77						
C28	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
33.54						
C29	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
22.52						
C3_1	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
28.27						
C3_2	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
28.24						
C30	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
24.90						
C31	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.37						
C31_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
3.19						
C31_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.15						
C32	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
27.62						
C33	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
25.92						
C34	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
36.74						
C35	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
26.88						
C36	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
36.00						

C37	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
26.64						
C38	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
26.67						
C39	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
22.27						
C4	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.11						
C4_1	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
33.64						
C4_2	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
29.56						
C4_3	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.24						
C4_4	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.45						
C40	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
36.25						
C41	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
28.65						
C42	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
24.39						
C43	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
25.45						
C44	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
26.78						
C45	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
24.93						
C46	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
33.61						
C47	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
29.18						
C48	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
32.37						
C49	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
23.47						
C5	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.12						
C5_1	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
32.07						
C5_2	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
30.88						
C50	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.64						
C50_1	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
14.72						
C50_3	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
29.96						
C50_4	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
29.87						
C51	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
24.82						
C52	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
28.36						
C53	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
39.15						
C54	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
31.98						
C55	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
38.87						

C56	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.29						
C57	18mROW-No-Sidewalk	0.60	12.54	0.19	39.25	1
24.29						
C58	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.08						
C58_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.22						
C58_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.15						
C59_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
0.72						
C59_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.11						
C6	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.36						
C6_1	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
29.53						
C6_2	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
32.85						
C60	TRIANGULAR	0.60	1.08	0.28	3.60	1
0.87						
C61_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
3.35						
C61_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.18						
C62	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.60						
C63_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
3.25						
C63_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
3.20						
C64	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.03						
C65_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.10						
C65_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.94						
C66_1	TRIANGULAR	0.60	1.08	0.28	3.60	1
0.93						
C66_2	TRIANGULAR	0.60	1.08	0.28	3.60	1
1.00						
C67	TRIANGULAR	0.60	1.08	0.28	3.60	1
0.99						
C68	TRIANGULAR	0.60	1.08	0.28	3.60	1
0.68						
C69	TRIANGULAR	0.60	1.08	0.28	3.60	1
2.03						
C7	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
34.70						
C8	18mROW-Db1-Sidewalk	0.60	13.43	0.25	39.25	1
35.18						
C9	18mROWwSidewalk	0.60	13.69	0.26	39.25	1
37.25						
PH4_100-168	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_102-100	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_104-102	CIRCULAR	0.30	0.07	0.07	0.30	1
0.07						

PH4_106-104	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_108-106	CIRCULAR	0.30	0.07	0.07	0.30	1
0.07						
PH4_110-108	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_202-166	CIRCULAR	0.38	0.11	0.09	0.38	1
0.08						
PH4_204-202	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_206-204	CIRCULAR	0.30	0.07	0.07	0.30	1
0.07						
PH4_208-206	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_210-208	CIRCULAR	0.30	0.07	0.07	0.30	1
0.07						
PH4_212-210	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_302-162	CIRCULAR	0.38	0.11	0.09	0.38	1
0.07						
PH4_304-302	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_306-304	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_308-306	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_310-308	CIRCULAR	0.30	0.07	0.07	0.30	1
0.07						
PH4_312-310	CIRCULAR	0.30	0.07	0.07	0.30	1
0.06						
PH4_402-508	CIRCULAR	0.45	0.16	0.11	0.45	1
0.13						
PH4_404-402	CIRCULAR	0.45	0.16	0.11	0.45	1
0.21						
PH4_406-404	CIRCULAR	0.38	0.11	0.09	0.38	1
0.08						
PH4_410-408	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
PH4_412-410	CIRCULAR	0.38	0.11	0.09	0.38	1
0.13						
PH4_414-412	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
PH4_502-162	CIRCULAR	0.45	0.16	0.11	0.45	1
0.14						
PH4_504-502	CIRCULAR	0.45	0.16	0.11	0.45	1
0.09						
PH4_506-504	CIRCULAR	0.45	0.16	0.11	0.45	1
0.13						
PH4_508-506	CIRCULAR	0.45	0.16	0.11	0.45	1
0.12						
PH4_510-512	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
PH4_512-406	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
PH4_602-408	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
PH4_604-602	CIRCULAR	0.38	0.11	0.09	0.38	1
0.10						
PH4_STM-71_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1
0.09						

Pipe_-_ (1)_ (RYCB)_1 CIRCULAR	0.25	0.05	0.06	0.25	1
0.06					
Pipe_-_ (10)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (100)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (101)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (103)_ (1)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
1	0.04				
Pipe_-_ (103)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (109)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (11)_ (RYCB) CIRCULAR	0.30	0.07	0.07	0.30	1
0.07					
Pipe_-_ (110)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (111)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (114)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (117)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (118)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (119)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (120)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (121)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (122)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (123)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.06					
Pipe_-_ (124)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (125)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (126)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (127)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (128)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (129)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (130)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (131)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (132)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (133)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (134)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (137)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					

Pipe_-_ (138)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (139)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (14)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (140)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (141)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.05					
Pipe_-_ (142)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (143)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (144)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (145)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (146)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (147)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (148)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (149)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (15)_ (RYCB) CIRCULAR	0.30	0.07	0.07	0.30	1
0.07					
Pipe_-_ (150)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (151)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (152)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (153)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.05					
Pipe_-_ (154)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (155)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (156)_ (1)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
1	0.04				
Pipe_-_ (156)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (157)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (159)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (16)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (160)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (161)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (162)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (164)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-_ (165)_ (RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					

Pipe_-(17)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(19)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(2)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.06					
Pipe_-(22)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(23)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(24)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(25)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(27)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(73)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(74)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(77)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(87)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(88)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(89)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(9)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(90)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(93)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(94)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(95)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(96)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.06					
Pipe_-(98)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
Pipe_-(99)_(RYCB) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
STM-23_(STM) CIRCULAR	0.45	0.16	0.11	0.45	1
0.14					
STM-24_(STM) CIRCULAR	0.45	0.16	0.11	0.45	1
0.14					
STM-27_(STM) CIRCULAR	0.25	0.05	0.06	0.25	1
0.05					
STM-28_(STM) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
STM-34_(1)_(1)_(STM) CIRCULAR	1.65	2.14	0.41	1.65	1
3.22					
STM-34_(1)_(STM) CIRCULAR	1.65	2.14	0.41	1.65	1
2.90					
STM-34_(STM) CIRCULAR	1.65	2.14	0.41	1.65	1
2.62					
STM-35_(STM) CIRCULAR	1.65	2.14	0.41	1.65	1
3.15					

STM-36_(STM) CIRCULAR	1.65	2.14	0.41	1.65	1
3.75					
STM-37_(STM) CIRCULAR	1.80	2.54	0.45	1.80	1
3.62					
STM-38_(STM) CIRCULAR	1.80	2.54	0.45	1.80	1
3.62					
STM-81_(STM) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
STM-82_(STM) CIRCULAR	0.25	0.05	0.06	0.25	1
0.04					
STM-83_(STM) CIRCULAR	0.25	0.05	0.06	0.25	1
0.06					

Transect Summary					

Transect 16.5mROW-Dbl-Sidewalk					
Area:					
	0.0004	0.0016	0.0036	0.0064	0.0100
	0.0144	0.0196	0.0256	0.0325	0.0401
	0.0485	0.0571	0.0680	0.0814	0.0955
	0.1102	0.1256	0.1416	0.1583	0.1756
	0.1936	0.2123	0.2316	0.2516	0.2722
	0.2934	0.3154	0.3379	0.3612	0.3851
	0.4096	0.4348	0.4606	0.4871	0.5143
	0.5421	0.5705	0.5996	0.6294	0.6598
	0.6909	0.7226	0.7550	0.7881	0.8217
	0.8561	0.8911	0.9267	0.9630	1.0000
Hrad:					
	0.0229	0.0458	0.0686	0.0915	0.1144
	0.1373	0.1602	0.1831	0.2059	0.2288
	0.2554	0.3003	0.2443	0.2872	0.3273
	0.3650	0.4003	0.4336	0.4651	0.4949
	0.5231	0.5499	0.5754	0.5997	0.6228
	0.6450	0.6662	0.6866	0.7062	0.7250
	0.7431	0.7605	0.7773	0.7936	0.8094
	0.8246	0.8394	0.8538	0.8677	0.8813
	0.8945	0.9073	0.9199	0.9321	0.9440
	0.9557	0.9671	0.9783	0.9893	1.0000
Width:					
	0.0215	0.0430	0.0645	0.0860	0.1074
	0.1289	0.1504	0.1719	0.1934	0.2149
	0.2328	0.2329	0.3512	0.3688	0.3863
	0.4038	0.4214	0.4389	0.4564	0.4740
	0.4915	0.5090	0.5266	0.5441	0.5616
	0.5792	0.5967	0.6142	0.6318	0.6493
	0.6668	0.6844	0.7019	0.7195	0.7370
	0.7545	0.7721	0.7896	0.8071	0.8247
	0.8422	0.8597	0.8773	0.8948	0.9123
	0.9299	0.9474	0.9649	0.9825	1.0000
Transect 16.5mROW-No-Sidewalk					
Area:					
	0.0004	0.0018	0.0040	0.0071	0.0112
	0.0161	0.0219	0.0286	0.0362	0.0447

	0.0541	0.0637	0.0737	0.0847	0.0964
	0.1089	0.1221	0.1362	0.1511	0.1667
	0.1831	0.2003	0.2183	0.2370	0.2566
	0.2769	0.2980	0.3199	0.3426	0.3661
	0.3903	0.4153	0.4412	0.4678	0.4952
	0.5233	0.5523	0.5820	0.6125	0.6438
	0.6759	0.7088	0.7425	0.7769	0.8121
	0.8481	0.8849	0.9225	0.9609	1.0000
Hrad:					
	0.0266	0.0531	0.0797	0.1062	0.1328
	0.1593	0.1859	0.2124	0.2390	0.2655
	0.2964	0.3485	0.3839	0.4313	0.4738
	0.5120	0.5466	0.5779	0.6064	0.6324
	0.6563	0.6783	0.6988	0.7177	0.7355
	0.7521	0.7677	0.7825	0.7965	0.8098
	0.8225	0.8346	0.8463	0.8574	0.8682
	0.8786	0.8887	0.8985	0.9080	0.9173
	0.9263	0.9351	0.9438	0.9522	0.9605
	0.9687	0.9767	0.9846	0.9923	1.0000
Width:					
	0.0226	0.0452	0.0678	0.0904	0.1130
	0.1356	0.1582	0.1808	0.2034	0.2260
	0.2449	0.2449	0.2664	0.2862	0.3061
	0.3259	0.3457	0.3655	0.3854	0.4052
	0.4250	0.4448	0.4647	0.4845	0.5043
	0.5241	0.5440	0.5638	0.5836	0.6035
	0.6233	0.6431	0.6629	0.6828	0.7026
	0.7224	0.7422	0.7621	0.7819	0.8017
	0.8216	0.8414	0.8612	0.8810	0.9009
	0.9207	0.9405	0.9603	0.9802	1.0000
Transect 16.5mROWwSidewalk					
Area:					
	0.0004	0.0017	0.0037	0.0066	0.0104
	0.0149	0.0203	0.0266	0.0336	0.0415
	0.0502	0.0592	0.0694	0.0815	0.0943
	0.1078	0.1220	0.1370	0.1526	0.1691
	0.1862	0.2041	0.2227	0.2420	0.2621
	0.2828	0.3043	0.3266	0.3496	0.3732
	0.3977	0.4228	0.4487	0.4753	0.5026
	0.5307	0.5595	0.5890	0.6193	0.6502
	0.6819	0.7144	0.7475	0.7814	0.8160
	0.8514	0.8874	0.9242	0.9617	1.0000
Hrad:					
	0.0249	0.0499	0.0748	0.0997	0.1247
	0.1496	0.1746	0.1995	0.2244	0.2494
	0.2783	0.3273	0.3057	0.3513	0.3932
	0.4317	0.4672	0.5001	0.5307	0.5591
	0.5857	0.6106	0.6340	0.6561	0.6770
	0.6967	0.7155	0.7333	0.7504	0.7666
	0.7822	0.7972	0.8116	0.8254	0.8388
	0.8517	0.8642	0.8763	0.8881	0.8995
	0.9107	0.9215	0.9321	0.9424	0.9525
	0.9624	0.9721	0.9815	0.9909	1.0000
Width:					
	0.0215	0.0430	0.0645	0.0860	0.1074
	0.1289	0.1504	0.1719	0.1934	0.2149

	0.2328	0.2329	0.3026	0.3214	0.3403
	0.3591	0.3780	0.3968	0.4157	0.4345
	0.4534	0.4722	0.4911	0.5099	0.5288
	0.5476	0.5665	0.5853	0.6042	0.6230
	0.6419	0.6607	0.6796	0.6984	0.7173
	0.7361	0.7550	0.7738	0.7927	0.8115
	0.8304	0.8492	0.8681	0.8869	0.9058
	0.9246	0.9435	0.9623	0.9812	1.0000
Transect 18mROW-Dbl-Sidewalk					
Area:					
	0.0004	0.0014	0.0032	0.0056	0.0088
	0.0126	0.0174	0.0258	0.0359	0.0472
	0.0599	0.0733	0.0873	0.1018	0.1169
	0.1326	0.1488	0.1656	0.1830	0.2009
	0.2194	0.2384	0.2580	0.2782	0.2989
	0.3202	0.3421	0.3645	0.3875	0.4110
	0.4351	0.4598	0.4850	0.5108	0.5372
	0.5641	0.5916	0.6196	0.6482	0.6774
	0.7071	0.7374	0.7683	0.7997	0.8317
	0.8642	0.8973	0.9310	0.9652	1.0000
Hrad:					
	0.0235	0.0469	0.0704	0.0939	0.1173
	0.1408	0.1300	0.1329	0.1661	0.1956
	0.2244	0.2622	0.2981	0.3322	0.3647
	0.3956	0.4252	0.4535	0.4805	0.5065
	0.5314	0.5554	0.5784	0.6007	0.6221
	0.6428	0.6628	0.6821	0.7009	0.7191
	0.7367	0.7538	0.7704	0.7866	0.8024
	0.8177	0.8327	0.8473	0.8616	0.8755
	0.8891	0.9025	0.9155	0.9283	0.9408
	0.9531	0.9651	0.9770	0.9886	1.0000
Width:					
	0.0200	0.0400	0.0600	0.0800	0.1000
	0.1199	0.1807	0.2699	0.3059	0.3419
	0.3746	0.3906	0.4067	0.4227	0.4387
	0.4548	0.4708	0.4868	0.5029	0.5189
	0.5350	0.5510	0.5670	0.5831	0.5991
	0.6151	0.6312	0.6472	0.6632	0.6793
	0.6953	0.7114	0.7274	0.7434	0.7595
	0.7755	0.7915	0.8076	0.8236	0.8396
	0.8557	0.8717	0.8877	0.9038	0.9198
	0.9359	0.9519	0.9679	0.9840	1.0000
Transect 18mROW-No-Sidewalk					
Area:					
	0.0004	0.0015	0.0034	0.0060	0.0094
	0.0135	0.0184	0.0246	0.0323	0.0413
	0.0518	0.0632	0.0753	0.0881	0.1015
	0.1156	0.1304	0.1459	0.1621	0.1789
	0.1965	0.2147	0.2336	0.2531	0.2734
	0.2943	0.3159	0.3381	0.3611	0.3847
	0.4091	0.4340	0.4597	0.4861	0.5131
	0.5408	0.5692	0.5983	0.6280	0.6584
	0.6895	0.7213	0.7538	0.7869	0.8207
	0.8552	0.8904	0.9263	0.9628	1.0000
Hrad:					

	0.0304	0.0608	0.0911	0.1215	0.1519
	0.1823	0.2123	0.2363	0.2557	0.2730
	0.2937	0.3332	0.3698	0.4038	0.4356
	0.4654	0.4933	0.5197	0.5446	0.5682
	0.5906	0.6120	0.6324	0.6520	0.6707
	0.6887	0.7060	0.7228	0.7389	0.7546
	0.7697	0.7845	0.7988	0.8127	0.8262
	0.8395	0.8524	0.8651	0.8774	0.8896
	0.9014	0.9131	0.9246	0.9359	0.9469
	0.9579	0.9686	0.9792	0.9897	1.0000
Width:					
	0.0200	0.0400	0.0600	0.0800	0.1000
	0.1199	0.1460	0.1840	0.2221	0.2602
	0.2949	0.3130	0.3311	0.3491	0.3672
	0.3853	0.4034	0.4215	0.4395	0.4576
	0.4757	0.4938	0.5119	0.5299	0.5480
	0.5661	0.5842	0.6023	0.6203	0.6384
	0.6565	0.6746	0.6927	0.7107	0.7288
	0.7469	0.7650	0.7830	0.8011	0.8192
	0.8373	0.8554	0.8734	0.8915	0.9096
	0.9277	0.9458	0.9638	0.9819	1.0000
Transect 18mROWwSidewalk					
Area:					
	0.0003	0.0014	0.0031	0.0055	0.0086
	0.0124	0.0171	0.0261	0.0369	0.0488
	0.0620	0.0760	0.0905	0.1055	0.1211
	0.1372	0.1538	0.1709	0.1886	0.2068
	0.2255	0.2448	0.2646	0.2850	0.3058
	0.3272	0.3491	0.3716	0.3946	0.4181
	0.4422	0.4667	0.4918	0.5175	0.5437
	0.5704	0.5976	0.6254	0.6537	0.6825
	0.7119	0.7418	0.7722	0.8031	0.8346
	0.8666	0.8992	0.9323	0.9659	1.0000
Hrad:					
	0.0226	0.0452	0.0679	0.0905	0.1131
	0.1357	0.1264	0.1305	0.1583	0.1852
	0.2118	0.2484	0.2834	0.3169	0.3489
	0.3796	0.4090	0.4372	0.4643	0.4905
	0.5156	0.5399	0.5633	0.5859	0.6078
	0.6290	0.6495	0.6694	0.6887	0.7074
	0.7257	0.7434	0.7606	0.7774	0.7938
	0.8097	0.8253	0.8405	0.8554	0.8699
	0.8841	0.8980	0.9117	0.9250	0.9381
	0.9509	0.9635	0.9759	0.9881	1.0000
Width:					
	0.0200	0.0400	0.0600	0.0800	0.1000
	0.1199	0.1909	0.2951	0.3306	0.3660
	0.3981	0.4135	0.4290	0.4444	0.4598
	0.4753	0.4907	0.5061	0.5216	0.5370
	0.5524	0.5679	0.5833	0.5987	0.6142
	0.6296	0.6450	0.6605	0.6759	0.6913
	0.7068	0.7222	0.7376	0.7531	0.7685
	0.7839	0.7994	0.8148	0.8302	0.8457
	0.8611	0.8765	0.8920	0.9074	0.9228
	0.9383	0.9537	0.9691	0.9846	1.0000

Transect 18mROWwSidewalk-Half					
Area:					
	0.0003	0.0012	0.0027	0.0047	0.0074
	0.0106	0.0149	0.0255	0.0381	0.0518
	0.0665	0.0819	0.0977	0.1139	0.1306
	0.1478	0.1654	0.1835	0.2020	0.2210
	0.2404	0.2602	0.2806	0.3013	0.3226
	0.3442	0.3664	0.3890	0.4120	0.4355
	0.4594	0.4838	0.5086	0.5339	0.5597
	0.5859	0.6125	0.6396	0.6672	0.6952
	0.7236	0.7525	0.7819	0.8117	0.8419
	0.8726	0.9038	0.9354	0.9675	1.0000
Hrad:					
	0.0197	0.0394	0.0591	0.0788	0.0985
	0.1182	0.0853	0.0859	0.1193	0.1501
	0.1798	0.2143	0.2476	0.2798	0.3108
	0.3409	0.3700	0.3981	0.4254	0.4519
	0.4776	0.5025	0.5267	0.5502	0.5731
	0.5954	0.6171	0.6382	0.6588	0.6789
	0.6985	0.7176	0.7363	0.7545	0.7724
	0.7898	0.8068	0.8235	0.8399	0.8559
	0.8715	0.8869	0.9020	0.9168	0.9313
	0.9455	0.9595	0.9732	0.9867	1.0000
Width:					
	0.0180	0.0361	0.0541	0.0721	0.0902
	0.1082	0.2136	0.3696	0.4014	0.4332
	0.4621	0.4759	0.4897	0.5034	0.5172
	0.5310	0.5448	0.5586	0.5724	0.5862
	0.6000	0.6138	0.6276	0.6414	0.6552
	0.6690	0.6828	0.6966	0.7103	0.7241
	0.7379	0.7517	0.7655	0.7793	0.7931
	0.8069	0.8207	0.8345	0.8483	0.8621
	0.8759	0.8897	0.9034	0.9172	0.9310
	0.9448	0.9586	0.9724	0.9862	1.0000
Transect 24mROW-Db1-Sidewalk					
Area:					
	0.0004	0.0014	0.0032	0.0056	0.0088
	0.0127	0.0173	0.0226	0.0286	0.0353
	0.0427	0.0503	0.0613	0.0762	0.0916
	0.1076	0.1242	0.1414	0.1592	0.1776
	0.1965	0.2160	0.2361	0.2568	0.2781
	0.3000	0.3224	0.3455	0.3691	0.3933
	0.4181	0.4434	0.4694	0.4959	0.5231
	0.5508	0.5790	0.6079	0.6374	0.6674
	0.6981	0.7293	0.7611	0.7934	0.8264
	0.8600	0.8941	0.9288	0.9641	1.0000
Hrad:					
	0.0214	0.0427	0.0641	0.0854	0.1068
	0.1282	0.1495	0.1709	0.1922	0.2136
	0.2384	0.2804	0.1850	0.2258	0.2646
	0.3015	0.3366	0.3702	0.4023	0.4330
	0.4625	0.4907	0.5179	0.5440	0.5691
	0.5933	0.6166	0.6392	0.6610	0.6821
	0.7025	0.7222	0.7414	0.7600	0.7780
	0.7956	0.8126	0.8292	0.8454	0.8612
	0.8765	0.8915	0.9062	0.9205	0.9344

Width:	0.9481	0.9615	0.9746	0.9874	1.0000
	0.0195	0.0390	0.0585	0.0780	0.0975
	0.1170	0.1365	0.1560	0.1755	0.1950
	0.2112	0.2112	0.4024	0.4186	0.4347
	0.4509	0.4670	0.4832	0.4993	0.5155
	0.5316	0.5478	0.5639	0.5801	0.5962
	0.6124	0.6285	0.6447	0.6608	0.6770
	0.6931	0.7093	0.7254	0.7416	0.7577
	0.7739	0.7900	0.8062	0.8223	0.8385
	0.8546	0.8708	0.8869	0.9031	0.9192
	0.9354	0.9515	0.9677	0.9838	1.0000
Transect 6.0mROW					
Area:	0.0005	0.0018	0.0041	0.0073	0.0115
	0.0165	0.0225	0.0294	0.0372	0.0459
	0.0555	0.0661	0.0776	0.0900	0.1030
	0.1161	0.1293	0.1424	0.1555	0.1686
	0.1817	0.1975	0.2158	0.2349	0.2548
	0.2754	0.2968	0.3189	0.3418	0.3655
	0.3900	0.4152	0.4412	0.4679	0.4954
	0.5237	0.5528	0.5826	0.6131	0.6445
	0.6766	0.7095	0.7431	0.7775	0.8127
	0.8486	0.8853	0.9228	0.9610	1.0000
Hrad:	0.0192	0.0384	0.0576	0.0768	0.0961
	0.1153	0.1345	0.1537	0.1729	0.1921
	0.2113	0.2305	0.2497	0.2689	0.3014
	0.3390	0.3764	0.4137	0.4508	0.4877
	0.5245	0.4313	0.4671	0.5009	0.5327
	0.5628	0.5913	0.6184	0.6441	0.6685
	0.6918	0.7141	0.7353	0.7557	0.7752
	0.7940	0.8120	0.8294	0.8461	0.8623
	0.8780	0.8931	0.9078	0.9221	0.9360
	0.9494	0.9626	0.9753	0.9878	1.0000
Width:	0.0233	0.0466	0.0699	0.0932	0.1165
	0.1398	0.1632	0.1865	0.2098	0.2331
	0.2564	0.2797	0.3030	0.3263	0.3330
	0.3331	0.3331	0.3332	0.3332	0.3333
	0.3333	0.4556	0.4750	0.4944	0.5139
	0.5333	0.5528	0.5722	0.5917	0.6111
	0.6306	0.6500	0.6694	0.6889	0.7083
	0.7278	0.7472	0.7667	0.7861	0.8056
	0.8250	0.8444	0.8639	0.8833	0.9028
	0.9222	0.9417	0.9611	0.9806	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 YES
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 01/01/2019 00:00:00
 Ending Date 01/02/2019 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:01:00
 Dry Time Step 00:01:00
 Routing Time Step 2.00 sec
 Variable Time Step YES
 Maximum Trials 21
 Number of Threads 6
 Head Tolerance 0.000100 m

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	1.374	71.665
Evaporation Loss	0.000	0.000
Infiltration Loss	0.303	15.824
Surface Runoff	1.052	54.886
Final Storage	0.020	1.024
Continuity Error (%)	-0.097	

	Volume	Volume
Flow Routing Continuity	hectare-m	10 ⁶ ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.052	10.522
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.016	0.164
External Outflow	1.033	10.331
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	0.042	0.416
Continuity Error (%)	-0.547	

 Highest Continuity Errors

Node Maj-04 (100.00%)
 Node 14 (99.84%)
 Node Maj-34 (57.37%)
 Node Maj-56 (52.21%)
 Node Maj-48_2 (31.02%)

 Time-Step Critical Elements

 Link Pipe_-(156)_ (1)_ (RYCB) (1.54%)

 Highest Flow Instability Indexes

 Link CB-52 (78)
 Link B4-Out (30)
 Link STM-38_ (STM) (28)
 Link STM-37_ (STM) (28)
 Link STM-36_ (STM) (26)

 Routing Time Step Summary

 Minimum Time Step : 0.50 sec
 Average Time Step : 1.96 sec
 Maximum Time Step : 2.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 5.17
 Percent Not Converging : 10.63
 Time Step Frequencies :
 2.000 - 1.516 sec : 96.05 %
 1.516 - 1.149 sec : 1.54 %
 1.149 - 0.871 sec : 0.80 %
 0.871 - 0.660 sec : 0.46 %
 0.660 - 0.500 sec : 1.15 %

 Subcatchment Runoff Summary

Perv	Total	Total	Total	Total	Total	Total	Imperv
Runoff	Runoff	Precip	Peak	Runoff	Evap	Infil	Runoff
Subcatchment	mm	10^6 ltr	mm	mm	mm	mm	mm
		CMS	mm	Coeff			
A10			71.66	0.00	0.00	29.92	30.11
41.15	41.15	0.08	0.07	0.574			
A11			71.66	0.00	0.00	30.29	30.11
40.78	40.78	0.12	0.09	0.569			

A12i			71.66	0.00	0.00	12.90	50.10
7.61	57.71	0.11	0.09	0.805			
A12iii			71.66	0.00	0.00	12.69	50.12
7.83	57.95	0.05	0.04	0.809			
A13			71.66	0.00	0.00	30.39	30.11
40.67	40.67	0.09	0.07	0.567			
A14			71.66	0.00	0.00	30.95	30.10
40.10	40.10	0.13	0.08	0.560			
A15i			71.66	0.00	0.00	12.88	50.10
7.63	57.73	0.14	0.11	0.806			
A15iii			71.66	0.00	0.00	12.91	50.10
7.59	57.69	0.16	0.12	0.805			
A16i			71.66	0.00	0.00	12.89	50.10
7.62	57.72	0.03	0.03	0.805			
A16iii			71.66	0.00	0.00	12.92	50.10
7.59	57.69	0.04	0.03	0.805			
A17			71.66	0.00	0.00	29.65	30.12
41.43	41.43	0.04	0.04	0.578			
A17iii			71.66	0.00	0.00	12.69	50.12
7.83	57.95	0.05	0.04	0.809			
A18i			71.66	0.00	0.00	12.88	50.10
7.63	57.73	0.11	0.08	0.806			
A19			71.66	0.00	0.00	29.72	30.12
41.36	41.36	0.08	0.08	0.577			
A1i			71.66	0.00	0.00	12.67	50.12
7.85	57.97	0.09	0.07	0.809			
A1iii			71.66	0.00	0.00	12.71	50.12
7.80	57.92	0.12	0.09	0.808			
A20i			71.66	0.00	0.00	12.73	50.12
7.78	57.90	0.11	0.09	0.808			
A20iii			71.66	0.00	0.00	12.74	50.11
7.77	57.88	0.12	0.09	0.808			
A21			71.66	0.00	0.00	27.14	35.09
43.81	43.81	0.14	0.11	0.611			
A22			71.66	0.00	0.00	25.32	30.12
15.64	45.75	0.01	0.01	0.638			
A23			71.66	0.00	0.00	26.95	35.09
44.01	44.01	0.07	0.06	0.614			
A24i			71.66	0.00	0.00	12.64	50.13
7.88	58.00	0.06	0.05	0.809			
A24iii			71.66	0.00	0.00	12.71	50.12
7.80	57.92	0.14	0.11	0.808			
A25			71.66	0.00	0.00	27.13	35.09
43.82	43.82	0.13	0.10	0.611			
A26i			71.66	0.00	0.00	12.63	50.13
7.89	58.02	0.03	0.03	0.810			
A26iii			71.66	0.00	0.00	12.87	50.10
7.64	57.74	0.10	0.08	0.806			
A27i			71.66	0.00	0.00	12.79	50.11
7.72	57.83	0.05	0.04	0.807			
A27iii			71.66	0.00	0.00	12.83	50.10
7.68	57.78	0.10	0.08	0.806			
A28i			71.66	0.00	0.00	12.75	50.11
7.76	57.87	0.08	0.07	0.808			
A28iii			71.66	0.00	0.00	12.74	50.11
7.77	57.88	0.08	0.06	0.808			
A29			71.66	0.00	0.00	26.66	35.10
44.32	44.32	0.05	0.05	0.618			
A2i			71.66	0.00	0.00	12.66	50.12
7.86	57.98	0.07	0.06	0.809			

A2ii		71.66	0.00	0.00	12.65	50.12
7.86	57.99	0.07	0.06	0.809		
A3		71.66	0.00	0.00	29.68	30.12
41.41	41.41	0.06	0.06	0.578		
A30		71.66	0.00	0.00	25.44	30.12
15.51	45.63	0.01	0.01	0.637		
A31		71.66	0.00	0.00	26.65	35.10
44.33	44.33	0.08	0.08	0.619		
A32i		71.66	0.00	0.00	12.74	50.11
7.78	57.89	0.09	0.07	0.808		
A32ii		71.66	0.00	0.00	12.62	50.13
7.90	58.03	0.05	0.04	0.810		
A33i		71.66	0.00	0.00	12.57	50.13
7.96	58.09	0.06	0.05	0.811		
A33ii		71.66	0.00	0.00	12.73	50.11
7.78	57.90	0.09	0.07	0.808		
A34i		71.66	0.00	0.00	12.77	50.11
7.74	57.85	0.12	0.10	0.807		
A34ii		71.66	0.00	0.00	12.82	50.11
7.69	57.79	0.16	0.12	0.806		
A35i		71.66	0.00	0.00	12.81	50.11
7.70	57.81	0.13	0.10	0.807		
A35ii		71.66	0.00	0.00	12.77	50.11
7.74	57.85	0.12	0.09	0.807		
A36		71.66	0.00	0.00	27.16	35.09
43.79	43.79	0.13	0.10	0.611		
A37		71.66	0.00	0.00	25.34	30.12
15.62	45.74	0.01	0.01	0.638		
A38		71.66	0.00	0.00	27.01	35.09
43.95	43.95	0.11	0.09	0.613		
A39i		71.66	0.00	0.00	12.71	50.12
7.80	57.92	0.12	0.10	0.808		
A39ii		71.66	0.00	0.00	12.61	50.13
7.91	58.04	0.04	0.03	0.810		
A4		71.66	0.00	0.00	12.74	50.11
7.77	57.88	0.05	0.04	0.808		
A40		71.66	0.00	0.00	27.08	35.09
43.87	43.87	0.10	0.08	0.612		
A41		71.66	0.00	0.00	26.62	35.10
44.36	44.36	0.03	0.03	0.619		
A42i		71.66	0.00	0.00	12.82	50.11
7.69	57.80	0.08	0.07	0.807		
A42ii		71.66	0.00	0.00	12.68	50.12
7.84	57.96	0.05	0.04	0.809		
A42iii		71.66	0.00	0.00	12.63	50.13
7.89	58.02	0.01	0.01	0.810		
A43		71.66	0.00	0.00	27.14	35.09
43.81	43.81	0.10	0.08	0.611		
A44		71.66	0.00	0.00	27.09	35.09
43.86	43.86	0.09	0.07	0.612		
A45i		71.66	0.00	0.00	12.84	50.10
7.67	57.77	0.10	0.07	0.806		
A45ii		71.66	0.00	0.00	12.65	50.13
7.87	57.99	0.04	0.04	0.809		
A46i		71.66	0.00	0.00	12.84	50.10
7.67	57.78	0.09	0.07	0.806		
A46ii		71.66	0.00	0.00	12.75	50.11
7.77	57.88	0.08	0.06	0.808		
A47		71.66	0.00	0.00	26.65	35.10
44.32	44.32	0.06	0.06	0.618		

A48		71.66	0.00	0.00	13.05	50.09
7.46	57.55	0.12	0.09	0.803		
A49		71.66	0.00	0.00	26.59	35.10
44.39	44.39	0.03	0.03	0.619		
A50		71.66	0.00	0.00	12.82	50.11
7.69	57.79	0.04	0.03	0.806		
A51		71.66	0.00	0.00	12.90	50.10
7.61	57.71	0.11	0.08	0.805		
A52		71.66	0.00	0.00	25.31	30.12
15.64	45.76	0.01	0.01	0.639		
A53		71.66	0.00	0.00	26.67	35.10
44.31	44.31	0.08	0.08	0.618		
A54		71.66	0.00	0.00	26.86	35.09
44.11	44.11	0.07	0.06	0.615		
A5i		71.66	0.00	0.00	12.75	50.11
7.77	57.88	0.06	0.05	0.808		
A5ii		71.66	0.00	0.00	12.83	50.10
7.68	57.78	0.15	0.12	0.806		
A6		71.66	0.00	0.00	29.57	30.12
41.52	41.52	0.05	0.05	0.579		
A7i		71.66	0.00	0.00	12.75	50.11
7.76	57.87	0.13	0.10	0.808		
A7ii		71.66	0.00	0.00	12.79	50.11
7.72	57.83	0.16	0.13	0.807		
A8i		71.66	0.00	0.00	12.83	50.11
7.68	57.79	0.13	0.10	0.806		
A8ii		71.66	0.00	0.00	12.84	50.10
7.67	57.77	0.11	0.08	0.806		
A9i		71.66	0.00	0.00	12.79	50.11
7.72	57.83	0.11	0.08	0.807		
A9ii		71.66	0.00	0.00	12.62	50.13
7.90	58.03	0.04	0.03	0.810		
B2		71.66	0.00	0.00	0.00	70.12
0.00	70.12	2.41	1.61	0.978		
B4i		71.66	0.00	0.00	35.85	20.07
15.32	35.39	0.34	0.19	0.494		
B4ii		71.66	0.00	0.00	31.80	20.07
19.41	39.48	0.02	0.02	0.551		
B4iii		71.66	0.00	0.00	31.76	20.07
19.45	39.53	0.00	0.00	0.552		
C1		71.66	0.00	0.00	12.83	50.11
7.68	57.79	0.07	0.05	0.806		
C2		71.66	0.00	0.00	12.73	50.12
7.78	57.90	0.05	0.04	0.808		
PH4_A01		71.66	0.00	0.00	37.20	11.35
23.06	34.41	0.04	0.05	0.480		
PH4_A02		71.66	0.00	0.00	42.65	2.11
26.97	29.07	0.00	0.00	0.406		
PH4_A03		71.66	0.00	0.00	7.04	59.49
4.44	63.94	0.01	0.01	0.892		
PH4_A04		71.66	0.00	0.00	5.70	61.63
3.64	65.27	0.05	0.04	0.911		
PH4_A05		71.66	0.00	0.00	43.39	2.11
26.17	28.27	0.01	0.01	0.395		
PH4_A06		71.66	0.00	0.00	34.54	16.51
20.67	37.18	0.02	0.02	0.519		
PH4_A07		71.66	0.00	0.00	6.14	60.92
3.91	64.83	0.08	0.06	0.905		
PH4_A08		71.66	0.00	0.00	10.59	53.83
6.63	60.46	0.01	0.01	0.844		

PH4_A09		71.66	0.00	0.00	13.72	48.87
8.51	57.39	0.01	0.01	0.801		
PH4_A10		71.66	0.00	0.00	6.14	60.92
3.91	64.83	0.08	0.06	0.905		
PH4_A11		71.66	0.00	0.00	43.28	2.10
26.29	28.40	0.01	0.01	0.396		
PH4_A12		71.66	0.00	0.00	8.79	56.67
5.56	62.23	0.08	0.06	0.868		
PH4_A13		71.66	0.00	0.00	10.14	54.54
6.37	60.91	0.02	0.01	0.850		
PH4_A14		71.66	0.00	0.00	14.52	47.46
9.16	56.62	0.01	0.01	0.790		
PH4_A15		71.66	0.00	0.00	7.45	58.80
4.75	63.55	0.06	0.05	0.887		
PH4_A16		71.66	0.00	0.00	7.02	59.51
4.47	63.98	0.03	0.02	0.893		
PH4_A17		71.66	0.00	0.00	43.07	2.11
26.51	28.61	0.01	0.01	0.399		
PH4_A18		71.66	0.00	0.00	20.73	37.21
13.00	50.21	0.01	0.01	0.701		
PH4_B01		71.66	0.00	0.00	44.69	0.00
27.03	27.03	0.01	0.01	0.377		
PH4_B02		71.66	0.00	0.00	5.69	61.63
3.64	65.27	0.05	0.04	0.911		
PH4_B03		71.66	0.00	0.00	43.49	2.11
26.07	28.18	0.01	0.01	0.393		
PH4_B04		71.66	0.00	0.00	4.38	63.47
2.81	66.28	0.04	0.03	0.925		
PH4_B05		71.66	0.00	0.00	43.30	2.10
26.27	28.38	0.01	0.01	0.396		
PH4_B06		71.66	0.00	0.00	9.23	55.96
5.84	61.81	0.06	0.05	0.862		
PH4_B07		71.66	0.00	0.00	7.46	58.80
4.75	63.55	0.06	0.05	0.887		
PH4_B08		71.66	0.00	0.00	42.59	2.11
27.04	29.15	0.00	0.01	0.407		
PH4_B09		71.66	0.00	0.00	3.94	63.88
2.52	66.40	0.02	0.02	0.927		
PH4_B10		71.66	0.00	0.00	43.18	2.11
26.39	28.50	0.01	0.01	0.398		
PH4_B11		71.66	0.00	0.00	8.78	56.67
5.58	62.25	0.12	0.09	0.869		
PH4_B12		71.66	0.00	0.00	3.94	64.03
2.52	66.55	0.03	0.02	0.929		
PH4_B13		71.66	0.00	0.00	43.07	2.11
26.51	28.62	0.00	0.01	0.399		
PH4_B14		71.66	0.00	0.00	6.14	60.92
3.92	64.84	0.05	0.04	0.905		
PH4_B15		71.66	0.00	0.00	42.92	2.10
26.67	28.78	0.01	0.01	0.402		
PH4_B16		71.66	0.00	0.00	7.01	58.98
4.48	63.46	0.03	0.02	0.886		
PH4_B17		71.66	0.00	0.00	45.56	2.10
23.97	26.07	0.04	0.03	0.364		
PH4_B18		71.66	0.00	0.00	42.78	2.10
26.82	28.92	0.00	0.00	0.404		

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
02_(CB)	JUNCTION	0.09	1.97	87.57	0 01:12	1.97
03_(CB)	JUNCTION	0.08	1.96	87.56	0 01:12	1.96
04_(CB)	JUNCTION	0.10	2.08	87.61	0 01:11	2.08
05_(CB)	JUNCTION	0.10	2.08	87.61	0 01:11	2.08
06_(CB)	JUNCTION	0.79	1.71	87.10	0 01:10	1.70
08_(CB)	JUNCTION	0.08	2.07	87.51	0 01:15	2.07
09_(CB)	JUNCTION	0.08	2.09	87.51	0 01:15	2.09
1	JUNCTION	0.00	0.00	91.15	0 00:00	0.00
1_(RYCB)	JUNCTION	0.89	2.26	87.68	0 01:13	2.26
10	JUNCTION	0.00	0.00	91.07	0 00:00	0.00
10_(CB)	JUNCTION	0.10	1.58	87.75	0 01:22	1.58
100_(STM)	JUNCTION	1.13	1.73	83.00	0 01:16	1.73
102_(STM)	JUNCTION	1.06	1.79	83.13	0 01:15	1.79
104_(STM)	JUNCTION	1.03	1.89	83.28	0 01:15	1.89
106_(STM)	JUNCTION	0.31	0.65	84.19	0 01:16	0.65
108_(STM)	JUNCTION	0.30	0.58	84.20	0 01:16	0.58
11	JUNCTION	0.00	0.00	90.95	0 00:00	0.00
11_(CB)	JUNCTION	0.39	1.86	87.88	0 01:13	1.86
110_(STM)	JUNCTION	0.30	0.64	84.58	0 01:13	0.64
112_(STM)	JUNCTION	0.55	1.67	83.57	0 01:15	1.66
114_(STM)	JUNCTION	0.33	0.78	84.15	0 01:13	0.78
116_(STM)	JUNCTION	0.32	0.77	84.27	0 01:13	0.77
118_(STM)	JUNCTION	0.32	0.66	84.54	0 01:15	0.66
12	JUNCTION	0.00	0.00	90.73	0 00:00	0.00
12_(CB)	JUNCTION	0.09	2.10	87.75	0 01:10	2.10
120_(STM)	JUNCTION	0.36	1.86	84.53	0 01:15	1.83
122_(STM)	JUNCTION	0.38	1.89	84.63	0 01:15	1.86
124_(STM)	JUNCTION	0.36	1.91	84.74	0 01:15	1.87
126_(STM)	JUNCTION	0.38	2.00	84.98	0 01:15	1.96
128_(STM)	JUNCTION	0.39	2.05	85.22	0 01:15	1.99
13	JUNCTION	0.00	0.00	90.78	0 00:00	0.00
13_(CB)	JUNCTION	0.09	1.96	87.75	0 01:11	1.95
130_(STM)	JUNCTION	0.32	1.29	85.56	0 01:15	1.22
132_(STM)	JUNCTION	0.27	1.26	85.75	0 01:12	1.13
134_(STM)	JUNCTION	0.33	1.50	86.31	0 01:12	0.81
136_(STM)	JUNCTION	0.37	2.04	85.38	0 01:15	1.98
138_(STM)	JUNCTION	0.38	2.05	85.47	0 01:15	1.98
14	JUNCTION	0.00	0.00	90.51	0 01:12	0.00
14_(CB)	JUNCTION	0.09	2.12	88.13	0 01:11	2.12
140_(STM)	JUNCTION	0.39	2.05	85.76	0 01:15	1.97
142_(STM)	JUNCTION	0.31	1.17	86.07	0 01:15	1.06
144_(STM)	JUNCTION	0.34	1.93	86.06	0 01:15	1.85
146_(STM)	JUNCTION	0.19	1.55	86.55	0 01:15	1.17
148_(STM)	JUNCTION	0.19	1.60	86.74	0 01:15	0.91
15	JUNCTION	0.00	0.00	90.55	0 00:00	0.00
15_(CB)	JUNCTION	0.09	2.12	88.13	0 01:11	2.11
15_RYCB	JUNCTION	0.02	0.83	87.42	0 01:11	0.81
150_(STM)	JUNCTION	0.37	2.17	86.55	0 01:12	1.78
152_(STM)	JUNCTION	0.32	1.21	86.47	0 01:15	1.02
154_(STM)	JUNCTION	0.32	1.18	86.53	0 01:15	0.99

156_(STM)	JUNCTION	0.32	2.15	87.88	0	01:14	0.96	51_(CB)	JUNCTION	0.08	1.92	87.98	0	01:12	1.91
158_(STM)	JUNCTION	0.37	2.07	86.98	0	01:12	1.82	52_(CB)	JUNCTION	0.51	2.18	87.39	0	01:10	2.18
16	JUNCTION	0.00	0.00	90.58	0	00:00	0.00	53_(CB)	JUNCTION	0.10	2.11	89.78	0	01:15	2.11
16_(CB)	JUNCTION	0.09	2.10	88.27	0	01:12	2.10	54_(CB)	JUNCTION	0.09	2.07	89.78	0	01:15	2.07
160_(STM)	JUNCTION	0.37	2.07	87.06	0	01:12	1.84	55_(CB)	JUNCTION	0.23	1.99	87.26	0	01:10	1.99
162_(STM)	JUNCTION	0.37	1.87	87.22	0	01:18	1.87	56	JUNCTION	0.00	0.00	90.74	0	00:00	0.00
164_(STM)	JUNCTION	0.36	1.72	87.33	0	01:18	1.72	56_(CB)	JUNCTION	0.23	1.99	87.26	0	01:10	1.99
166_(STM)	JUNCTION	0.33	1.19	87.36	0	01:18	1.19	57_(CB)	JUNCTION	0.09	2.14	87.35	0	01:12	2.14
168_(STM)	JUNCTION	0.32	0.91	87.41	0	01:17	0.91	58_(CB)	JUNCTION	0.00	0.11	85.51	0	01:10	0.10
17	JUNCTION	0.00	0.00	90.58	0	00:00	0.00	59_(CB)	JUNCTION	0.01	0.18	86.03	0	01:09	0.18
17_(CB)	JUNCTION	0.09	2.09	88.26	0	01:11	2.08	6	JUNCTION	0.00	0.00	90.80	0	00:00	0.00
170_(STM)	JUNCTION	0.31	0.53	87.59	0	01:14	0.53	60	JUNCTION	0.00	0.00	90.61	0	00:00	0.00
18	JUNCTION	0.00	0.00	90.79	0	00:00	0.00	61	JUNCTION	0.00	0.00	90.75	0	00:00	0.00
18_(CB)	JUNCTION	0.31	1.57	88.54	0	01:12	1.57	62	JUNCTION	0.00	0.00	90.77	0	00:00	0.00
19	JUNCTION	0.00	0.00	90.34	0	00:00	0.00	63	JUNCTION	0.00	0.00	90.83	0	00:00	0.00
19_(CB)	JUNCTION	0.08	2.09	88.37	0	01:15	2.09	64	JUNCTION	0.00	0.00	90.91	0	00:00	0.00
2	JUNCTION	0.00	0.00	91.10	0	00:00	0.00	65	JUNCTION	0.00	0.00	90.86	0	00:00	0.00
20	JUNCTION	0.00	0.00	90.35	0	00:00	0.00	66	JUNCTION	0.00	0.00	90.55	0	00:00	0.00
20_(CB)	JUNCTION	0.11	2.11	88.74	0	01:12	2.11	67	JUNCTION	0.00	0.00	90.69	0	00:00	0.00
21	JUNCTION	0.00	0.00	90.00	0	00:00	0.00	7	JUNCTION	0.00	0.00	90.46	0	00:00	0.00
21_(CB)	JUNCTION	0.10	1.97	88.74	0	01:12	1.96	8	JUNCTION	0.00	0.00	89.84	0	00:00	0.00
2121_(STM)	JUNCTION	2.10	2.58	82.82	0	02:59	2.58	9	JUNCTION	0.00	0.00	91.15	0	00:00	0.00
2142_(STM)	JUNCTION	2.23	2.72	82.83	0	02:40	2.71	98_(STM)	JUNCTION	1.22	1.75	82.92	0	01:16	1.74
2143_(STM)	JUNCTION	2.40	2.89	82.82	0	02:59	2.89	ELB_1_(RYCB)	JUNCTION	0.01	1.18	87.69	0	01:10	1.18
2144_(STM)	JUNCTION	2.47	2.96	82.82	0	02:59	2.96	ELB_10_(RYCB)	JUNCTION	0.29	1.35	89.00	0	01:11	1.35
22_(RYCB)	JUNCTION	0.61	1.91	88.99	0	01:13	1.91	ELB_11_(RYCB)	JUNCTION	0.31	1.34	88.94	0	01:05	1.32
23_(CB)	JUNCTION	0.05	2.05	88.97	0	01:11	2.04	ELB_12_(RYCB)	JUNCTION	0.29	1.45	89.45	0	01:09	1.41
24_(CB)	JUNCTION	0.05	2.05	88.97	0	01:11	2.04	ELB_13_(RYCB)	JUNCTION	0.30	1.34	88.90	0	01:13	1.33
25_(CB)	JUNCTION	0.00	0.07	86.84	0	01:10	0.07	ELB_14_(RYCB)	JUNCTION	0.29	1.30	89.08	0	01:09	0.94
26_(CB)	JUNCTION	0.00	0.04	86.82	0	01:10	0.04	ELB_15_(RYCB)	JUNCTION	0.30	1.29	88.49	0	01:14	1.29
27_(CB)	JUNCTION	0.08	1.96	88.73	0	01:13	1.95	ELB_16_(RYCB)	JUNCTION	0.31	1.32	90.00	0	01:05	1.24
28_(CB)	JUNCTION	0.08	1.96	88.73	0	01:13	1.95	ELB_17_(RYCB)	JUNCTION	0.29	0.94	88.49	0	01:10	0.83
29_(RYCB)	JUNCTION	3.11	4.42	89.73	0	01:10	4.41	ELB_18_(RYCB)	JUNCTION	0.29	1.30	88.88	0	01:10	0.80
3	JUNCTION	0.00	0.00	91.06	0	00:00	0.00	ELB_19_(RYCB)	JUNCTION	0.29	1.44	88.41	0	01:09	1.43
30_(CB)	JUNCTION	0.02	0.68	87.61	0	01:10	0.68	ELB_2_(RYCB)	JUNCTION	0.36	1.62	87.88	0	01:10	1.60
31_(CB)	JUNCTION	0.72	1.74	88.64	0	01:11	1.74	ELB_20_(RYCB)	JUNCTION	0.31	1.62	88.00	0	01:14	1.62
32_(CB)	JUNCTION	0.06	1.40	89.69	0	01:13	1.40	ELB_21_(RYCB)	JUNCTION	0.29	1.55	89.61	0	01:09	1.20
33_(CB)	JUNCTION	0.82	2.26	89.73	0	01:13	2.26	ELB_22_(RYCB)	JUNCTION	0.32	1.36	89.90	0	01:10	1.36
34_(CB)	JUNCTION	0.10	2.01	89.52	0	01:12	2.01	ELB_23_(RYCB)	JUNCTION	0.30	1.71	90.70	0	01:11	1.71
35_(CB)	JUNCTION	0.10	2.01	89.52	0	01:12	2.01	ELB_24_(RYCB)	JUNCTION	0.00	0.00	86.55	0	00:00	0.00
36_(CB)	JUNCTION	0.07	2.07	89.86	0	01:10	2.07	ELB_25_(RYCB)	JUNCTION	0.02	1.12	87.55	0	01:10	1.12
37_(CB)	JUNCTION	0.06	2.05	89.85	0	01:10	2.05	ELB_3_(RYCB)	JUNCTION	0.30	1.49	87.97	0	01:12	1.49
38_(RYCB)	JUNCTION	0.02	0.86	88.24	0	01:11	0.85	ELB_4_(RYCB)	JUNCTION	0.22	1.43	87.96	0	01:12	1.43
39_(RYCB)	JUNCTION	0.02	1.19	89.86	0	01:12	1.19	ELB_5_(RYCB)	JUNCTION	0.21	1.18	87.71	0	01:09	0.89
4	JUNCTION	0.00	0.00	90.53	0	00:00	0.00	ELB_6_(RYCB)	JUNCTION	0.29	1.45	88.00	0	01:14	1.45
40_(CB)	JUNCTION	0.05	1.92	90.15	0	01:11	1.92	ELB_7_(RYCB)	JUNCTION	0.33	1.38	88.18	0	01:11	1.37
41_(CB)	JUNCTION	0.05	2.02	90.15	0	01:10	2.02	ELB_8_(RYCB)	JUNCTION	0.00	1.00	87.93	0	01:09	0.48
42_(CB)	JUNCTION	0.10	2.11	90.41	0	01:12	2.11	ELB_9_(RYCB)	JUNCTION	0.30	1.53	88.58	0	01:12	1.52
43_(CB)	JUNCTION	0.10	2.10	90.40	0	01:13	2.10	J1	JUNCTION	0.00	0.00	88.48	0	00:00	0.00
44_(CB)	JUNCTION	0.08	2.09	89.01	0	01:10	2.09	Maj-01_2	JUNCTION	0.00	0.00	90.90	0	00:00	0.00
45_(CB)	JUNCTION	0.08	2.10	89.02	0	01:11	2.10	Maj-02	JUNCTION	0.00	0.00	90.67	0	00:00	0.00
46_(CB)	JUNCTION	0.08	2.11	88.99	0	01:11	2.11	Maj-02_2	JUNCTION	0.00	0.05	90.47	0	01:12	0.05
47_(CB)	JUNCTION	0.08	1.97	89.00	0	01:10	1.96	Maj-03	JUNCTION	0.01	0.20	90.47	0	01:12	0.20
48_(CB)	JUNCTION	0.11	2.16	88.53	0	01:14	2.16	Maj-04	JUNCTION	0.00	0.00	90.61	0	01:15	0.00
49_(CB)	JUNCTION	0.10	2.01	88.53	0	01:14	2.01	Maj-04_2	JUNCTION	0.00	0.00	90.51	0	00:00	0.00
5	JUNCTION	0.00	0.00	90.56	0	00:00	0.00	Maj-05	JUNCTION	0.00	0.00	90.40	0	00:00	0.00
50_(CB)	JUNCTION	0.08	1.95	87.98	0	01:12	1.94	Maj-05_2	JUNCTION	0.00	0.00	90.37	0	01:20	0.00

Maj-06	JUNCTION	0.00	0.01	90.24	0	01:11	0.01
Maj-06_2	JUNCTION	0.00	0.13	90.23	0	01:10	0.13
Maj-07	JUNCTION	0.00	0.05	90.32	0	01:10	0.05
Maj-08	JUNCTION	0.00	0.05	90.20	0	01:10	0.05
Maj-09	JUNCTION	0.00	0.07	89.92	0	01:10	0.07
Maj-10	JUNCTION	0.00	0.15	89.92	0	01:10	0.15
Maj-11	JUNCTION	0.00	0.07	89.89	0	01:11	0.07
Maj-12	JUNCTION	0.01	0.19	89.86	0	01:15	0.19
Maj-13	JUNCTION	0.00	0.00	89.97	0	00:00	0.00
Maj-14	JUNCTION	0.01	0.21	89.69	0	01:16	0.21
Maj-15	JUNCTION	0.00	0.03	89.69	0	01:16	0.03
Maj-15_2	JUNCTION	0.00	0.03	89.39	0	01:10	0.03
Maj-16	JUNCTION	0.01	0.18	89.60	0	01:12	0.18
Maj-17	JUNCTION	0.00	0.00	90.06	0	00:00	0.00
Maj-18_2	JUNCTION	0.00	0.00	89.51	0	00:00	0.00
Maj-19	JUNCTION	0.00	0.02	89.41	0	01:10	0.02
Maj-19_2	JUNCTION	0.00	0.04	89.57	0	01:10	0.04
Maj-20	JUNCTION	0.01	0.09	89.26	0	01:10	0.09
Maj-21	JUNCTION	0.01	0.21	88.81	0	01:13	0.21
Maj-23	JUNCTION	0.00	0.03	89.27	0	01:10	0.03
Maj-24	JUNCTION	0.00	0.14	89.05	0	01:11	0.14
Maj-25	JUNCTION	0.00	0.00	89.15	0	00:00	0.00
Maj-26	JUNCTION	0.01	0.20	88.81	0	01:13	0.20
Maj-27	JUNCTION	0.00	0.00	88.85	0	00:00	0.00
Maj-28	JUNCTION	0.01	0.22	88.47	0	01:15	0.22
Maj-29	JUNCTION	0.00	0.00	88.59	0	00:00	0.00
Maj-30	JUNCTION	0.01	0.19	88.59	0	01:14	0.19
Maj-31	JUNCTION	0.00	0.03	89.06	0	01:11	0.03
Maj-32	JUNCTION	0.01	0.18	89.06	0	01:10	0.18
Maj-33	JUNCTION	0.00	0.15	89.07	0	01:11	0.15
Maj-34	JUNCTION	0.00	0.01	89.07	0	01:12	0.01
Maj-34_2	JUNCTION	0.00	0.00	89.16	0	00:00	0.00
Maj-35	JUNCTION	0.01	0.17	88.32	0	01:11	0.17
Maj-36	JUNCTION	0.00	0.00	88.41	0	00:00	0.00
Maj-37	JUNCTION	0.01	0.20	88.19	0	01:11	0.20
Maj-38	JUNCTION	0.00	0.00	88.19	0	01:12	0.00
Maj-39	JUNCTION	0.00	0.00	88.07	0	01:58	0.00
Maj-40	JUNCTION	0.00	0.00	87.97	0	00:00	0.00
Maj-41	JUNCTION	0.01	0.21	87.83	0	01:11	0.21
Maj-42	JUNCTION	0.01	0.17	88.05	0	01:11	0.17
Maj-43	JUNCTION	0.00	0.00	88.07	0	00:00	0.00
Maj-44	JUNCTION	0.01	0.28	87.82	0	01:21	0.28
Maj-45	JUNCTION	0.00	0.02	87.83	0	01:12	0.02
Maj-46	JUNCTION	0.01	0.16	87.57	0	01:14	0.16
Maj-48_2	JUNCTION	0.00	0.00	87.75	0	01:25	0.00
Maj-48_3	JUNCTION	0.00	0.03	87.67	0	01:09	0.03
Maj-50	JUNCTION	0.01	0.15	87.58	0	01:12	0.15
Maj-51	JUNCTION	0.00	0.01	87.72	0	01:11	0.01
Maj-52	JUNCTION	0.01	0.15	87.62	0	01:11	0.15
Maj-53	JUNCTION	0.00	0.03	87.62	0	01:12	0.03
Maj-54	JUNCTION	0.00	0.07	87.33	0	01:10	0.07
Maj-55	JUNCTION	0.00	0.03	87.52	0	01:10	0.03
Maj-56	JUNCTION	0.00	0.01	88.81	0	01:12	0.01
Maj-58	JUNCTION	0.01	0.26	87.42	0	01:12	0.26
Maj-59	JUNCTION	0.00	0.00	87.53	0	00:00	0.00
Maj-60	JUNCTION	0.00	0.00	88.62	0	00:00	0.00
Maj-61	JUNCTION	0.00	0.06	88.76	0	01:11	0.06

Maj-62	JUNCTION	0.00	0.06	89.91	0	01:12	0.06
Maj-63	JUNCTION	0.00	0.13	87.85	0	01:11	0.13
Maj-64	JUNCTION	0.00	0.01	88.81	0	01:13	0.01
Maj-65	JUNCTION	0.00	0.04	87.84	0	01:14	0.04
Maj-66	JUNCTION	0.00	0.04	87.69	0	01:11	0.04
Maj-67	JUNCTION	0.00	0.06	88.01	0	01:11	0.06
Maj-Park	JUNCTION	0.00	0.00	86.50	0	00:00	0.00
PH4_CB50-51	JUNCTION	0.05	2.16	90.50	0	01:10	2.16
PH4_CB52-53	JUNCTION	0.04	2.09	90.50	0	01:10	2.09
PH4_CB54-55	JUNCTION	0.09	2.19	90.62	0	01:10	2.19
PH4_CB56-57	JUNCTION	0.11	2.15	90.66	0	01:11	2.15
PH4_CB58-59	JUNCTION	0.10	1.94	91.00	0	01:11	1.94
PH4_CB60-61	JUNCTION	0.10	1.86	90.95	0	01:11	1.86
PH4_CB62-63	JUNCTION	0.10	1.97	90.92	0	01:12	1.97
PH4_CB64-65	JUNCTION	0.10	1.98	91.03	0	01:11	1.98
PH4_CB66-67	JUNCTION	0.07	1.88	90.52	0	01:10	1.88
PH4_CB68-69	JUNCTION	0.09	1.93	90.69	0	01:11	1.93
PH4_CB70-71	JUNCTION	0.12	2.13	90.70	0	01:12	2.13
PH4_CB72-73	JUNCTION	0.11	2.23	90.68	0	01:11	2.23
PH4_CB74-75	JUNCTION	0.09	2.19	90.54	0	01:11	2.19
PH4_CB78-79	JUNCTION	0.00	0.01	90.44	0	01:10	0.01
PH4_CB80-81	JUNCTION	0.11	2.22	90.57	0	01:11	2.22
PH4_CB82-83	JUNCTION	0.00	0.00	90.88	0	01:10	0.00
PH4_CB84-85	JUNCTION	0.00	0.00	90.86	0	01:10	0.00
PH4_CB86-87	JUNCTION	0.00	0.00	90.96	0	01:10	0.00
PH4_CB88-89	JUNCTION	0.00	0.00	90.69	0	01:10	0.00
PH4_CB90-91	JUNCTION	0.00	0.00	90.52	0	01:10	0.00
PH4_CB92-93	JUNCTION	0.00	0.00	90.41	0	01:10	0.00
PH4_MH100	JUNCTION	0.12	1.20	89.68	0	01:10	1.20
PH4_MH100_dummy	JUNCTION	0.02	0.32	88.80	0	01:10	0.32
PH4_MH102	JUNCTION	0.04	1.12	89.81	0	01:10	1.12
PH4_MH104	JUNCTION	0.04	1.05	89.83	0	01:10	1.05
PH4_MH106	JUNCTION	0.03	0.95	89.85	0	01:10	0.94
PH4_MH108	JUNCTION	0.03	0.85	89.85	0	01:10	0.85
PH4_MH110	JUNCTION	0.02	0.66	89.85	0	01:10	0.66
PH4_MH202	JUNCTION	0.14	1.58	89.83	0	01:09	1.58
PH4_MH202_dummy	JUNCTION	0.02	0.21	88.46	0	01:04	0.21
PH4_MH204	JUNCTION	0.06	1.46	89.92	0	01:09	1.46
PH4_MH206	JUNCTION	0.05	1.37	89.94	0	01:10	1.37
PH4_MH208	JUNCTION	0.05	1.35	90.04	0	01:03	1.27
PH4_MH210	JUNCTION	0.04	1.28	90.07	0	01:03	1.18
PH4_MH212	JUNCTION	0.03	1.98	90.96	0	01:03	0.99
PH4_MH302	JUNCTION	0.17	2.79	89.13	0	01:10	2.79
PH4_MH302_dummy	JUNCTION	0.03	0.90	87.24	0	01:18	0.90
PH4_MH304	JUNCTION	0.10	2.70	89.16	0	01:10	2.70
PH4_MH306	JUNCTION	0.07	2.25	89.20	0	01:10	2.25
PH4_MH308	JUNCTION	0.07	2.13	89.28	0	01:10	2.13
PH4_MH310	JUNCTION	0.06	2.04	89.30	0	01:10	2.04
PH4_MH312	JUNCTION	0.05	2.94	90.38	0	01:05	1.86
PH4_MH402	JUNCTION	0.04	0.68	87.81	0	01:12	0.67
PH4_MH404	JUNCTION	0.03	0.62	87.86	0	01:12	0.61
PH4_MH406	JUNCTION	0.03	0.71	88.05	0	01:12	0.70
PH4_MH408	JUNCTION	0.03	0.63	88.13	0	01:14	0.63
PH4_MH410	JUNCTION	0.02	0.48	88.14	0	01:13	0.48
PH4_MH412	JUNCTION	0.01	0.37	88.15	0	01:13	0.37
PH4_MH414	JUNCTION	0.01	0.16	88.16	0	01:13	0.16
PH4_MH502	JUNCTION	0.03	0.49	87.36	0	01:10	0.49

PH4_MH504	JUNCTION	0.03	0.52	87.40	0	01:10	0.52
PH4_MH506	JUNCTION	0.03	0.58	87.51	0	01:10	0.58
PH4_MH508	JUNCTION	0.03	0.57	87.55	0	01:12	0.57
PH4_MH510	JUNCTION	0.02	0.44	88.15	0	01:12	0.39
PH4_MH512	JUNCTION	0.02	0.56	88.08	0	01:12	0.54
PH4_MH602	JUNCTION	0.02	0.54	88.14	0	01:13	0.54
PH4_MH604	JUNCTION	0.01	0.34	88.15	0	01:12	0.34
PH4_RYCB150	JUNCTION	0.01	0.36	88.65	0	01:10	0.35
PH4_RYCB151	JUNCTION	0.01	0.42	88.62	0	01:10	0.42
PH4_RYCB153	JUNCTION	0.00	0.27	88.62	0	01:10	0.26
PH4_RYCB154	JUNCTION	0.01	0.39	88.34	0	01:10	0.39
PH4_RYCB155	JUNCTION	0.00	0.22	88.66	0	01:10	0.22
PH4_RYCB156	JUNCTION	0.00	0.19	88.12	0	01:10	0.19
PH4_RYCB158	JUNCTION	0.00	0.24	88.49	0	01:10	0.23
PH4_RYCB20	JUNCTION	0.01	0.66	89.86	0	01:10	0.66
PH4_RYCB21	JUNCTION	0.21	1.26	89.98	0	01:11	1.26
PH4_RYCB22	JUNCTION	0.24	1.69	90.28	0	01:13	1.69
PH4_RYCB23	JUNCTION	0.01	0.95	89.74	0	01:10	0.94
PH4_RYCB24	JUNCTION	0.05	1.44	89.09	0	01:17	1.44
RYCB_1_(RYCB)	JUNCTION	0.31	1.69	87.69	0	01:11	1.68
RYCB_10_(RYCB)	JUNCTION	0.33	1.47	88.49	0	01:14	1.47
RYCB_11_(RYCB)	JUNCTION	0.31	1.36	88.71	0	01:11	1.36
RYCB_12_(RYCB)	JUNCTION	0.35	1.91	89.91	0	01:12	1.91
RYCB_13_(RYCB)	JUNCTION	0.01	0.87	88.41	0	01:11	0.84
RYCB_14_(RYCB)	JUNCTION	0.34	1.76	89.90	0	01:11	1.75
RYCB_15_(RYCB)	JUNCTION	0.02	1.21	89.91	0	01:11	1.20
RYCB_18_(RYCB)	JUNCTION	0.34	2.32	88.08	0	01:11	2.32
RYCB_2_(RYCB)	JUNCTION	0.05	1.86	87.87	0	01:11	1.86
RYCB_3_(RYCB)	JUNCTION	0.31	1.78	87.96	0	01:13	1.78
RYCB_4_(RYCB)	JUNCTION	0.31	1.73	87.85	0	01:13	1.73
RYCB_5_(RYCB)	JUNCTION	0.39	1.97	88.01	0	01:11	1.96
RYCB_6_(RYCB)	JUNCTION	0.36	1.71	87.43	0	01:10	1.66
RYCB_7_(RYCB)	JUNCTION	0.33	2.07	88.56	0	01:11	2.00
RYCB_8_(RYCB)	JUNCTION	0.35	1.79	88.76	0	01:11	1.79
RYCB_9_(RYCB)	JUNCTION	0.31	1.72	89.26	0	01:12	1.72
Slope1	JUNCTION	0.00	0.10	89.17	0	01:10	0.10
StartNullStruct2	JUNCTION	0.02	1.40	88.02	0	01:07	1.24
StartNullStruct3	JUNCTION	0.01	0.50	84.59	0	01:14	0.47
STM-251_(STM)	JUNCTION	0.30	0.95	86.26	0	01:15	0.95
Structure_-_18_(RYCB)	JUNCTION	0.33	1.79	87.37	0	01:12	1.79
TEE_1_(RYCB)	JUNCTION	0.31	1.66	87.87	0	01:10	1.66
TEE_10_(RYCB)	JUNCTION	0.01	0.92	87.72	0	01:09	0.61
TEE_11_(RYCB)	JUNCTION	0.01	0.87	87.46	0	01:10	0.82
TEE_12_(RYCB)	JUNCTION	0.30	1.73	88.58	0	01:12	1.72
TEE_13_(RYCB)	JUNCTION	0.02	1.58	88.58	0	01:12	1.57
TEE_14_(RYCB)	JUNCTION	0.03	1.74	88.60	0	01:11	1.72
TEE_15_(RYCB)	JUNCTION	0.01	1.21	88.59	0	01:11	1.11
TEE_16_(RYCB)	JUNCTION	0.29	1.61	88.88	0	01:08	1.40
TEE_17_(RYCB)	JUNCTION	0.29	1.42	88.81	0	01:11	1.39
TEE_18_(RYCB)	JUNCTION	0.29	1.36	88.90	0	01:11	1.36
TEE_19_(RYCB)	JUNCTION	0.32	1.36	88.80	0	01:05	1.34
TEE_2_(RYCB)	JUNCTION	0.30	1.61	87.96	0	01:13	1.61
TEE_20_(RYCB)	JUNCTION	0.32	1.48	88.77	0	01:11	1.48
TEE_21_(RYCB)	JUNCTION	0.33	1.60	88.77	0	01:11	1.60
TEE_22_(RYCB)	JUNCTION	0.30	1.49	89.27	0	01:12	1.48
TEE_23_(RYCB)	JUNCTION	0.31	1.50	88.90	0	01:12	1.50

TEE_24_(RYCB)	JUNCTION	0.29	1.32	89.01	0	01:09	1.02
TEE_25_(RYCB)	JUNCTION	0.29	1.19	88.72	0	01:11	1.19
TEE_26_(RYCB)	JUNCTION	0.33	1.53	89.92	0	01:11	1.53
TEE_27_(RYCB)	JUNCTION	0.33	1.69	89.92	0	01:12	1.69
TEE_28_(RYCB)	JUNCTION	0.29	1.00	88.47	0	01:10	0.91
TEE_29_(RYCB)	JUNCTION	0.30	1.53	88.40	0	01:12	1.52
TEE_3_(RYCB)	JUNCTION	0.29	1.32	87.57	0	01:08	1.18
TEE_30_(RYCB)	JUNCTION	0.30	1.65	88.40	0	01:12	1.64
TEE_31_(RYCB)	JUNCTION	0.30	1.77	88.39	0	01:12	1.77
TEE_32_(RYCB)	JUNCTION	0.03	1.60	88.38	0	01:12	1.60
TEE_33_(RYCB)	JUNCTION	0.04	2.02	88.15	0	01:11	2.02
TEE_34_(RYCB)	JUNCTION	0.33	2.32	88.30	0	01:11	2.31
TEE_35_(RYCB)	JUNCTION	0.32	2.21	88.25	0	01:11	2.20
TEE_36_(RYCB)	JUNCTION	0.33	1.60	89.90	0	01:11	1.60
TEE_37_(RYCB)	JUNCTION	0.31	1.21	89.86	0	01:11	1.21
TEE_38_(RYCB)	JUNCTION	0.31	1.32	89.84	0	01:11	1.32
TEE_39_(RYCB)	JUNCTION	0.32	1.51	89.79	0	01:10	1.51
TEE_4_(RYCB)	JUNCTION	0.30	1.86	87.88	0	01:06	1.41
TEE_40_(RYCB)	JUNCTION	0.30	1.61	90.44	0	01:11	1.61
TEE_41_(RYCB)	JUNCTION	0.30	1.52	90.16	0	01:11	1.52
TEE_42_(RYCB)	JUNCTION	0.00	0.00	86.35	0	00:00	0.00
TEE_43_(RYCB)	JUNCTION	0.01	0.22	86.33	0	01:10	0.22
TEE_44_(RYCB)	JUNCTION	0.01	0.65	86.69	0	01:09	0.44
TEE_5_(RYCB)	JUNCTION	0.02	1.39	87.48	0	01:10	1.34
TEE_6_(RYCB)	JUNCTION	0.30	1.57	87.92	0	01:13	1.57
TEE_7_(RYCB)	JUNCTION	0.35	1.72	88.18	0	01:11	1.71
TEE_8_(RYCB)	JUNCTION	0.36	1.79	88.13	0	01:11	1.79
TEE_9_(RYCB)	JUNCTION	0.36	1.86	88.08	0	01:11	1.86
Maj-01	OUTFALL	0.00	0.00	91.06	0	00:00	0.00
Maj-18	OUTFALL	0.00	0.00	89.55	0	00:00	0.00
Maj-22	OUTFALL	0.00	0.00	88.83	0	00:00	0.00
Maj-48	OUTFALL	0.00	0.00	87.75	0	00:00	0.00
Maj-49	OUTFALL	0.00	0.00	87.67	0	00:00	0.00
Maj-57	OUTFALL	0.00	0.00	89.06	0	00:00	0.00
OF1	OUTFALL	0.00	0.00	85.00	0	00:00	0.00
STM-111_(STM)	OUTFALL	2.19	2.68	82.81	0	03:00	2.68
B2_Stor	STORAGE	0.00	0.19	90.69	0	01:14	0.19

Node Inflow Summary

Total Inflow	Flow Balance	Error Percent	Type	Maximum	Maximum	Time of Max Occurrence	Lateral Inflow	Volume
				Lateral Inflow	Total Inflow			
0.0766	0.009		JUNCTION	0.000	0.027	0 01:11	0	
			JUNCTION	0.000	0.031	0 01:12	0	0.

04_(CB)		JUNCTION	0.000	0.027	0	01:11	0
0.0814	0.016						
05_(CB)		JUNCTION	0.000	0.027	0	01:11	0
0.0814	0.013						
06_(CB)		JUNCTION	0.000	0.032	0	01:10	0
0.0453	2.084						
08_(CB)		JUNCTION	0.000	0.032	0	01:02	0
0.078	0.033						
09_(CB)		JUNCTION	0.000	0.028	0	01:01	0
0.0704	0.048						
1		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
1_(RYCB)		JUNCTION	0.000	0.075	0	01:09	0
0.0851	0.814						
10		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
10_(CB)		JUNCTION	0.000	0.031	0	01:22	0
0.124	0.103						
100_(STM)		JUNCTION	0.000	3.791	0	01:15	0
10	0.185						
102_(STM)		JUNCTION	0.000	3.739	0	01:15	0
9.88	0.138						
104_(STM)		JUNCTION	0.000	3.742	0	01:15	0
9.83	-0.119						
106_(STM)		JUNCTION	0.000	0.113	0	01:14	0
0.245	0.192						
108_(STM)		JUNCTION	0.000	0.056	0	01:13	0
0.0849	0.397						
11		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
11_(CB)		JUNCTION	0.000	0.094	0	01:10	0
0.208	0.219						
110_(STM)		JUNCTION	0.000	0.056	0	01:13	0
0.0844	0.420						
112_(STM)		JUNCTION	0.000	3.445	0	01:15	0
9.15	0.346						
114_(STM)		JUNCTION	0.000	0.301	0	01:12	0
0.775	-0.020						
116_(STM)		JUNCTION	0.000	0.228	0	01:12	0
0.479	-0.120						
118_(STM)		JUNCTION	0.000	0.095	0	01:11	0
0.249	1.440						
12		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
12_(CB)		JUNCTION	0.000	0.050	0	01:01	0
0.141	0.011						
120_(STM)		JUNCTION	0.000	3.034	0	01:15	0
8.1	-0.006						
122_(STM)		JUNCTION	0.000	2.935	0	01:15	0
7.82	0.016						
124_(STM)		JUNCTION	0.000	2.935	0	01:15	0
7.82	-0.030						
126_(STM)		JUNCTION	0.000	2.935	0	01:15	0
7.82	-0.061						
128_(STM)		JUNCTION	0.000	2.880	0	01:15	0
7.67	0.078						
13		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
13_(CB)		JUNCTION	0.000	0.048	0	01:11	0
0.137	0.011						

130_(STM)		JUNCTION	0.000	0.162	0	01:10	0
0.445	0.538						
132_(STM)		JUNCTION	0.000	0.108	0	01:10	0
0.277	0.141						
134_(STM)		JUNCTION	0.000	0.017	0	01:11	0
0.00122	29.719						
136_(STM)		JUNCTION	0.000	2.596	0	01:16	0
6.95	0.006						
138_(STM)		JUNCTION	0.000	2.470	0	01:16	0
6.62	-0.073						
14		JUNCTION	0.000	0.000	0	01:10	0
6.41e-06	6.399 ltr						
14_(CB)		JUNCTION	0.000	0.029	0	01:01	0
0.0774	0.069						
140_(STM)		JUNCTION	0.000	2.406	0	01:11	0
6.38	-0.105						
142_(STM)		JUNCTION	0.000	0.109	0	01:12	0
0.21	0.557						
144_(STM)		JUNCTION	0.000	2.314	0	01:12	0
6.07	0.022						
146_(STM)		JUNCTION	0.000	0.218	0	01:15	0
0.501	-0.132						
148_(STM)		JUNCTION	0.000	0.207	0	01:14	0
0.483	0.446						
15		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
15_(CB)		JUNCTION	0.000	0.029	0	01:01	0
0.0773	0.067						
15_RYCB		JUNCTION	0.000	0.150	0	01:11	0
0.227	-0.011						
150_(STM)		JUNCTION	0.000	2.002	0	01:12	0
5.29	-0.186						
152_(STM)		JUNCTION	0.000	0.203	0	01:26	0
0.556	0.030						
154_(STM)		JUNCTION	0.000	0.104	0	01:25	0
0.274	0.266						
156_(STM)		JUNCTION	0.000	0.099	0	01:15	0
0.276	0.932						
158_(STM)		JUNCTION	0.000	1.637	0	01:12	0
4.46	0.314						
16		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
16_(CB)		JUNCTION	0.000	0.023	0	01:01	0
0.0632	0.080						
160_(STM)		JUNCTION	0.000	1.540	0	01:12	0
4.16	-0.061						
162_(STM)		JUNCTION	0.000	1.566	0	01:12	0
4.16	0.075						
164_(STM)		JUNCTION	0.000	1.112	0	01:12	0
3.15	0.047						
166_(STM)		JUNCTION	0.000	0.206	0	01:23	0
0.574	0.111						
168_(STM)		JUNCTION	0.000	0.132	0	01:10	0
0.389	0.053						
17		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
17_(CB)		JUNCTION	0.000	0.028	0	01:01	0
0.074	0.059						
170_(STM)		JUNCTION	0.000	0.068	0	01:12	0
0.208	0.193						

18		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
18_(CB)		JUNCTION	0.000	0.092	0 01:11	0
0.188	0.175					
19		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
19_(CB)		JUNCTION	0.000	0.071	0 01:15	0
0.16	-0.014					
2		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
20		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
20_(CB)		JUNCTION	0.000	0.036	0 01:01	0
0.117	-0.011					
21		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
21_(CB)		JUNCTION	0.000	0.035	0 01:01	0
0.114	-0.008					
2121_(STM)		JUNCTION	0.000	3.860	0 01:16	0
10.2	0.785					
2142_(STM)		JUNCTION	0.000	4.011	0 01:16	0
10.5	0.819					
2143_(STM)		JUNCTION	0.000	3.943	0 01:16	0
10.4	0.398					
2144_(STM)		JUNCTION	0.000	3.940	0 01:16	0
10.4	0.409					
22_(RYCB)		JUNCTION	0.000	0.072	0 01:10	0
0.0769	0.403					
23_(CB)		JUNCTION	0.000	0.049	0 01:11	0
0.0943	-0.005					
24_(CB)		JUNCTION	0.000	0.049	0 01:11	0
0.0943	-0.005					
25_(CB)		JUNCTION	0.000	0.009	0 01:10	0
0.0136	0.003					
26_(CB)		JUNCTION	0.000	0.004	0 01:10	0
0.00668	0.004					
27_(CB)		JUNCTION	0.000	0.068	0 01:13	0
0.178	0.005					
28_(CB)		JUNCTION	0.000	0.068	0 01:13	0
0.178	0.005					
29_(RYCB)		JUNCTION	0.000	0.077	0 01:06	0
0.087	4.355					
3		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
30_(CB)		JUNCTION	0.000	0.087	0 01:10	0
0.129	-0.002					
31_(CB)		JUNCTION	0.000	0.109	0 01:10	0
0.154	0.558					
32_(CB)		JUNCTION	0.000	0.069	0 01:31	0
0.134	0.269					
33_(CB)		JUNCTION	0.000	0.075	0 01:11	0
0.173	0.559					
34_(CB)		JUNCTION	0.000	0.049	0 01:14	0
0.15	-0.008					
35_(CB)		JUNCTION	0.000	0.049	0 01:14	0
0.15	-0.008					
36_(CB)		JUNCTION	0.000	0.037	0 01:01	0
0.0941	0.063					
37_(CB)		JUNCTION	0.000	0.050	0 01:02	0
0.11	0.037					

38_(RYCB)		JUNCTION	0.000	0.053	0 01:10	0
0.0536	0.002					
39_(RYCB)		JUNCTION	0.000	0.054	0 01:07	0
0.0627	0.006					
4		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
40_(CB)		JUNCTION	0.000	0.048	0 01:10	0
0.0863	0.000					
41_(CB)		JUNCTION	0.000	0.056	0 01:05	0
0.0876	0.001					
42_(CB)		JUNCTION	0.000	0.034	0 01:01	0
0.0995	0.001					
43_(CB)		JUNCTION	0.000	0.058	0 01:02	0
0.108	0.015					
44_(CB)		JUNCTION	0.000	0.032	0 01:02	0
0.0749	0.035					
45_(CB)		JUNCTION	0.000	0.023	0 01:01	0
0.0588	0.078					
46_(CB)		JUNCTION	0.000	0.033	0 01:01	0
0.0797	0.026					
47_(CB)		JUNCTION	0.000	0.027	0 01:01	0
0.0708	0.057					
48_(CB)		JUNCTION	0.000	0.028	0 01:01	0
0.0861	-0.005					
49_(CB)		JUNCTION	0.000	0.027	0 01:01	0
0.0839	0.010					
5		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
50_(CB)		JUNCTION	0.000	0.048	0 01:12	0
0.125	0.007					
51_(CB)		JUNCTION	0.000	0.047	0 01:12	0
0.124	0.011					
52_(CB)		JUNCTION	0.000	0.052	0 01:10	0
0.0607	0.502					
53_(CB)		JUNCTION	0.000	0.050	0 01:15	0
0.139	-0.011					
54_(CB)		JUNCTION	0.000	0.049	0 01:15	0
0.138	-0.011					
55_(CB)		JUNCTION	0.000	0.046	0 01:10	0
0.0675	0.319					
56		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
56_(CB)		JUNCTION	0.000	0.046	0 01:10	0
0.0675	0.319					
57_(CB)		JUNCTION	0.000	0.050	0 01:12	0
0.133	0.070					
58_(CB)		JUNCTION	0.191	0.191	0 01:10	0.335
0.335	-12.230					
59_(CB)		JUNCTION	0.000	0.006	0 01:09	0
0.00954	-0.007					
6		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
60		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
61		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
62		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					
63		JUNCTION	0.000	0.000	0 00:00	0
0	0.000 ltr					

64		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
65		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
66		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
67		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
7		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
8		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
9		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
98_(STM)		JUNCTION	0.000	3.870	0	01:15	0
10.2	0.494						
ELB_1_(RYCB)		JUNCTION	0.000	0.009	0	01:05	0
0.00104	0.388						
ELB_10_(RYCB)		JUNCTION	0.000	0.028	0	01:10	0
0.000879	33.593						
ELB_11_(RYCB)		JUNCTION	0.000	0.033	0	01:04	0
0.000799	41.826						
ELB_12_(RYCB)		JUNCTION	0.000	0.018	0	01:09	0
0.00111	0.583						
ELB_13_(RYCB)		JUNCTION	0.000	0.018	0	01:09	0
0.00106	23.142						
ELB_14_(RYCB)		JUNCTION	0.000	0.018	0	01:09	0
0.000721	76.868						
ELB_15_(RYCB)		JUNCTION	0.000	0.011	0	01:07	0
0.0011	18.882						
ELB_16_(RYCB)		JUNCTION	0.000	0.029	0	01:05	0
0.000933	20.845						
ELB_17_(RYCB)		JUNCTION	0.000	0.011	0	01:10	0
0.00072	86.943						
ELB_18_(RYCB)		JUNCTION	0.000	0.014	0	01:10	0
0.00103	20.086						
ELB_19_(RYCB)		JUNCTION	0.000	0.036	0	01:09	0
0.00113	30.919						
ELB_2_(RYCB)		JUNCTION	0.000	0.026	0	01:07	0
0.00117	0.000						
ELB_20_(RYCB)		JUNCTION	0.000	0.136	0	01:10	0
0.0189	5.350						
ELB_21_(RYCB)		JUNCTION	0.000	0.029	0	01:09	0
0.00112	2.210						
ELB_22_(RYCB)		JUNCTION	0.000	0.027	0	01:05	0
0.00149	-3.579						
ELB_23_(RYCB)		JUNCTION	0.062	0.062	0	01:10	0.0638
0.0638	1.095						
ELB_24_(RYCB)		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
ELB_25_(RYCB)		JUNCTION	0.077	0.077	0	01:10	0.0807
0.0807	-0.009						
ELB_3_(RYCB)		JUNCTION	0.000	0.024	0	01:09	0
0.00114	30.631						
ELB_4_(RYCB)		JUNCTION	0.000	0.013	0	01:08	0
0.00138	7.272						
ELB_5_(RYCB)		JUNCTION	0.000	0.016	0	01:08	0
0.001	-3.511						
ELB_6_(RYCB)		JUNCTION	0.000	0.042	0	01:10	0
0.0132	-3.951						

ELB_7_(RYCB)		JUNCTION	0.000	0.049	0	01:03	0
0.00105	18.442						
ELB_8_(RYCB)		JUNCTION	0.000	0.022	0	01:09	0
0.000439	0.969						
ELB_9_(RYCB)		JUNCTION	0.000	0.023	0	01:07	0
0.00173	2.606						
J1		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-01_2		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-02		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-02_2		JUNCTION	0.000	0.016	0	01:10	0
0.00345	5.664						
Maj-03		JUNCTION	0.166	0.166	0	01:10	0.208
0.211	-0.012						
Maj-04		JUNCTION	0.000	0.000	0	01:10	0
5.12e-06	5.123 ltr						
Maj-04_2		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-05		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-05_2		JUNCTION	0.000	0.000	0	01:10	0
1.77e-05	2.662 ltr						
Maj-06		JUNCTION	0.001	0.001	0	01:10	0.000868
0.000883	13.400						
Maj-06_2		JUNCTION	0.111	0.144	0	01:10	0.138
0.174	-0.041						
Maj-07		JUNCTION	0.072	0.072	0	01:10	0.0765
0.0766	0.093						
Maj-08		JUNCTION	0.000	0.037	0	01:10	0
0.0414	0.611						
Maj-09		JUNCTION	0.042	0.133	0	01:10	0.0532
0.115	-0.215						
Maj-10		JUNCTION	0.162	0.162	0	01:10	0.209
0.225	0.024						
Maj-11		JUNCTION	0.000	0.074	0	01:10	0
0.0398	-3.761						
Maj-12		JUNCTION	0.183	0.235	0	01:10	0.237
0.278	0.668						
Maj-13		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-14		JUNCTION	0.116	0.137	0	01:10	0.148
0.158	-0.296						
Maj-15		JUNCTION	0.000	0.038	0	01:12	0
0.0124	17.821						
Maj-15_2		JUNCTION	0.000	0.035	0	01:10	0
0.0479	-0.055						
Maj-16		JUNCTION	0.231	0.231	0	01:10	0.295
0.299	-0.273						
Maj-17		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-18_2		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-19		JUNCTION	0.000	0.021	0	01:10	0
0.0254	0.209						
Maj-19_2		JUNCTION	0.056	0.056	0	01:10	0.0733
0.0733	-0.033						
Maj-20		JUNCTION	0.229	0.236	0	01:10	0.301
0.306	-0.907						

Maj-21		JUNCTION	0.040	0.272	0	01:10	0.0504
0.36	0.817						
Maj-23		JUNCTION	0.000	0.018	0	01:10	0
0.0257	-0.227						
Maj-24		JUNCTION	0.126	0.144	0	01:10	0.163
0.189	0.079						
Maj-25		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-26		JUNCTION	0.183	0.183	0	01:10	0.232
0.232	0.065						
Maj-27		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-28		JUNCTION	0.161	0.195	0	01:10	0.201
0.219	0.064						
Maj-29		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-30		JUNCTION	0.130	0.138	0	01:10	0.165
0.17	0.083						
Maj-31		JUNCTION	0.000	0.030	0	01:10	0
0.00652	4.772						
Maj-32		JUNCTION	0.120	0.120	0	01:10	0.155
0.157	-0.242						
Maj-33		JUNCTION	0.104	0.104	0	01:10	0.134
0.134	-0.038						
Maj-34		JUNCTION	0.000	0.007	0	01:11	0
0.000515	134.557						
Maj-34_2		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-35		JUNCTION	0.109	0.109	0	01:10	0.137
0.137	0.056						
Maj-36		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-37		JUNCTION	0.124	0.124	0	01:10	0.155
0.155	0.033						
Maj-38		JUNCTION	0.000	0.002	0	01:11	0
6.68e-05	56.111 ltr						
Maj-39		JUNCTION	0.000	0.000	0	01:12	0
2.15e-06	0.000 ltr						
Maj-40		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-41		JUNCTION	0.220	0.220	0	01:10	0.282
0.283	-0.134						
Maj-42		JUNCTION	0.194	0.194	0	01:10	0.249
0.249	0.041						
Maj-43		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-44		JUNCTION	0.133	0.188	0	01:10	0.167
0.202	0.087						
Maj-45		JUNCTION	0.000	0.042	0	01:10	0
0.00518	20.597						
Maj-46		JUNCTION	0.104	0.125	0	01:10	0.132
0.148	-0.005						
Maj-48_2		JUNCTION	0.000	0.000	0	01:14	0
2.12e-05	6.571 ltr						
Maj-48_3		JUNCTION	0.012	0.012	0	01:10	0.0147
0.0147	-0.154						
Maj-50		JUNCTION	0.129	0.130	0	01:10	0.159
0.161	0.037						
Maj-51		JUNCTION	0.003	0.003	0	01:10	0.00316
0.00316	2.227						

Maj-52		JUNCTION	0.132	0.133	0	01:10	0.169
0.171	-0.023						
Maj-53		JUNCTION	0.000	0.031	0	01:10	0
0.0138	0.755						
Maj-54		JUNCTION	0.087	0.102	0	01:10	0.118
0.135	-0.047						
Maj-55		JUNCTION	0.030	0.030	0	01:10	0.0381
0.0382	-1.254						
Maj-56		JUNCTION	0.000	0.001	0	01:11	0
3.79e-05	19.775 ltr						
Maj-58		JUNCTION	0.091	0.106	0	01:10	0.117
0.134	0.381						
Maj-59		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-60		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
Maj-61		JUNCTION	0.000	0.005	0	01:11	0
0.000712	-0.562						
Maj-62		JUNCTION	0.000	0.006	0	01:11	0
0.00106	1.162						
Maj-63		JUNCTION	0.000	0.034	0	01:11	0
0.00949	-0.041						
Maj-64		JUNCTION	0.000	0.001	0	01:11	0
7.59e-05	145.853						
Maj-65		JUNCTION	0.000	0.001	0	01:13	0
5.03e-05	6.408						
Maj-66		JUNCTION	0.000	0.002	0	01:10	0
9.83e-05	4.783						
Maj-67		JUNCTION	0.000	0.006	0	01:11	0
0.00123	-0.772						
Maj-Park		JUNCTION	0.000	0.000	0	00:00	0
0	0.000 ltr						
PH4_CB50-51		JUNCTION	0.020	0.020	0	01:10	0.0273
0.0273	0.095						
PH4_CB52-53		JUNCTION	0.016	0.016	0	01:10	0.0219
0.0219	0.069						
PH4_CB54-55		JUNCTION	0.030	0.030	0	01:10	0.0404
0.0404	0.156						
PH4_CB56-57		JUNCTION	0.037	0.037	0	01:10	0.0489
0.0489	0.106						
PH4_CB58-59		JUNCTION	0.058	0.058	0	01:10	0.0778
0.0778	0.131						
PH4_CB60-61		JUNCTION	0.038	0.038	0	01:10	0.0516
0.0516	0.177						
PH4_CB62-63		JUNCTION	0.060	0.060	0	01:10	0.0778
0.0778	0.163						
PH4_CB64-65		JUNCTION	0.060	0.060	0	01:10	0.0804
0.0804	0.155						
PH4_CB66-67		JUNCTION	0.024	0.024	0	01:10	0.032
0.032	0.100						
PH4_CB68-69		JUNCTION	0.046	0.046	0	01:10	0.061
0.061	0.148						
PH4_CB70-71		JUNCTION	0.045	0.045	0	01:10	0.0581
0.0581	0.141						
PH4_CB72-73		JUNCTION	0.047	0.047	0	01:10	0.0616
0.0616	0.064						
PH4_CB74-75		JUNCTION	0.094	0.094	0	01:10	0.121
0.121	0.058						
PH4_CB78-79		JUNCTION	0.021	0.021	0	01:10	0.0279
0.0279	-0.128						

PH4_CB880-81	JUNCTION	0.035	0.035	0	01:10	0.0467
0.0467	0.057					
PH4_CB882-83	JUNCTION	0.006	0.006	0	01:10	0.00831
0.00831	-0.752					
PH4_CB884-85	JUNCTION	0.009	0.009	0	01:10	0.0121
0.0121	-0.185					
PH4_CB886-87	JUNCTION	0.009	0.009	0	01:10	0.0109
0.0109	-0.544					
PH4_CB888-89	JUNCTION	0.013	0.013	0	01:10	0.0164
0.0164	-0.123					
PH4_CB90-91	JUNCTION	0.012	0.012	0	01:10	0.0142
0.0142	-0.254					
PH4_CB92-93	JUNCTION	0.008	0.008	0	01:10	0.00853
0.00853	-0.078					
PH4_MH100	JUNCTION	0.000	0.064	0	01:10	0
0.182	0.019					
PH4_MH100_dummy	JUNCTION	0.000	0.064	0	01:10	0
0.182	-0.043					
PH4_MH102	JUNCTION	0.000	0.057	0	01:11	0
0.17	0.021					
PH4_MH104	JUNCTION	0.000	0.036	0	01:11	0
0.0918	-0.120					
PH4_MH106	JUNCTION	0.000	0.026	0	01:10	0
0.0681	0.084					
PH4_MH108	JUNCTION	0.000	0.021	0	01:04	0
0.0617	0.044					
PH4_MH110	JUNCTION	0.000	0.017	0	01:05	0
0.0106	-0.016					
PH4_MH202	JUNCTION	0.000	0.059	0	01:10	0
0.185	0.025					
PH4_MH202_dummy	JUNCTION	0.000	0.059	0	01:10	0
0.185	-0.011					
PH4_MH204	JUNCTION	0.000	0.046	0	01:11	0
0.169	0.001					
PH4_MH206	JUNCTION	0.000	0.028	0	01:10	0
0.0912	-0.078					
PH4_MH208	JUNCTION	0.000	0.034	0	01:02	0
0.0913	-0.029					
PH4_MH210	JUNCTION	0.000	0.043	0	01:02	0
0.0921	0.134					
PH4_MH212	JUNCTION	0.000	0.027	0	01:03	0
0.0117	-0.414					
PH4_MH302	JUNCTION	0.000	0.053	0	01:10	0
0.135	0.048					
PH4_MH302_dummy	JUNCTION	0.000	0.053	0	01:10	0
0.135	-0.062					
PH4_MH304	JUNCTION	0.000	0.052	0	01:06	0
0.128	-0.034					
PH4_MH306	JUNCTION	0.000	0.052	0	01:06	0
0.117	-0.332					
PH4_MH308	JUNCTION	0.000	0.039	0	01:10	0
0.0852	0.314					
PH4_MH310	JUNCTION	0.000	0.032	0	01:06	0
0.0756	0.099					
PH4_MH312	JUNCTION	0.000	0.029	0	01:05	0
0.0147	-0.101					
PH4_MH402	JUNCTION	0.000	0.170	0	01:14	0
0.462	0.024					
PH4_MH404	JUNCTION	0.000	0.152	0	01:14	0
0.411	-0.014					

PH4_MH406	JUNCTION	0.000	0.140	0	01:14	0
0.384	0.068					
PH4_MH408	JUNCTION	0.000	0.092	0	01:15	0
0.255	-0.145					
PH4_MH410	JUNCTION	0.000	0.041	0	01:16	0
0.103	-0.026					
PH4_MH412	JUNCTION	0.000	0.035	0	01:10	0
0.0948	-0.064					
PH4_MH414	JUNCTION	0.000	0.021	0	01:10	0
0.0546	0.157					
PH4_MH502	JUNCTION	0.000	0.185	0	01:10	0
0.497	0.000					
PH4_MH504	JUNCTION	0.000	0.184	0	01:10	0
0.497	-0.001					
PH4_MH506	JUNCTION	0.000	0.184	0	01:10	0
0.497	0.042					
PH4_MH508	JUNCTION	0.000	0.170	0	01:14	0
0.462	0.025					
PH4_MH510	JUNCTION	0.000	0.052	0	01:10	0
0.128	0.184					
PH4_MH512	JUNCTION	0.000	0.051	0	01:12	0
0.128	-0.173					
PH4_MH602	JUNCTION	0.000	0.041	0	01:13	0
0.126	-0.008					
PH4_MH604	JUNCTION	0.000	0.023	0	01:10	0
0.0642	-0.016					
PH4_RYCB150	JUNCTION	0.009	0.009	0	01:10	0.00713
0.00713	-0.005					
PH4_RYCB151	JUNCTION	0.010	0.010	0	01:10	0.0072
0.0072	-0.007					
PH4_RYCB153	JUNCTION	0.008	0.008	0	01:10	0.00624
0.00624	-0.005					
PH4_RYCB154	JUNCTION	0.010	0.010	0	01:10	0.00817
0.00817	-0.004					
PH4_RYCB155	JUNCTION	0.006	0.006	0	01:10	0.00437
0.00437	-0.011					
PH4_RYCB156	JUNCTION	0.006	0.006	0	01:10	0.00458
0.00458	-0.005					
PH4_RYCB158	JUNCTION	0.007	0.007	0	01:10	0.00568
0.00568	-0.003					
PH4_RYCB20	JUNCTION	0.002	0.010	0	01:06	0.00116
0.00157	-0.003					
PH4_RYCB21	JUNCTION	0.008	0.008	0	01:10	0.00679
0.00735	3.265					
PH4_RYCB22	JUNCTION	0.024	0.024	0	01:10	0.0245
0.0246	1.039					
PH4_RYCB23	JUNCTION	0.013	0.013	0	01:10	0.0102
0.0102	-0.003					
PH4_RYCB24	JUNCTION	0.012	0.019	0	01:05	0.00887
0.0104	0.496					
RYCB_1_(RYCB)	JUNCTION	0.032	0.032	0	01:10	0.0329
0.0339	1.054					
RYCB_10_(RYCB)	JUNCTION	0.000	0.077	0	01:10	0
0.128	0.443					
RYCB_11_(RYCB)	JUNCTION	0.068	0.073	0	01:09	0.0919
0.096	0.794					
RYCB_12_(RYCB)	JUNCTION	0.090	0.090	0	01:10	0.117
0.126	0.942					
RYCB_13_(RYCB)	JUNCTION	0.055	0.055	0	01:10	0.0544
0.0569	1.150					

RYCB_14_(RYCB)	JUNCTION	0.074	0.074	0	01:10	0.0831	
0.0988	1.190						
RYCB_15_(RYCB)	JUNCTION	0.000	0.054	0	01:07	0	
0.0625	-0.323						
RYCB_18_(RYCB)	JUNCTION	0.012	0.137	0	01:09	0.0133	
0.235	0.359						
RYCB_2_(RYCB)	JUNCTION	0.081	0.083	0	01:08	0.103	
0.107	0.560						
RYCB_3_(RYCB)	JUNCTION	0.070	0.075	0	01:09	0.0873	
0.0913	1.518						
RYCB_4_(RYCB)	JUNCTION	0.058	0.072	0	01:11	0.0603	
0.0744	1.238						
RYCB_5_(RYCB)	JUNCTION	0.077	0.101	0	01:11	0.0961	
0.137	0.804						
RYCB_6_(RYCB)	JUNCTION	0.006	0.135	0	01:09	0.00639	
0.141	0.293						
RYCB_7_(RYCB)	JUNCTION	0.112	0.170	0	01:09	0.142	
0.234	0.157						
RYCB_8_(RYCB)	JUNCTION	0.102	0.102	0	01:10	0.129	
0.138	0.817						
RYCB_9_(RYCB)	JUNCTION	0.075	0.090	0	01:09	0.0786	
0.0831	1.818						
Slope1		JUNCTION	0.127	0.143	0	01:10	0.164
0.192	-0.143						
StartNullStruct2		JUNCTION	0.000	0.040	0	01:07	0
0.00283	4.715						
StartNullStruct3		JUNCTION	0.000	0.058	0	01:13	0
0.0687	0.005						
STM-251_(STM)		JUNCTION	0.000	0.053	0	01:10	0
0.0833	-0.122						
Structure_-(18)_(RYCB)	JUNCTION	0.000	0.137	0	01:09	0	
0.234	-0.074						
TEE_1_(RYCB)	JUNCTION	0.000	0.032	0	01:07	0	
0.00573	-0.347						
TEE_10_(RYCB)	JUNCTION	0.000	0.027	0	01:09	0	
0.00198	-14.164						
TEE_11_(RYCB)	JUNCTION	0.049	0.050	0	01:09	0.0514	
0.0533	0.280						
TEE_12_(RYCB)	JUNCTION	0.000	0.029	0	01:06	0	
0.00662	4.764						
TEE_13_(RYCB)	JUNCTION	0.000	0.034	0	01:11	0	
0.012	2.836						
TEE_14_(RYCB)	JUNCTION	0.075	0.079	0	01:08	0.0872	
0.0939	0.056						
TEE_15_(RYCB)	JUNCTION	0.000	0.044	0	01:08	0	
0.011	1.912						
TEE_16_(RYCB)	JUNCTION	0.000	0.044	0	01:08	0	
0.00828	1.250						
TEE_17_(RYCB)	JUNCTION	0.000	0.038	0	01:08	0	
0.00559	8.208						
TEE_18_(RYCB)	JUNCTION	0.000	0.031	0	01:10	0	
0.00296	13.073						
TEE_19_(RYCB)	JUNCTION	0.000	0.039	0	01:04	0	
0.00268	5.533						
TEE_2_(RYCB)	JUNCTION	0.000	0.026	0	01:09	0	
0.00434	13.751						
TEE_20_(RYCB)	JUNCTION	0.000	0.041	0	01:03	0	
0.00601	6.786						
TEE_21_(RYCB)	JUNCTION	0.000	0.041	0	01:03	0	
0.0101	3.215						

TEE_22_(RYCB)	JUNCTION	0.000	0.018	0	01:09	0	
0.0047	3.752						
TEE_23_(RYCB)	JUNCTION	0.078	0.078	0	01:11	0.128	
0.129	0.718						
TEE_24_(RYCB)	JUNCTION	0.000	0.020	0	01:09	0	
0.00255	13.264						
TEE_25_(RYCB)	JUNCTION	0.000	0.020	0	01:09	0	
0.00563	8.279						
TEE_26_(RYCB)	JUNCTION	0.000	0.035	0	01:05	0	
0.00395	-1.920						
TEE_27_(RYCB)	JUNCTION	0.000	0.035	0	01:05	0	
0.00941	2.565						
TEE_28_(RYCB)	JUNCTION	0.000	0.015	0	01:10	0	
0.00257	10.717						
TEE_29_(RYCB)	JUNCTION	0.000	0.038	0	01:08	0	
0.0036	9.821						
TEE_3_(RYCB)	JUNCTION	0.000	0.021	0	01:07	0	
0.00428	3.278						
TEE_30_(RYCB)	JUNCTION	0.000	0.038	0	01:08	0	
0.00691	5.800						
TEE_31_(RYCB)	JUNCTION	0.000	0.038	0	01:08	0	
0.0109	4.905						
TEE_32_(RYCB)	JUNCTION	0.100	0.100	0	01:10	0.129	
0.134	0.228						
TEE_33_(RYCB)	JUNCTION	0.000	0.056	0	01:20	0	
0.0943	-0.002						
TEE_34_(RYCB)	JUNCTION	0.087	0.087	0	01:10	0.105	
0.114	0.413						
TEE_35_(RYCB)	JUNCTION	0.000	0.044	0	01:10	0	
0.0267	1.176						
TEE_36_(RYCB)	JUNCTION	0.000	0.032	0	01:04	0	
0.0052	1.961						
TEE_37_(RYCB)	JUNCTION	0.000	0.062	0	01:05	0	
0.0502	1.077						
TEE_38_(RYCB)	JUNCTION	0.000	0.056	0	01:06	0	
0.0496	-0.051						
TEE_39_(RYCB)	JUNCTION	0.037	0.077	0	01:06	0.0377	
0.0873	0.425						
TEE_4_(RYCB)	JUNCTION	0.000	0.023	0	01:05	0	
0.00858	-0.089						
TEE_40_(RYCB)	JUNCTION	0.000	0.058	0	01:10	0	
0.0631	0.591						
TEE_41_(RYCB)	JUNCTION	0.000	0.054	0	01:07	0	
0.0627	0.418						
TEE_42_(RYCB)	JUNCTION	0.000	0.000	0	00:00	0	
0	0.000 ltr						
TEE_43_(RYCB)	JUNCTION	0.065	0.065	0	01:10	0.0728	
0.0728	0.004						
TEE_44_(RYCB)	JUNCTION	0.000	0.074	0	01:09	0	
0.0807	-0.195						
TEE_5_(RYCB)	JUNCTION	0.080	0.086	0	01:09	0.0829	
0.0883	0.151						
TEE_6_(RYCB)	JUNCTION	0.000	0.028	0	01:13	0	
0.0168	1.087						
TEE_7_(RYCB)	JUNCTION	0.032	0.047	0	01:03	0.0333	
0.0352	0.931						
TEE_8_(RYCB)	JUNCTION	0.000	0.043	0	01:03	0	
0.0355	-0.052						
TEE_9_(RYCB)	JUNCTION	0.000	0.036	0	01:03	0	
0.0379	0.880						

Maj-01	OUTFALL	0.051	0.051	0	01:10	0.0659
0.0659	0.000					
Maj-18	OUTFALL	0.000	0.000	0	00:00	0
0	0.000 ltr					
Maj-22	OUTFALL	0.000	0.000	0	00:00	0
0	0.000 ltr					
Maj-48	OUTFALL	0.000	0.000	0	00:00	0
0	0.000 ltr					
Maj-49	OUTFALL	0.000	0.000	0	00:00	0
0	0.000 ltr					
Maj-57	OUTFALL	0.000	0.000	0	00:00	0
0	0.000 ltr					
OF1	OUTFALL	0.000	0.000	0	00:00	0
0	0.000 ltr					
STM-111 (STM)	OUTFALL	0.000	3.935	0	01:16	0
10.4	0.000					
B2_Stor	STORAGE	1.609	1.609	0	01:10	2.41
2.41	-0.007					

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
02_(CB)	JUNCTION	0.85	1.838	0.632
03_(CB)	JUNCTION	0.81	1.833	0.637
04_(CB)	JUNCTION	0.89	1.950	0.520
05_(CB)	JUNCTION	0.89	1.949	0.521
06_(CB)	JUNCTION	0.40	0.780	0.893
08_(CB)	JUNCTION	0.49	1.723	0.527
09_(CB)	JUNCTION	0.50	1.739	0.511
10_(CB)	JUNCTION	0.96	1.233	0.412
11_(CB)	JUNCTION	1.07	1.310	0.274
116_(STM)	JUNCTION	0.10	0.016	3.907
12_(CB)	JUNCTION	0.62	1.754	0.496
120_(STM)	JUNCTION	0.35	0.218	3.548
122_(STM)	JUNCTION	0.36	0.250	3.601
124_(STM)	JUNCTION	0.35	0.270	3.455
126_(STM)	JUNCTION	0.36	0.346	3.489
128_(STM)	JUNCTION	0.33	0.386	3.415
13_(CB)	JUNCTION	0.62	1.607	0.480
130_(STM)	JUNCTION	0.41	0.541	3.487
132_(STM)	JUNCTION	0.36	0.591	3.434
134_(STM)	JUNCTION	0.22	0.916	3.014
136_(STM)	JUNCTION	0.30	0.380	3.266
138_(STM)	JUNCTION	0.29	0.393	3.300
14_(CB)	JUNCTION	0.61	1.770	0.480
140_(STM)	JUNCTION	0.15	0.244	3.487
142_(STM)	JUNCTION	0.22	0.408	3.086
144_(STM)	JUNCTION	0.17	0.276	3.398
146_(STM)	JUNCTION	0.08	0.599	2.574
148_(STM)	JUNCTION	0.01	0.688	2.472

15_(CB)	JUNCTION	0.61	1.766	0.484
15_RYCB	JUNCTION	0.33	0.529	1.349
150_(STM)	JUNCTION	0.20	0.668	3.251
152_(STM)	JUNCTION	0.09	0.288	3.528
154_(STM)	JUNCTION	0.19	0.476	3.560
156_(STM)	JUNCTION	0.17	1.474	2.062
158_(STM)	JUNCTION	0.32	0.709	3.090
16_(CB)	JUNCTION	0.65	1.746	0.504
160_(STM)	JUNCTION	0.33	0.711	3.102
164_(STM)	JUNCTION	0.23	0.374	2.950
17_(CB)	JUNCTION	0.54	1.736	0.514
18_(CB)	JUNCTION	0.74	1.068	0.337
19_(CB)	JUNCTION	0.52	1.739	0.511
20_(CB)	JUNCTION	0.77	1.764	0.486
21_(CB)	JUNCTION	0.77	1.616	0.481
2142_(STM)	JUNCTION	16.34	0.545	4.546
2143_(STM)	JUNCTION	22.57	0.770	3.500
2144_(STM)	JUNCTION	22.55	0.807	3.183
23_(CB)	JUNCTION	0.35	1.696	0.554
24_(CB)	JUNCTION	0.35	1.696	0.554
27_(CB)	JUNCTION	0.51	1.606	0.429
28_(CB)	JUNCTION	0.51	1.606	0.509
30_(CB)	JUNCTION	0.17	0.335	2.058
31_(CB)	JUNCTION	0.34	0.767	1.033
33_(CB)	JUNCTION	0.71	1.241	0.339
34_(CB)	JUNCTION	0.71	1.659	0.591
35_(CB)	JUNCTION	0.71	1.659	0.591
36_(CB)	JUNCTION	0.61	1.719	0.531
37_(CB)	JUNCTION	0.40	1.704	0.546
40_(CB)	JUNCTION	0.35	1.575	0.579
42_(CB)	JUNCTION	0.71	1.757	0.493
44_(CB)	JUNCTION	0.45	1.739	0.511
45_(CB)	JUNCTION	0.57	1.752	0.498
46_(CB)	JUNCTION	0.46	1.759	0.491
47_(CB)	JUNCTION	0.52	1.615	0.481
48_(CB)	JUNCTION	0.72	1.809	0.441
49_(CB)	JUNCTION	0.72	1.661	0.436
50_(CB)	JUNCTION	0.51	1.596	0.498
51_(CB)	JUNCTION	0.51	1.566	0.494
52_(CB)	JUNCTION	23.51	1.827	3.020
53_(CB)	JUNCTION	0.58	1.764	0.486
54_(CB)	JUNCTION	0.58	1.718	0.484
55_(CB)	JUNCTION	0.41	1.638	0.612
56_(CB)	JUNCTION	0.41	1.638	0.612
57_(CB)	JUNCTION	0.50	1.443	0.647
59_(CB)	JUNCTION	0.12	0.051	2.219
ELB_1_(RYCB)	JUNCTION	0.18	0.933	0.000
ELB_10_(RYCB)	JUNCTION	0.08	0.800	0.000
ELB_11_(RYCB)	JUNCTION	0.47	0.790	0.000
ELB_12_(RYCB)	JUNCTION	0.13	0.903	0.000
ELB_13_(RYCB)	JUNCTION	0.23	0.792	0.000
ELB_14_(RYCB)	JUNCTION	0.08	0.750	0.000
ELB_15_(RYCB)	JUNCTION	0.34	0.740	0.000
ELB_16_(RYCB)	JUNCTION	0.48	0.775	0.000
ELB_17_(RYCB)	JUNCTION	0.05	0.391	0.364
ELB_18_(RYCB)	JUNCTION	0.05	0.751	0.000
ELB_19_(RYCB)	JUNCTION	0.19	0.887	0.000

ELB_2_(RYCB)	JUNCTION	0.31	1.069	0.000
ELB_21_(RYCB)	JUNCTION	0.12	0.996	0.000
ELB_22_(RYCB)	JUNCTION	0.48	0.810	0.000
ELB_23_(RYCB)	JUNCTION	0.14	1.158	0.000
ELB_25_(RYCB)	JUNCTION	0.15	0.869	0.000
ELB_3_(RYCB)	JUNCTION	0.18	0.939	0.000
ELB_4_(RYCB)	JUNCTION	0.20	0.959	0.000
ELB_5_(RYCB)	JUNCTION	0.06	0.706	0.000
ELB_7_(RYCB)	JUNCTION	0.90	0.827	0.000
ELB_8_(RYCB)	JUNCTION	0.03	0.750	0.000
ELB_9_(RYCB)	JUNCTION	0.21	0.977	0.000
PH4_MH100	JUNCTION	0.71	0.828	1.182
PH4_MH100_dummy	JUNCTION	0.07	0.017	2.063
PH4_MH102	JUNCTION	0.66	0.781	1.209
PH4_MH104	JUNCTION	0.63	0.699	1.291
PH4_MH106	JUNCTION	0.57	0.596	1.224
PH4_MH108	JUNCTION	0.42	0.501	1.139
PH4_MH110	JUNCTION	0.32	0.364	0.936
PH4_MH202	JUNCTION	0.85	1.205	0.845
PH4_MH204	JUNCTION	0.75	1.113	0.927
PH4_MH206	JUNCTION	0.72	1.017	1.073
PH4_MH208	JUNCTION	0.69	0.999	1.041
PH4_MH210	JUNCTION	0.66	0.931	0.919
PH4_MH212	JUNCTION	0.63	1.680	0.000
PH4_MH302	JUNCTION	0.67	2.419	1.331
PH4_MH302_dummy	JUNCTION	0.32	0.523	3.222
PH4_MH304	JUNCTION	0.58	1.953	1.437
PH4_MH306	JUNCTION	0.55	1.904	1.336
PH4_MH308	JUNCTION	0.50	1.783	1.267
PH4_MH310	JUNCTION	0.46	1.688	1.302
PH4_MH312	JUNCTION	0.44	2.640	0.000
PH4_MH402	JUNCTION	0.35	0.183	2.857
PH4_MH404	JUNCTION	0.30	0.174	2.676
PH4_MH406	JUNCTION	0.28	0.189	2.756
PH4_MH408	JUNCTION	0.27	0.181	2.744
PH4_MH410	JUNCTION	0.12	0.056	2.439
PH4_MH502	JUNCTION	0.29	0.044	2.836
PH4_MH504	JUNCTION	0.38	0.074	2.886
PH4_MH506	JUNCTION	0.35	0.102	3.128
PH4_MH508	JUNCTION	0.24	0.070	3.240
PH4_MH510	JUNCTION	0.05	0.062	2.473
PH4_MH512	JUNCTION	0.22	0.156	2.479
PH4_MH602	JUNCTION	0.21	0.134	2.551
RYCB_13_(RYCB)	JUNCTION	0.12	0.452	1.242
RYCB_14_(RYCB)	JUNCTION	0.49	0.802	0.554
RYCB_15_(RYCB)	JUNCTION	0.27	0.879	0.944
RYCB_18_(RYCB)	JUNCTION	0.29	1.072	0.021
RYCB_3_(RYCB)	JUNCTION	0.28	1.111	0.489
RYCB_7_(RYCB)	JUNCTION	0.21	0.957	0.827
RYCB_9_(RYCB)	JUNCTION	0.20	0.863	0.000
StartNullStruct2	JUNCTION	0.30	1.150	0.000
StartNullStruct3	JUNCTION	0.05	0.051	3.206
TEE_1_(RYCB)	JUNCTION	0.34	1.108	0.000
TEE_10_(RYCB)	JUNCTION	0.05	0.656	0.094
TEE_11_(RYCB)	JUNCTION	0.11	0.612	0.585
TEE_12_(RYCB)	JUNCTION	0.26	1.170	0.000
TEE_13_(RYCB)	JUNCTION	0.30	1.270	0.000

TEE_15_(RYCB)	JUNCTION	0.20	0.947	0.773
TEE_16_(RYCB)	JUNCTION	0.16	1.051	0.000
TEE_17_(RYCB)	JUNCTION	0.13	0.826	0.034
TEE_18_(RYCB)	JUNCTION	0.11	0.800	0.051
TEE_19_(RYCB)	JUNCTION	0.50	0.796	0.000
TEE_2_(RYCB)	JUNCTION	0.22	1.034	0.000
TEE_20_(RYCB)	JUNCTION	0.54	0.918	0.000
TEE_21_(RYCB)	JUNCTION	0.59	1.039	0.000
TEE_22_(RYCB)	JUNCTION	0.24	0.930	0.000
TEE_23_(RYCB)	JUNCTION	0.29	0.936	0.000
TEE_24_(RYCB)	JUNCTION	0.10	0.754	0.000
TEE_25_(RYCB)	JUNCTION	0.19	0.625	0.359
TEE_26_(RYCB)	JUNCTION	0.52	0.963	0.000
TEE_27_(RYCB)	JUNCTION	0.56	1.123	0.000
TEE_28_(RYCB)	JUNCTION	0.08	0.435	0.320
TEE_29_(RYCB)	JUNCTION	0.21	0.969	0.000
TEE_3_(RYCB)	JUNCTION	0.12	0.762	0.048
TEE_30_(RYCB)	JUNCTION	0.25	1.088	0.000
TEE_31_(RYCB)	JUNCTION	0.27	1.206	0.000
TEE_32_(RYCB)	JUNCTION	0.34	1.347	0.000
TEE_33_(RYCB)	JUNCTION	0.44	1.767	0.076
TEE_34_(RYCB)	JUNCTION	0.40	1.765	0.000
TEE_35_(RYCB)	JUNCTION	0.36	1.608	0.000
TEE_36_(RYCB)	JUNCTION	0.58	1.045	0.000
TEE_37_(RYCB)	JUNCTION	0.46	0.663	0.088
TEE_38_(RYCB)	JUNCTION	0.46	0.745	0.000
TEE_39_(RYCB)	JUNCTION	0.49	0.952	0.000
TEE_4_(RYCB)	JUNCTION	0.19	1.300	0.000
TEE_40_(RYCB)	JUNCTION	0.16	1.057	0.000
TEE_41_(RYCB)	JUNCTION	0.21	0.962	0.142
TEE_44_(RYCB)	JUNCTION	0.05	0.327	1.065
TEE_5_(RYCB)	JUNCTION	0.30	1.125	0.545
TEE_6_(RYCB)	JUNCTION	0.22	1.020	0.000
TEE_7_(RYCB)	JUNCTION	0.92	1.106	0.000
TEE_8_(RYCB)	JUNCTION	0.95	1.231	0.000
TEE_9_(RYCB)	JUNCTION	0.98	1.304	0.000

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 Pondered Depth Meters
ELB_1_(RYCB)	0.05	0.004	0 01:10	0.000	0.043
ELB_10_(RYCB)	0.01	0.023	0 01:10	0.000	0.039
ELB_11_(RYCB)	0.01	0.022	0 01:05	0.000	0.038
ELB_12_(RYCB)	0.01	0.013	0 01:09	0.000	0.003
ELB_13_(RYCB)	0.06	0.013	0 01:09	0.000	0.041
ELB_15_(RYCB)	0.07	0.002	0 01:12	0.000	0.034
ELB_16_(RYCB)	0.01	0.020	0 01:05	0.000	0.021
ELB_18_(RYCB)	0.01	0.008	0 01:10	0.000	0.000

ELB_19_(RYCB)	0.08	0.033	0	01:09	0.000	0.105
ELB_2_(RYCB)	0.22	0.015	0	01:07	0.000	0.207
ELB_21_(RYCB)	0.01	0.022	0	01:09	0.000	0.006
ELB_22_(RYCB)	0.07	0.023	0	01:05	0.000	0.058
ELB_23_(RYCB)	0.12	0.008	0	01:09	0.001	0.399
ELB_25_(RYCB)	0.06	0.012	0	01:05	0.001	0.119
ELB_3_(RYCB)	0.11	0.020	0	01:09	0.000	0.165
ELB_4_(RYCB)	0.12	0.008	0	01:10	0.001	0.209
ELB_5_(RYCB)	0.01	0.012	0	01:09	0.000	0.006
ELB_7_(RYCB)	0.08	0.028	0	01:04	0.000	0.068
ELB_9_(RYCB)	0.10	0.020	0	01:08	0.001	0.229
PH4_MH212	0.01	0.011	0	01:03	0.000	0.000
PH4_MH312	0.01	0.019	0	01:05	0.000	0.000
RYCB_9_(RYCB)	0.10	0.016	0	01:10	0.001	0.180
StartNullStruct2	0.01	0.017	0	01:07	0.000	0.000
TEE_1_(RYCB)	0.22	0.017	0	01:09	0.001	0.219
TEE_12_(RYCB)	0.13	0.020	0	01:07	0.002	0.396
TEE_13_(RYCB)	0.11	0.018	0	01:11	0.001	0.289
TEE_16_(RYCB)	0.01	0.023	0	01:08	0.000	0.000
TEE_19_(RYCB)	0.01	0.009	0	01:05	0.000	0.018
TEE_2_(RYCB)	0.13	0.010	0	01:10	0.001	0.250
TEE_20_(RYCB)	0.16	0.007	0	01:05	0.001	0.150
TEE_21_(RYCB)	0.16	0.005	0	01:08	0.001	0.161
TEE_22_(RYCB)	0.06	0.008	0	01:11	0.000	0.066
TEE_23_(RYCB)	0.10	0.006	0	01:11	0.000	0.118
TEE_24_(RYCB)	0.01	0.013	0	01:09	0.000	0.003
TEE_26_(RYCB)	0.26	0.026	0	01:05	0.001	0.207
TEE_27_(RYCB)	0.35	0.017	0	01:06	0.001	0.287
TEE_29_(RYCB)	0.08	0.005	0	01:10	0.000	0.085
TEE_30_(RYCB)	0.10	0.012	0	01:10	0.001	0.171
TEE_31_(RYCB)	0.11	0.022	0	01:09	0.001	0.239
TEE_32_(RYCB)	0.09	0.015	0	01:09	0.000	0.158
TEE_34_(RYCB)	0.11	0.013	0	01:09	0.001	0.242
TEE_35_(RYCB)	0.08	0.010	0	01:10	0.000	0.106
TEE_36_(RYCB)	0.08	0.004	0	01:09	0.000	0.081
TEE_38_(RYCB)	0.04	0.008	0	01:06	0.000	0.018
TEE_39_(RYCB)	0.10	0.004	0	01:08	0.000	0.125
TEE_4_(RYCB)	0.01	0.015	0	01:06	0.000	0.000
TEE_40_(RYCB)	0.08	0.006	0	01:10	0.001	0.128
TEE_6_(RYCB)	0.07	0.007	0	01:13	0.000	0.050
TEE_7_(RYCB)	0.31	0.034	0	01:04	0.001	0.289
TEE_8_(RYCB)	0.32	0.029	0	01:03	0.001	0.266
TEE_9_(RYCB)	0.27	0.004	0	01:07	0.001	0.204

Storage Volume Summary

of Max	Maximum	Average	Avg	Evap	Exfil	Maximum	Max	Time
Occurrence	Outflow	Volume	Pcnt	Pcnt	Pcnt	Volume	Pcnt	
Storage Unit	hr:min	1000 m3	Full	Loss	Loss	1000 m3	Full	days

B2_Stor	0.008	1	0	0	0.342	62	0
01:14	0.855						

Outfall Loading Summary

Outfall Node	Flow Freq	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Maj-01	15.72	0.007	0.051	0.066
Maj-18	0.00	0.000	0.000	0.000
Maj-22	0.00	0.000	0.000	0.000
Maj-48	0.00	0.000	0.000	0.000
Maj-49	0.00	0.000	0.000	0.000
Maj-57	0.00	0.000	0.000	0.000
OF1	0.00	0.000	0.000	0.000
STM-111_(STM)	99.80	0.184	3.935	10.429
System	14.44	0.192	3.952	10.495

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	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
1_(STM)	CONDUIT	0.104	0 01:25	1.10	1.01	1.00
10	CHANNEL	0.000	0 00:00	0.00	0.00	0.27
10_(STM)	CONDUIT	2.935	0 01:15	2.05	0.80	1.00
11	CHANNEL	0.000	0 00:00	0.00	0.00	0.26
11_(STM)	CONDUIT	2.937	0 01:15	2.05	1.11	1.00
12	CHANNEL	0.000	0 00:00	0.00	0.00	0.26
12_(STM)	CONDUIT	3.038	0 01:15	2.35	1.19	0.85
13	CHANNEL	0.000	0 00:00	0.00	0.00	0.01
13_(STM)	CONDUIT	3.446	0 01:15	2.42	1.24	0.98
14	CHANNEL	0.000	0 00:00	0.00	0.00	0.00
14_(STM)	CONDUIT	3.739	0 01:15	1.79	1.00	0.94
15	CHANNEL	0.000	0 00:00	0.00	0.00	0.24
15_(10)_ (STM)	CONDUIT	2.470	0 01:16	1.83	0.67	1.00
15_(11)_ (STM)	CONDUIT	2.596	0 01:16	1.85	1.05	1.00
15_(12)_ (STM)	CONDUIT	0.212	0 01:15	0.96	0.53	1.00
15_(13)_ (STM)	CONDUIT	0.231	0 01:22	0.89	0.51	1.00
15_(14)_ (STM)	CONDUIT	1.540	0 01:12	1.82	0.98	1.00
15_(15)_ (STM)	CONDUIT	1.540	0 01:12	1.78	0.79	1.00
15_(16)_ (STM)	CONDUIT	1.637	0 01:12	1.91	1.01	1.00
15_(19)_ (STM)	CONDUIT	0.070	0 01:15	1.08	0.68	0.80

15_(20)_ (STM)	CONDUIT	0.158	0	01:23	1.03	0.45	1.00	56	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
15_(21)_ (STM)	CONDUIT	0.235	0	01:23	1.37	0.62	1.00	57	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
15_(22)_ (STM)	CONDUIT	1.112	0	01:12	1.70	0.64	1.00	58	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
15_(3)_ (STM)	CONDUIT	0.097	0	01:17	1.07	0.99	0.98	59	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
15_(4)_ (STM)	CONDUIT	0.228	0	01:12	1.47	1.13	0.95	6	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
15_(5)_ (STM)	CONDUIT	0.301	0	01:13	1.61	1.15	0.81	6_(STM)	CONDUIT	0.048	0	01:11	0.99	1.01	1.00
15_(9)_ (STM)	CONDUIT	2.349	0	01:17	1.82	0.87	1.00	60	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
16	CHANNEL	0.000	0	00:00	0.00	0.00	0.24	61	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
17	CHANNEL	0.000	0	00:00	0.00	0.00	0.18	62	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
18	CHANNEL	0.000	0	01:10	0.01	0.00	0.08	63	CHANNEL	0.000	0	00:00	0.00	0.00	0.25
18_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.18	7	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
18_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	7_(1)_ (STM)	CONDUIT	0.162	0	01:10	1.13	1.26	1.00
19	CHANNEL	0.000	0	00:00	0.00	0.00	0.01	7_(STM)	CONDUIT	0.108	0	01:10	0.99	1.35	1.00
2	CHANNEL	0.000	0	00:00	0.00	0.00	0.20	8	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
2_(STM)	CONDUIT	0.108	0	01:26	1.07	0.87	1.00	8_(STM)	CONDUIT	2.880	0	01:15	2.01	1.08	1.00
20	CHANNEL	0.000	0	00:00	0.00	0.00	0.23	9	CHANNEL	0.000	0	00:00	0.00	0.00	0.27
21	CHANNEL	0.000	0	00:00	0.00	0.00	0.23	9_(STM)	CONDUIT	2.935	0	01:15	2.05	1.07	1.00
22	CHANNEL	0.000	0	00:00	0.00	0.00	0.12	C1	CHANNEL	0.015	0	01:10	0.17	0.00	0.24
23	CHANNEL	0.000	0	00:00	0.00	0.00	0.12	C1_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
24	CHANNEL	0.000	0	00:00	0.00	0.00	0.06	C1_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
25	CHANNEL	0.000	0	00:00	0.00	0.00	0.06	C10	CHANNEL	0.000	0	00:00	0.00	0.00	0.12
26	CHANNEL	0.000	0	00:00	0.00	0.00	0.17	C11	CHANNEL	0.000	0	00:00	0.00	0.00	0.15
27	CHANNEL	0.000	0	00:00	0.00	0.00	0.17	C12	CHANNEL	0.074	0	01:10	0.47	0.00	0.12
28	CHANNEL	0.000	0	00:00	0.00	0.00	0.22	C13	CHANNEL	0.063	0	01:11	0.11	0.00	0.21
29	CHANNEL	0.000	0	00:00	0.00	0.00	0.22	C14	CHANNEL	0.000	0	00:00	0.00	0.00	0.16
3	CHANNEL	0.000	0	00:00	0.00	0.00	0.20	C15	CHANNEL	0.007	0	01:16	0.02	0.00	0.17
3_(STM)	CONDUIT	0.208	0	01:26	1.41	0.82	1.00	C16	CHANNEL	0.000	0	00:00	0.00	0.00	0.17
30	CHANNEL	0.000	0	00:00	0.00	0.00	0.23	C17	CHANNEL	0.038	0	01:12	0.10	0.00	0.19
31	CHANNEL	0.000	0	00:00	0.00	0.00	0.23	C18	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
32	CHANNEL	0.000	0	00:00	0.00	0.00	0.28	C18_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
33	CHANNEL	0.000	0	00:00	0.00	0.00	0.28	C18_3	CHANNEL	0.011	0	01:16	0.16	0.00	0.09
34	CHANNEL	0.000	0	00:00	0.00	0.00	0.25	C18_4	CHANNEL	0.016	0	01:10	0.18	0.00	0.12
35	CHANNEL	0.000	0	01:10	0.03	0.00	0.16	C18_5	CHANNEL	0.035	0	01:10	0.72	0.00	0.06
36	CHANNEL	0.000	0	01:10	0.00	0.00	0.00	C18_6	CHANNEL	0.021	0	01:10	0.56	0.00	0.05
37	CHANNEL	0.000	0	01:10	0.00	0.00	0.00	C18_7	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
38	CHANNEL	0.000	0	01:10	0.00	0.00	0.01	C18_8	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
39	CHANNEL	0.000	0	01:10	0.21	0.00	0.04	C18_9	CHANNEL	0.000	0	00:00	0.00	0.00	0.03
4	CHANNEL	0.000	0	00:00	0.00	0.00	0.26	C19	CHANNEL	0.018	0	01:10	0.51	0.00	0.05
4_(STM)	CONDUIT	1.978	0	01:12	1.87	1.02	1.00	C2	CHANNEL	0.000	0	00:00	0.00	0.00	0.22
40	CHANNEL	0.000	0	01:10	0.00	0.00	0.07	C2_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.04
41	CONDUIT	0.000	0	00:00	0.00	0.00	0.10	C2_2	CHANNEL	0.016	0	01:10	0.06	0.00	0.21
42	CONDUIT	0.000	0	00:00	0.00	0.00	0.10	C20	CHANNEL	0.007	0	01:10	0.06	0.00	0.09
43	CONDUIT	0.000	0	00:00	0.00	0.00	0.31	C21	CHANNEL	0.233	0	01:10	0.85	0.01	0.24
44	CONDUIT	0.000	0	00:00	0.00	0.00	0.31	C22	CHANNEL	0.000	0	00:00	0.00	0.00	0.18
45	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C23	CHANNEL	0.018	0	01:10	0.28	0.00	0.15
46	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C24	CHANNEL	0.000	0	00:00	0.00	0.00	0.12
47	CONDUIT	0.000	0	00:00	0.00	0.00	0.40	C25	CHANNEL	0.000	0	00:00	0.00	0.00	0.17
48	CONDUIT	0.000	0	00:00	0.00	0.00	0.40	C26	CHANNEL	0.000	0	00:00	0.00	0.00	0.17
49	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C27	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
5	CHANNEL	0.000	0	00:00	0.00	0.00	0.26	C27_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
5_(STM)	CONDUIT	2.273	0	01:11	1.83	0.80	1.00	C27_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.18
50	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C28	CHANNEL	0.000	0	00:00	0.00	0.00	0.18
51	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C29	CHANNEL	0.000	0	00:00	0.00	0.00	0.13
52	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C3_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00
53	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C3_2	CHANNEL	0.000	0	01:12	0.00	0.00	0.16
54	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C30	CHANNEL	0.007	0	01:11	0.04	0.00	0.13
55	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	C31	CONDUIT	0.000	0	00:00	0.00	0.00	0.00

C31_1	CONDUIT	0.005	0	01:11	0.18	0.00	0.19	C66_2	CONDUIT	0.001	0	01:11	0.03	0.00	0.19
C31_2	CONDUIT	0.005	0	01:11	0.08	0.00	0.23	C67	CONDUIT	0.001	0	01:10	0.10	0.00	0.12
C32	CHANNEL	0.000	0	01:12	0.01	0.00	0.15	C68	CONDUIT	0.001	0	01:10	0.18	0.00	0.09
C33	CHANNEL	0.030	0	01:10	0.10	0.00	0.18	C69	CONDUIT	0.016	0	01:31	0.49	0.01	0.24
C34	CHANNEL	0.016	0	01:11	0.04	0.00	0.18	C7	CHANNEL	0.037	0	01:10	0.54	0.00	0.08
C35	CHANNEL	0.000	0	00:00	0.00	0.00	0.16	C8	CHANNEL	0.035	0	01:10	0.49	0.00	0.10
C36	CHANNEL	0.000	0	00:00	0.00	0.00	0.14	C9	CHANNEL	0.058	0	01:10	0.20	0.00	0.18
C37	CHANNEL	0.000	0	00:00	0.00	0.00	0.14	PH4_100-168	CONDUIT	0.064	0	01:10	1.03	1.05	0.83
C38	CHANNEL	0.000	0	00:00	0.00	0.00	0.14	PH4_102-100	CONDUIT	0.057	0	01:11	0.80	1.01	1.00
C39	CHANNEL	0.000	0	00:00	0.00	0.00	0.14	PH4_104-102	CONDUIT	0.036	0	01:11	0.63	0.53	1.00
C4	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	PH4_106-104	CONDUIT	0.027	0	01:41	0.72	0.46	1.00
C4_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	PH4_108-106	CONDUIT	0.022	0	01:40	0.83	0.32	1.00
C4_2	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	PH4_110-108	CONDUIT	0.011	0	01:05	0.46	0.19	1.00
C4_3	CONDUIT	0.006	0	01:11	0.07	0.00	0.33	PH4_202-166	CONDUIT	0.059	0	01:10	1.04	0.73	0.51
C4_4	CONDUIT	0.005	0	01:12	0.10	0.00	0.22	PH4_204-202	CONDUIT	0.046	0	01:11	0.66	0.83	1.00
C40	CHANNEL	0.000	0	00:00	0.00	0.00	0.23	PH4_206-204	CONDUIT	0.028	0	01:44	0.71	0.41	1.00
C41	CHANNEL	0.004	0	01:12	0.01	0.00	0.24	PH4_208-206	CONDUIT	0.028	0	01:10	0.70	0.48	1.00
C42	CHANNEL	0.042	0	01:10	0.10	0.00	0.19	PH4_210-208	CONDUIT	0.031	0	01:02	0.89	0.46	1.00
C43	CHANNEL	0.000	0	00:00	0.00	0.00	0.17	PH4_212-210	CONDUIT	0.020	0	01:03	0.38	0.35	1.00
C44	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	PH4_302-162	CONDUIT	0.053	0	01:08	0.76	0.75	1.00
C45	CHANNEL	0.000	0	01:12	0.00	0.00	0.00	PH4_304-302	CONDUIT	0.047	0	01:12	0.67	0.85	1.00
C46	CHANNEL	0.000	0	00:00	0.00	0.00	0.16	PH4_306-304	CONDUIT	0.052	0	01:06	0.85	0.91	1.00
C47	CHANNEL	0.002	0	01:11	0.00	0.00	0.17	PH4_308-306	CONDUIT	0.039	0	01:10	0.80	0.69	1.00
C48	CHANNEL	0.004	0	01:12	0.04	0.00	0.15	PH4_310-308	CONDUIT	0.032	0	01:05	0.93	0.47	1.00
C49	CHANNEL	0.009	0	01:12	0.03	0.00	0.16	PH4_312-310	CONDUIT	0.018	0	01:05	0.54	0.31	1.00
C5	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	PH4_402-508	CONDUIT	0.170	0	01:14	1.07	1.35	1.00
C5_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	PH4_404-402	CONDUIT	0.152	0	01:14	0.96	0.74	1.00
C5_2	CHANNEL	0.000	0	01:20	0.00	0.00	0.01	PH4_406-404	CONDUIT	0.140	0	01:14	1.26	1.79	1.00
C50	CONDUIT	0.102	0	01:10	0.76	0.04	0.37	PH4_410-408	CONDUIT	0.041	0	01:22	0.66	0.39	1.00
C50_1	CHANNEL	0.000	0	00:00	0.00	0.00	0.00	PH4_412-410	CONDUIT	0.036	0	01:17	0.91	0.28	0.99
C50_3	CHANNEL	0.000	0	01:25	0.01	0.00	0.02	PH4_414-412	CONDUIT	0.021	0	01:10	0.74	0.20	0.63
C50_4	CHANNEL	0.007	0	01:10	0.44	0.00	0.04	PH4_502-162	CONDUIT	0.185	0	01:10	1.30	1.30	0.91
C51	CHANNEL	0.025	0	01:10	0.09	0.00	0.15	PH4_504-502	CONDUIT	0.185	0	01:10	1.16	1.96	1.00
C52	CHANNEL	0.001	0	01:11	0.02	0.00	0.14	PH4_506-504	CONDUIT	0.184	0	01:10	1.16	1.40	1.00
C53	CHANNEL	0.001	0	01:11	0.04	0.00	0.14	PH4_508-506	CONDUIT	0.170	0	01:14	1.07	1.37	1.00
C54	CHANNEL	0.000	0	00:00	0.00	0.00	0.13	PH4_510-512	CONDUIT	0.051	0	01:12	0.89	0.50	1.00
C55	CHANNEL	0.015	0	01:12	0.25	0.00	0.08	PH4_512-406	CONDUIT	0.051	0	01:12	0.80	0.53	1.00
C56	CONDUIT	0.001	0	01:11	0.02	0.00	0.19	PH4_602-408	CONDUIT	0.043	0	01:24	0.72	0.42	1.00
C57	CHANNEL	0.008	0	01:10	0.12	0.00	0.08	PH4_604-602	CONDUIT	0.022	0	01:13	0.64	0.21	0.95
C58	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	PH4_STM-71_(STM)	CONDUIT	0.092	0	01:15	0.97	1.06	1.00
C58_1	CONDUIT	0.034	0	01:11	0.27	0.02	0.34	Pipe_--(1)_(RYCB)_1	CONDUIT	0.063	0	01:10	1.41	1.05	0.85
C58_2	CONDUIT	0.034	0	01:11	0.59	0.02	0.23	Pipe_--(10)_(RYCB)	CONDUIT	0.089	0	01:13	1.82	2.13	1.00
C59_1	CONDUIT	0.001	0	01:13	0.16	0.00	0.07	Pipe_--(100)_(RYCB)	CONDUIT	0.030	0	01:16	0.60	0.70	1.00
C59_2	CONDUIT	0.000	0	01:14	0.13	0.00	0.03	Pipe_--(101)_(RYCB)	CONDUIT	0.037	0	01:11	0.76	0.89	1.00
C6	CONDUIT	0.000	0	00:00	0.00	0.00	0.04	Pipe_--(103)_(1)_(RYCB)	CONDUIT	0.056	0	01:20	1.14	1.33	1.00
C6_1	CHANNEL	0.032	0	01:10	0.31	0.00	0.15	Pipe_--(103)_(RYCB)	CONDUIT	0.056	0	01:20	1.14	1.33	1.00
C6_2	CHANNEL	0.001	0	01:11	0.02	0.00	0.12	Pipe_--(109)_(RYCB)	CONDUIT	0.029	0	01:09	0.61	0.68	1.00
C60	CONDUIT	0.000	0	00:00	0.00	0.00	0.01	Pipe_--(11)_(RYCB)	CONDUIT	0.137	0	01:09	1.94	2.01	1.00
C61_1	CONDUIT	0.002	0	01:10	0.19	0.00	0.19	Pipe_--(110)_(RYCB)	CONDUIT	0.018	0	01:09	0.45	0.44	1.00
C61_2	CONDUIT	0.001	0	01:11	0.16	0.00	0.05	Pipe_--(111)_(RYCB)	CONDUIT	0.018	0	01:09	0.42	0.44	1.00
C62	CONDUIT	0.000	0	00:00	0.00	0.00	0.13	Pipe_--(114)_(RYCB)	CONDUIT	0.028	0	01:10	0.67	0.66	1.00
C63_1	CONDUIT	0.006	0	01:11	0.08	0.00	0.27	Pipe_--(117)_(RYCB)	CONDUIT	0.018	0	01:09	0.49	0.42	1.00
C63_2	CONDUIT	0.006	0	01:11	0.09	0.00	0.25	Pipe_--(118)_(RYCB)	CONDUIT	0.020	0	01:09	0.43	0.47	1.00
C64	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	Pipe_--(119)_(RYCB)	CONDUIT	0.018	0	01:09	0.40	0.43	1.00
C65_1	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	Pipe_--(120)_(RYCB)	CONDUIT	0.011	0	01:10	0.37	0.27	1.00
C65_2	CONDUIT	0.000	0	00:00	0.00	0.00	0.14	Pipe_--(121)_(RYCB)	CONDUIT	0.014	0	01:09	0.30	0.33	1.00
C66_1	CONDUIT	0.000	0	01:13	0.05	0.00	0.01	Pipe_--(122)_(RYCB)	CONDUIT	0.014	0	01:10	0.30	0.33	1.00

Pipe__ (123) (RYCB)	CONDUIT	0.029	0	01:05	0.69	0.48	1.00
Pipe__ (124) (RYCB)	CONDUIT	0.035	0	01:05	0.73	0.83	1.00
Pipe__ (125) (RYCB)	CONDUIT	0.035	0	01:05	0.71	0.83	1.00
Pipe__ (126) (RYCB)	CONDUIT	0.058	0	01:10	1.18	1.38	1.00
Pipe__ (127) (RYCB)	CONDUIT	0.054	0	01:07	1.11	1.29	1.00
Pipe__ (128) (RYCB)	CONDUIT	0.054	0	01:07	1.11	1.29	1.00
Pipe__ (129) (RYCB)	CONDUIT	0.027	0	01:05	0.57	0.63	1.00
Pipe__ (130) (RYCB)	CONDUIT	0.032	0	01:04	0.70	0.76	1.00
Pipe__ (131) (RYCB)	CONDUIT	0.062	0	01:05	1.31	1.48	1.00
Pipe__ (132) (RYCB)	CONDUIT	0.056	0	01:06	1.22	1.33	1.00
Pipe__ (133) (RYCB)	CONDUIT	0.048	0	01:06	0.98	1.15	1.00
Pipe__ (134) (RYCB)	CONDUIT	0.027	0	01:09	0.56	0.63	1.00
Pipe__ (137) (RYCB)	CONDUIT	0.033	0	01:03	0.79	0.79	1.00
Pipe__ (138) (RYCB)	CONDUIT	0.031	0	01:03	0.70	0.74	1.00
Pipe__ (139) (RYCB)	CONDUIT	0.024	0	01:09	0.55	0.59	1.00
Pipe__ (14) (RYCB)	CONDUIT	0.044	0	01:08	0.89	1.04	1.00
Pipe__ (140) (RYCB)	CONDUIT	0.026	0	01:09	0.53	0.62	1.00
Pipe__ (141) (RYCB)	CONDUIT	0.033	0	01:04	0.79	0.61	1.00
Pipe__ (142) (RYCB)	CONDUIT	0.039	0	01:04	0.83	0.92	1.00
Pipe__ (143) (RYCB)	CONDUIT	0.041	0	01:03	0.84	0.97	1.00
Pipe__ (144) (RYCB)	CONDUIT	0.041	0	01:03	0.83	0.97	1.00
Pipe__ (145) (RYCB)	CONDUIT	0.036	0	01:09	0.83	0.87	1.00
Pipe__ (146) (RYCB)	CONDUIT	0.038	0	01:08	0.81	0.89	1.00
Pipe__ (147) (RYCB)	CONDUIT	0.038	0	01:08	0.77	0.89	1.00
Pipe__ (148) (RYCB)	CONDUIT	0.038	0	01:08	0.77	0.89	1.00
Pipe__ (149) (RYCB)	CONDUIT	0.044	0	01:10	0.90	1.06	1.00
Pipe__ (15) (RYCB)	CONDUIT	0.150	0	01:11	2.12	2.19	1.00
Pipe__ (150) (RYCB)	CONDUIT	0.031	0	01:10	0.73	0.74	1.00
Pipe__ (151) (RYCB)	CONDUIT	0.038	0	01:08	0.87	0.89	1.00
Pipe__ (152) (RYCB)	CONDUIT	0.044	0	01:08	0.93	1.04	1.00
Pipe__ (153) (RYCB)	CONDUIT	0.022	0	01:09	0.53	0.43	1.00
Pipe__ (154) (RYCB)	CONDUIT	0.023	0	01:07	0.55	0.54	1.00
Pipe__ (155) (RYCB)	CONDUIT	0.029	0	01:06	0.64	0.68	1.00
Pipe__ (156) (1) (RYCB)	CONDUIT	0.068	0	01:08	1.38	1.62	1.00
Pipe__ (156) (RYCB)	CONDUIT	0.034	0	01:11	0.70	0.82	1.00
Pipe__ (157) (RYCB)	CONDUIT	0.074	0	01:09	1.52	1.77	1.00
Pipe__ (159) (RYCB)	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
Pipe__ (16) (RYCB)	CONDUIT	0.086	0	01:09	1.75	2.07	1.00
Pipe__ (160) (RYCB)	CONDUIT	0.000	0	00:00	0.00	0.00	0.33
Pipe__ (161) (RYCB)	CONDUIT	0.009	0	01:05	0.27	0.21	1.00
Pipe__ (162) (RYCB)	CONDUIT	0.011	0	01:07	0.30	0.26	1.00
Pipe__ (164) (RYCB)	CONDUIT	0.077	0	01:10	1.57	1.84	1.00
Pipe__ (165) (RYCB)	CONDUIT	0.020	0	01:09	0.40	0.47	1.00
Pipe__ (17) (RYCB)	CONDUIT	0.050	0	01:09	1.11	1.13	1.00
Pipe__ (19) (RYCB)	CONDUIT	0.072	0	01:10	1.47	1.71	1.00
Pipe__ (2) (RYCB)	CONDUIT	0.071	0	01:11	1.50	1.20	0.93
Pipe__ (22) (RYCB)	CONDUIT	0.049	0	01:11	1.01	1.17	1.00
Pipe__ (23) (RYCB)	CONDUIT	0.075	0	01:11	1.53	1.79	1.00
Pipe__ (24) (RYCB)	CONDUIT	0.077	0	01:06	1.56	1.82	1.00
Pipe__ (25) (RYCB)	CONDUIT	0.068	0	01:11	1.39	1.63	1.00
Pipe__ (27) (RYCB)	CONDUIT	0.075	0	01:09	1.53	1.79	1.00
Pipe__ (73) (RYCB)	CONDUIT	0.092	0	01:11	1.87	2.19	1.00
Pipe__ (74) (RYCB)	CONDUIT	0.054	0	01:07	1.28	1.28	1.00
Pipe__ (77) (RYCB)	CONDUIT	0.051	0	01:10	1.04	1.22	1.00
Pipe__ (87) (RYCB)	CONDUIT	0.032	0	01:07	0.71	0.76	1.00
Pipe__ (88) (RYCB)	CONDUIT	0.032	0	01:07	0.65	0.76	1.00
Pipe__ (89) (RYCB)	CONDUIT	0.013	0	01:08	0.34	0.32	1.00

Pipe__ (9) (RYCB)	CONDUIT	0.094	0	01:10	1.92	2.23	1.00
Pipe__ (90) (RYCB)	CONDUIT	0.026	0	01:07	0.87	0.63	1.00
Pipe__ (93) (RYCB)	CONDUIT	0.016	0	01:08	0.42	0.38	1.00
Pipe__ (94) (RYCB)	CONDUIT	0.021	0	01:07	0.50	0.50	1.00
Pipe__ (95) (RYCB)	CONDUIT	0.023	0	01:05	0.50	0.55	1.00
Pipe__ (96) (RYCB)	CONDUIT	0.049	0	01:03	1.12	0.78	1.00
Pipe__ (98) (RYCB)	CONDUIT	0.036	0	01:03	0.73	0.85	1.00
Pipe__ (99) (RYCB)	CONDUIT	0.028	0	01:13	0.66	0.67	1.00
STM-23 (STM)	CONDUIT	0.112	0	01:16	1.02	0.78	0.65
STM-24 (STM)	CONDUIT	0.056	0	01:14	0.52	0.39	0.69
STM-27 (STM)	CONDUIT	0.017	0	01:11	0.41	0.36	1.00
STM-28 (STM)	CONDUIT	0.056	0	01:13	1.22	1.46	0.89
STM-34 (1) (1) (STM)	CONDUIT	3.860	0	01:16	2.23	1.20	0.86
STM-34 (1) (STM)	CONDUIT	3.792	0	01:15	1.89	1.31	0.89
STM-34 (STM)	CONDUIT	3.741	0	01:15	1.83	1.43	0.91
STM-35 (STM)	CONDUIT	3.849	0	01:16	2.01	1.22	1.00
STM-36 (STM)	CONDUIT	3.943	0	01:16	1.96	1.05	1.00
STM-37 (STM)	CONDUIT	3.940	0	01:16	1.72	1.09	1.00
STM-38 (STM)	CONDUIT	3.935	0	01:16	1.74	1.09	1.00
STM-81 (STM)	CONDUIT	0.068	0	01:12	1.39	1.72	1.00
STM-82 (STM)	CONDUIT	0.058	0	01:14	1.26	1.38	0.89
STM-83 (STM)	CONDUIT	0.051	0	01:12	1.19	0.86	1.00
CB-02	ORIFICE	0.026	0	01:12			1.00
CB-03	ORIFICE	0.031	0	01:12			1.00
CB-04	ORIFICE	0.027	0	01:11			1.00
CB-05	ORIFICE	0.027	0	01:11			1.00
CB-06	ORIFICE	0.032	0	01:10			1.00
CB-08	ORIFICE	0.032	0	01:15			1.00
CB-09	ORIFICE	0.027	0	01:14			1.00
CB-10	ORIFICE	0.031	0	01:21			1.00
CB-11	ORIFICE	0.043	0	01:13			1.00
CB-12	ORIFICE	0.050	0	01:11			1.00
CB-13	ORIFICE	0.048	0	01:11			1.00
CB-14	ORIFICE	0.027	0	01:11			1.00
CB-15	ORIFICE	0.027	0	01:11			1.00
CB-16	ORIFICE	0.021	0	01:12			1.00
CB-17	ORIFICE	0.027	0	01:11			1.00
CB-18	ORIFICE	0.056	0	01:12			1.00
CB-19	ORIFICE	0.071	0	01:15			1.00
CB-20	ORIFICE	0.036	0	01:13			1.00
CB-21	ORIFICE	0.035	0	01:13			1.00
CB-23	ORIFICE	0.049	0	01:10			1.00
CB-24	ORIFICE	0.049	0	01:10			1.00
CB-25	ORIFICE	0.009	0	01:10			0.27
CB-26	ORIFICE	0.004	0	01:10			0.17
CB-27	ORIFICE	0.068	0	01:13			1.00
CB-28	ORIFICE	0.068	0	01:13			1.00
CB-30	ORIFICE	0.087	0	01:10			1.00
CB-31	ORIFICE	0.109	0	01:11			1.00
CB-32	ORIFICE	0.040	0	01:13			1.00
CB-33	ORIFICE	0.059	0	01:13			1.00
CB-34	ORIFICE	0.049	0	01:13			1.00
CB-35	ORIFICE	0.049	0	01:13			1.00
CB-36	ORIFICE	0.036	0	01:10			1.00
CB-37	ORIFICE	0.049	0	01:10			1.00
CB-40	ORIFICE	0.047	0	01:11			1.00
CB-41	ORIFICE	0.049	0	01:10			1.00

CB-42	ORIFICE	0.032	0	01:12	1.00	OR-46	ORIFICE	0.033	0	01:01	
CB-43	ORIFICE	0.036	0	01:13	1.00	OR-47	ORIFICE	0.027	0	01:01	
CB-44	ORIFICE	0.032	0	01:11	1.00	OR-48	ORIFICE	0.028	0	01:01	
CB-45	ORIFICE	0.021	0	01:11	1.00	OR-49	ORIFICE	0.027	0	01:01	
CB-46	ORIFICE	0.032	0	01:11	1.00	OR-50	ORIFICE	0.048	0	01:12	
CB-47	ORIFICE	0.026	0	01:11	1.00	OR-51	ORIFICE	0.047	0	01:12	
CB-48	ORIFICE	0.028	0	01:14	1.00	OR-52	ORIFICE	0.052	0	01:10	
CB-49	ORIFICE	0.027	0	01:13	1.00	OR-53	ORIFICE	0.050	0	01:15	
CB-50	ORIFICE	0.048	0	01:11	1.00	OR-54	ORIFICE	0.049	0	01:15	
CB-51	ORIFICE	0.047	0	01:11	1.00	OR-55	ORIFICE	0.046	0	01:10	
CB-52	ORIFICE	0.051	0	01:10	1.00	OR-56	ORIFICE	0.046	0	01:10	
CB-53	ORIFICE	0.050	0	01:15	1.00	OR-57	ORIFICE	0.050	0	01:12	
CB-54	ORIFICE	0.049	0	01:15	1.00	PH4_ICD150	ORIFICE	0.008	0	01:10	1.00
CB-55	ORIFICE	0.046	0	01:10	1.00	PH4_ICD151	ORIFICE	0.009	0	01:10	1.00
CB-56	ORIFICE	0.046	0	01:10	1.00	PH4_ICD153	ORIFICE	0.007	0	01:10	1.00
CB-57	ORIFICE	0.050	0	01:12	1.00	PH4_ICD154	ORIFICE	0.008	0	01:10	1.00
OR-02	ORIFICE	0.027	0	01:11	1.00	PH4_ICD155	ORIFICE	0.006	0	01:10	1.00
OR-03	ORIFICE	0.031	0	01:12	1.00	PH4_ICD156	ORIFICE	0.006	0	01:10	1.00
OR-04	ORIFICE	0.027	0	01:11	1.00	PH4_ICD158	ORIFICE	0.007	0	01:10	1.00
OR-05	ORIFICE	0.027	0	01:11	1.00	PH4_ICD20	ORIFICE	0.008	0	01:06	1.00
OR-06	ORIFICE	0.006	0	01:10	0.21	PH4_ICD21	ORIFICE	0.007	0	01:12	1.00
OR-08	ORIFICE	0.032	0	01:02		PH4_ICD22	ORIFICE	0.012	0	01:22	1.00
OR-09	ORIFICE	0.028	0	01:01		PH4_ICD23	ORIFICE	0.011	0	01:11	1.00
OR1	ORIFICE	0.006	0	01:09	1.00	PH4_ICD24	ORIFICE	0.013	0	01:30	1.00
OR-10	ORIFICE	0.031	0	01:22		PH4_ICD50	ORIFICE	0.006	0	01:10	1.00
OR-11	ORIFICE	0.060	0	01:03		PH4_ICD51	ORIFICE	0.006	0	01:10	1.00
OR-12	ORIFICE	0.050	0	01:01		PH4_ICD52	ORIFICE	0.006	0	01:10	1.00
OR-13	ORIFICE	0.048	0	01:11		PH4_ICD53	ORIFICE	0.006	0	01:10	1.00
OR-14	ORIFICE	0.029	0	01:01		PH4_ICD54	ORIFICE	0.008	0	01:10	1.00
OR-15	ORIFICE	0.029	0	01:01		PH4_ICD55	ORIFICE	0.006	0	01:10	1.00
OR-16	ORIFICE	0.023	0	01:01		PH4_ICD56	ORIFICE	0.008	0	01:11	1.00
OR-17	ORIFICE	0.028	0	01:01		PH4_ICD57	ORIFICE	0.006	0	01:11	1.00
OR-18	ORIFICE	0.062	0	01:04		PH4_ICD58	ORIFICE	0.012	0	01:03	1.00
OR-19	ORIFICE	0.071	0	01:15		PH4_ICD59	ORIFICE	0.012	0	01:03	1.00
OR2	ORIFICE	0.006	0	01:09	0.21	PH4_ICD60	ORIFICE	0.007	0	01:03	1.00
OR-20	ORIFICE	0.036	0	01:01		PH4_ICD61	ORIFICE	0.009	0	01:03	1.00
OR-21	ORIFICE	0.035	0	01:01		PH4_ICD62	ORIFICE	0.012	0	01:02	1.00
OR-23	ORIFICE	0.049	0	01:11		PH4_ICD63	ORIFICE	0.012	0	01:02	1.00
OR-24	ORIFICE	0.049	0	01:11		PH4_ICD64	ORIFICE	0.012	0	01:02	1.00
OR-25	ORIFICE	0.009	0	01:10		PH4_ICD65	ORIFICE	0.012	0	01:02	1.00
OR-26	ORIFICE	0.004	0	01:10	0.18	PH4_ICD66	ORIFICE	0.007	0	01:06	1.00
OR-27	ORIFICE	0.068	0	01:13		PH4_ICD67	ORIFICE	0.006	0	01:06	1.00
OR-28	ORIFICE	0.068	0	01:13		PH4_ICD68	ORIFICE	0.011	0	01:06	1.00
OR-30	ORIFICE	0.087	0	01:10		PH4_ICD69	ORIFICE	0.011	0	01:06	1.00
OR-31	ORIFICE	0.043	0	01:10	0.81	PH4_ICD70	ORIFICE	0.008	0	01:12	1.00
OR-32	ORIFICE	0.069	0	01:31		PH4_ICD71	ORIFICE	0.008	0	01:12	1.00
OR-33	ORIFICE	0.050	0	01:05		PH4_ICD72	ORIFICE	0.010	0	01:11	1.00
OR-34	ORIFICE	0.049	0	01:14		PH4_ICD73	ORIFICE	0.010	0	01:11	1.00
OR-35	ORIFICE	0.049	0	01:14		PH4_ICD74	ORIFICE	0.022	0	01:11	1.00
OR-36	ORIFICE	0.037	0	01:01		PH4_ICD75	ORIFICE	0.022	0	01:11	1.00
OR-37	ORIFICE	0.050	0	01:02		PH4_ICD80	ORIFICE	0.008	0	01:11	1.00
OR-40	ORIFICE	0.048	0	01:10		PH4_ICD81	ORIFICE	0.006	0	01:11	1.00
OR-41	ORIFICE	0.056	0	01:05		PH4_ST1	ORIFICE	0.064	0	01:10	1.00
OR-42	ORIFICE	0.034	0	01:01		PH4_ST2	ORIFICE	0.059	0	01:10	1.00
OR-43	ORIFICE	0.058	0	01:02		PH4_ST3	ORIFICE	0.053	0	01:10	1.00
OR-44	ORIFICE	0.032	0	01:02		RYCB-01	ORIFICE	0.027	0	01:12	1.00
OR-45	ORIFICE	0.023	0	01:01		RYCB-02	ORIFICE	0.047	0	01:11	1.00

RYCB-03	ORIFICE	0.056	0	01:13	1.00
RYCB-04	ORIFICE	0.058	0	01:13	1.00
RYCB-06	ORIFICE	0.128	0	01:10	1.00
RYCB-07	ORIFICE	0.150	0	01:11	1.00
RYCB-10	ORIFICE	0.071	0	01:14	1.00
RYCB-18	ORIFICE	0.134	0	01:12	1.00
RYCB-22	ORIFICE	0.055	0	01:13	1.00
RYCB-29	ORIFICE	0.053	0	01:10	1.00
RYCB-38	ORIFICE	0.044	0	01:11	1.00
RYCB-39	ORIFICE	0.053	0	01:12	1.00
B2-Out	DUMMY	0.855	0	01:14	
B4-Out	DUMMY	0.188	0	01:10	
PH4_ICD78	DUMMY	0.011	0	01:10	
PH4_ICD79	DUMMY	0.011	0	01:10	
PH4_ICD82	DUMMY	0.003	0	01:10	
PH4_ICD83	DUMMY	0.003	0	01:10	
PH4_ICD84	DUMMY	0.005	0	01:10	
PH4_ICD85	DUMMY	0.005	0	01:10	
PH4_ICD86	DUMMY	0.004	0	01:10	
PH4_ICD87	DUMMY	0.004	0	01:10	
PH4_ICD88	DUMMY	0.006	0	01:10	
PH4_ICD89	DUMMY	0.006	0	01:10	
PH4_ICD90	DUMMY	0.006	0	01:10	
PH4_ICD91	DUMMY	0.006	0	01:10	
PH4_ICD92	DUMMY	0.004	0	01:10	
PH4_ICD93	DUMMY	0.004	0	01:10	

Flow Classification Summary

Inlet Conduit Ctrl	Adjusted /Actual Length	----- Fraction of Time in Flow Class -----							Norm
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit		
1	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00
1_(STM)	1.00	0.02	0.00	0.00	0.05	0.00	0.00	0.93	0.00
10	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
10_(STM)	1.00	0.02	0.00	0.00	0.41	0.00	0.00	0.56	0.00
11	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
11_(STM)	1.00	0.02	0.00	0.00	0.15	0.00	0.00	0.83	0.00
12	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
12_(STM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00

13	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00
13_(STM)	1.00	0.02	0.00	0.00	0.95	0.00	0.00	0.03	0.03
14	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00
14_(STM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.00
15	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
15_(10)_ (STM)	1.00	0.02	0.00	0.00	0.11	0.02	0.00	0.85	0.00
15_(11)_ (STM)	1.00	0.02	0.00	0.00	0.41	0.00	0.00	0.57	0.00
15_(12)_ (STM)	1.00	0.02	0.00	0.00	0.08	0.00	0.00	0.90	0.00
15_(13)_ (STM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00
15_(14)_ (STM)	1.00	0.02	0.00	0.00	0.10	0.08	0.00	0.80	0.00
15_(15)_ (STM)	1.00	0.02	0.00	0.00	0.32	0.04	0.00	0.62	0.00
15_(16)_ (STM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00
15_(19)_ (STM)	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00
15_(20)_ (STM)	1.00	0.02	0.00	0.00	0.16	0.00	0.00	0.82	0.10
15_(21)_ (STM)	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.00
15_(22)_ (STM)	1.00	0.02	0.00	0.00	0.38	0.00	0.00	0.60	0.09
15_(3)_ (STM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.93	0.00
15_(4)_ (STM)	1.00	0.02	0.00	0.00	0.06	0.00	0.00	0.92	0.00
15_(5)_ (STM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
15_(9)_ (STM)	1.00	0.02	0.00	0.00	0.21	0.00	0.00	0.77	0.00
16	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
17	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
18	1.00	0.01	0.85	0.00	0.14	0.00	0.00	0.00	0.98
18_1	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
18_2	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00
19	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00
2	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
2_(STM)	1.00	0.02	0.00	0.00	0.09	0.00	0.00	0.89	0.00
20	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
21	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00

22	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
23	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
24	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
25	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
26	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
27	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
28	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
29	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
3	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
3 (STM)	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.00
0.00									
30	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
31	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
32	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
33	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
34	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
35	1.00	0.85	0.00	0.00	0.04	0.00	0.00	0.11	0.96
0.00									
36	1.00	0.01	0.84	0.00	0.13	0.01	0.00	0.00	0.00
0.00									
37	1.00	0.01	0.84	0.00	0.13	0.02	0.00	0.00	0.95
0.00									
38	1.00	0.01	0.84	0.00	0.13	0.02	0.00	0.00	0.95
0.00									
39	1.00	0.85	0.00	0.00	0.01	0.00	0.00	0.14	0.00
0.00									
4	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
4 (STM)	1.00	0.02	0.00	0.00	0.06	0.00	0.00	0.92	0.00
0.00									
40	1.00	0.01	0.85	0.00	0.14	0.00	0.00	0.00	0.98
0.00									
41	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
42	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
43	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
44	1.00	0.98	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
45	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
46	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
47	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

48	1.00	0.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
49	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
5	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
5 (STM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00
0.00									
50	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
51	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
52	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
53	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
54	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
55	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
56	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
57	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
58	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
59	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
6	1.00	0.85	0.15	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
6 (STM)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00
0.00									
60	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
61	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
62	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
63	1.00	0.96	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
7 (1) (STM)	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.00
0.00									
7 (STM)	1.00	0.02	0.00	0.00	0.05	0.00	0.00	0.93	0.00
0.00									
8	1.00	0.86	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
8 (STM)	1.00	0.02	0.00	0.00	0.17	0.05	0.00	0.76	0.00
0.00									
9	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
9 (STM)	1.00	0.02	0.00	0.00	0.20	0.00	0.00	0.78	0.00
0.00									
C1	1.00	0.41	0.10	0.00	0.44	0.05	0.00	0.00	0.12
0.00									
C1_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C1_2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

C10	1.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C11	1.00	0.49	0.51	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C12	1.00	0.02	0.40	0.00	0.57	0.02	0.00	0.00	0.95
0.00									
C13	1.00	0.02	0.00	0.00	0.61	0.37	0.00	0.00	0.11
0.00									
C14	1.00	0.42	0.58	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C15	1.00	0.02	0.04	0.00	0.92	0.03	0.00	0.00	0.11
0.00									
C16	1.00	0.58	0.42	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C17	1.00	0.02	0.04	0.00	0.93	0.02	0.00	0.00	0.09
0.00									
C18	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C18_2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C18_3	1.00	0.02	0.04	0.00	0.91	0.03	0.00	0.00	0.11
0.00									
C18_4	1.00	0.02	0.00	0.00	0.80	0.18	0.00	0.00	0.11
0.00									
C18_5	1.00	0.02	0.00	0.00	0.37	0.61	0.00	0.00	0.86
0.00									
C18_6	1.00	0.02	0.00	0.00	0.73	0.25	0.00	0.00	0.00
0.00									
C18_7	1.00	0.05	0.95	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C18_8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C18_9	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C19	1.00	0.02	0.00	0.00	0.35	0.64	0.00	0.00	0.95
0.00									
C2	1.00	0.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C2_1	1.00	0.05	0.95	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C2_2	1.00	0.02	0.03	0.00	0.93	0.02	0.00	0.00	0.09
0.00									
C20	1.00	0.02	0.73	0.00	0.25	0.00	0.00	0.00	0.98
0.00									
C21	1.00	0.02	0.00	0.00	0.42	0.56	0.00	0.00	0.05
0.00									
C22	1.00	0.40	0.60	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C23	1.00	0.02	0.01	0.00	0.51	0.46	0.00	0.00	0.22
0.00									
C24	1.00	0.30	0.70	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C25	1.00	0.51	0.49	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C26	1.00	0.51	0.49	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C27	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C27_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									

C27_2	1.00	0.57	0.43	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C28	1.00	0.57	0.43	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C29	1.00	0.56	0.44	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C3_1	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00
0.00									
C3_2	1.00	0.02	0.03	0.00	0.95	0.00	0.00	0.00	0.96
0.00									
C30	1.00	0.02	0.04	0.00	0.92	0.03	0.00	0.00	0.10
0.00									
C31	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C31_1	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00
0.00									
C31_2	1.00	0.02	0.04	0.00	0.95	0.00	0.00	0.00	0.95
0.00									
C32	1.00	0.02	0.04	0.00	0.92	0.03	0.00	0.00	0.10
0.00									
C33	1.00	0.02	0.03	0.00	0.93	0.02	0.00	0.00	0.10
0.00									
C34	1.00	0.02	0.03	0.00	0.93	0.02	0.00	0.00	0.10
0.00									
C35	1.00	0.58	0.42	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C36	1.00	0.60	0.40	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C37	1.00	0.60	0.40	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C38	1.00	0.45	0.55	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C39	1.00	0.45	0.55	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C4_1	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.00
0.00									
C4_2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C4_3	1.00	0.05	0.01	0.00	0.03	0.00	0.00	0.92	0.01
0.00									
C4_4	1.00	0.02	0.04	0.00	0.95	0.00	0.00	0.00	0.95
0.00									
C40	1.00	0.61	0.39	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C41	1.00	0.02	0.04	0.00	0.92	0.03	0.00	0.00	0.10
0.00									
C42	1.00	0.02	0.04	0.00	0.91	0.04	0.00	0.00	0.10
0.00									
C43	1.00	0.48	0.52	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C44	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00
0.00									
C45	1.00	0.05	0.00	0.00	0.90	0.05	0.00	0.00	0.00
0.00									
C46	1.00	0.63	0.37	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C47	1.00	0.02	0.04	0.00	0.94	0.01	0.00	0.00	0.10
0.00									

C48	1.00	0.02	0.04	0.00	0.92	0.03	0.00	0.00	0.10
0.00									
C49	1.00	0.02	0.01	0.00	0.91	0.07	0.00	0.00	0.12
0.00									
C5	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C5_1	1.00	0.04	0.96	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C5_2	1.00	0.02	0.02	0.00	0.96	0.00	0.00	0.00	0.96
0.00									
C50	1.00	0.99	0.00	0.00	0.00	0.00	0.01	0.00	0.00
0.00									
C50_1	1.00	0.06	0.94	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C50_3	1.00	0.02	0.04	0.00	0.93	0.02	0.00	0.00	0.10
0.00									
C50_4	1.00	0.02	0.68	0.00	0.19	0.11	0.00	0.00	0.87
0.00									
C51	1.00	0.02	0.01	0.00	0.89	0.09	0.00	0.00	0.12
0.00									
C52	1.00	0.02	0.00	0.00	0.88	0.10	0.00	0.00	0.13
0.00									
C53	1.00	0.02	0.00	0.00	0.88	0.10	0.00	0.00	0.13
0.00									
C54	1.00	0.52	0.48	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C55	1.00	0.02	0.01	0.00	0.90	0.08	0.00	0.00	0.12
0.00									
C56	1.00	0.02	0.04	0.00	0.95	0.00	0.00	0.00	0.95
0.00									
C57	1.00	0.40	0.11	0.00	0.46	0.03	0.00	0.00	0.12
0.00									
C58	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C58_1	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00
0.00									
C58_2	1.00	0.02	0.03	0.00	0.95	0.00	0.00	0.00	0.95
0.00									
C59_1	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00
0.00									
C59_2	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.00	0.00
0.00									
C6	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C6_1	1.00	0.01	0.00	0.00	0.90	0.09	0.00	0.00	0.07
0.00									
C6_2	1.00	0.01	0.01	0.00	0.89	0.09	0.00	0.00	0.14
0.00									
C60	1.00	0.05	0.95	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C61_1	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.94	0.00
0.00									
C61_2	1.00	0.02	0.04	0.00	0.95	0.00	0.00	0.00	0.95
0.00									
C62	1.00	0.47	0.53	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C63_1	1.00	0.05	0.01	0.00	0.03	0.00	0.00	0.92	0.01
0.00									
C63_2	1.00	0.02	0.04	0.00	0.95	0.00	0.00	0.00	0.95
0.00									

C64	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C65_1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C65_2	1.00	0.60	0.40	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C66_1	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.00
0.00									
C66_2	1.00	0.02	0.04	0.00	0.95	0.00	0.00	0.00	0.95
0.00									
C67	1.00	0.49	0.49	0.00	0.00	0.00	0.02	0.00	0.00
0.00									
C68	1.00	0.42	0.52	0.00	0.00	0.00	0.06	0.00	0.00
0.00									
C69	1.00	0.58	0.39	0.00	0.01	0.00	0.02	0.00	0.00
0.00									
C7	1.00	0.01	0.00	0.00	0.95	0.04	0.00	0.00	0.95
0.00									
C8	1.00	0.01	0.00	0.00	0.57	0.41	0.00	0.00	0.09
0.00									
C9	1.00	0.34	0.07	0.00	0.56	0.02	0.00	0.00	0.13
0.00									
PH4_100-168	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
0.00									
PH4_102-100	1.00	0.01	0.00	0.00	0.54	0.00	0.00	0.46	0.09
0.00									
PH4_104-102	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.00
0.00									
PH4_106-104	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_108-106	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_110-108	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_202-166	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
0.00									
PH4_204-202	1.00	0.01	0.00	0.00	0.59	0.00	0.00	0.40	0.09
0.00									
PH4_206-204	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.00
0.00									
PH4_208-206	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_210-208	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_212-210	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.01
0.00									
PH4_302-162	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.95	0.00
0.00									
PH4_304-302	1.00	0.01	0.00	0.00	0.47	0.00	0.00	0.52	0.08
0.00									
PH4_306-304	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.95	0.00
0.00									
PH4_308-306	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.95	0.00
0.00									
PH4_310-308	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00
0.00									
PH4_312-310	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_402-508	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									

PH4_404-402	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.00
0.00									
PH4_406-404	1.00	0.01	0.00	0.00	0.04	0.00	0.00	0.95	0.00
0.00									
PH4_410-408	1.00	0.01	0.00	0.00	0.06	0.00	0.00	0.93	0.01
0.00									
PH4_412-410	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.00
0.00									
PH4_414-412	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.97	0.01
0.00									
PH4_502-162	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.98	0.00
0.00									
PH4_504-502	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.84
0.00									
PH4_506-504	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.31
0.00									
PH4_508-506	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.00
0.00									
PH4_510-512	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.01
0.00									
PH4_512-406	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.95	0.00
0.00									
PH4_602-408	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
PH4_604-602	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.03
0.00									
PH4_STM-71_(STM)	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00
0.00									
Pipe_-_ (1)_ (RYCB)_1	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00
0.00									
Pipe_-_ (10)_ (RYCB)	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.94	0.00
0.00									
Pipe_-_ (100)_ (RYCB)	1.00	0.04	0.00	0.00	0.08	0.00	0.00	0.87	0.94
0.00									
Pipe_-_ (101)_ (RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.92	0.00
0.00									
Pipe_-_ (103)_ (1)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (103)_ (RYCB)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.94
0.00									
Pipe_-_ (109)_ (RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (11)_ (RYCB)	1.00	0.03	0.00	0.00	0.15	0.00	0.00	0.82	0.04
0.00									
Pipe_-_ (110)_ (RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.91	0.01
0.00									
Pipe_-_ (111)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.90	0.01
0.00									
Pipe_-_ (114)_ (RYCB)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00
0.00									
Pipe_-_ (117)_ (RYCB)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00
0.00									
Pipe_-_ (118)_ (RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.92	0.00
0.00									
Pipe_-_ (119)_ (RYCB)	1.00	0.89	0.02	0.00	0.09	0.00	0.00	0.00	0.94
0.00									
Pipe_-_ (120)_ (RYCB)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (121)_ (RYCB)	1.00	0.04	0.01	0.00	0.04	0.00	0.00	0.91	0.02
0.00									

Pipe_-_ (122)_ (RYCB)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (123)_ (RYCB)	1.00	0.05	0.00	0.00	0.04	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (124)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (125)_ (RYCB)	1.00	0.04	0.00	0.00	0.08	0.00	0.00	0.87	0.03
0.00									
Pipe_-_ (126)_ (RYCB)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (127)_ (RYCB)	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.94	0.00
0.00									
Pipe_-_ (128)_ (RYCB)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (129)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.90	0.01
0.00									
Pipe_-_ (130)_ (RYCB)	1.00	0.04	0.00	0.00	0.06	0.00	0.00	0.90	0.01
0.00									
Pipe_-_ (131)_ (RYCB)	1.00	0.04	0.00	0.00	0.04	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (132)_ (RYCB)	1.00	0.05	0.00	0.00	0.04	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (133)_ (RYCB)	1.00	0.04	0.00	0.00	0.09	0.00	0.00	0.86	0.93
0.00									
Pipe_-_ (134)_ (RYCB)	1.00	0.04	0.01	0.00	0.09	0.00	0.00	0.86	0.95
0.00									
Pipe_-_ (137)_ (RYCB)	1.00	0.04	0.00	0.00	0.06	0.00	0.00	0.89	0.00
0.00									
Pipe_-_ (138)_ (RYCB)	1.00	0.04	0.00	0.00	0.06	0.00	0.00	0.89	0.00
0.00									
Pipe_-_ (139)_ (RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.92	0.00
0.00									
Pipe_-_ (14)_ (RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (140)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.90	0.01
0.00									
Pipe_-_ (141)_ (RYCB)	1.00	0.04	0.00	0.00	0.04	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (142)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.91	0.00
0.00									
Pipe_-_ (143)_ (RYCB)	1.00	0.04	0.00	0.00	0.05	0.00	0.00	0.90	0.00
0.00									
Pipe_-_ (144)_ (RYCB)	1.00	0.03	0.01	0.00	0.09	0.00	0.00	0.87	0.04
0.00									
Pipe_-_ (145)_ (RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (146)_ (RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
0.00									
Pipe_-_ (147)_ (RYCB)	1.00	0.05	0.00	0.00	0.04	0.00	0.00	0.91	0.01
0.00									
Pipe_-_ (148)_ (RYCB)	1.00	0.04	0.00	0.00	0.11	0.00	0.00	0.85	0.93
0.00									
Pipe_-_ (149)_ (RYCB)	1.00	0.04	0.00	0.00	0.11	0.00	0.00	0.85	0.92
0.00									
Pipe_-_ (15)_ (RYCB)	1.00	0.03	0.00	0.00	0.92	0.05	0.00	0.00	0.00
0.00									
Pipe_-_ (150)_ (RYCB)	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.94	0.00
0.00									
Pipe_-_ (151)_ (RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
0.00									

Pipe_-(152)_(RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
Pipe_-(153)_(RYCB)	1.00	0.05	0.89	0.00	0.06	0.00	0.00	0.00	0.95
Pipe_-(154)_(RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.92	0.00
Pipe_-(155)_(RYCB)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00
Pipe_-(156)_(1)_(RYCB)	1.00	0.02	0.00	0.00	0.05	0.00	0.00	0.94	0.00
Pipe_-(156)_(RYCB)	1.00	0.02	0.87	0.00	0.11	0.00	0.00	0.00	0.94
Pipe_-(157)_(RYCB)	1.00	0.04	0.00	0.00	0.01	0.00	0.00	0.96	0.00
Pipe_-(159)_(RYCB)	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe_-(16)_(RYCB)	1.00	0.04	0.00	0.00	0.21	0.00	0.00	0.75	0.88
Pipe_-(160)_(RYCB)	1.00	0.95	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Pipe_-(161)_(RYCB)	1.00	0.04	0.00	0.00	0.07	0.00	0.00	0.89	0.94
Pipe_-(162)_(RYCB)	1.00	0.85	0.05	0.00	0.10	0.00	0.00	0.00	0.93
Pipe_-(164)_(RYCB)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00
Pipe_-(165)_(RYCB)	1.00	0.04	0.00	0.00	0.08	0.00	0.00	0.87	0.94
Pipe_-(17)_(RYCB)	1.00	0.04	0.00	0.00	0.01	0.00	0.00	0.95	0.00
Pipe_-(19)_(RYCB)	1.00	0.04	0.00	0.00	0.13	0.00	0.00	0.83	0.04
Pipe_-(2)_(RYCB)	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00
Pipe_-(22)_(RYCB)	1.00	0.27	0.59	0.00	0.15	0.00	0.00	0.00	0.93
Pipe_-(23)_(RYCB)	1.00	0.32	0.52	0.00	0.16	0.00	0.01	0.00	0.92
Pipe_-(24)_(RYCB)	1.00	0.04	0.00	0.00	0.12	0.00	0.00	0.84	0.02
Pipe_-(25)_(RYCB)	1.00	0.42	0.42	0.00	0.16	0.00	0.01	0.00	0.91
Pipe_-(27)_(RYCB)	1.00	0.04	0.00	0.00	0.14	0.00	0.00	0.82	0.05
Pipe_-(73)_(RYCB)	1.00	0.29	0.54	0.00	0.16	0.00	0.01	0.00	0.91
Pipe_-(74)_(RYCB)	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.02
Pipe_-(77)_(RYCB)	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.04
Pipe_-(87)_(RYCB)	1.00	0.05	0.00	0.00	0.05	0.00	0.00	0.91	0.01
Pipe_-(88)_(RYCB)	1.00	0.04	0.00	0.00	0.04	0.00	0.00	0.91	0.00
Pipe_-(89)_(RYCB)	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.92	0.00
Pipe_-(9)_(RYCB)	1.00	0.02	0.00	0.00	0.65	0.00	0.01	0.32	0.87
Pipe_-(90)_(RYCB)	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.03

Pipe_-(93)_(RYCB)	1.00	0.05	0.00	0.00	0.02	0.00	0.00	0.93	0.00
Pipe_-(94)_(RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.93	0.01
Pipe_-(95)_(RYCB)	1.00	0.04	0.00	0.00	0.09	0.00	0.00	0.86	0.94
Pipe_-(96)_(RYCB)	1.00	0.04	0.00	0.00	0.06	0.00	0.00	0.90	0.00
Pipe_-(98)_(RYCB)	1.00	0.03	0.80	0.00	0.17	0.00	0.00	0.00	0.91
Pipe_-(99)_(RYCB)	1.00	0.05	0.00	0.00	0.03	0.00	0.00	0.91	0.01
STM-23_(STM)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
STM-24_(STM)	1.00	0.02	0.01	0.00	0.16	0.00	0.01	0.80	0.10
STM-27_(STM)	1.00	0.04	0.01	0.00	0.03	0.00	0.00	0.92	0.00
STM-28_(STM)	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.00
STM-34_(1)_(1)_(STM)	1.00	0.02	0.00	0.00	0.93	0.00	0.00	0.05	0.00
STM-34_(1)_(STM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.00
STM-34_(STM)	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.00
STM-35_(STM)	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.00
STM-36_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STM-37_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STM-38_(STM)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STM-81_(STM)	1.00	0.88	0.00	0.00	0.03	0.00	0.00	0.09	0.00
STM-82_(STM)	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00
STM-83_(STM)	1.00	0.05	0.00	0.00	0.04	0.00	0.00	0.92	0.00

Conduit Surcharge Summary

Conduit	Hours Full			Hours Above Normal Flow	Hours Capacity Limited
	Both Ends	Upstream	Dnstream		
1_(STM)	0.17	0.17	0.19	0.02	0.01
10_(STM)	0.35	0.36	0.36	0.01	0.35
11_(STM)	0.35	0.37	0.35	0.29	0.35
12_(STM)	0.01	0.39	0.01	0.39	0.01
13_(STM)	0.01	0.08	0.01	0.40	0.01
14_(STM)	0.01	0.01	0.01	0.01	0.01
15_(10)_(STM)	0.30	0.30	0.30	0.01	0.30
15_(11)_(STM)	0.32	0.32	0.33	0.19	0.24

15_(12)_(STM)	0.01	0.01	0.07	0.01	0.01
15_(13)_(STM)	0.11	0.11	0.17	0.01	0.01
15_(14)_(STM)	0.31	0.31	0.33	0.01	0.26
15_(15)_(STM)	0.32	0.34	0.32	0.01	0.32
15_(16)_(STM)	0.20	0.34	0.20	0.02	0.20
15_(19)_(STM)	0.01	0.01	0.02	0.01	0.01
15_(20)_(STM)	0.02	0.02	0.18	0.01	0.01
15_(21)_(STM)	0.19	0.19	0.23	0.01	0.01
15_(22)_(STM)	0.23	0.23	0.31	0.01	0.01
15_(3)_(STM)	0.01	0.01	0.11	0.01	0.01
15_(4)_(STM)	0.01	0.10	0.01	0.23	0.01
15_(5)_(STM)	0.01	0.01	0.01	0.28	0.01
15_(9)_(STM)	0.26	0.26	0.29	0.01	0.01
2_(STM)	0.21	0.21	0.22	0.01	0.02
3_(STM)	0.15	0.15	0.20	0.01	0.01
4_(STM)	0.20	0.20	0.23	0.02	0.01
5_(STM)	0.15	0.19	0.15	0.01	0.15
6_(STM)	0.37	0.37	0.41	0.01	0.11
7_(1)_(STM)	0.33	0.43	0.34	0.40	0.30
7_(STM)	0.39	0.41	0.41	0.43	0.36
8_(STM)	0.34	0.34	0.36	0.22	0.26
9_(STM)	0.35	0.37	0.35	0.21	0.35
PH4_100-168	0.01	0.07	0.01	0.06	0.01
PH4_102-100	0.67	0.67	0.71	0.04	0.03
PH4_104-102	0.65	0.65	0.66	0.01	0.01
PH4_106-104	0.60	0.60	0.63	0.01	0.01
PH4_108-106	0.49	0.49	0.57	0.01	0.01
PH4_110-108	0.32	0.32	0.42	0.01	0.01
PH4_204-202	0.76	0.76	0.85	0.01	0.01
PH4_206-204	0.74	0.74	0.75	0.01	0.01
PH4_208-206	0.71	0.71	0.72	0.01	0.01
PH4_210-208	0.68	0.68	0.69	0.01	0.01
PH4_212-210	0.63	0.63	0.66	0.01	0.01
PH4_302-162	0.31	0.32	0.31	0.01	0.25
PH4_304-302	0.65	0.65	0.67	0.01	0.01
PH4_306-304	0.57	0.57	0.58	0.01	0.05
PH4_308-306	0.52	0.52	0.55	0.01	0.01
PH4_310-308	0.48	0.48	0.50	0.01	0.01
PH4_312-310	0.44	0.44	0.46	0.01	0.01
PH4_402-508	0.24	0.43	0.24	0.48	0.24
PH4_404-402	0.30	0.30	0.35	0.01	0.01
PH4_406-404	0.35	0.46	0.35	0.54	0.35
PH4_410-408	0.18	0.18	0.27	0.01	0.01
PH4_412-410	0.01	0.01	0.12	0.01	0.01
PH4_502-162	0.01	0.29	0.01	0.46	0.01
PH4_504-502	0.29	0.38	0.29	0.56	0.29
PH4_506-504	0.38	0.43	0.38	0.48	0.38
PH4_508-506	0.35	0.39	0.35	0.48	0.35
PH4_510-512	0.05	0.05	0.22	0.01	0.01
PH4_512-406	0.27	0.27	0.28	0.01	0.01
PH4_602-408	0.24	0.24	0.27	0.01	0.01
PH4_604-602	0.01	0.01	0.21	0.01	0.01
PH4_STM-71_(STM)	0.35	0.35	0.38	0.19	0.18
Pipe_-(1)_(RYCB)_1	0.01	0.01	0.01	0.04	0.01
Pipe_-(10)_(RYCB)	0.29	0.34	0.29	0.34	0.29
Pipe_-(100)_(RYCB)	0.22	0.22	0.34	0.01	0.01
Pipe_-(101)_(RYCB)	0.32	0.32	0.36	0.01	0.01

Pipe_-(103)_(1)_(RYCB)	0.44	0.44	0.44	0.16	0.43
Pipe_-(103)_(RYCB)	0.41	0.41	0.44	0.17	0.17
Pipe_-(109)_(RYCB)	0.11	0.11	0.20	0.01	0.01
Pipe_-(11)_(RYCB)	0.44	0.44	0.48	0.38	0.38
Pipe_-(110)_(RYCB)	0.13	0.13	0.24	0.01	0.01
Pipe_-(111)_(RYCB)	0.24	0.24	0.36	0.01	0.01
Pipe_-(114)_(RYCB)	0.08	0.08	0.11	0.01	0.01
Pipe_-(117)_(RYCB)	0.08	0.08	0.10	0.01	0.01
Pipe_-(118)_(RYCB)	0.10	0.10	0.19	0.01	0.01
Pipe_-(119)_(RYCB)	0.23	0.23	0.29	0.01	0.01
Pipe_-(120)_(RYCB)	0.05	0.05	0.08	0.01	0.01
Pipe_-(121)_(RYCB)	0.09	0.09	0.23	0.01	0.01
Pipe_-(122)_(RYCB)	0.05	0.05	0.12	0.01	0.01
Pipe_-(123)_(RYCB)	0.48	0.48	0.51	0.01	0.01
Pipe_-(124)_(RYCB)	0.52	0.52	0.56	0.01	0.01
Pipe_-(125)_(RYCB)	0.57	0.57	0.67	0.01	0.01
Pipe_-(126)_(RYCB)	0.14	0.14	0.16	0.14	0.13
Pipe_-(127)_(RYCB)	0.17	0.17	0.21	0.13	0.13
Pipe_-(128)_(RYCB)	0.22	0.22	0.27	0.13	0.13
Pipe_-(129)_(RYCB)	0.48	0.48	0.58	0.01	0.01
Pipe_-(130)_(RYCB)	0.58	0.58	0.64	0.01	0.01
Pipe_-(131)_(RYCB)	0.46	0.46	0.49	0.02	0.01
Pipe_-(132)_(RYCB)	0.46	0.46	0.46	0.01	0.01
Pipe_-(133)_(RYCB)	0.47	0.47	0.49	0.01	0.01
Pipe_-(134)_(RYCB)	0.05	0.05	0.11	0.01	0.01
Pipe_-(137)_(RYCB)	0.93	0.93	0.95	0.01	0.01
Pipe_-(138)_(RYCB)	0.95	0.95	0.98	0.01	0.01
Pipe_-(139)_(RYCB)	0.18	0.18	0.22	0.01	0.01
Pipe_-(14)_(RYCB)	0.21	0.21	0.21	0.01	0.01
Pipe_-(140)_(RYCB)	0.25	0.25	0.33	0.01	0.01
Pipe_-(141)_(RYCB)	0.47	0.47	0.50	0.01	0.01
Pipe_-(142)_(RYCB)	0.50	0.50	0.54	0.01	0.01
Pipe_-(143)_(RYCB)	0.54	0.54	0.59	0.01	0.01
Pipe_-(144)_(RYCB)	0.59	0.59	0.70	0.01	0.01
Pipe_-(145)_(RYCB)	0.19	0.19	0.21	0.01	0.01
Pipe_-(146)_(RYCB)	0.22	0.22	0.25	0.01	0.01
Pipe_-(147)_(RYCB)	0.25	0.25	0.27	0.01	0.01
Pipe_-(148)_(RYCB)	0.28	0.28	0.34	0.01	0.01
Pipe_-(149)_(RYCB)	0.38	0.38	0.40	0.01	0.01
Pipe_-(15)_(RYCB)	0.33	0.36	0.33	0.37	0.33
Pipe_-(150)_(RYCB)	0.11	0.11	0.13	0.01	0.01
Pipe_-(151)_(RYCB)	0.14	0.14	0.16	0.01	0.01
Pipe_-(152)_(RYCB)	0.17	0.17	0.20	0.01	0.01
Pipe_-(153)_(RYCB)	0.03	0.03	0.05	0.01	0.01
Pipe_-(154)_(RYCB)	0.21	0.21	0.26	0.01	0.01
Pipe_-(155)_(RYCB)	0.27	0.27	0.30	0.01	0.01
Pipe_-(156)_(1)_(RYCB)	0.36	0.37	0.36	0.14	0.34
Pipe_-(156)_(RYCB)	0.32	0.32	0.37	0.01	0.01
Pipe_-(157)_(RYCB)	0.05	0.15	0.05	0.15	0.05
Pipe_-(16)_(RYCB)	0.31	0.31	0.32	0.21	0.21
Pipe_-(161)_(RYCB)	0.18	0.18	0.30	0.01	0.01
Pipe_-(162)_(RYCB)	0.34	0.34	0.47	0.01	0.01
Pipe_-(164)_(RYCB)	0.30	0.30	0.30	0.32	0.28
Pipe_-(165)_(RYCB)	0.20	0.20	0.31	0.01	0.01
Pipe_-(17)_(RYCB)	0.11	0.11	0.12	0.02	0.03
Pipe_-(19)_(RYCB)	0.38	0.38	0.43	0.11	0.11
Pipe_-(2)_(RYCB)	0.01	0.09	0.01	0.11	0.01

Pipe_-_ (22)_ (RYCB)	0.67	0.67	0.76	0.09	0.09
Pipe_-_ (23)_ (RYCB)	0.69	0.69	0.71	0.29	0.29
Pipe_-_ (24)_ (RYCB)	0.49	0.50	0.50	0.24	0.23
Pipe_-_ (25)_ (RYCB)	0.33	0.33	0.34	0.20	0.20
Pipe_-_ (27)_ (RYCB)	0.38	0.38	0.46	0.13	0.13
Pipe_-_ (73)_ (RYCB)	0.71	0.71	0.74	0.30	0.30
Pipe_-_ (74)_ (RYCB)	0.30	0.30	0.31	0.13	0.13
Pipe_-_ (77)_ (RYCB)	0.26	0.26	0.33	0.02	0.02
Pipe_-_ (87)_ (RYCB)	0.30	0.30	0.34	0.01	0.01
Pipe_-_ (88)_ (RYCB)	0.35	0.35	0.47	0.01	0.01
Pipe_-_ (89)_ (RYCB)	0.20	0.20	0.28	0.01	0.01
Pipe_-_ (9)_ (RYCB)	1.06	1.06	1.07	0.31	0.31
Pipe_-_ (90)_ (RYCB)	0.30	0.30	0.31	0.01	0.01
Pipe_-_ (93)_ (RYCB)	0.06	0.06	0.12	0.01	0.01
Pipe_-_ (94)_ (RYCB)	0.12	0.12	0.19	0.01	0.01
Pipe_-_ (95)_ (RYCB)	0.20	0.20	0.30	0.01	0.01
Pipe_-_ (96)_ (RYCB)	0.90	0.90	0.92	0.01	0.01
Pipe_-_ (98)_ (RYCB)	0.98	0.98	1.06	0.01	0.01
Pipe_-_ (99)_ (RYCB)	0.16	0.16	0.22	0.01	0.01
STM-27_ (STM)	0.22	0.22	0.36	0.01	0.01
STM-28_ (STM)	0.01	0.14	0.01	0.17	0.01
STM-34_ (1)_ (1)_ (STM)	0.01	0.01	0.01	0.33	0.01
STM-34_ (1)_ (STM)	0.01	0.01	0.01	0.41	0.01
STM-34_ (STM)	0.01	0.01	0.01	0.46	0.01
STM-35_ (STM)	11.15	11.17	16.34	0.35	0.11
STM-36_ (STM)	22.57	22.59	22.57	0.14	0.24
STM-37_ (STM)	22.55	22.58	22.55	0.19	0.27
STM-38_ (STM)	22.57	22.57	22.57	0.19	0.08
STM-81_ (STM)	0.25	0.35	0.25	0.34	0.25
STM-82_ (STM)	0.01	0.15	0.01	0.14	0.01
STM-83_ (STM)	0.30	0.30	0.41	0.01	0.01

Analysis begun on: Thu Oct 31 12:39:35 2024
 Analysis ended on: Thu Oct 31 12:39:45 2024
 Total elapsed time: 00:00:10

Appendix D
Sanitary Sewer Design Sheets and Sanitary Calculations

SANITARY SEWER DESIGN SHEET



Novatech Project #: 118224
 Project Name: The Commons (Phase 4) A
 Date: 10/31/2024
 Input By: Brad Smith
 Reviewed By:
 Drawing Reference: 118224-GP-MD, 118224-SAN-MD

Legend: Design Input by User
 As-Built Input by User
 Cumulative Cell
 Calculated Design Cell Output
 Calculated Annual Cell Output
 Calculated Rare Cell Output
 MOE - Design Guidelines for Sewage Works (2008)

Location				Demand																	Design Capacity										
Street	Area ID	From MH	To MH	Residential Flow							Industrial / Commercial / Institutional (ICI) Flow							Extraneous Flow			Total Design Flow	Proposed Sewer Pipe Sizing / Design									
				Singles	Semis / Towns	Apts	Park Area	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Commercial / Institutional Area (ha.)	Cumulative Commercial / Institutional Area (ha.)	Average Design Commercial / Institutional Flow (L/s)	Commercial / Institutional Peaking Factor	Cumulative ICI Area (ha.)	Peak Design ICI Flow Q (ic) (L/s)		Cumulative Extraneous Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)
STREET 1	A-1	111	109		6			0.016	0.016	0.05	3.71	0.19	0.096	0.096	0.000	0.000	0.00	1.00	0.000	0.00	0.096	0.03	0.23	39.9	200 PVC	0.203	0.013	0.65	27.6	0.85	0.8%
STREET 1	A-2	109	107		0			0.000	0.016	0.05	3.71	0.19	0.014	0.110	0.000	0.000	0.00	1.00	0.000	0.00	0.110	0.04	0.23	8.2	200 PVC	0.203	0.013	0.50	24.2	0.75	1.0%
STREET 1	A-3	107	105		0			0.000	0.016	0.05	3.71	0.19	0.025	0.135	0.000	0.000	0.00	1.00	0.000	0.00	0.135	0.04	0.24	17.9	200 PVC	0.203	0.013	0.32	19.4	0.60	1.2%
STREET 1	A-4	105	103		1			0.003	0.019	0.06	3.71	0.23	0.033	0.168	0.000	0.000	0.00	1.00	0.000	0.00	0.168	0.06	0.28	8.8	200 PVC	0.203	0.013	0.50	24.2	0.75	1.2%
STREET 1	A-5	103	101		11			0.030	0.049	0.16	3.65	0.58	0.128	0.296	0.000	0.000	0.00	1.00	0.000	0.00	0.296	0.10	0.67	37.9	200 PVC	0.203	0.013	0.32	19.4	0.60	3.5%
STREET 1	A-6	101	201		0			0.000	0.049	0.16	3.65	0.58	0.016	0.312	0.000	0.000	0.00	1.00	0.000	0.00	0.296	0.10	0.67	31.3	200 PVC	0.203	0.013	0.32	19.4	0.60	3.5%
STREET 2	A-7	205	203		12			0.032	0.032	0.11	3.68	0.39	0.179	0.179	0.000	0.000	0.00	1.00	0.000	0.00	0.179	0.06	0.45	39.4	200 PVC	0.203	0.013	0.32	19.4	0.60	2.3%
STREET 2	-	203	201		0			0.000	0.032	0.11	3.68	0.39	0.000	0.179	0.000	0.000	0.00	1.00	0.000	0.00	0.179	0.06	0.45	3.1	200 PVC	0.203	0.013	0.50	24.2	0.75	1.8%
STREET 2	-	201	169		0			0.000	0.081	0.26	3.61	0.95	0.000	0.491	0.000	0.000	0.00	1.00	0.000	0.00	0.491	0.16	1.11	13.0	200 PVC	0.203	0.013	0.32	19.4	0.60	5.7%
STREET 2	A-8	209	207		12			0.032	0.032	0.11	3.68	0.39	0.183	0.183	0.000	0.000	0.00	1.00	0.000	0.00	0.183	0.06	0.45	43.4	200 PVC	0.203	0.013	0.32	19.4	0.60	2.3%
STREET 2	-	207	167		0			0.000	0.032	0.11	3.68	0.39	0.000	0.183	0.000	0.000	0.00	1.00	0.000	0.00	0.183	0.06	0.45	11.0	200 PVC	0.203	0.013	0.30	18.7	0.58	2.4%
STREET 3	A-9	313	311		5			0.014	0.014	0.04	3.72	0.16	0.081	0.081	0.000	0.000	0.00	1.00	0.000	0.00	0.081	0.03	0.19	36.2	200 PVC	0.203	0.013	0.65	27.6	0.85	0.7%
STREET 3	A-10	311	307		1			0.003	0.016	0.05	3.71	0.19	0.032	0.113	0.000	0.000	0.00	1.00	0.000	0.00	0.113	0.04	0.23	10.4	200 PVC	0.203	0.013	0.50	24.2	0.75	1.0%
STREET 3	A-11	307	305		5			0.014	0.030	0.10	3.68	0.35	0.084	0.198	0.000	0.000	0.00	1.00	0.000	0.00	0.198	0.07	0.42	41.8	200 PVC	0.203	0.013	0.32	19.4	0.60	2.2%
STREET 3	A-12	305	303		0			0.000	0.030	0.10	3.68	0.35	0.020	0.218	0.000	0.000	0.00	1.00	0.000	0.00	0.218	0.07	0.43	10.3	200 PVC	0.203	0.013	0.50	24.2	0.75	1.8%
STREET 3	A-13	303	301		0			0.000	0.030	0.10	3.68	0.35	0.035	0.253	0.000	0.000	0.00	1.00	0.000	0.00	0.253	0.08	0.44	15.7	200 PVC	0.203	0.013	0.33	19.7	0.61	2.2%
STREET 3	-	301	163		0			0.000	0.030	0.10	3.68	0.35	0.000	0.253	0.000	0.000	0.00	1.00	0.000	0.00	0.253	0.08	0.44	9.9	200 PVC	0.203	0.013	0.30	18.7	0.58	2.3%
VENTUS	A-14	165	163		5			0.014	0.043	0.14	3.66	0.51	0.065	0.065	0.000	0.000	0.00	1.00	0.000	0.00	0.065	0.02	0.53	56.2	200 PVC	0.203	0.013	0.32	19.4	0.60	2.8%
STREET 4	B-1	413	411		7			0.019	0.019	0.06	3.71	0.23	0.136	0.136	0.000	0.000	0.00	1.00	0.000	0.00	0.136	0.04	0.27	50.0	200 PVC	0.203	0.013	0.65	27.6	0.85	1.0%
STREET 4	B-2	411	409		0			0.000	0.019	0.06	3.71	0.23	0.023	0.159	0.000	0.000	0.00	1.00	0.000	0.00	0.159	0.05	0.28	11.9	200 PVC	0.203	0.013	0.50	24.2	0.75	1.2%
STREET 4	B-3	409	407		0			0.000	0.019	0.06	3.71	0.23	0.031	0.191	0.000	0.000	0.00	1.00	0.000	0.00	0.191	0.06	0.29	26.9	200 PVC	0.203	0.013	0.32	19.4	0.60	1.5%
STREET 6	B-4	601	603		14			0.038	0.038	0.12	3.67	0.45	0.206	0.396	0.000	0.000	0.00	1.00	0.000	0.00	0.396	0.13	0.58	52.9	200 PVC	0.203	0.013	0.32	19.4	0.60	3.0%
STREET 6	B-5	603	407		0			0.000	0.038	0.12	3.67	0.45	0.011	0.408	0.000	0.000	0.00	1.00	0.000	0.00	0.408	0.13	0.58	8.8	200 PVC	0.203	0.013	0.32	19.4	0.60	3.0%
STREET 4	B-6	407	405		0			0.000	0.019	0.06	3.71	0.23	0.035	0.634	0.000	0.000	0.00	1.00	0.000	0.00	0.634	0.21	0.44	32.6	200 PVC	0.203	0.013	0.32	19.4	0.60	2.3%
STREET 5	B-7	509	511		12			0.032	0.032	0.11	3.68	0.39	0.194	0.194	0.000	0.000	0.00	1.00	0.000	0.00	0.194	0.06	0.45	47.3	200 PVC	0.203	0.013	0.32	19.4	0.60	2.3%
STREET 5	B-8	511	405		1			0.003	0.035	0.11	3.67	0.42	0.013	0.207	0.000	0.000	0.00	1.00	0.000	0.00	0.207	0.07	0.49	9.9	200 PVC	0.203	0.013	0.32	19.4	0.60	2.5%
STREET 4	B-9	405	403		0			0.000	0.019	0.06	3.71	0.23	0.025	0.867	0.000	0.000	0.00	1.00	0.000	0.00	0.867	0.29	0.51	23.3	200 PVC	0.203	0.013	0.32	19.4	0.60	2.7%
STREET 4	B-10	403	401		0			0.000	0.019	0.06	3.71	0.23	0.019	0.886	0.000	0.000	0.00	1.00	0.000	0.00	0.886	0.29	0.52	10.5	200 PVC	0.203	0.013	0.50	24.2	0.75	2.1%
STREET 4	B-11	401	507		6			0.016	0.035	0.11	3.67	0.42	0.106	0.992	0.000	0.000	0.00	1.00	0.000	0.00	0.992	0.33	0.75	49.2	200 PVC	0.203	0.013	0.32	19.4	0.60	3.9%
STREET 5	B-12	507	505		0			0.000	0.035	0.11	3.67	0.42	0.013	1.005	0.000	0.000	0.00	1.00	0.000	0.00	1.005	0.33	0.75	12.0	200 PVC	0.203	0.013	0.32	19.4	0.60	3.9%
STREET 5	B-13	505	503		0			0.000	0.035	0.11	3.67	0.42	0.033	1.038	0.000	0.000	0.00	1.00	0.000	0.00	1.038	0.34	0.76	22.2	200 PVC	0.203	0.013	0.32	19.4	0.60	3.9%
STREET 5	B-14	503	501		0			0.000	0.035	0.11	3.67	0.42	0.018	1.055	0.000	0.000	0.00	1.00	0.000	0.00	1.055	0.35	0.77	8.4	200 PVC	0.203	0.013	0.32	19.4	0.60	4.0%
STREET 5	-	501	163		0			0.000	0.035	0.11	3.67	0.42	0.000	1.055	0.000	0.000	0.00	1.00	0.000	0.00	1.055	0.35	0.77	11.7	200 PVC	0.203	0.013	0.32	19.4	0.60	4.0%
PUBLIC PARK	B-15	701	EX			0.143		0.001	0.001	0.00	3.78	0.01	0.166	0.166	0.000	0.000	0.00	1.00	0.000	0.00	0.166	0.05	0.06	9.8	150 PVC	0.152	0.013	1.00	15.9	0.87	0.4%
Totals					0	110	0	0.143	0.298	0.96	3.46	3.34	2.203	2.203	0.000	0.000	0.00	1.00	0.000	0.00	2.203	0.73	4.07	867.3							

Demand Equation / Parameters

- $Q(D), Q(A), Q(R) = Q(p) + Q(t) + Q(ici) + Q(e)$
- $Q(p) = (P \times q \times M \times K / 86,400)$
- $q =$ 280 L/person/day (design)
200 L/person/day (annual and rare)
- M = Harmon Formula (maximum of 4.0)**
- $K =$ 0.8 (design)
0.6 (annual and rare)
- Park flow is considered equivalent to a single unit / ha**
Park Demand = 4 single unit equivalent / park ha (~ 3,600 L/ha/day)
- $Q(t) =$ 0.45 L/s/unit
- $Q(ici) =$ ICI Area x ICI Flow x ICI Peak
- $Q(e) =$ 0.33 L/s/ha (design)
0.30 L/s/ha (annual)
0.55 L/s/ha (rare)

Definitions

$Q(D)$ = Peak Design Flow (L/s)
 $Q(A)$ = Peak Annual Flow (L/s)
 $Q(R)$ = Peak Rare Flow (L/s)
 $Q(p)$ = Peak Design Population Flow (L/s)
 $Q(q)$ = Average Population Flow (L/s)

P = Residential Population = 3.4
 q = Average Capita Flow = 2.7
 M = Harmon Formula = 2.1
 K = Harmon Correction Factor = 1.5
 $Typ. Service Diameter (mm) =$ 135
 $Typ. Service Length (m) =$ 15
 $ICI Pipe Rate (L/mm dia/m/hr) =$ 0.007
 $Q(t) =$ Foundation Flow (L/s)
 $Q(ici) =$ Industrial / Commercial / Institutional Flow (L/s)
 $Q(e) =$ Extraneous Flow (L/s)

Institutional / Commercial / Industrial	Industrial	Commercial / Institutional
Design = 35000	28000	L/gross ha/day
Annual / Rare = 10000	17000	L/gross ha/day

ICI Peak *

Design = 1.0	1.5	* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)
Annual / Rare = 1.0	1.0	

Capacity Equation

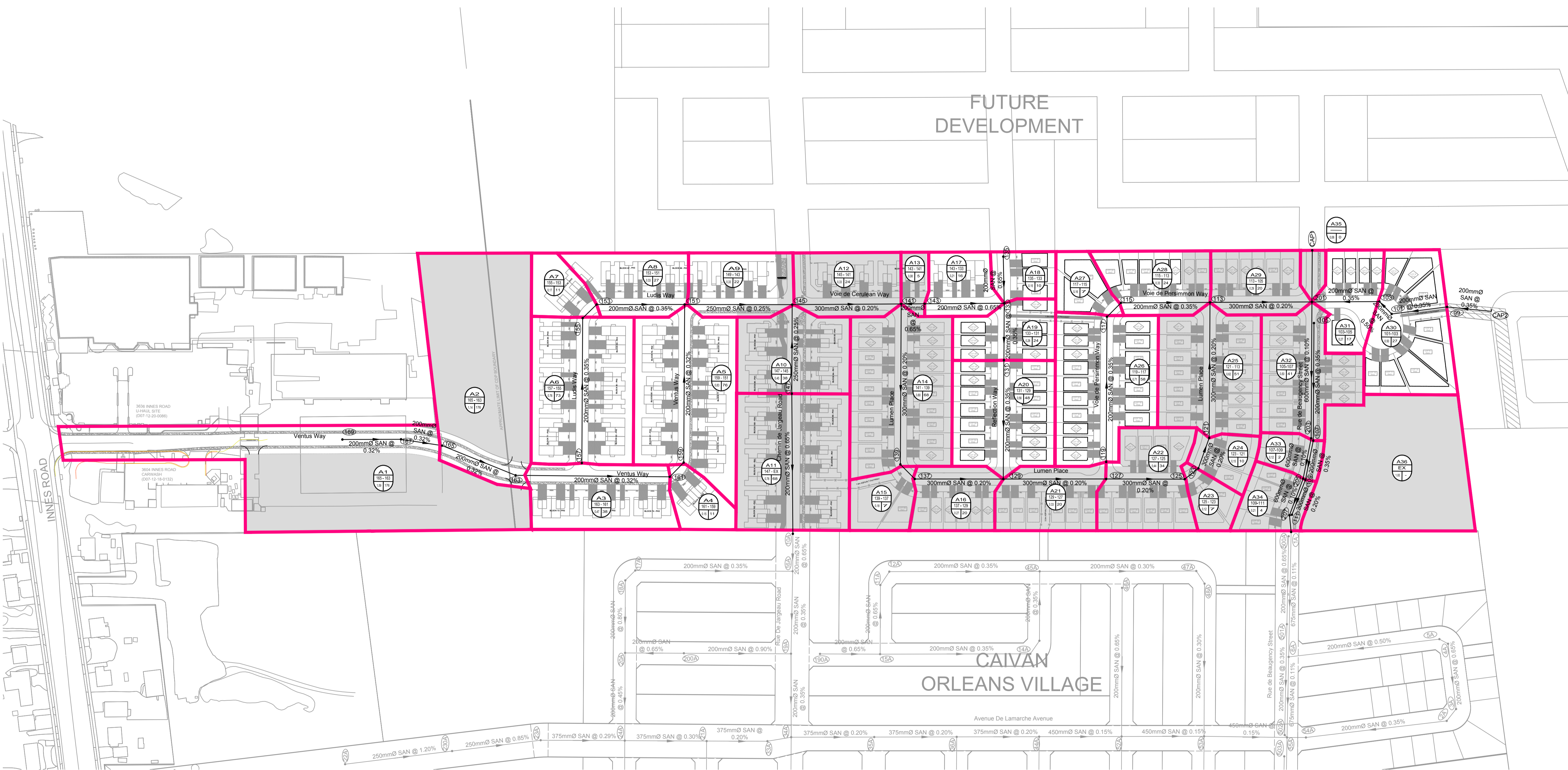
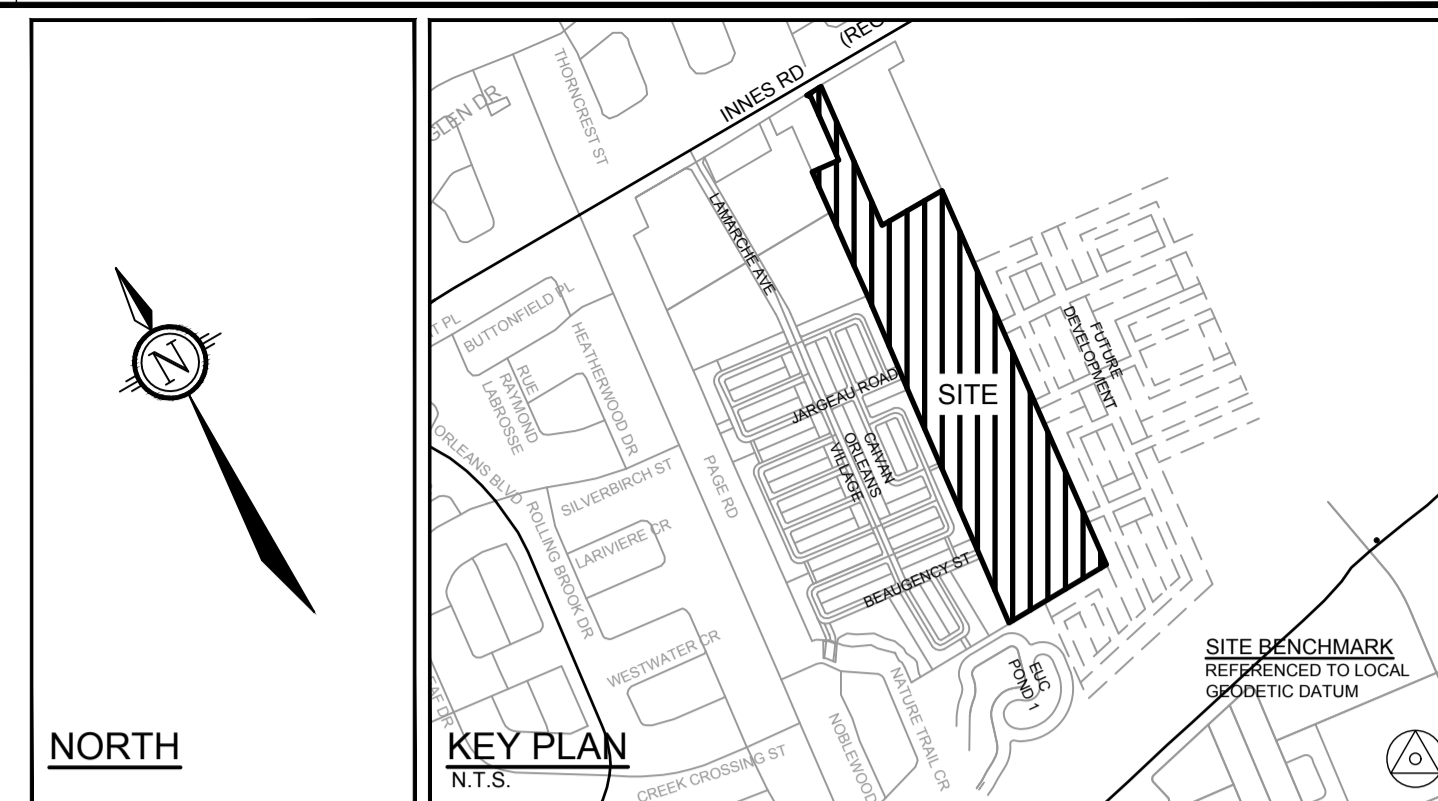
$Q_{full} = (1/h) Ap R^{(2/3)} So^{(1/2)}$

Definitions

$Q_{full} =$ Capacity (L/s)
 $n =$ Manning coefficient of roughness (0.013)
 $Ap =$ Pipe flow area (m²)
 $R =$ Wetted perimeter (m)
 $So =$ Pipe slope/gradient

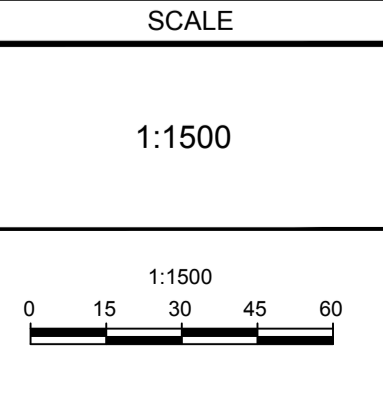
LEGEND

- DRAINAGE AREA BOUNDARY
- AREA 19 AREA NUMBER
- 101-103 MANHOLE TO MANHOLE
- 104 POPULATION
- 105 AREA (ha)
- PROPOSED SANITARY SEWER C/W FLOW DIRECTION
- PROPOSED SAN MH



NOTE:
 THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY	No.	REVISION	DATE	BY
10.	FINAL REVIEW, ECA, CLI AND MATERIAL ORDER	MAR 21/24	BHB	8.	ISSUED FOR REVIEW PHASE 2 & 3	APRIL 3/23	BHB
9.	REVISED AND ISSUED FOR REVIEW AND TENDER	JAN 17/24	BHB	7.	ISSUED FOR FINAL CITY APPROVAL AND ECA	MAY 11/22	BHB
				6.	REVISED AND REISSUED FOR REVIEW	MAR 10/22	BHB
				5.	REVISED AND REISSUED FOR REVIEW	NOV 25/21	BHB
				4.	ISSUED FOR REVIEW	JUNE 18/21	BHB
				3.	REVISED AND REISSUED FOR DRAFT PLAN APPROVAL	NOV 27/20	BHB
				2.	REVISED AND REISSUED FOR DRAFT PLAN APPROVAL	APR 3/20	BHB
				1.	DRAFT PLAN	OCT 4/19	BHB



DESIGN	DJC
CHECKED	BCS
DRAWN	DJC
CHECKED	BCS
APPROVED	BHB

FOR REVIEW ONLY

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LOCATION CITY OF OTTAWA THE COMMONS	
DRAWING NAME SANITARY DRAINAGE AREA PLAN	
PROJECT No. 118224-00	REV # 9
DRAWING No. 118224-SAN	

M:\2018\118224\CADD\Design\118224-SAN.dwg, 118224-SAN, Mar 21, 2024 - 12:46pm, bsmth

#18535
D07-16-19-0027

SANITARY SEWER DESIGN SHEET



Novatech Project #: 118224
 Project Name: The Commons
 Date: 1/17/2024
 Input By: Bradley Reed
 Reviewed By: Sam Bahra
 Drawing Reference: 118224-GP1-4, 118224-SAN

Legend: Design Input by User
 As-Built Input by User
 Cumulative Cell
 Calculated Design Cell Output
 Calculated Annual Cell Output
 Calculated Flow Cell Output
 MCE - Design Guidelines for Sewage Works (2008)

Location				Demand															Design Capacity										Design Partial Pipe Flow Checks													
Street	Area ID	From MH	To MH	Residential Flow					Industrial / Commercial / Institutional (ICI) Flow					Extraneous Flow Area Method					Proposed Sewer Pipe Sizing / Design					Design Check Summary	Design Check 1 Pipe Capacity Q < Qfull	Design Check 2 Full Flow Velocity Vfull > 0.6m/s	Design Check 3 Number of Units > 10 N/A, if slope > 0.65%	Design Check 4 d/D > 0.30 N/A, if slope > 0.65%	Design Check 4b Partial Flow Velocity Vactual > 0.6m/s N/A, if slope > 0.65%	Design Check 5 Pipe Length < 15m N/A, if slope > 0.65%												
				Singles	Semis / Towns	Apts	Park Area	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(p) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Commercial / Institutional Area (ha.)	Cumulative Commercial / Institutional Area (ha.)	Average Design Commercial / Institutional Flow (L/s)	Commercial / Institutional Peaking Factor	Cumulative ICI Area (ha.)	Peak Design ICI Flow Q(ici) (L/s)	Extraneous Flow Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)								Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Q(D) / Qfull	d / D	V / Vfull	Partial Flow Velocity (m/s)	
Ventus Way	A1	169	167			84			0.176	0.176	0.57	3.53	2.02	1.590	1.590	0.000	0.000	0.00	1.00	0.000	0.00	1.590	0.52	2.54	113.8	200 PVC	0.203	0.013	0.32	19.4	0.60	13.1%	24.0%	68.4%	0.41	OK	OK	OK	N/A	N/A	N/A	OK
	-	167	165						0.000	0.176	0.57	3.53	2.02	0.000	1.590	0.000	0.000	0.00	1.00	0.000	0.00	1.590	0.52	2.54	20.1	200 PVC	0.203	0.013	0.32	19.4	0.60	13.1%	24.0%	68.4%	0.41	OK	OK	OK	N/A	N/A	N/A	OK
	A2	165	163			84			0.176	0.353	1.14	3.44	3.93	1.140	2.730	0.000	0.000	0.00	1.00	0.000	0.00	2.730	0.90	4.83	57.8	200 PVC	0.203	0.013	0.32	19.4	0.60	25.0%	34.0%	83.0%	0.50	OK	OK	OK	N/A	N/A	N/A	OK
	A3	163	161			14			0.038	0.214	0.69	3.51	2.44	0.470	2.060	0.000	0.000	0.00	1.00	0.000	0.00	2.060	0.68	3.12	109.4	200 PVC	0.203	0.013	0.32	19.4	0.60	18.1%	27.0%	73.2%	0.44	OK	OK	OK	N/A	N/A	N/A	OK
	A4	161	159			4			0.011	0.225	0.73	3.50	2.55	0.150	2.210	0.000	0.000	0.00	1.00	0.000	0.00	2.210	0.73	3.28	14.1	200 PVC	0.203	0.013	0.30	24.2	0.75	13.6%	24.0%	68.4%	0.51	SHORT RUN	OK	OK	OK	N/A	N/A	N/A
Ludis Way	A5	159	151			28			0.076	0.301	0.97	3.46	3.37	0.830	3.040	0.000	0.000	0.00	1.00	0.000	0.00	3.040	1.00	4.38	112.1	200 PVC	0.203	0.013	0.32	19.4	0.60	22.6%	32.0%	80.4%	0.48	OK	OK	OK	N/A	N/A	N/A	OK
	A6	157	155			27			0.073	0.073	0.24	3.62	0.86	0.760	0.760	0.000	0.000	0.00	1.00	0.000	0.00	0.760	0.25	1.11	102.8	200 PVC	0.203	0.013	0.35	20.2	0.62	5.6%	15.0%	51.7%	0.32	OK	OK	OK	N/A	N/A	N/A	OK
	A7	155	153			4			0.011	0.084	0.27	3.61	0.98	0.170	0.930	0.000	0.000	0.00	1.00	0.000	0.00	0.930	0.31	1.29	13.8	200 PVC	0.203	0.013	0.50	24.2	0.75	5.3%	15.0%	51.7%	0.39	SHORT RUN	OK	OK	OK	N/A	N/A	N/A
Ludis Way	A8	153	151			10			0.027	0.111	0.36	3.58	1.29	0.330	1.260	0.000	0.000	0.00	1.00	0.000	0.00	1.260	0.42	1.70	62.5	200 PVC	0.203	0.013	0.35	20.2	0.62	8.4%	19.0%	59.7%	0.37	OK	OK	OK	N/A	N/A	N/A	OK
	A9	151	145			8			0.022	0.433	1.40	3.40	4.78	0.330	4.630	0.000	0.000	0.00	1.00	0.000	0.00	4.630	1.53	6.30	76.3	200 PVC	0.254	0.013	0.25	31.0	0.81	20.3%	30.0%	77.6%	0.48	OK	OK	OK	N/A	N/A	N/A	OK
Chemin de Jargeau Road	A10	147	145			14			0.038	0.038	0.12	3.67	0.45	0.450	0.450	0.000	0.000	0.00	1.00	0.000	0.00	0.450	0.15	0.60	63.2	200 PVC	0.254	0.013	0.25	31.0	0.81	1.9%	9.0%	37.5%	0.23							
	A11	147	EX			25			0.068	0.068	0.22	3.63	0.79	0.790	0.790	0.000	0.000	0.00	1.00	0.000	0.00	0.790	0.26	1.05	99.4	200 PVC	0.203	0.013	0.65	27.6	0.85	3.8%	13.0%	47.3%	0.40							
Voie de Canéan Way	A12	145	141			9			0.024	0.495	1.60	3.38	5.42	0.330	5.410	0.000	0.000	0.00	1.00	0.000	0.00	5.410	1.76	7.21	77.3	300 PVC	0.305	0.013	0.20	45.1	0.82	16.0%	27.0%	73.2%	0.45							
	A13	143	141			2			0.005	0.005	0.02	3.75	0.07	0.080	0.080	0.000	0.000	0.00	1.00	0.000	0.00	0.080	0.03	0.09	16.6	200 PVC	0.203	0.013	0.65	27.6	0.85	0.3%	4.0%	22.2%	0.19							
Lumen Place	A14	141	139			20			0.069	0.569	1.84	3.38	6.19	0.600	6.290	0.000	0.000	0.00	1.00	0.000	0.00	6.290	2.08	8.26	113.9	300 PVC	0.305	0.013	0.20	45.1	0.82	18.3%	28.0%	74.7%	0.48							
	A15	139	137			2			0.007	0.575	1.86	3.35	1.80	4.470	4.470	0.000	0.000	0.00	1.00	0.000	0.00	4.470	2.14	8.38	14.8	300 PVC	0.305	0.013	0.50	71.3	0.98	11.8%	23.0%	68.6%	0.65							
	A16	137	129			6			0.020	0.596	1.93	3.35	6.46	0.270	6.740	0.000	0.000	0.00	1.00	0.000	0.00	6.740	2.22	8.68	62.8	300 PVC	0.305	0.013	0.20	45.1	0.82	19.3%	29.0%	76.2%	0.47							
Voie de Canéan Way	A17	143	133			6			0.016	0.016	0.05	3.71	0.19	0.210	0.210	0.000	0.000	0.00	1.00	0.000	0.00	0.210	0.07	0.28	56.5	200 PVC	0.203	0.013	0.65	27.6	0.85	1.0%	6.0%	28.9%	0.25	OK	OK	OK	N/A	N/A	N/A	OK
Reflection Way	A18	135	133			3			0.010	0.010	0.03	3.73	0.12	0.150	0.150	0.000	0.000	0.00	1.00	0.000	0.00	0.150	0.05	0.17	33.1	200 PVC	0.203	0.013	0.65	27.6	0.85	0.6%	5.0%	25.7%	0.22	OK	OK	OK	N/A	N/A	N/A	OK
Reflection Way	A19	133	131			7			0.024	0.050	0.16	3.65	0.59	0.280	0.640	0.000	0.000	0.00	1.00	0.000	0.00	0.640	0.21	0.81	40.4	200 PVC	0.203	0.013	0.35	20.2	0.62	4.0%	13.0%	47.3%	0.30	OK	OK	OK	N/A	N/A	N/A	OK
Lumen Place	A20	131	129			14			0.048	0.098	0.32	3.60	1.14	0.560	1.200	0.000	0.000	0.00	1.00	0.000	0.00	1.200	0.40	1.54	84.3	300 PVC	0.203	0.013	0.35	20.2	0.62	7.6%	18.0%	57.7%	0.36	OK	OK	OK	N/A	N/A	N/A	OK
	A21	129	127			6			0.020	0.714	2.31	3.31	7.66	0.330	8.270	0.000	0.000	0.00	1.00	0.000	0.00	8.270	2.73	10.36	73.0	300 PVC	0.305	0.013	0.20	45.1	0.82	23.0%	32.0%	80.4%	0.50							
	A22	127	125			10			0.034	0.748	2.42	3.30	8.00	0.440	8.710	0.000	0.000	0.00	1.00	0.000	0.00	8.710	2.87	10.88	55.7	300 PVC	0.305	0.013	0.20	45.1	0.82	24.1%	33.0%	81.7%	0.51							
	A23	125	123			2			0.007	0.755	2.45	3.30	8.07	0.120	8.830	0.000	0.000	0.00	1.00	0.000	0.00	8.830	2.91	10.98	12.4	300 PVC	0.305	0.013	0.50	71.3	0.98	15.4%	26.0%	71.7%	0.70							
	A24	123	121			3			0.010	0.765	2.48	3.30	8.17	0.150	8.980	0.000	0.000	0.00	1.00	0.000	0.00	8.980	2.96	11.14	23.0	300 PVC	0.305	0.013	0.20	45.1	0.82	24.7%	33.0%	81.7%	0.51							
Voie de Persimmon Way	A25	121	113			15			0.051	0.816	2.64	3.28	8.68	0.620	9.600	0.000	0.000	0.00	1.00	0.000	0.00	9.600	3.17	11.85	96.2	300 PVC	0.305	0.013	0.20	45.1	0.82	26.3%	34.0%	83.0%	0.51							
	A26	119	117			17			0.058	0.058	0.19	3.64	0.68	0.710	0.710	0.000	0.000	0.00	1.00	0.000	0.00	0.710	0.23	0.92	103.0	200 PVC	0.203	0.013	0.35	20.2	0.62	4.5%	14.0%	49.5%	0.31	OK	OK	OK	N/A	N/A	N/A	OK
	A27	117	115			2			0.007	0.065	0.21	3.63	0.76	0.160	0.870	0.000	0.000	0.00	1.00	0.000	0.00	0.870	0.29	1.05	14.0	200 PVC	0.203	0.013	0.50	71.3	0.75	4.3%	14.0%	49.5%	0.37	SHORT RUN	OK	OK	OK	N/A	N/A	N/A
Voie de Persimmon Way	A28	115	113			7			0.024	0.088	0.29	3.61	1.03	0.330	1.200	0.000	0.000	0.00	1.00	0.000	0.00	1.200	0.40	1.43	63.2	200 PVC	0.203	0.013	0.35	20.2	0.62	7.1%	17.0%	55.8%								

Appendix E
Boundary Conditions, Water Demand Calculations and Hydraulic Modeling

Boundary Condition Request

Novatech Project #: 118224
Project Name: The Commons - Phase 4
Date: 9/19/2024
Input By: BCS
Reviewed By: BHB
Drawing Reference: 118224-PH mkup

Legend: Input by User No Input Required
 Calculated Cells →
Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
 MOE Design Guidelines for Drinking-Water Systems (2008)
 Fire Underwriter's Survey Guideline (2020)
 Ontario Building Code, Part 3 (2012)

Small System = NO

	# of Dwellings	Area (ha.)	Pop. Equiv.	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Residential Input						
Singles			0.00	0.00	0.00	0.00
Semis / Townhomes	98		264.60	0.86	2.14	4.72
Apartments (2-BR)			0.00	0.00	0.00	0.00
Apartments (1-BR)			0.00	0.00	0.00	0.00
Apartments (Avg)			0.00	0.00	0.00	0.00
Industrial / Commercial / Institutional (ICI) Input						
Industrial Area - Light				0.00	0.00	0.00
Industrial Area - Heavy				0.00	0.00	0.00
Commercial Area				0.00	0.00	0.00
Institutional Area				0.00	0.00	0.00
Other Area		0.17		0.02	0.03	0.05
Totals	98	0.17	264.60	0.88	2.17	4.77

Summary

i. Type of Development and Units:	Residential (98 Back-to-Back Townhomes) and Park
ii. Site Address:	3610 Innes Road
iii. Proposed Water Service Connection Location(s):	Refer to 118224-PH mkup Connection 1 - Innes Road, existing 305mm stub Connection 2 - Ventus Way, existing 203mm stub
iv. Average Day Flow Demand:	0.88 L/s
v. Peak Hour Flow Demand:	4.77 L/s
vi. Maximum Day Flow Demand:	2.17 L/s
vii. Required Fire Flow #1:	10000 L/min
viii. Required Fire Flow #2:	12000 L/min
ix. Required Fire Flow #3:	13000 L/min
x. Required Fire Flow #4:	14000 L/min
xi. Required Fire Flow #5:	16000 L/min

Design Parameters

Residential					
Unit Type Population Equiv.	Singles	Semis/ Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)
	3.4	2.7	2.1	1.4	1.8
Daily Demand	L/per person/day				
Average Demand	280				

Residential Peaking Factors		Max Day (x Avg Day)	Peak Hour (x Avg Day)
Small System (If Applicable) <i>Modified</i>	Pop.		
	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
	300	3.60	5.50
	450	3.00	5.50
500	2.90	5.50	
Large System (Default)	> 500	2.50	5.50

Institutional / Commercial / Industrial				
Industrial		Commercial	Institutional	Other Use [1]
Light	Heavy			
L/gross ha/day			L/gross ha/day	
35,000	55,000	28,000	28,000	9,300

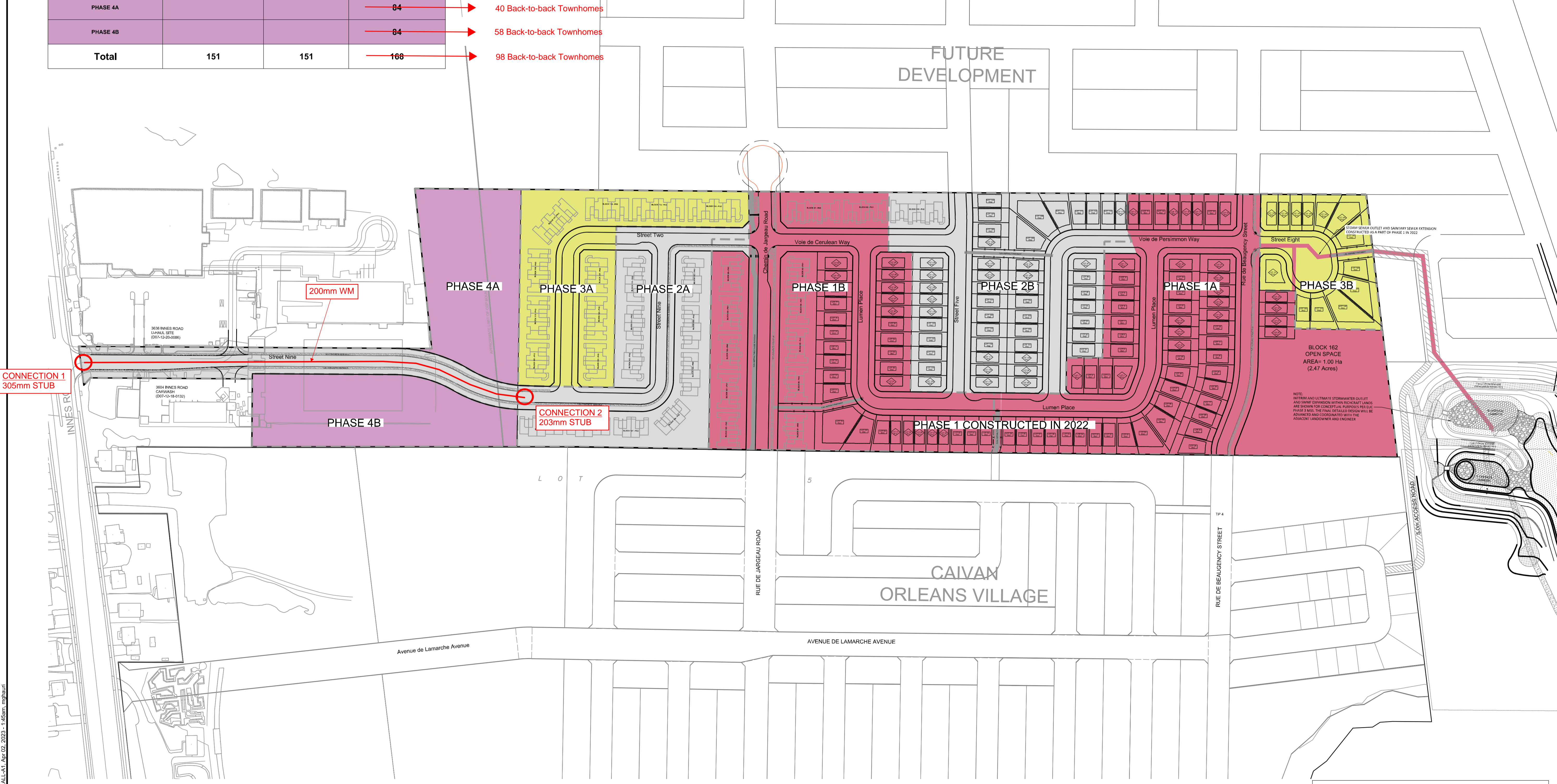
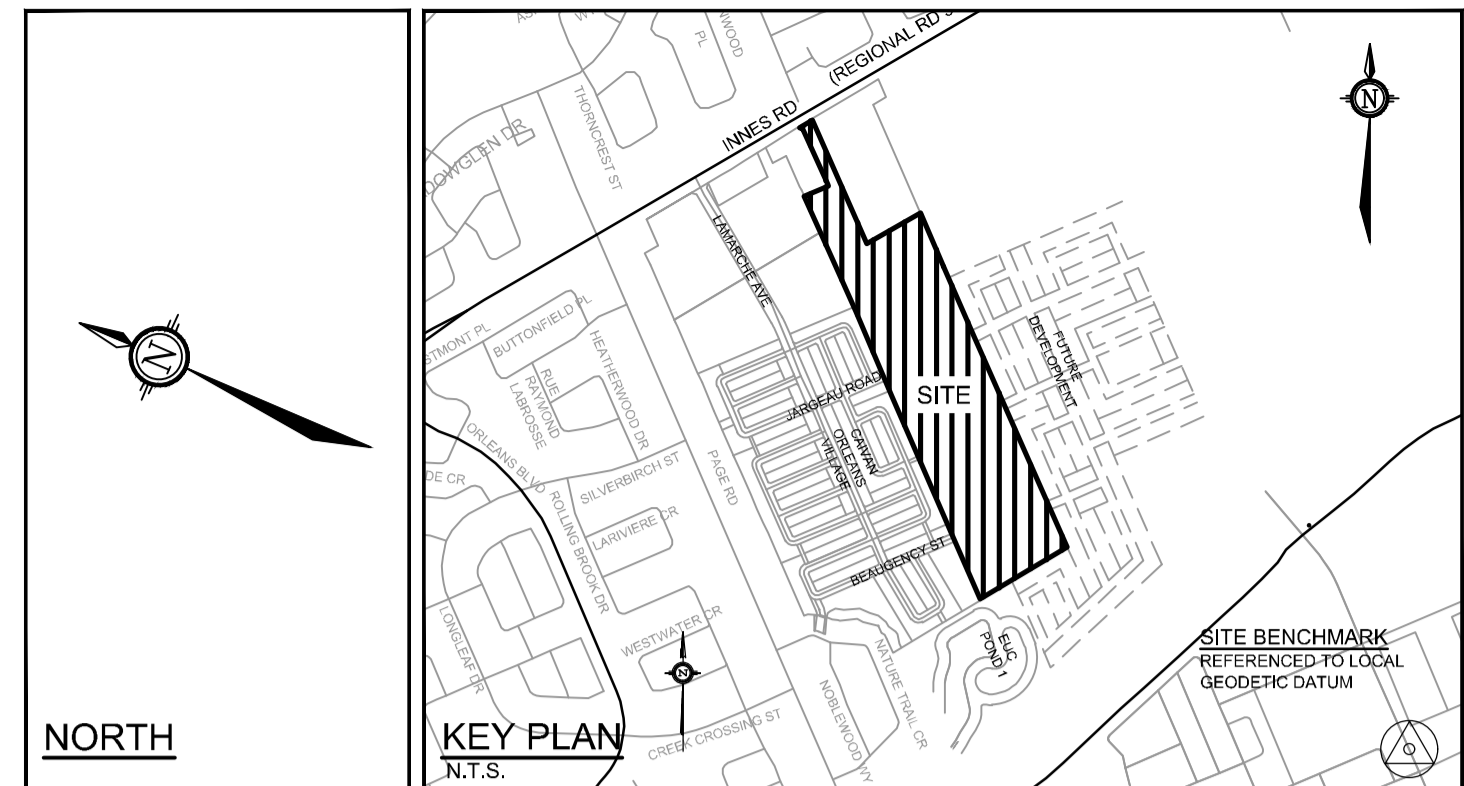
[1] Park flow based on EUC Ph3 CDP MSS by DSEL dated 2020-06-25

ICI Peaking Factors	Max Day (x Avg Day)	Peak Hour (x Avg Day)
	1.50	2.70

UNIT MIX BREAKDOWN			
PHASING	SINGLES	TOWNHOMES	MEDIUM DENSITY
PHASE 1A	59		
PHASE 1B	31	50	
PHASE 2A		46	
PHASE 2B	48	6	
PHASE 3A		49	
PHASE 3B	13		
PHASE 4A			84
PHASE 4B			84
Total	151	151	168

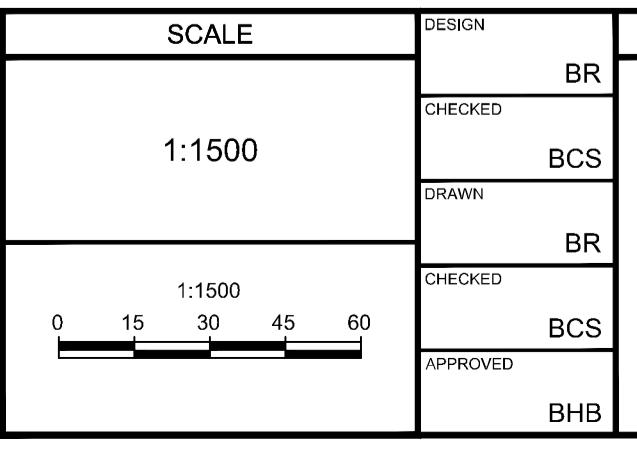
84 → 40 Back-to-back Townhomes
 84 → 58 Back-to-back Townhomes
 168 → 98 Back-to-back Townhomes

REVIEWED BY
 DEVELOPMENT REVIEW SERVICES BRANCH
 Signed *[Signature]*
 Date May 13 2024
 Plan Number # 18535



NOTE:
 THE POSITION OF ALL POLE LINES, CONDUITS,
 WATERMANS, SEWERS AND OTHER
 UNDERGROUND AND OVERGROUND UTILITIES AND
 STRUCTURES IS NOT NECESSARILY SHOWN ON
 THE CONTRACT DRAWINGS, AND WHERE SHOWN,
 THE ACCURACY OF THE POSITION OF SUCH
 UTILITIES AND STRUCTURES IS NOT GUARANTEED,
 BEFORE STARTING WORK, DETERMINE THE EXACT
 LOCATION OF ALL SUCH UTILITIES AND
 STRUCTURES AND ASSUME ALL LIABILITY FOR
 DAMAGE TO THEM.

No.	REVISION	DATE	BY	No.	REVISION	DATE	BY
11.	FINAL REVIEW, ECA, CLI AND MATERIAL ORDER	MAR 21/24	BHB	8.	ISSUED FOR REVIEW PHASE 2 & 3	APRIL 6/23	BHB
10.	REVISED AND ISSUED FOR REVIEW AND TENDER	JAN 17/24	BHB	7.	PARK PHASING	FEB 1/23	BHB
9.	REVISED PHASING	JUNE 3/23	BHB	6.	ISSUED FOR CONSTRUCTION	JUNE 27/22	BHB
				5.	ISSUED FOR FINAL CITY APPROVAL AND ECA	MAY 11/22	BHB
				4.	ISSUED FOR ECA AND TENDER	MAR 18/22	BHB
				3.	REVISED AND REISSUED FOR REVIEW	MAR 10/22	BHB
				2.	REVISED AND REISSUED FOR REVIEW	NOV 25/21	BHB
				1.	ISSUED FOR REVIEW	JUNE 18/21	BHB



DESIGN: BR
 CHECKED: BCS
 DRAWN: BR
 CHECKED: BCS
 APPROVED: BHB

NOVATECH
 Engineers, Planners & Landscape Architects
 Suite 200, 240 Michael Cowpland Drive
 Ottawa, Ontario, Canada K2M 1P6
 Telephone: (613) 254-9643
 Facsimile: (613) 254-5867
 Website: www.novatech-eng.com

LOCATION: CITY OF OTTAWA THE COMMONS
 DRAWING NAME: PHASING PLAN
 PROJECT No.: 118224-00
 REV: REV #11
 DRAWING No.: 118224-PH

M:\2018\118224\CAD\Design\118224-PH.dwg OVERALL A1 Apr 02 2023 - 1:45pm mghauri

#18535
 D07-16-19-007

Miro Savic

From: Unrau, Derek <derek.unrau@ottawa.ca>
Sent: Tuesday, October 1, 2024 2:03 PM
To: Sam Bahia; Ben Sweet
Cc: Miro Savic; Polyak, Alex
Subject: RE: 3610 Innes Road / PC2024-0252 - Water Boundary Conditions Request (118224)
Attachments: R1_3610 Innes Boundary Condition(24September2024).pdf

Good afternoon Sam and Ben,

Please see attached boundary condition request results.
Note scenario connection 2 #5 is below the City's minimum pressure.

As the watermain in the area is not in place and operational, we may be requiring another boundary condition request once it is constructed, and when the specific connections to that watermain are identified by a future application submission with the necessary plans and reports.

Let me know if you have any questions.

Regards,

Derek Unrau, C.E.T.

Project Manager

Planning, Development and Building Services Department (PDBS)

Development Review - East Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 27670, Derek.Unrau@ottawa.ca



From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: September 24, 2024 1:51 PM
To: Unrau, Derek <derek.unrau@ottawa.ca>; Ben Sweet <b.sweet@novatech-eng.com>
Cc: Miro Savic <m.savic@novatech-eng.com>; Polyak, Alex <alex.polyak@ottawa.ca>
Subject: RE: 3610 Innes Road / PC2024-0252 - Water Boundary Conditions Request (118224)

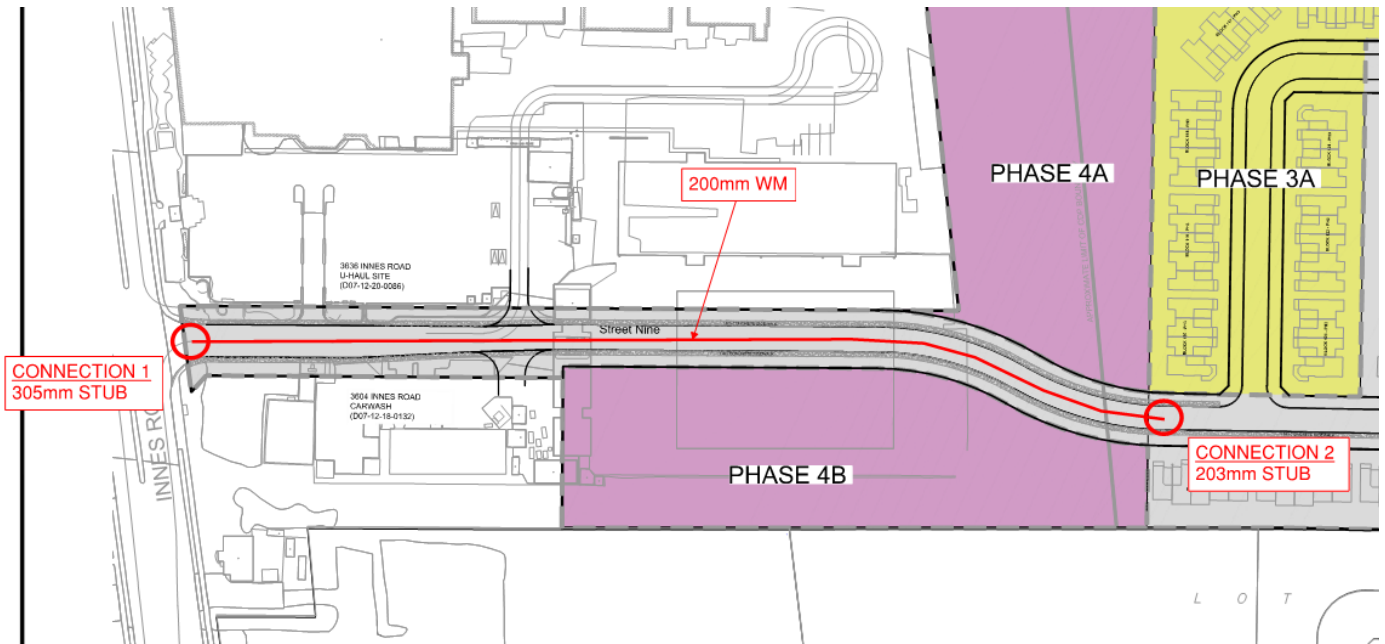
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Hello

Ben had indicated the connection locations within the Ventus Public WM (that is currently under construction).

The reason for this, is that there is 2/3 public hydrants along that section that we'd like to include for the model, in-lieu of just the private Watermains on site. Is it possible to obtain the BCs based on Ben's WM demands at those locations?



Sam Bahia, P.Eng., Senior Project Manager | Land Development

NOVATECH

Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285

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From: Unrau, Derek <derek.unrau@ottawa.ca>

Sent: Tuesday, September 24, 2024 1:37 PM

To: Sam Bahia <s.bahia@novatech-eng.com>; Ben Sweet <b.sweet@novatech-eng.com>

Cc: Miro Savic <m.savic@novatech-eng.com>; Polyak, Alex <alex.polyak@ottawa.ca>

Subject: RE: 3610 Innes Road / PC2024-0252 - Water Boundary Conditions Request (118224)

Hi Sam,

Apologies, the plan dated July 30, 2024, with 'U' shape internal road design I understand to be the latest concept. Please let us know if there is a newer version.

The reason we need to see the proposed connection locations is so that we could provide you with appropriate boundary conditions. The connections shown on your request do not indicate where your site will be making a connection to the watermain on Ventus Way.

Do you have any specific questions or concerns that you wish to discuss?

Regards,

Derek Unrau, C.E.T.

Project Manager

Planning, Development and Building Services Department (PDBS)

Development Review - East Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1



From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: September 24, 2024 11:46 AM
To: Unrau, Derek <derek.unrau@ottawa.ca>; Ben Sweet <b.sweet@novatech-eng.com>
Cc: Miro Savic <m.savic@novatech-eng.com>; Polyak, Alex <alex.polyak@ottawa.ca>
Subject: RE: 3610 Innes Road / PC2024-0252 - Water Boundary Conditions Request (118224)

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Hi Derek

Do you have a few minutes to discuss – in light of the attached and revised concept within the attached email?

Regards

Sam Bahia, P.Eng., Senior Project Manager | Land Development

NOVATECH

Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285

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From: Unrau, Derek <derek.unrau@ottawa.ca>
Sent: Tuesday, September 24, 2024 10:32 AM
To: Ben Sweet <b.sweet@novatech-eng.com>
Cc: Sam Bahia <s.bahia@novatech-eng.com>; Miro Savic <m.savic@novatech-eng.com>; Polyak, Alex <alex.polyak@ottawa.ca>
Subject: RE: 3610 Innes Road / PC2024-0252 - Water Boundary Conditions Request (118224)

Hi Ben,

Thank you for your email requesting boundary conditions for this application.

Each block may only have a maximum of 2 connections into Ventus Way. Please provide a plan indicating the specific watermain connection locations to be proposed for block 1 and 2. I have attached the latest concept plan we have been provided. Once that is received, I will review and send it to Asset Management for confirmation.

Please let me know if you have any questions.

Regards,

Derek Unrau, C.E.T.

Project Manager

Planning, Development and Building Services Department (PDBS)

Development Review - East Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1



From: Ben Sweet <b.sweet@novatech-eng.com>
Sent: September 19, 2024 1:23 PM
To: Unrau, Derek <derek.unrau@ottawa.ca>
Cc: Sam Bahia <s.bahia@novatech-eng.com>; Miro Savic <m.savic@novatech-eng.com>
Subject: 3610 Innes Road / PC2024-0252 - Water Boundary Conditions Request (118224)

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Hi Derek,

Please find attached Water Demand Design Sheet and Phasing Plan markup in support of the water boundary conditions request for the above noted file.

Based on GeoOttawa, there is an existing 305mm stub at Innes Road (Connection 1) and an existing 203mm stub at Ventus Way (Connection 2). We are proposing to model the proposed 200mm watermain link between the two connections, along with the Phase 4A and 4B medium density blocks proposed onsite watermain. This will allow us to model the hydrants along the proposed 200mm watermain link and consider available fire flow from these hydrants, as well as the onsite hydrants, for firefighting purposes.

Let us know if you would like us to model different connections points so we can update the Water Demand Design Sheet accordingly.

Thanks,

Ben Sweet, P.Eng., Project Manager | Land Development Engineering

NOVATECH

Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 250

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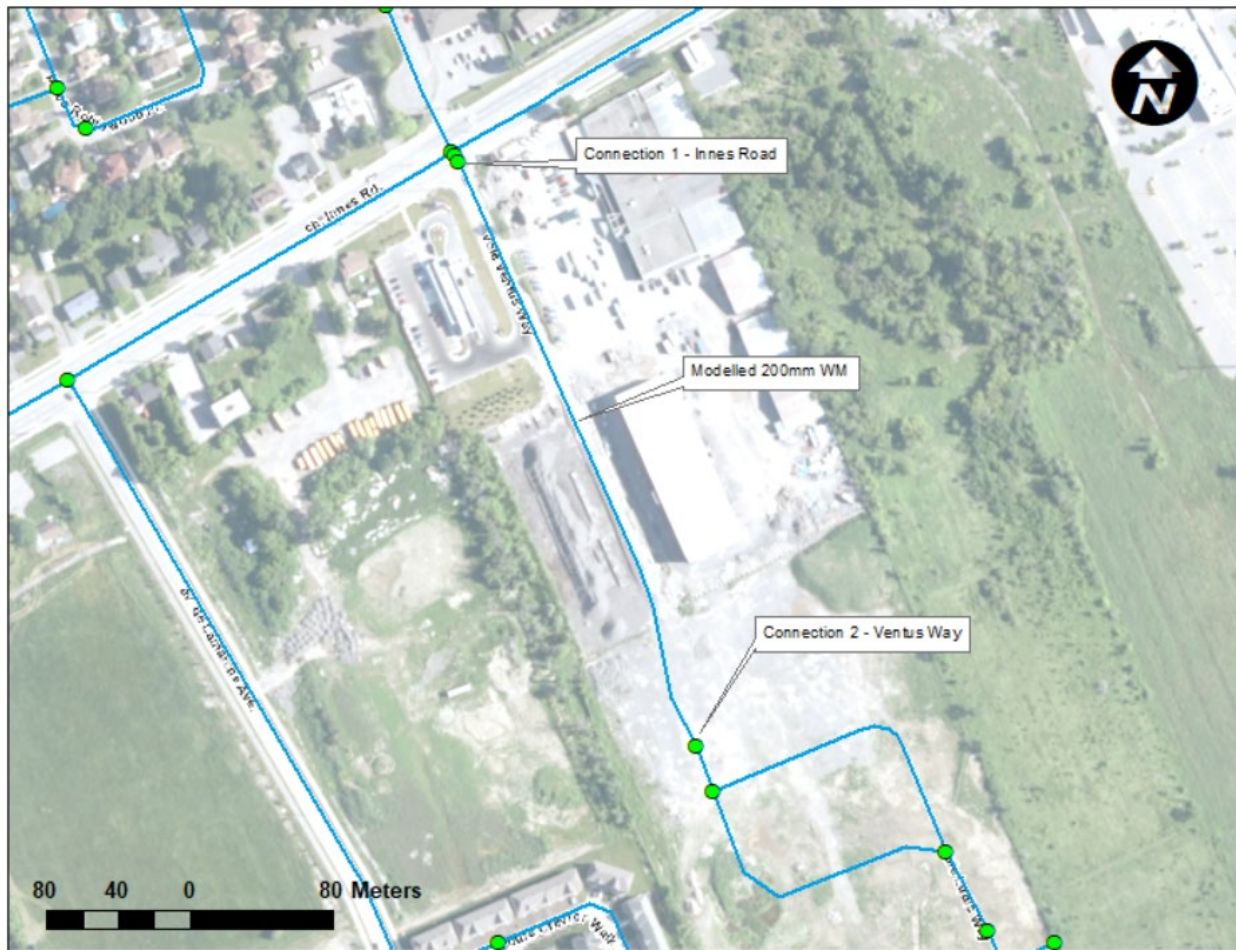
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Boundary Conditions 3610 Innes Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	53	0.88
Maximum Daily Demand	130	2.17
Peak Hour	286	4.77
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	12,000	200.00
Fire Flow Demand #3	13,000	216.67
Fire Flow Demand #4	14,000	233.33
Fire Flow Demand #5	16,000	266.67

Location



Results

Connection 1 - Innes Road

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.7	56.5
Peak Hour	127.3	51.7
Max Day plus Fire Flow #1	127.4	51.9
Max Day plus Fire Flow #2	126.5	50.5
Max Day plus Fire Flow #3	125.9	49.8
Max Day plus Fire Flow #4	125.8	49.6
Max Day plus Fire Flow #5	125.2	48.7

¹ Ground Elevation = 90.9 m

Connection 2 - Ventus Way

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.8	58.6
Peak Hour	127.2	53.6
Max Day plus Fire Flow #1	117.7	40.1
Max Day plus Fire Flow #2	112.9	33.2
Max Day plus Fire Flow #3	110.2	29.4
Max Day plus Fire Flow #4	107.7	25.9
Max Day plus Fire Flow #5	102.1	17.9

¹ Ground Elevation = 89.5 m

Notes

1. Per the OWDG Section 4.2.2:
 - a. During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 20 psi.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
 Project Name: The Commons - Phase 4
 Date: 9/13/2024
 Input By: MS
 Reviewed By: SB
 Drawing Reference:

Legend: Input by User
 No Input Required

Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 1 (12-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	Floor Area A	Building Footprint (m ²)	551.00		1,653	
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
		Area of structure considered (m ²)		1,653		
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			13,000	
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge		
		Non-combustible		-25%	-15%	
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
Rapid burning		25%				
4	Sprinkler Reduction (2)	FUS Table 4		Reduction		
		Adequately Designed System (NFPA 13)	No	-30%	0	
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
		Cumulative Sub-Total		0%		
Area of Sprinklered Coverage (m²)	0	0%				
Cumulative Total		0%				
5	Exposure Surcharge (3)	FUS Table 5		Surcharge		
		North Side	>30m	0%	3,315	
		East Side	>30m	0%		
		South Side	10.1 - 20 m	15%		
		West Side	10.1 - 20 m	15%		
Cumulative Total		30%				
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	14,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	233
				or	USGPM	3,699

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
 Project Name: The Commons - Phase 4
 Date: 9/13/2024
 Input By: MS
 Reviewed By: SB
 Drawing Reference:

Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 2 (8-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow					
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5
		Type IV - Mass Timber		Varies	
		Type III - Ordinary construction		1	
		Type II - Non-combustible construction		0.8	
		Type I - Fire resistive construction (2 hrs)		0.6	
2	Floor Area A	Building Footprint (m ²)	378.67		1,136
		Number of Floors/Storeys	3		
		Protected Openings (1 hr) if C<1.0			
		Area of structure considered (m ²)		1,136	
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			11,000
Reductions or Surcharges					
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge	-15%
		Non-combustible		-25%	
		Limited combustible	Yes	-15%	
		Combustible		0%	
		Free burning		15%	
Rapid burning		25%			
4	Sprinkler Reduction (2)	FUS Table 4		Reduction	0
		Adequately Designed System (NFPA 13)	No	-30%	
		Standard Water Supply	No	-10%	
		Fully Supervised System	No	-10%	
		Cumulative Sub-Total		0%	
Area of Sprinklered Coverage (m²)	0	0%	Cumulative Total	0%	
5	Exposure Surcharge (3)	FUS Table 5		Surcharge	2,805
		North Side	10.1 - 20 m	15%	
		East Side	>30m	0%	
		South Side	10.1 - 20 m	15%	
		West Side	2Hr Firewall	0%	
Cumulative Total		30%			
Results					
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000
		(2,000 L/min < Fire Flow < 45,000 L/min)	or	L/s	200
			or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
 Project Name: The Commons - Phase 4
 Date: 9/13/2024
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 Reviewed By: SB
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 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 2 (4-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier		1.5	
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5		
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
Floor Area				568	8,000	
2	A	Building Footprint (m ²)	189.33			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
F	Base fire flow without reductions					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	6,800	
	(1)	Non-combustible		-25%		
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
Sprinkler Reduction		FUS Table 4	Reduction	0		
(2)	Adequately Designed System (NFPA 13)	No	-30%			
	Standard Water Supply	No	-10%			
	Fully Supervised System	No	-10%			
	Cumulative Sub-Total				0%	
Area of Sprinklered Coverage (m²)		0	0%	Cumulative Total	0%	
5	Exposure Surcharge		FUS Table 5	Surcharge	3,060	
	(3)	North Side	10.1 - 20 m	15%		
		East Side	2Hr Firewall	0%		
		South Side	10.1 - 20 m	15%		
		West Side	10.1 - 20 m	15%		
	Cumulative Total			45%		
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	10,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	167
				or	USGPM	2,642

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 3 (8-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow					
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5
		Type IV - Mass Timber		Varies	
		Type III - Ordinary construction		1	
		Type II - Non-combustible construction		0.8	
		Type I - Fire resistive construction (2 hrs)		0.6	
2	Floor Area A	Building Footprint (m ²)	367.33		1,102
		Number of Floors/Storeys	3		
		Protected Openings (1 hr) if C<1.0			
		Area of structure considered (m ²)		1,102	
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			11,000
Reductions or Surcharges					
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge	-15%
		Non-combustible		-25%	
		Limited combustible	Yes	-15%	
		Combustible		0%	
		Free burning		15%	
Rapid burning		25%			
4	Sprinkler Reduction (2)	FUS Table 4		Reduction	0
		Adequately Designed System (NFPA 13)	No	-30%	
		Standard Water Supply	No	-10%	
		Fully Supervised System	No	-10%	
		Cumulative Sub-Total		0%	
Area of Sprinklered Coverage (m²)	0	0%	Cumulative Total	0%	
5	Exposure Surcharge (3)	FUS Table 5		Surcharge	2,805
		North Side	10.1 - 20 m	15%	
		East Side	>30m	0%	
		South Side	10.1 - 20 m	15%	
		West Side	2Hr Firewall	0%	
Cumulative Total		30%			
Results					
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000
		(2,000 L/min < Fire Flow < 45,000 L/min)	or	L/s	200
			or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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 Drawing Reference:

Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 3 (4-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow					
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5
		Type IV - Mass Timber		Varies	
		Type III - Ordinary construction		1	
		Type II - Non-combustible construction		0.8	
		Type I - Fire resistive construction (2 hrs)		0.6	
2	Floor Area A	Building Footprint (m ²)	183.67		551
		Number of Floors/Storeys	3		
		Protected Openings (1 hr) if C<1.0			
		Area of structure considered (m ²)			
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			8,000
Reductions or Surcharges					
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge	-15%
		Non-combustible		-25%	
		Limited combustible	Yes	-15%	
		Combustible		0%	
		Free burning		15%	
Rapid burning		25%			
4	Sprinkler Reduction (2)	FUS Table 4		Reduction	0
		Adequately Designed System (NFPA 13)	No	-30%	
		Standard Water Supply	No	-10%	
		Fully Supervised System	No	-10%	
		Cumulative Sub-Total		0%	
Area of Sprinklered Coverage (m²)	0	0%			
Cumulative Total		0%			
5	Exposure Surcharge (3)	FUS Table 5		Surcharge	3,060
		North Side	10.1 - 20 m	15%	
		East Side	2Hr Firewall	0%	
		South Side	10.1 - 20 m	15%	
		West Side	10.1 - 20 m	15%	
Cumulative Total		45%			
Results					
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	10,000
		(2,000 L/min < Fire Flow < 45,000 L/min)	or	L/s	167
			or	USGPM	2,642

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 4 (8-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow					
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5
		Type IV - Mass Timber		Varies	
		Type III - Ordinary construction		1	
		Type II - Non-combustible construction		0.8	
		Type I - Fire resistive construction (2 hrs)		0.6	
2	Floor Area A	Building Footprint (m ²)	378.67		1,136
		Number of Floors/Storeys	3		
		Protected Openings (1 hr) if C<1.0			
		Area of structure considered (m ²)		1,136	
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			11,000
Reductions or Surcharges					
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge	-15%
		Non-combustible		-25%	
		Limited combustible	Yes	-15%	
		Combustible		0%	
		Free burning		15%	
Rapid burning		25%			
4	Sprinkler Reduction (2)	FUS Table 4		Reduction	0
		Adequately Designed System (NFPA 13)	No	-30%	
		Standard Water Supply	No	-10%	
		Fully Supervised System	No	-10%	
		Cumulative Sub-Total		0%	
Area of Sprinklered Coverage (m²)	0	0%	Cumulative Total	0%	
5	Exposure Surcharge (3)	FUS Table 5		Surcharge	2,805
		North Side	10.1 - 20 m	15%	
		East Side	>30m	0%	
		South Side	10.1 - 20 m	15%	
		West Side	2Hr Firewall	0%	
Cumulative Total		30%			
Results					
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000
		(2,000 L/min < Fire Flow < 45,000 L/min)	or	L/s	200
			or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
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 Drawing Reference:

Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 4 (4-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier		1.5	
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5		
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
Floor Area				568	8,000	
2	A	Building Footprint (m ²)	189.33			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
F	Base fire flow without reductions					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	6,800	
	(1)	Non-combustible		-25%		
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
Sprinkler Reduction		FUS Table 4	Reduction	0		
(2)	Adequately Designed System (NFPA 13)	No	-30%			
	Standard Water Supply	No	-10%			
	Fully Supervised System	No	-10%			
	Cumulative Sub-Total				0%	
Area of Sprinklered Coverage (m²)		0	0%	Cumulative Total	0%	
5	Exposure Surcharge		FUS Table 5	Surcharge	3,060	
	(3)	North Side	10.1 - 20 m	15%		
		East Side	2Hr Firewall	0%		
		South Side	10.1 - 20 m	15%		
		West Side	10.1 - 20 m	15%		
	Cumulative Total			45%		
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	10,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	167
				or	USGPM	2,642

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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 Drawing Reference:

Legend: Input by User
 No Input Required

Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 5 (10-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier		1.5	
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5		
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	Floor Area				12,000	
	A	Building Footprint (m ²)	477			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
		Area of structure considered (m ²)		1,431		
F	Base fire flow without reductions					
	$F = 220 C (A)^{0.5}$					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	10,200	
	(1)	Non-combustible		-25%		
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	Sprinkler Reduction		FUS Table 4	Reduction	0	
	(2)	Adequately Designed System (NFPA 13)	No	-30%		
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
		Cumulative Sub-Total				0%
		Area of Sprinklered Coverage (m²)	0			0%
		Cumulative Total	0%			
5	Exposure Surcharge		FUS Table 5	Surcharge	4,080	
	(3)	North Side	10.1 - 20 m	15%		
		East Side	>30m	0%		
		South Side	20.1 - 30 m	10%		
		West Side	10.1 - 20 m	15%		
				Cumulative Total		40%
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	14,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	233
				or	USGPM	3,699

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 6 (8-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	Floor Area A	Building Footprint (m ²)	378.67		1,136	
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
		Area of structure considered (m ²)		1,136		
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			11,000	
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge		
		Non-combustible		-25%	-15%	9,350
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
Rapid burning		25%				
4	Sprinkler Reduction (2)	FUS Table 4		Reduction		
		Adequately Designed System (NFPA 13)	No	-30%	0	
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
		Cumulative Sub-Total		0%		
Area of Sprinklered Coverage (m²)	0	0%				
Cumulative Total		0%				
5	Exposure Surcharge (3)	FUS Table 5		Surcharge		
		North Side	2Hr Firewall	0%	2,805	
		East Side	10.1 - 20 m	15%		
		South Side	10.1 - 20 m	15%		
		West Side	>30m	0%		
Cumulative Total		30%				
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	200
				or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 6 (4-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow					
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5
		Type IV - Mass Timber		Varies	
		Type III - Ordinary construction		1	
		Type II - Non-combustible construction		0.8	
		Type I - Fire resistive construction (2 hrs)		0.6	
2	Floor Area A	Building Footprint (m ²)	378.67		1,136
		Number of Floors/Storeys	3		
		Protected Openings (1 hr) if C<1.0			
		Area of structure considered (m ²)		1,136	
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			11,000
Reductions or Surcharges					
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge	
		Non-combustible		-25%	-15%
		Limited combustible	Yes	-15%	
		Combustible		0%	
		Free burning		15%	
Rapid burning		25%			
4	Sprinkler Reduction (2)	FUS Table 4		Reduction	
		Adequately Designed System (NFPA 13)	No	-30%	0
		Standard Water Supply	No	-10%	
		Fully Supervised System	No	-10%	
		Cumulative Sub-Total		0%	
Area of Sprinklered Coverage (m²)	0	0%			
Cumulative Total		0%			
5	Exposure Surcharge (3)	FUS Table 5		Surcharge	
		North Side	>30m	0%	1,403
		East Side	10.1 - 20 m	15%	
		South Side	2Hr Firewall	0%	
		West Side	>30m	0%	
Cumulative Total		15%			
Results					
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	11,000
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	183
				or	2,906

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

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Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 7 (8-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	Floor Area A	Building Footprint (m ²)	386		1,158	
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
		Area of structure considered (m ²)				
	F	Base fire flow without reductions $F = 220 C (A)^{0.5}$			11,000	
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge (1)	FUS Table 3		Reduction/Surcharge		
		Non-combustible		-25%	-15%	
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
Rapid burning		25%				
4	Sprinkler Reduction (2)	FUS Table 4		Reduction		
		Adequately Designed System (NFPA 13)	No	-30%	0	
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
		Cumulative Sub-Total		0%		
Area of Sprinklered Coverage (m²)	0	0%				
Cumulative Total		0%				
5	Exposure Surcharge (3)	FUS Table 5		Surcharge		
		North Side	>30m	0%	2,805	
		East Side	10.1 - 20 m	15%		
		South Side	2Hr Firewall	0%		
		West Side	10.1 - 20 m	15%		
Cumulative Total		30%				
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	200
				or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
 Project Name: The Commons - Phase 4
 Date: 9/13/2024
 Input By: MS
 Reviewed By: SB
 Drawing Reference:

Legend: Input by User
 No Input Required

Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 8 (6-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier		1.5	
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5		
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
Floor Area				831	10,000	
2	A	Building Footprint (m ²)	277			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
F	Base fire flow without reductions					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	8,500	
	(1)	Non-combustible		-25%		
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
Sprinkler Reduction		FUS Table 4	Reduction	0		
(2)	Adequately Designed System (NFPA 13)	No	-30%			
	Standard Water Supply	No	-10%			
	Fully Supervised System	No	-10%			
	Cumulative Sub-Total				0%	
Area of Sprinklered Coverage (m²)		0	0%			
Cumulative Total			0%			
5	Exposure Surcharge		FUS Table 5	Surcharge	3,825	
	(3)	North Side	2Hr Firewall	0%		
		East Side	10.1 - 20 m	15%		
		South Side	10.1 - 20 m	15%		
		West Side	10.1 - 20 m	15%		
	Cumulative Total			45%		
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	200
				or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
 Project Name: The Commons - Phase 4
 Date: 9/13/2024
 Input By: MS
 Reviewed By: SB
 Drawing Reference:

Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 9 (8-units)
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier		1.5	
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5		
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
Floor Area				1,158	11,000	
2	A	Building Footprint (m ²)	386			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
F	Base fire flow without reductions					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	9,350	
	(1)	Non-combustible		-25%		
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
Sprinkler Reduction		FUS Table 4	Reduction	0		
(2)	Adequately Designed System (NFPA 13)	No	-30%			
	Standard Water Supply	No	-10%			
	Fully Supervised System	No	-10%			
	Cumulative Sub-Total				0%	
Area of Sprinklered Coverage (m²)		0	0%	Cumulative Total	0%	
5	Exposure Surcharge		FUS Table 5	Surcharge	2,805	
	(3)	North Side	>30m	0%		
		East Side	10.1 - 20 m	15%		
		South Side	2Hr Firewall	0%		
		West Side	10.1 - 20 m	15%		
	Cumulative Total			30%		
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	200
				or	USGPM	3,170

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 118224
 Project Name: The Commons - Phase 4
 Date: 9/13/2024
 Input By: MS
 Reviewed By: SB
 Drawing Reference:

Legend: Input by User
 No Input Required

Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: 3-Storey Townhouse Block 10
 Type V - Wood frame

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier		1.5	
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5		
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	Floor Area				10,000	
	A	Building Footprint (m ²)	277			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0				
		Area of structure considered (m ²)		831		
F	Base fire flow without reductions					
	$F = 220 C (A)^{0.5}$					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	8,500	
	(1)	Non-combustible		-25%		
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	Sprinkler Reduction		FUS Table 4	Reduction	0	
	(2)	Adequately Designed System (NFPA 13)	No	-30%		
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
		Cumulative Sub-Total				0%
		Area of Sprinklered Coverage (m²)	0			0%
		Cumulative Total	0%			
5	Exposure Surcharge		FUS Table 5	Surcharge	3,400	
	(3)	North Side	2Hr Firewall	0%		
		East Side	10.1 - 20 m	15%		
		South Side	20.1 - 30 m	10%		
		West Side	10.1 - 20 m	15%		
			Cumulative Total	40%		
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	12,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	200
				or	USGPM	3,170

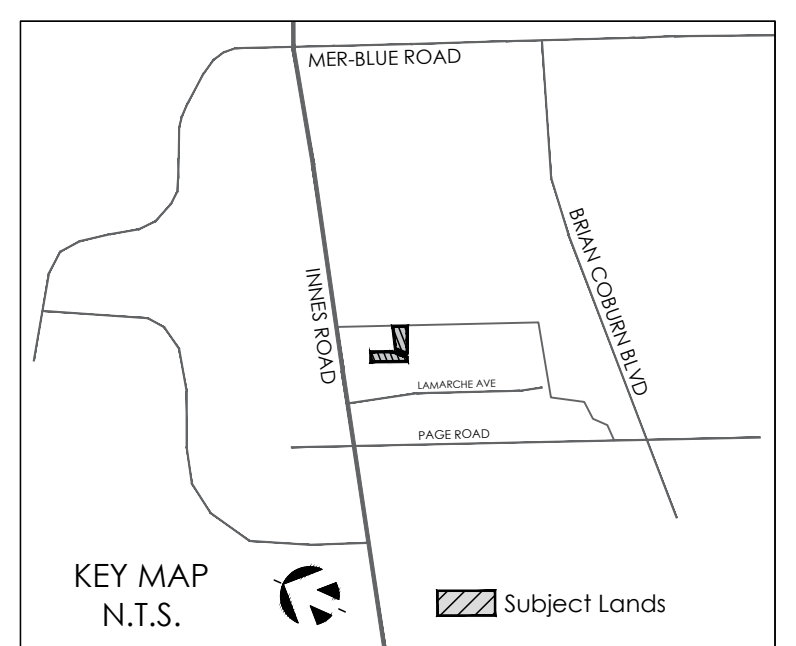
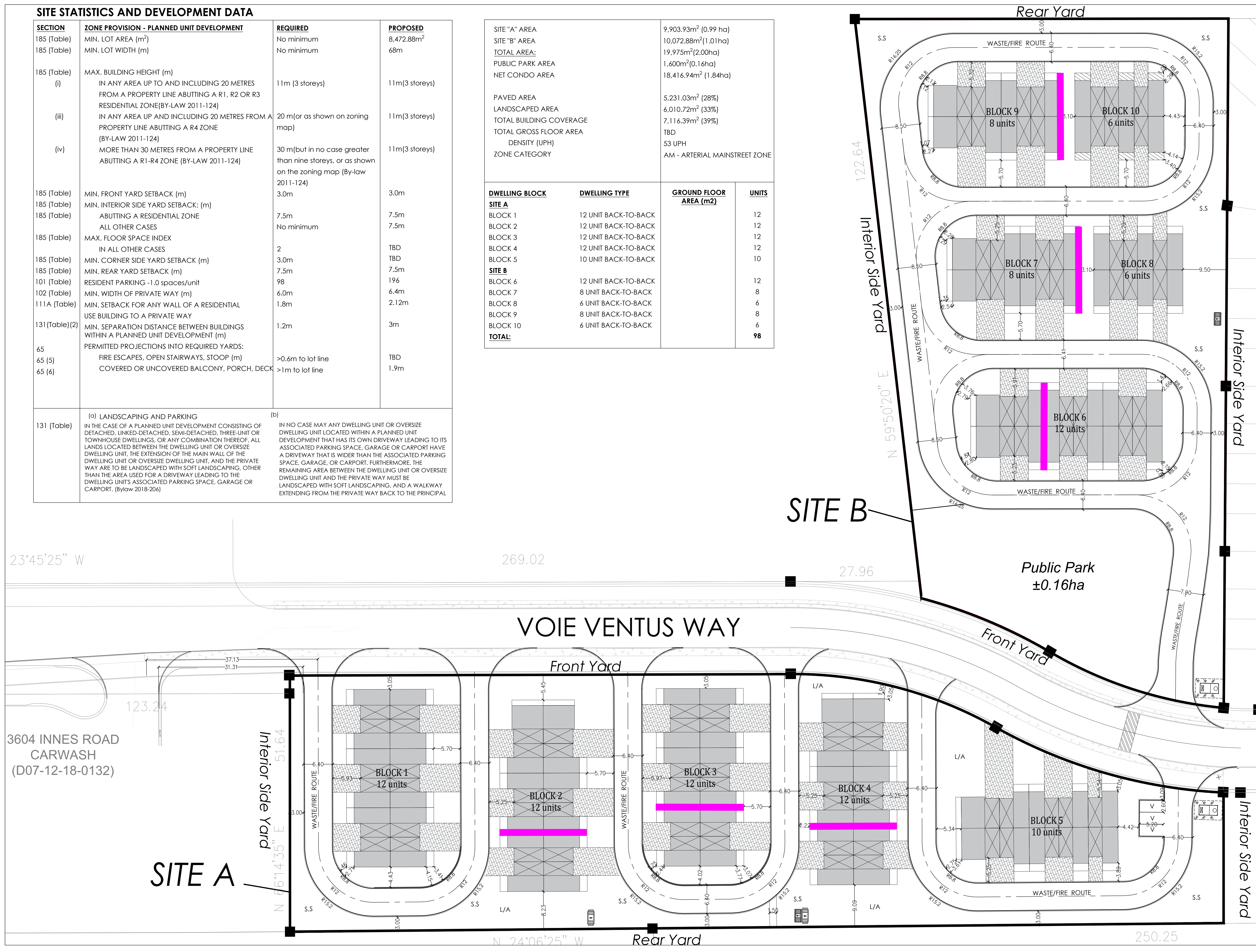
SITE STATISTICS AND DEVELOPMENT DATA

SECTION	ZONE PROVISION - PLANNED UNIT DEVELOPMENT	REQUIRED	PROPOSED
185 (Table)	MIN. LOT AREA (m ²)	No minimum	8,472.88m ²
185 (Table)	MIN. LOT WIDTH (m)	No minimum	68m
185 (Table)	MAX. BUILDING HEIGHT (m)		
(i)	IN ANY AREA UP TO AND INCLUDING 20 METRES FROM A PROPERTY LINE ABUTTING A R1, R2 OR R3 RESIDENTIAL ZONE(BY-LAW 2011-124)	11m (3 storeys)	11m(3 storeys)
(iii)	IN ANY AREA UP AND INCLUDING 20 METRES FROM A PROPERTY LINE ABUTTING A R4 ZONE (BY-LAW 2011-124)	20 m(or as shown on zoning map)	11m(3 storeys)
(iv)	MORE THAN 30 METRES FROM A PROPERTY LINE ABUTTING A R1-R4 ZONE (BY-LAW 2011-124)	30 m(but in no case greater than nine storeys, or as shown on the zoning map (By-law 2011-124)	11m(3 storeys)
185 (Table)	MIN. FRONT YARD SETBACK (m)	3.0m	3.0m
185 (Table)	MIN. INTERIOR SIDE YARD SETBACK: (m)		
185 (Table)	ABUTTING A RESIDENTIAL ZONE	7.5m	7.5m
185 (Table)	ALL OTHER CASES	No minimum	7.5m
185 (Table)	MAX. FLOOR SPACE INDEX		
	IN ALL OTHER CASES	2	TBD
185 (Table)	MIN. CORNER SIDE YARD SETBACK (m)	3.0m	TBD
185 (Table)	MIN. REAR YARD SETBACK (m)	7.5m	7.5m
101 (Table)	RESIDENT PARKING -1.0 spaces/unit	98	196
102 (Table)	MIN. WIDTH OF PRIVATE WAY (m)	6.0m	6.4m
111A (Table)	MIN. SETBACK FOR ANY WALL OF A RESIDENTIAL USE BUILDING TO A PRIVATE WAY	1.8m	2.12m
131 (Table)(2)	MIN. SEPARATION DISTANCE BETWEEN BUILDINGS WITHIN A PLANNED UNIT DEVELOPMENT (m)	1.2m	3m
65	PERMITTED PROJECTIONS INTO REQUIRED YARDS:		
65 (5)	FIRE ESCAPES, OPEN STAIRWAYS, STOOP (m)	>0.6m to lot line	TBD
65 (6)	COVERED OR UNCOVERED BALCONY, PORCH, DECK	>1m to lot line	1.9m
131 (Table)	(a) LANDSCAPING AND PARKING	(b)	
	IN THE CASE OF A PLANNED UNIT DEVELOPMENT CONSISTING OF DETACHED, LINKED-DETACHED, SEMI-DETACHED, THREE-UNIT OR TOWNHOUSE DWELLINGS, OR ANY COMBINATION THEREOF, ALL LANDS LOCATED BETWEEN THE DWELLING UNIT OR OVERSIZE DWELLING UNIT, THE EXTENSION OF THE MAIN WALL OF THE DWELLING UNIT OR OVERSIZE DWELLING UNIT, AND THE PRIVATE WAY ARE TO BE LANDSCAPED WITH SOFT LANDSCAPING, OTHER THAN THE AREA USED FOR A DRIVEWAY LEADING TO THE DWELLING UNIT'S ASSOCIATED PARKING SPACE, GARAGE OR CARPORT. (Bylaw 2018-206)	IN NO CASE MAY ANY DWELLING UNIT OR OVERSIZE DWELLING UNIT LOCATED WITHIN A PLANNED UNIT DEVELOPMENT THAT HAS ITS OWN DRIVEWAY LEADING TO ITS ASSOCIATED PARKING SPACE, GARAGE OR CARPORT HAVE A DRIVEWAY THAT IS WIDER THAN THE ASSOCIATED PARKING SPACE, GARAGE, OR CARPORT. FURTHERMORE, THE REMAINING AREA BETWEEN THE DWELLING UNIT OR OVERSIZE DWELLING UNIT AND THE PRIVATE WAY MUST BE LANDSCAPED WITH SOFT LANDSCAPING, AND A WALKWAY EXTENDING FROM THE PRIVATE WAY BACK TO THE PRINCIPAL	

SITE "A" AREA	9,903.93m ² (0.99 ha)
SITE "B" AREA	10,072.88m ² (1.01ha)
TOTAL AREA:	19,975m ² (2.00ha)
PUBLIC PARK AREA	1,600m ² (0.16ha)
NET CONDO AREA	18,416.94m ² (1.84ha)

PAVED AREA	5,231.03m ² (28%)
LANDSCAPED AREA	6,010.72m ² (33%)
TOTAL BUILDING COVERAGE	7,116.39m ² (39%)
TOTAL GROSS FLOOR AREA	TBD
DENSITY (UPH)	53 UPH
ZONE CATEGORY	AM - ARTERIAL MAINSTREET ZONE

DWELLING BLOCK	DWELLING TYPE	GROUND FLOOR AREA (m ²)	UNITS
SITE A			
BLOCK 1	12 UNIT BACK-TO-BACK		12
BLOCK 2	12 UNIT BACK-TO-BACK		12
BLOCK 3	12 UNIT BACK-TO-BACK		12
BLOCK 4	12 UNIT BACK-TO-BACK		12
BLOCK 5	10 UNIT BACK-TO-BACK		10
SITE B			
BLOCK 6	12 UNIT BACK-TO-BACK		12
BLOCK 7	8 UNIT BACK-TO-BACK		8
BLOCK 8	6 UNIT BACK-TO-BACK		6
BLOCK 9	8 UNIT BACK-TO-BACK		8
BLOCK 10	6 UNIT BACK-TO-BACK		6
TOTAL:			98



NOVATECH MARKUP

12/09/24	Revision 1	JH
12/08/24	Draft for review	WS
DATE (mm-yy)	REVISION	BY

- GENERAL NOTES**
- DO NOT SCALE DRAWINGS FOR PRINT.
 - THIS DRAWING IS THE EXCLUSIVE PROPERTY OF KORSIK URBAN PLANNING AND MATIAMY HOMES. COPYRIGHT RESERVED.
 - WALKWAYS AND CURBS TO BE TIED INTO PUBLIC ROW WHERE APPLICABLE.
 - REFERENCES CITY OF OTTAWA T.W.S.I. DETAIL SC7.3

PROJECT TEAM

SITE PLAN DESIGN: KORSIK Urban Planning

LANDSCAPE ARCHITECTURE: NAK design strategies

MECHANICAL/ELECTRICAL: L.R.J.

PLANNING: NOVATECH

TRANSPORTATION: NOVATECH

ARCHITECTURE: Glenview Homes

GEOTECHNICAL & STRUCTURAL: paterson group

CIVIL ENGINEERS: NOVATECH

Glenview homes

GLENVIEW THE COMMONS SITE PLAN

PART OF LOT 4
CONCESSION 3 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
REGISTERED PLAN #

CITY OF OTTAWA

TITLE:	SITE PLAN	
DATE:	OCTOBER 7, 2024	DRAWN BY: JH
FILE NO.:		CHECKED BY: CR
JOB NO.:		DRAWING NO.:

33 Dundas & Concession 3 (Glenview Commons) Site Plan 2024-10-07 (Glenview - The Commons - Site Plan) - 2024-10-07 (11:57) (11:57) (11:57) (11:57)

Water Demand Design Sheet



Novatech Project #: 118224
 Project Name: THE COMMONS PHASE 4
 Date: 9/10/2024
 Input By: VBP
 Reviewed By: BCS
 Drawing Reference: 118224 - WM

Legend: Input by User (Yellow) No Input Required (Grey)
 Calculated Cells → (Light Blue)

Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
 MOE Design Guidelines for Drinking-Water Systems (2008)
 Fire Underwriter's Survey Guideline (2020)
 Ontario Building Code, Part 3 (2012)

Small System = NO

Location	Total Water Demand																					
	Residential Input & Average Demand							Industrial / Commercial / Institutional (ICI) Input & Average Demand					Maximum Day & Peak Hour Demand					Design Fire Demand				
	Nodes	Singles	Semis / Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)	Pop. Equiv.	Res. Average Day Flow Demand (L/s)	Indust. Area		Comm. Area (ha.)	Inst. Area (ha.)	Other Area (ha.)	ICI Average Day Flow Demand (L/s)	Maximum Day Demand			Peak Hour Demand			Required Fire Flow (RFF)	
									Light (ha.)	Heavy (ha.)					Res. Peaking Factor	ICI Peaking Factor	Max Day Flow Demand (L/s)	Res. Peaking Factor	ICI Peaking Factor	Peak Hour Flow Demand (L/s)	FUS (L/min)	Max Day + RFF (L/s)
3						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
4		6				16.20	0.05						0.00	2.50	1.50	0.13	5.50	2.70	0.29	14,000	233.46	
5		12				32.40	0.11						0.00	2.50	1.50	0.26	5.50	2.70	0.58	14,000	233.60	
6						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
7						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
8		12				32.40	0.11						0.00	2.50	1.50	0.26	5.50	2.70	0.58	14,000	233.60	
9		12				32.40	0.11						0.00	2.50	1.50	0.26	5.50	2.70	0.58	14,000	233.60	
10						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
11						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
12						0.00	0.00					0.170	0.02	2.50	1.50	0.03	5.50	2.70	0.05	14,000	233.36	
13						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
14		16				43.20	0.14						0.00	2.50	1.50	0.35	5.50	2.70	0.77	14,000	233.68	
15						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
16						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
17						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
18		9				24.30	0.08						0.00	2.50	1.50	0.20	5.50	2.70	0.43	12,000	200.20	
19						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
20						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
21		10				27.00	0.09						0.00	2.50	1.50	0.22	5.50	2.70	0.48	12,000	200.22	
22						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
23						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
24		12				32.40	0.11						0.00	2.50	1.50	0.26	5.50	2.70	0.58	12,000	200.26	
25		9				24.30	0.08						0.00	2.50	1.50	0.20	5.50	2.70	0.43	12,000	200.20	
26						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
27						0.00	0.00						0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	
Totals	0	98	0	0	0	264.60	0.86	0.00	0.00	0.00	0.00	0.170	0.02	2.50	1.50	2.17	5.50	2.70	4.77			

Demand Parameters

Residential					
Unit Type	Singles	Semis / Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)
Population Equiv.	3.4	2.7	2.1	1.4	1.8
Daily Demand	L/per person/day				
Average Demand	280				
Basic Demand	200				

Institutional / Commercial / Industrial				
Indust.		Comm.	Inst.	Other Use [1]
Light	Heavy			
L/gross ha/day				
35,000	55,000	28,000	28,000	9,300
10,000	17,000	17,000	17,000	

[1] Park flow based on EUC Ph3 CDP MSS by DSEL dated 2020-06-25

ICI Peaking Factors	Max Day (x Avg Day)	Peak Hour (x Avg Day)
	1.50	2.70

Residential Peaking Factors		Max Day (x Avg Day)	Peak Hour (x Avg Day)
	Pop.		
Small System (If Applicable)	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
	300	3.60	5.50
	450	3.00	5.50
Modified	500	2.90	5.50
Large System (Default)	> 500	2.50	5.50

Quick Fire Flow Reference Guide			
FUS (L/min)	Comments	OBC (L/min)	Comments
> 2,000	Min FUS	< 9,000	Unsprinklered Non- Combustible
10,000	Low Density - Singles/Towns		
	Complies w/ TB2014-01 Cap. (10m rear spacing, 6 units max, <600 m²)		
13,000	Non-complying w/TB2014-01. Calculate.		
15,000	Medium Density Back-to-back Towns.		
20,000	High Density		
	Wood Frame 4-Storey		
5,000	Fire-Resistive Podium/Multi-Storey		
30,000	High Contiguous / Hazard Areas		
< 45,000	Max FUS		

Water Demand Design Sheet



Maximum Pressure During Average Day (AVDY) Conditions

Novatech Project #: 118224

Project Name: THE COMMONS PHASE 4

Date: 9/10/2024

Input By: VBP

Reviewed By: BCS

Drawing Reference: 118224 - WM

Legend: Input by User No Input Required

Acceptable (40psi - 80psi)

Acceptable w/ PRV (81psi - 100psi)

Unacceptable (< 40psi or > 100psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)	Age (hrs)
3	90.56	0.00	130.75	40.19	57	0.91
4	90.97	0.05	130.75	39.78	57	1.03
5	91.00	0.11	130.75	39.75	57	0.90
6	90.73	0.00	130.76	40.03	57	0.66
7	90.76	0.00	130.77	40.01	57	0.62
8	91.02	0.11	130.77	39.75	57	0.74
9	90.88	0.11	130.77	39.89	57	0.63
10	90.53	0.00	130.77	40.24	57	0.41
11	90.41	0.00	130.78	40.37	57	0.40
12	90.47	0.02	130.79	40.32	57	0.38
13	90.61	0.00	130.79	40.18	57	0.28
14	90.43	0.14	130.79	40.36	57	0.10
15	90.26	0.00	130.79	40.53	58	0.26
16	90.25	0.00	130.79	40.54	58	0.02
17	90.35	0.00	130.79	40.44	58	0.27
18	90.98	0.08	130.79	39.81	57	1.64
19	90.54	0.00	130.79	40.25	57	2.27
20	90.97	0.00	130.79	39.82	57	6.27
21	90.80	0.09	130.79	39.99	57	7.02
22	90.55	0.00	130.79	40.24	57	4.12
23	91.01	0.00	130.79	39.78	57	16.16
24	90.90	0.11	130.79	39.89	57	21.68
25	91.18	0.08	130.79	39.61	56	5.41
26	90.65	0.00	130.75	40.10	57	0.70
27	90.23	0.00	130.79	40.56	58	0.01

Water Demand Design Sheet



Engineers, Planners & Landscape Architects

Minimum Pressure During Peak Hour (PKHR) Conditions

Novatech Project #: 118224

Project Name: THE COMMONS PHASE 4

Date: 9/10/2024

Input By: VBP

Reviewed By: BCS

Drawing Reference: 118224 - WM

Legend: Input by User No Input Required

Acceptable (≥ 40 psi)

Unacceptable (< 40 psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
3	90.56	0.00	127.24	36.68	52
4	90.97	0.29	127.23	36.26	52
5	91.00	0.58	127.23	36.23	52
6	90.73	0.00	127.23	36.50	52
7	90.76	0.00	127.22	36.46	52
8	91.02	0.58	127.21	36.19	51
9	90.88	0.58	127.21	36.33	52
10	90.53	0.00	127.21	36.68	52
11	90.41	0.00	127.21	36.80	52
12	90.47	0.05	127.21	36.74	52
13	90.61	0.00	127.20	36.59	52
14	90.43	0.77	127.20	36.77	52
15	90.26	0.00	127.20	36.94	53
16	90.25	0.00	127.20	36.95	53
17	90.35	0.00	127.20	36.85	52
18	90.98	0.43	127.20	36.22	52
19	90.54	0.00	127.20	36.66	52
20	90.97	0.00	127.20	36.23	52
21	90.80	0.48	127.20	36.40	52
22	90.55	0.00	127.20	36.65	52
23	91.01	0.00	127.20	36.19	51
24	90.90	0.58	127.20	36.30	52
25	91.18	0.43	127.20	36.02	51
26	90.65	0.00	127.23	36.58	52
27	90.23	0.00	127.20	36.97	53

Water Demand Design Sheet



Engineers, Planners & Landscape Architects

Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF #2) Condition

Novatech Project #: 118224

Project Name: THE COMMONS PHASE 4

Date: 9/10/2024

Input By: VBP

Reviewed By: BCS

Drawing Reference: 118224 - WM

Legend: Input by User No Input Required

Acceptable (≥ 20 psi)

Unacceptable (< 20 psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Run 1 (12000 L/min)

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
3	90.56	0.00	118.66	28.10	40
4	90.97	0.13	118.25	27.28	39
5	91.00	0.26	118.03	27.03	38
6	90.73	0.00	117.60	26.87	38
7	90.76	0.00	115.66	24.90	35
8	91.02	0.26	115.32	24.30	35
9	90.88	0.26	115.15	24.27	35
10	90.53	0.00	114.81	24.28	35
11	90.41	0.00	114.06	23.65	34
12	90.47	0.03	113.23	22.76	32
13	90.61	0.00	112.92	22.31	32
14	90.43	0.35	112.45	22.02	31
15	90.26	0.00	112.02	21.76	31
16	90.25	0.00	112.04	21.79	31
17	90.35	0.00	112.19	21.84	31
18	90.98	0.20	109.29	18.31	26
19	90.54	0.00	108.46	17.92	25
20	90.97	0.00	108.42	17.45	25
21	90.80	52.72	108.64	17.84	25
22	90.55	0.00	107.36	16.81	24
23	91.01	0.00	107.36	16.35	23
24	90.90	95.26	106.54	15.64	22
25	91.18	52.70	106.82	15.64	22
26	90.65	0.00	118.07	27.42	39
27	90.23	0.00	112.23	22.00	31

Water Demand Design Sheet



Engineers, Planners & Landscape Architects

Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF #2) Condition

Novatech Project #: 118224

Project Name: THE COMMONS PHASE 4

Date: 9/10/2024

Input By: VBP

Reviewed By: BCS

Drawing Reference: 118224 - WM

Legend: Input by User No Input Required

Acceptable (\Rightarrow 20psi)

Unacceptable ($<$ 20psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Run 2 (12000 L/min)

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
3	90.56	0.00	118.66	28.10	40
4	90.97	0.13	118.25	27.28	39
5	91.00	0.26	118.03	27.03	38
6	90.73	0.00	117.60	26.87	38
7	90.76	0.00	115.66	24.90	35
8	91.02	0.26	115.32	24.30	35
9	90.88	0.26	115.15	24.27	35
10	90.53	0.00	114.81	24.28	35
11	90.41	0.00	114.06	23.65	34
12	90.47	0.03	113.23	22.76	32
13	90.61	0.00	112.92	22.31	32
14	90.43	0.35	112.45	22.02	31
15	90.26	0.00	112.03	21.77	31
16	90.25	0.00	112.04	21.79	31
17	90.35	0.00	112.20	21.85	31
18	90.98	95.20	108.72	17.74	25
19	90.54	0.00	108.72	18.18	26
20	90.97	0.00	108.94	17.97	26
21	90.80	52.72	109.11	18.31	26
22	90.55	0.00	108.61	18.06	26
23	91.01	0.00	108.71	17.70	25
24	90.90	0.26	108.66	17.76	25
25	91.18	52.70	108.48	17.30	25
26	90.65	0.00	118.07	27.42	39
27	90.23	0.00	112.23	22.00	31

Water Demand Design Sheet



Engineers, Planners & Landscape Architects

Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF #4) Condition

Novatech Project #: 118224

Project Name: THE COMMONS PHASE 4

Date: 9/10/2024

Input By: VBP

Reviewed By: BCS

Drawing Reference: 118224 - WM

Legend: Input by User No Input Required

Acceptable (≥ 20 psi)

Unacceptable (< 20 psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Run 1 (14000 L/min)

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
3	90.56	0.00	107.57	17.01	24
4	90.97	0.13	106.64	15.67	22
5	91.00	46.26	106.14	15.14	22
6	90.73	0.00	106.13	15.40	22
7	90.76	0.00	106.05	15.29	22
8	91.02	46.26	105.82	14.80	21
9	90.88	0.26	105.90	15.02	21
10	90.53	0.00	106.07	15.54	22
11	90.41	46.00	106.14	15.73	22
12	90.47	0.03	106.62	16.15	23
13	90.61	0.00	106.84	16.23	23
14	90.43	0.35	107.15	16.72	24
15	90.26	0.00	107.27	17.01	24
16	90.25	0.00	107.28	17.03	24
17	90.35	0.00	107.18	16.83	24
18	90.98	0.20	107.27	16.29	23
19	90.54	0.00	107.27	16.73	24
20	90.97	0.00	107.27	16.30	23
21	90.80	0.22	107.27	16.47	23
22	90.55	0.00	107.27	16.72	24
23	91.01	0.00	107.27	16.26	23
24	90.90	0.26	107.27	16.37	23
25	91.18	0.20	107.27	16.09	23
26	90.65	95.00	106.15	15.50	22
27	90.23	0.00	107.31	17.08	24

Water Demand Design Sheet



Engineers, Planners & Landscape Architects

Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF #4) Condition

Novatech Project #: 118224

Project Name: THE COMMONS PHASE 4

Date: 9/10/2024

Input By: VBP

Reviewed By: BCS

Drawing Reference: 118224 - WM

Legend: Input by User No Input Required

Acceptable (≥ 20 psi)

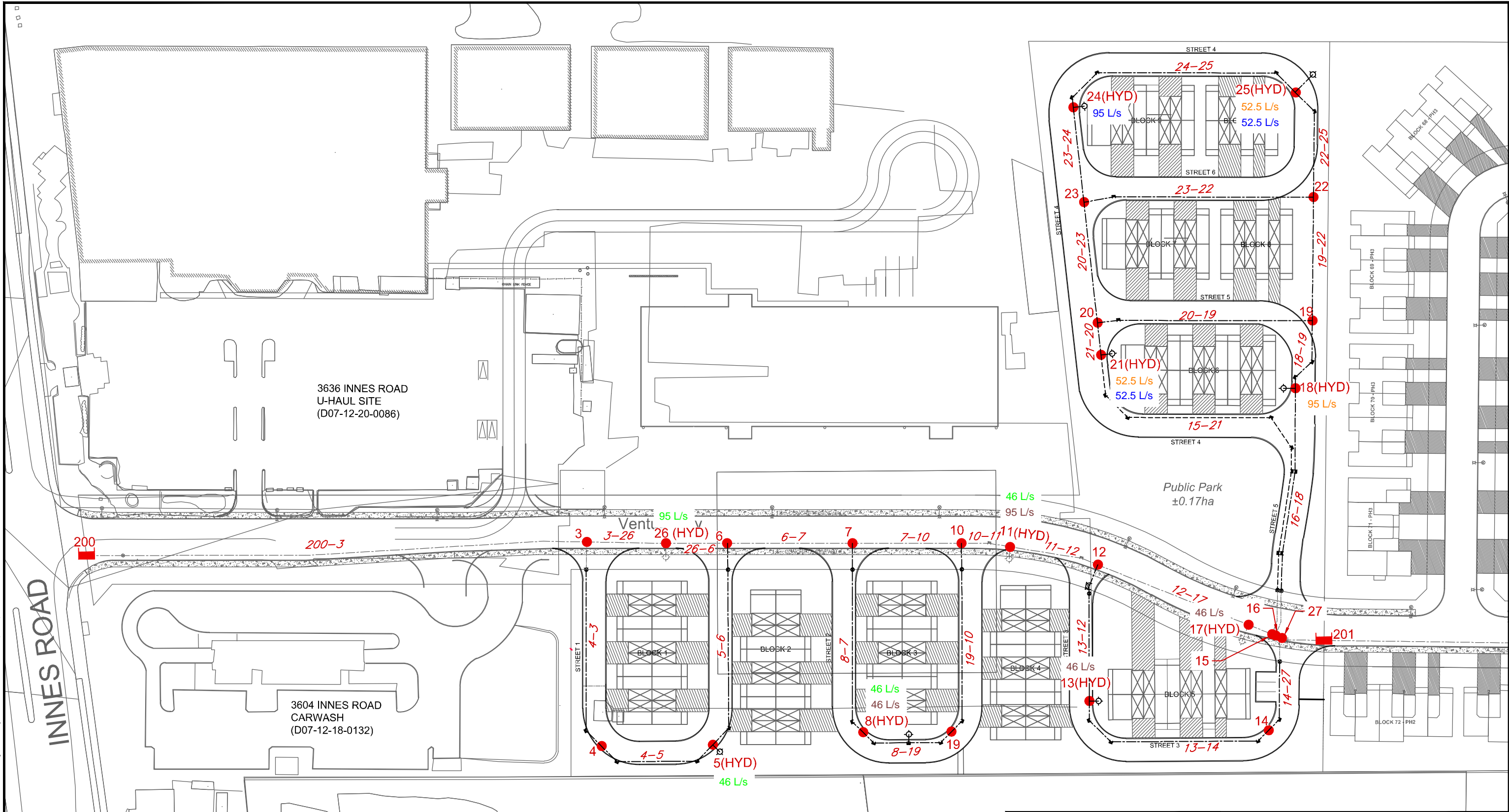
Unacceptable (< 20 psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Run 2 (14000 L/min)

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
3	90.56	0.00	112.99	22.43	32
4	90.97	0.13	112.32	21.35	30
5	91.00	0.26	111.95	20.95	30
6	90.73	0.00	111.26	20.53	29
7	90.76	0.00	108.08	17.32	25
8	91.02	46.26	107.11	16.09	23
9	90.88	0.26	107.09	16.21	23
10	90.53	0.00	107.06	16.53	24
11	90.41	95.00	106.51	16.10	23
12	90.47	0.03	106.53	16.06	23
13	90.61	46.00	106.47	15.86	23
14	90.43	0.35	106.82	16.39	23
15	90.26	0.00	106.92	16.66	24
16	90.25	0.00	106.94	16.69	24
17	90.35	46.00	106.71	16.36	23
18	90.98	0.20	106.93	15.95	23
19	90.54	0.00	106.93	16.39	23
20	90.97	0.00	106.92	15.95	23
21	90.80	0.22	106.92	16.12	23
22	90.55	0.00	106.92	16.37	23
23	91.01	0.00	106.92	15.91	23
24	90.90	0.26	106.92	16.02	23
25	91.18	0.20	106.92	15.74	22
26	90.65	0.00	112.02	21.37	30
27	90.23	0.00	107.00	16.77	24

M:\2018\118224\CAD\Design\Medium Density\118224-WM-MD.dwg, WM Layout, Oct 09, 2024 - 4:03pm, vpatel



- EXISTING 200mmØ WATERMAIN
- PROPOSED 200mmØ WATERMAIN
- PROPOSED 250mmØ WATERMAIN
- WATERMAIN NODE
- RESERVOIR
- MD + FF #2 RUN 1 - 12000 L/min COMBINED FLOW
- MD + FF #2 RUN 2 - 12000 L/min COMBINED FLOW
- MD + FF #4 RUN 1 - 14000 L/min COMBINED FLOW
- MD + FF #4 RUN 2 - 14000 L/min COMBINED FLOW

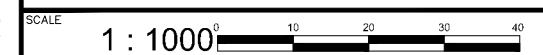


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THE COMMONS PHASE 4

WATERMAIN LAYOUT PLAN



DATE: OCT 2024 JOB: 118224 FIGURE: WM

1. Background

On behalf of the City of Ottawa, the National Research Council of Canada (NRC) evaluated the City's hydrant spacing guidelines in relation to Required Fire Flow (RFF) as calculated using the Fire Underwriters Survey (FUS) methodology. This work led to the development of a procedure to be used to establish the appropriate sizing of, and hydrant spacing on, dead-end watermains. This procedure may also be used as an optional watermain network design method to optimize watermain sizing based on RFF and standard hydrant spacing.

The procedure is partially based on the NFPA 1: Fire Code (NFPA1) and the City of Ottawa existing hydrant classification practice (refer to **Attachment A** at the end of this appendix for relevant excerpts of the Fire Code).

2. Rationale for Guideline

Given a Required Fire Flow (RFF) for a certain asset/structure/building, proper planning must ensure that there is a sufficient number of hydrants at sufficient proximities to actually provide the RFF. Both the capacity of the hydrants and their proximity to the asset/structure/building must be considered. Pressure losses (due to friction) in firehoses are proportional to the firehose length. Therefore, the actual fire flow delivered by the nozzle at the end of a very long firehose will be less compared to a short firehose connected to the same hydrant. Table 1 provides conservative values for hydrant fire flow capacity adjusted for firehose length.

3. Hydrant Capacity Requirement

For the purposes of this guidelines, the aggregate fire flow capacity of all contributing fire hydrants within 150 m of a building/asset/structure¹, measured in accordance with Table 1, shall be not less than the RFF.

4. Standard Practice

For the vast majority of developments, hydrant spacing as indicated in Section 4.5, Table 4.9, Ottawa Design Guidelines – Water Distribution, are sufficient to meet the RFF. This has been verified by evaluating approved development plans representing a

¹ Although NFPA 1 considers hydrant contribution at distances of up to 1000ft (305 m), Ottawa Fire Services (OFS) would need two pumpers to deliver flow from such a distance (one pumper midway – acting as a booster). Moreover, OFS cautioned that some redundancy is advisable to account for accessibility limitations in emergency situations, wind effects, etc. Therefore 150 m was considered as the maximum contributing distance

Appendix I: Guideline on Coordination of Hydrant Placement with Required Fire Flow

range of land uses and configurations. However, in some instances involving dead-end watermains, standard spacing requirements may not be sufficient to meet RFF.

Standard design practice involves systematic checking of design fire flows at every node in hydraulic models of proposed water distribution systems. Normally the entire design fire flow is applied to each node in succession. Nodes are typically at water main junctions rather than actual hydrant locations. This significantly simplifies the design process and the current software packages that are normally used for this purpose have been developed based on this practice. The “point load assumption” produces a conservative design.

Table 1. Maximum flow to be considered from a given hydrant

Hydrant Class	Distance to asset/structure/building (m) ^a	Contribution to required fire flow (L/min) ^b
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800
A	≤ 75	3,800
	> 75 and ≤ 150	2,850
B	≤ 75	1,900
	> 75 and ≤ 150	1,500
C	≤ 75	800
	> 75 and ≤ 150	800

^a Distance of contributing hydrant from the structure, measured in accordance with NFPA 1 (Appendix A).

^b Maximum flow contribution to be considered for a given asset/structure/building, at a residual pressure of 20 psi, measured at the location of the main, at ground level.

4. Intended Application of Guideline

The intent of this procedure is to:

- Determine the appropriate sizing of dead end watermains and associated hydrant requirements.
- Provide an optional approach to local watermain network sizing that will assist the designer in determining the minimum pipe sizing needed to meet RFF.

The procedure permits the designer to: (a) reconcile available hydrant flow with computed RFFs, and (b) allow the distribution of RFFs along multiple hydrants, rather

than consider RFF to be a point flow. The application of this protocol may result in reduced watermain diameters compared to those determined based on a traditional design approach. Caution is required in the application of the procedure to ensure that the transmission function of any watermains identified in a Master Servicing Study is not compromised. Normally, watermains 300mm in diameter and larger that are identified in such studies would not be considered for resizing.

5. Application Procedure

5.1 Rated hydrants

The procedure described here would apply to an existing watermain network with existing hydrants (i.e., re-development or infill in existing neighborhoods):

- Identify critical zones within the (re)development area, e.g., high RFF, dead ends, small diameter watermains, low C factor, and/or high geographic elevation zones.
- For the critical zones use Table 1 to examine if there are sufficient hydrants to deliver the RFF (following procedure described in 5.3).
- If hydrant capacity is insufficient, then consider either:
 - adding hydrants as appropriate;
 - determine if the existing hydrants can be upgraded to higher rating; or
 - upgrade existing watermains.

5.2 Un-rated hydrants

There are currently about 24,800 hydrants in the City of Ottawa, of which about 78% are rated. Of the rated hydrants, 96% are AA (Blue), 3% are A (Green). Many of the un-rated hydrants are located in old parts of the City, often installed on water mains with minimum diameter of 6" (150 mm), and would be likely to have a low rating.

Based on a review of hydrants that have been installed as part of recent urban development, approximately 99% of those which were rated are rated AA, and only 1% are rated A.

5.2.1 Un-rated Existing Hydrants

In cases where fire flow is to be evaluated in areas with an established water distribution network and with existing fire hydrants (i.e., re-development or infill in existing neighborhoods), all un-rated hydrants should be tested and rated in accordance with NFPA standard 291. The procedure described in Section 5.1 can then be followed to complete the design.

5.2.2 Planned hydrants

Planned hydrants cannot be tested for rating because they have not been installed yet. Moreover, the rating of a hydrant is an intrinsic property of the hydrant and can therefore not be directly evaluated by simulation. Based on the statistics cited previously, it can be assumed for design purposes that all planned hydrants are AA. However, there could be a situation where the proposed network might not have sufficient capacity to supply 5,700 L/min to a AA-rated hydrant in a specific area. Hydraulic analysis is required to confirm that the distribution network is capable of providing the hydrants with the fire flows in Table 1.

5.3 Hydrant Placement and Watermain Size Optimization

Ottawa design guidelines for watermain sizing and hydrant placement (Section 4) stipulate that the RFF be added to the average hourly rate of a peak day demand. This fire flow is added to hydraulic nodes in the vicinity of the planned development, while ensuring that the residual pressure is at least 140 kPa (measured at the location of the main, at ground level).² The following procedure is used to optimize watermain sizing and hydrant placement based on the RFF.

- Place hydrants throughout the development area according to the current Ottawa design guidelines.
- Size water mains and locate hydrants according to standard design procedures. Assume all hydrants are AA-rated.
- Identify the most critical zones in the development area, e.g. highest required fire flows, dead ends, longest distances between junctions, and/or highest elevation. Within these critical zones identify critical structures, i.e. those with highest RFF or greatest distance from proposed hydrant locations. Identify the closest hydrants to these buildings.
- For each critical structure, distribute the RFF according to Table 1 (i.e., assign a flow of 5,700 L/min to all hydrants with a distance of less or equal to 75 m from the test property and 3,800 L/min to all hydrants with a distance of more than 75 m but less or equal to 150 m from the test property) These hydrants are to be represented as hydrant-nodes in the network model, where the hydrant lateral would connect to the proposed water main.

² At the time when this protocol was proposed, the City of Ottawa had in effect Technical Bulletin ISDTB 2014-02, whereby RFF may be capped at 10,000 L/min for single detached dwellings (with a minimum 10 m separation between the backs of adjacent units and for side-by-side town and row houses that comply with the OBC Div. B, subsection 3.1.10 requirement (compartments of no more than 600 m² area).

Appendix I: Guideline on Coordination of Hydrant Placement with Required Fire Flow

- For each critical structure, run a single fire flow simulation ensuring that the RFF is provided by hydrants within 150 m distance from the test property, with a minimum residual pressure of 140 kPa.
- If the required residual pressure cannot be achieved, consider either re-sizing of pipes, and/or re-spacing of hydrants.

The above procedure is optional except for dead-end watermains servicing cul-de-sacs because (a) based on standard spacing requirements, there would often be insufficient fire flow provided and (b) the watermain would otherwise could be sized larger than necessary and lead to excessive water age and on-going flushing requirements.

Irrespective of the above, if the RFF is equal to or less than 10,000 L/min, then:

- where the distance between two adjacent hydraulic nodes is greater than the inter-hydrant spacing allowed in the guideline, a hydraulic node should be added halfway between the two nodes, and proceed with fire flow simulations to verify watermain sizing, ensuring that the simulation considers RFF at the new hydraulic node.

Attachment A—Excerpts from NFPA 1 Fire Code (2015 Edition)

18.5 Fire Hydrants.

18.5.1 Fire Hydrant Locations and Distribution. Fire hydrants shall be provided in accordance with Section 18.5 for all new buildings, or buildings relocated into the jurisdiction unless otherwise permitted by 18.5.1.1 or 18.5.1.2.

18.5.1.4* The distances specified in Section 18.5 shall be measured along fire department access roads in accordance with 18.2.3.

18.5.1.5 Where fire department access roads are provided with median dividers incapable of being crossed by fire apparatus, or where fire department access roads have traffic counts of more than 30,000 vehicles per day, hydrants shall be placed on both sides of the fire department access road on an alternating basis, and the distances specified by Section 18.5 shall be measured independently of the hydrants on the opposite side of the fire department access road.

18.5.1.6 Fire hydrants shall be located not more than 12 ft (3.7 m) from the fire department access road.

18.5.2 Detached One- and Two-Family Dwellings. Fire hydrants shall be provided for detached one- and two-family dwellings in accordance with both of the following:

- (1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 600 ft (183 m).
- (2) The maximum distance between fire hydrants shall not exceed 800 ft (244 m).

18.5.3 Buildings Other than Detached One- and Two-Family Dwellings. Fire hydrants shall be provided for buildings other than detached one- and two-family dwellings in accordance with both of the following:

- (1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 400 ft (122 m).
- (2) The maximum distance between fire hydrants shall not exceed 500 ft (152 m).

18.5.4 Minimum Number of Fire Hydrants for Fire Flow.

18.5.4.1 The minimum number of fire hydrants needed to deliver the required fire flow for new buildings in accordance with Section 18.4 shall be determined in accordance with Section 18.5.4.

Ottawa Design Guidelines – Water Distribution

Appendix I: Guideline on Coordination of Hydrant Placement with Required Fire Flow

18.5.4.2 The aggregate fire flow capacity of all fire hydrants within 1000 ft (305 m) of the building, measured in accordance with 18.5.1.4 and 18.5.1.5, shall be not less than the required fire flow determined in accordance with Section 18.4.

18.5.4.3* The maximum fire flow capacity for which a fire hydrant shall be credited shall be as specified by Table 18.5.4.3. Capacities exceeding the values specified in Table 18.5.4.3 shall be permitted when local fire department operations have the ability to accommodate such values as determined by the fire department.

Table 18.5.4.3 Maximum fire flow hydrant capacity

Distance to buildings ^a		Maximum capacity ^b	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

^a Measured in accordance with 18.5.1.4 and 18.5.1.5.

^b Minimum 20 psi (139.9 kPa) residual pressure.

18.5.4.4 Fire hydrants required by 18.5.2 and 18.5.3 shall be included in the minimum number of fire hydrants for fire flow required by 18.5.4.

The City of Ottawa design guidelines on hydrant classification conform to the NFPA Standard #291, which recommends the following:

5.1 Classification of Hydrants. Hydrants should be classified in accordance with their rated capacities [at 20 psi (1.4 bar) residual pressure or other designated value as follows:

- (1) Class AA — Rated capacity of 1500 gpm (5700L/min) or greater
- (2) Class A — Rated capacity of 1000–1499 gpm (3800– 5699 L/min)
- (3) Class B — Rated capacity of 500–999 gpm (1900–3799 L/min)
- (4) Class C — Rated capacity of less than 500 gpm (1900 L/min)

Appendix F
Development Servicing Study Checklist

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.
- Statement of objectives and servicing criteria.
- Identification of existing and proposed infrastructure available in the immediate area.
- Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- Proposed phasing of the development, if applicable.

- Reference to geotechnical studies and recommendations concerning servicing.

- All preliminary and formal site plan submissions should have the following information:
 - Metric scale

 - North arrow (including construction North)

 - Key plan

 - Name and contact information of applicant and property owner

 - Property limits including bearings and dimensions

 - Existing and proposed structures and parking areas

 - Easements, road widening and rights-of-way

 - Adjacent street names

4.2 Development Servicing Report: Water

- Confirm consistency with Master Servicing Study, if available
- Availability of public infrastructure to service proposed development
- Identification of system constraints
- Identify boundary conditions
- Confirmation of adequate domestic supply and pressure
- Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
- Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
- Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
- Address reliability requirements such as appropriate location of shut-off valves
- Check on the necessity of a pressure zone boundary modification.
- Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- Confirm consistency with Master Servicing Study and/or justifications for deviations.
- Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.
- Description of proposed sewer network including sewers, pumping stations, and forcemains.
- Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

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

- Inclusion of hydraulic analysis including hydraulic grade line elevations.
- Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

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

4.6 Conclusion Checklist

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