

STORMWATER MANAGEMENT AND HYDRAULIC ANALYSIS REPORT

December 2024

**Prepared for:
City of Brampton**

TABLE OF CONTENTS

List of Figures	iii
List of Tables	iii
1 INTRODUCTION	1
1.1 Project Overview	1
1.2 Study Area	1
1.3 Scope of Work and Study Objectives	1
2 HYDROLOGIC ANALYSIS	4
2.1 Existing Conditions.....	4
2.2 Methodology.....	4
2.3 Allowable Release Rate	5
2.4 Proposed Conditions.....	5
2.5 Proposed Conditions-Uncontrolled Scenario.....	6
3 STORMWATER MANAGEMENT.....	7
3.1 Stormwater Management Criteria	7
3.2 Quantity Control	7
3.3 Quality Control.....	7
3.4 Water Balance and Erosion Control.....	9
4 CREEK CROSSING AND HYDRAULIC ANALYSIS	10
4.1 Hydraulic Design Criteria	10
4.2 Methodology.....	10
4.3 Existing Condition	11
4.3.1 Mimico Creek - Williams Parkway and Torbram Road Intersection.....	11
4.3.2 Spring Creek - Chinguacousy Trail and Williams Parkway Intersection	12
4.4 Proposed Condition	13
4.4.1 Mimico Creek - Williams Parkway and Torbram Road Intersection.....	13
5 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION CONDITIONS	15
6 CONCLUSION	16
7 REFERENCES.....	17

List of Figures

Figure 1.1 Study Area Map	3
---------------------------------	---

List of Tables

Table 2.1 Peak Flow Rates at HRP's under Existing Conditions	5
Table 2.2 Peak Flow Rates at HRP's under proposed Conditions	6
Table 3.1 Stormwater Management Criteria	7
Table 3.2 Summary of Quality Control Units.....	8
Table 3.3 Retention Volume Analysis Results	9
Table 4.1 Comparison of Water Levels: TRCA Model and revised Existing Condition.....	11
Table 4.2 Comparison of Water Levels: TRCA Model and revised Existing Condition.....	12
Table 4.3 Comparison of Water Levels: revised EXISTING AND Proposed option.....	14

Williams Parkway Improvements from Dixie Road to Torbram Road

Prepared by:

Reviewed by:



DEVI THAPA, PhD, P.ENG.

**SENIOR ENGINEER - WATER RESOURCES
PARSONS INC.**



MEHDI HEIDARI, PhD, P.ENG.

**PRINCIPAL ENGINEER - WATER RESOURCES
PARSONS INC.**

Revision	Date	Description
1	July 12, 2024	Draft Report
2	September 27, 2024	Revised Report
3	October 30, 2024	Revised Report
4	December 18, 2024	Final Report

1 INTRODUCTION

1.1 Project Overview

Parsons Inc. was retained by the City of Brampton (City) to undertake the Municipal Class Environmental Assessment (MCEA) Study for the improvement of Williams Parkway from Dixie Road to Torbram Road in the City of Brampton. The proposed road improvements consist of implementing a multi-use trail on both sides of the road to provide better active transportation connectivity within the existing network in the City.

As part of the MCEA Study, a Stormwater Management and Hydraulic Analysis Report has been prepared to document the existing drainage patterns, as well as to propose a stormwater management strategy. The goal is to address the increased peak flows while ensuring no adverse impacts occur due to the proposed multi-use trail.

1.2 Study Area

The study area, Williams Parkway from Dixie Road to Torbram Road, is an east-west minor arterial road within the City of Brampton, primarily providing access to the surrounding residential and school areas on either side of the road. The land use in this area consists of low-density residential areas. The existing roadway consists of a four-lane paved road with an urban cross-section. Spring Creek and Mimico Creek are the major watercourses in the study area. The Spring Creek crosses the Williams Parkway between Dixie Road and Bramalea Road, and the Mimico Creek crosses at the intersection of Williams Parkway and Torbram Road, which are shown in **Figure 1.1**.

The study area falls under the jurisdiction of the Toronto and Region Conservation Authority (TRCA) and some sections are within the TRCA regulated area. This segment of the road crosses two watersheds within the TRCA limits: Spring Creek Watershed and Mimico Creek Watershed.

As part of the project background, it is noted that an MCEA Study was in progress for Torbram Road from Bovaird Drive to Queen Street East, Brampton, Ontario. A hydraulic analysis was also undertaken for Mimico Creek as part of that study and Parsons Inc. incorporated the findings of the previous study in the current analysis. Details of this analysis are presented in **Section 4**.

1.3 Scope of Work and Study Objectives

As part of this study, the existing drainage conditions have been assessed to identify the current issues. Furthermore, a drainage and stormwater management plan has been developed for the proposed Williams Parkway improvement works that minimizes impacts on the existing watercourse and drainage pattern.

The study objectives include the following:

- Hydrologic analysis of the existing conditions to establish the peak flows threshold limits for the proposed conditions;
- Hydrologic analysis of the proposed improvement works within Williams Parkway Right of Way (ROW) to assess any adverse impacts on the existing stormwater outlets;
- Maintain the existing drainage patterns and outlets in the post-development conditions;
- Propose adequate mitigation measures for the runoff generated during the post-development conditions to ensure there are no detrimental impacts at the outlets (i.e., provide stormwater management quantity control);
- Undertake capacity analysis of the existing storm sewer system within the study area and propose the upsized storm sewer system to convey the increased road runoff as required;
- Improve water quality of the post-development roadway runoff, prior to discharging at the existing outlets;
- Undertake the hydraulic analysis of Spring Creek at the upstream and downstream of Williams Parkway;

- Undertake the hydraulic analysis of Mimico Creek at the upstream and downstream of Torbram Road & Williams Parkway intersection;
- Propose adequate culvert size for the Spring Creek and Mimico Creek crossing that complies with City's requirements of conveying the Regional storm event without road overtopping; and
- Provide safe drainage conveyance to reduce potential flood risks and prevent damage to private and public properties.

This report illustrates how the existing drainage system will be affected by the proposed improvements to Williams Parkway and identifies possible mitigation measures required to ensure that the stormwater management (SWM) criteria can be met.

FIGURE 1.1 Study Area Map



2 HYDROLOGIC ANALYSIS

Hydrologic analysis has been performed for the sub-watershed within the Spring Creek and Mimico Creek watershed. Contributing catchment areas based on topographic contour data was obtained from the City of Brampton. In this analysis, flow from the subcatchment area is discharged to the outlet location known as hydrologic reference points (HRPs). There are five (5) HRPs in the Project limit, which four (4) of them is in the Mimico sub-watershed and one (1) is in the Spring Creek (Etobicoke) watershed. Peak flow rates for each subcatchment have been estimated through Visual OTTHYMO (VO) Model using AES rainfall distribution.

2.1 Existing Conditions

As previously noted, the Study Area is located within the TRCA's jurisdiction, mostly within the Spring Creek and Mimico Creek watershed. The hydrologic Visual OTTHYMO (VO) file along with the watershed catchment areas were received from TRCA in June 2022. Each subcatchment convey only the runoff generated within ROW. The existing roadway has 1.5 m wide sidewalks on both sides. The existing SWM system does not provide for any water quality treatment before draining into the watercourses or external storm sewer system. Six (6) storm sewer outlets have been identified within the Project limits as shown in the Existing Condition drawing in Appendix A. It shows a simple representation of the entire existing drainage system within the project limits. Figure B1 to Figure B7 of **Appendix-B** presents the drainage mosaics for the existing HRPs. Six (6) HRPs have been identified for the overland drainage patterns and the existing outlets within the study limits:

- HRP-1 represents the Mimico Creek crossing at the Torbram Road and Williams Parkway intersection. The flow from the subcatchment CA-27, CA-28, CA-29, CA-30, and CA-31 are conveyed to HRP1 (Figure B1 in Appendix B). Major overland flow as well as minor system flow between Graymar Road and Williams Parkway are being conveyed east towards the Creek.
- HRP-2 represents the outfall to Mimico Creek near Don Doan Trail. The flow from the subcatchment CA-21, CA-22, CA-23, CA-24, CA-25, and CA-26 are conveyed to HRP2 (Figure B1, B2 and B3 in Appendix B). Major overland flow as well as minor system flow between Glenridge Road, and William Parkway are being conveyed to the Mimico Creek.
- HRP-3 captured the roadway flow between the eastside of Bramalea Road and the westside of Glenridge Road. The flow from the subcatchment CA-17, CA-18, and CA-19 are conveyed to HRP3 (Figure B3 and B4 in Appendix B). Major overland flow as well as minor system flow are conveyed southward to the Glenridge Road.
- HRP-4A and HRP-4B captures the roadway flow between the eastside of MacKay Street S and the westside of Bramalea Road. The flow from the subcatchment CA-12, CA-13, CA-14, CA-15, and CA-16 are conveyed to HRP4A (Figure B4 and B5 in Appendix B) and CA-16 is conveyed to HRP4B (Figure B4 in Appendix B). Major overland flow as well as minor system flow are conveyed to the Bramalea Road in a southerly direction.
- HRP-5 represents a combination of two outlets: west of Spring Creek and east of Spring Creek, which both ultimately discharge to the Spring Creek. The flow from the subcatchment CA-01, CA-02, CA-03, CA-04, CA-05, CA-06, CA-07, CA-08, CA-09, CA-10 and CA-11 are conveyed to HRP5 (Figure B5, B6 and B7 in Appendix B). Major overland flow as well as minor system flow between Dixie Road and MacKay St S would eventually discharge to the Spring Creek.

These six HRPs have been used as reference points for peak flow comparison between existing and post-development condition, as shown in **Appendix-B**.

2.2 Methodology

As part of the hydrologic analysis, it was identified that the study area crosses the following Mimico Creek sub-watersheds: 103, 104, 105, and 108. Similarly, a small portion of the Spring Creek (Etobicoke) sub-watersheds of 81 and 446 crosses

the study area. The original Visual OTTHYMO model input parameters associated with these areas are included in **Table B.1** in **Appendix-B**.

Overland drainage areas within the Williams Parkway ROW were delineated based on the location of high points and low points along the road profile and they were defined using the relevant input parameters for the larger sub-watershed where they were extracted from. Due to the urban nature of the watersheds, all of the contained catchment areas were defined as STANDHYDs in the TRCA hydrologic VO model; therefore, the same approach was maintained through modelling of the road catchments. The imperviousness was adjusted based on the distribution of pervious and impervious areas within the road ROW. As a result, a small-scale hydrologic model was created to include all road catchments within the limits of the work to quantify the existing peak flows at each HRP. The Existing Drainage Area Map shows the existing sub-watershed boundaries, the water crossings, the existing road catchments, and the existing drainage pattern for the Torbram Road drainage area (**Appendix-B**).

Table B.2 in **Appendix-B** shows the revised VO model input parameters for the Williams Parkway catchments under the existing conditions.

2.3 Allowable Release Rate

A VO hydrologic model was developed to assess the localized runoff generated from the roadway pavements under existing conditions. For the Mimico Creek and Spring Creek watershed, TRCA's stormwater management criteria require the post-development peak flows to be controlled by the pre-development levels for all storms up to and including the 100-year storm based on 12-hr AES distribution (TRCA SWM Criteria, 2012).

As described in **Section 2.1**, the existing peak flows from the road catchments were determined at each HRP using Visual OTTHYMO 5.2. **Table 2.1** summarizes these existing peak flows at all HRPs. **Visual OTTHYMO Modelling Schematic-1 Existing Condition** in **Appendix-B** illustrates the existing condition of the road catchments. Detailed existing condition hydrologic modelling output files are included in **Appendix-B**.

TABLE 2.1 PEAK FLOW RATES AT HRPS UNDER EXISTING CONDITIONS

	Q _{EX} , Flow (l/s)					
Return Period (12hr AES)	HRPs	HRP-1	HRP-2	HRP-3	HRP-4	HRP-5
	VO ID	801	701	601	20	10
	A (ha)	1.79	2.06	1.41	1.85	4.06
	Imperviousness, %	61.7	62.6	47.0	62.9	61.4
	2-year	78	90	54	80	145
	5-year	104	120	74	108	196
	10-year	123	141	89	127	231
	25-year	146	168	107	151	277
	50-year	163	188	121	169	311
	100-year	180	207	134	187	346
	Regional	253	291	197	263	531

2.4 Proposed Conditions

As noted above, the proposed roadway improvements include 3.0 m wide multi-use trails on both sides of Williams Parkway from Torbram Road to Dixie Road. Similar to the existing condition drainage pattern, the proposed road profile follows the existing road profile, and the same five (5) HRPs were considered in the proposed condition hydrologic analysis. The details of the proposed conditions for drainage mosaics are provided in **Appendix-B (Figure B8 to B14)**. As similar to the existing conditions, the Visual OTTHYMO hydrologic modelling was utilized to analyse the runoff generated by the proposed

catchments and to determine the increase imperviousness impact on the overall drainage flow. Impervious area is increased due to widening the sidewalk to a multi-use trail from 1.5 to 3.0 m. The proposed preliminary design of Williams Parkway includes narrowing the outer travel lane which helps to increase the pervious area. The catchbasin (CB) locations are relocated according to the curb adjustment, and all are shown in the preliminary design drawings.

2.5 Proposed Conditions-Uncontrolled Scenario

The same methodology was applied for this scenario similar to the one defined for the existing condition as stated in **Section 2.2. Visual OTTHYMO Modelling Schematic-2 - Proposed Condition** in **Appendix-B** shows the proposed condition-uncontrolled scenario for the hydrologic modelling. Relevant input parameters for the large sub-watershed were extracted from TRCA hydrologic model, and estimated imperviousness and catchment area information within the limits of work are presented in the **Table B.3** in **Appendix-B**. Proposed peak flows at all HRPs are illustrated in **Table 2.2**. Detailed modelling output files are included in **Appendix-B**.

TABLE 2.2 PEAK FLOW RATES AT HRPS UNDER PROPOSED CONDITIONS

	Q _{PR} Flow (l/s)										
Return Period (12 hr-AES)	HRPs	HRP-1		HRP-2		HRP-3		HRP-4		HRR-5	
	VO ID	801		701		601		20		10	
	A (ha)	1.79		2.06		1.41		1.85		4.06	
	Imperviousness, %	63.9		64.8		48.7		65.4		63.5	
		Q _{PR}	Q _{PR-QEX}	Q _{PR}	Q _{PR-QEX}	Q _{PR}	Q _{PR-QEX}	Q _{PR}	Q _{PR-QEX}	Q _{PR}	Q _{PR-QEX}
	2-year	79	1	91	1	54	0	81	1	147	2
	5-year	105	1	122	2	75	1	109	1	198	2
	10-year	124	1	143	2	89	0	128	1	234	3
	25-year	147	1	169	1	108	1	152	1	28	3
	50-year	164	1	189	1	121	0	170	1	314	3
	100-year	181	1	209	2	135	1	188	1	349	3
	Regional	254	1	292	1	197	0	263	0	533	2

3 STORMWATER MANAGEMENT

3.1 Stormwater Management Criteria

Stormwater management in the form of quantity and quality control is proposed within the limits of the Project. **Table 3.1** summarizes the criteria for both quantity and quality control, although **Section 2.3** has already provided the quantity control requirements for Mimico Creek and Spring Creek Watershed.

TABLE 3.1 STORMWATER MANAGEMENT CRITERIA

Items	Descriptions
Quantity Control	Mimico Creek Watershed: Control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm (Mimico Hydrology Update, Marshall Macklin Monaghan, 2009). 12-hr AES distribution design storm shall be considered for the Mimico Creek watershed peak flow analysis. Spring Creek Watershed: North of Bovaird Drive, control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm. For all other tributaries and reaches, post to pre-development quantity controls are not required. (Etobicoke Creek Hydrology Update, Totten Sims Hubicki, 2007).
Quality Control	The stormwater management criterion stipulates that all watercourses and water bodies within TRCA's jurisdiction are classified as requiring an Enhanced level of protection (80% TSS removal) (TRCA Stormwater Management Criteria) Table 3.2 Water Quality Storage Requirement based on Receiving Waters (Stormwater Management Planning and Design Manual, MOECC, 2003)

3.2 Quantity Control

The post-development flows from the Project area were generated for the 2-year to 100-year storm events using the AES rainfall distribution. **Table 2.2** presents the peak flow rates under the proposed conditions and increased flow value at the HRP. The modelling results show that the flow increase at HRP1 to HRP4 (Mimico Creek) are less than 1 l/s comparing to the existing conditions. Therefore, the proposed development works will have an insignificant impact on the creek flow (Mimico) system. Similarly, the modelling results show that the flow increase at the HRP5 (Spring Creek) are less than 3 l/s comparing to the existing conditions. The TRCA stormwater management guidelines mentioned that quantity control of the post-development peak flows to pre-development peak flows is required only north of the Bovaird Drive. However, the estimated peak flows will have a negligible impact for the proposed development works on the Spring Creek flow system. The negligible change in impervious surfaces indicates that there will be a minimum change in the peak flow rate in the storm sewer system. Due to the increase in peak flow, no modification to the existing storm sewer system is necessary for the proposed road improvements. Therefore, there are no changes to the existing storm sewer system and no required quantity control for Williams Parkway in the project limits.

3.3 Quality Control

The existing Williams Parkway corridor does not have any form of quality control and does not currently meet the TRCA requirements for water quality control. Therefore, SWM quality control treatment needs to be implemented to meet TRCA's 80% TSS removal and Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA, Appendix A) requirements. Due to the limited road right of-way, LIDs were not considered in preliminary design as there is not sufficient

space but will be reviewed in detailed design. Stormwater quality control could be provided throughout the Project limits through Stormceptor EFO units, which are an oil grit separator (OGS)/hydrodynamic separator that effectively targets sediment, free oils, gross pollutants, and other pollutants that cling to particles, such as nutrients and metals. These units are only permissible as pre-treatment or last resort as per control hierarchy of the CLI ECA. Therefore, a feasibility analysis of other stormwater BMPs, primarily LID, is required at the detailed design stage to fulfill water quality control requirement.

Seven of these units are proposed throughout the Project limits. Table 3.2 summarizes the quality control units required for the project based on the drainage area characteristics at each outlet in order to meet the SWM quality control criteria of 80% TSS removal. The details of the units are included in **Appendix B**.

The Stormceptor EFO units would be installed at all storm sewer outlets that discharge into existing watercourses, as well as before discharging into the municipal system.

Stormceptor EF is the recent advancement in the Stormceptor OGS technology series, and it is intended to remove a wide range of pollutants from stormwater and snowmelt runoff. This technology has been third-party tested in accordance with the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and performance has been third-party verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol.

Modelling the quality control units was undertaken using PCSWMM from Imbrium Website. Modelling output files as well as typical design details including drawings and specifications for all units are included in **Appendix C**.

Any opportunity to use additional control measures to enhance water quality control (e.g., infiltration tanks or swales) will require further detailed investigation. Other low-impact development (LID) options, such as bio-swales or bio-retentions, require sufficient installation space. The feasibility of SWM options including enhanced grass swales, infiltration trenches and other LID methodologies should be assessed during the detailed design stage. The proposed SWM system will not only meet regular municipal engineering criteria, but it will also fulfill the requirements regulated in the special policy area (SPA) approved by the province. Additional hydrogeological and geotechnical studies to support the LID design will be required.

TABLE 3.2 SUMMARY OF QUALITY CONTROL UNITS

Outlet / HRP	Contributing Area (ha)	Average Impervious Proposed %	Stormceptor EFO ID	Required EFO model	%TSS Removal Achieved
HRP -1	1.79	63.9	W1	EFO10	63
HRP-2	2.06	64.8	W2	EFO10	62
HRP-3	1.41	48.7	W3	EFO8	62
HRP-4A	1.35	64.8	W4A	EFO8	61
HRP-4B	0.51	65.9	W4B	EFO6	64
HRP-5A	2.77	49.3	W5A	EFO10	60
HRP-5B	1.28	70.6	W5B	EFO8	61

Therefore, further study will be conducted during the detailed design stage to meet the CLI ECA criteria, where the primary goal is to control the 90th percentile runoff volume and achieve 80% TSS control, following a hierarchy of retention, LID filtration, and conventional stormwater management. Detailed design will include an assessment that follows the City's Low Impact Development Feasibility Study Scope of Work are included in **Appendix E**. This entails collecting and reviewing background information, a feasibility screening of LID opportunities (which includes site restrictions, geotechnical, hydrogeological and SUE information), and a feasibility report. This will ultimately result in recommended solutions for LIDs in the corridor.

3.4 Water Balance and Erosion Control

Proposed design provides the on-site retention of runoff from a 5mm storm event through infiltration or evapotranspiration. A simplified water balance analysis has been carried out to ensure that the 5 mm retention is achieved within the Project limit. The total drainage area of Williams Parkway within the ROW is 10.7 ha and requires at least 535 m³ on-site storage to accommodate the 5 mm rainfall. A further study will be conducted during the detailed design stage to meet the CLI ECA water balance criteria that will confirm post-to-predevelopment average annual infiltration match.

The pervious drainage areas can provide storage volume within the ROW. The pervious drainage area along Williams Parkway is typically silty-clay material covered with a 200 mm topsoil. Water balance analysis results presented in **Table 3.3** are based on water-holding capacity for only topsoil thickness and a conservative infiltration rate for topsoil. The results show that the soil-water holding capacity and 12-hr infiltration in the pervious drainage area exceed the required 5 mm retention storage for the Project.

TABLE 3.3 RETENTION VOLUME ANALYSIS RESULTS

HRP ID	Pervious Area (ha)	Soil-Water Holding Capacity for Silty Clay Topsoil (mm/200mm)	Soil-Water Holding Capacity (m ³)	Steady Infiltration Rate for Silty Clay Soil (mm/hr)	Infiltration Volume for 12 hr of Precipitation (m ³)
HRP-1	0.62	33	203.81	5	370.56
HRP-2	0.54	33	179.45	5	326.28
HRP-3	0.59	33	195.99	5	356.34
HRP-4	0.51	33	168.27	5	305.94
HRP-5	1.57	33	519.42	5	944.40
Total in ROW			1266.94		2303.5

4 CREEK CROSSING AND HYDRAULIC ANALYSIS

4.1 Hydraulic Design Criteria

The design of the creek crossings (bridges/culverts) are based on the City of Brampton Subdivision Manual (December 2008). The major design criteria items are as follows:

- The culverts and bridges under Arterial Road shall be designed without overtopping during all storm events including the Regional storm event.
- At local roads, the overland flow depth over the gutter elevation shall not be more than 300 mm and must not cause damage to private properties.
- Stacked culverts may be permitted to facilitate flow retardation. Specific design must be submitted to show that 100-year storm can be accommodate and shall include calculation of the hydraulic grade line.

4.2 Methodology

As previously mentioned, the study area within the Mimico Creek and Spring Creek watersheds is located within the TRCA jurisdiction. TRCA maintains and updates hydraulic models in digital form as HEC-RAS (River Analysis System) models in the area of this study. The latest updated existing HEC-RAS models were obtained from TRCA for the above noted watershed. The input required to run the model includes cross-sectional elevation information determined by topographical survey and contour mapping from City's GIS file.

In the HEC-RAS model the following changes are made to evaluate the existing and proposed drainage conditions:

- The locations of a few sections are changed compared to the original TRCA's HEC-RAS model and floodplain mapping from TRCA to ensure that these sections can be used in both existing and proposed drainage conditions;
- Location of the cross-sections are adjusted to fit the existing and proposed culverts as per the model requirements;
- The cross-sections are updated considering the recent topographical survey information of the road and GIS shapefiles received from the City;
- Downstream reach lengths are updated due to the adjustments in the cross-section locations compared to their original locations;
- Proposed culverts data are added in the model to reflect the post-development conditions;
- Roadway and deck geometry are updated; and
- Channel bottom in the HEC-RAS for the existing and proposed drainage conditions are revised to match the TRCA channel bottom.

In the study area, one crossing (Mimico Creek) is identified at the Torbram Road and Williams Parkway intersection and the other crossing (Spring Creek) is located where Chinguacousy Trail crosses under Williams Parkway. Subsequent sections of this report will detail the analysis for these creek crossings. The main objective of the hydraulic analysis is to ensure that the TRCA Regulatory flood levels are not exceeded and the Regional storm event is not overtopping the road. Differences in the water levels have been tabulated in the subsequent sections of this report.

4.3 Existing Condition

4.3.1 Mimico Creek - Williams Parkway and Torbram Road Intersection

The revised existing geometry is created to reflect the latest surface information near the Torbram Road and Williams Parkway intersection. The culvert at this intersection which conveys the Mimico Creek flow from west to east of the Torbram Road. This culvert is an arch culvert type, and its location is shown in Existing Condition Map in **Appendix B**.

The specifications of the existing arch CSP culvert are as follows:

- Span (m) x Rise (m): 3.9 x 2.7
- Length (m): 80.7
- Upstream invert (m): 208.33
- Downstream invert (m): 207.89
- Slope (%): 0.53

The results for the revised existing condition analysis show that the updated 100-year and Regional water levels differ from the original model received from TRCA. Slight decreases in water levels are observed in the Parsons' hydraulic results at a few cross-sections compared to the original TRCA model as noted in **Table 4.1**. The HEC-RAS modelling output files are provided in **Appendix D**. For the existing conditions, the culvert design follows the study report titled "Stormwater Management and Hydraulic Analysis - Torbram Road from Bovaird Drive to Queen Street East (November 2019)" prepared and submitted by Parsons for the Torbram Road MCEA, which has since been cancelled.

TABLE 4.1 COMPARISON OF WATER LEVELS: TRCA MODEL AND REVISED EXISTING CONDITION

HEC-RAS Stations	Water Level (m)					
	Existing Condition					
	TRCA Results		Parsons Results (revised Existing Model)		Difference in W.L. (TRCA - Parsons)	
	Regional	100-year	Regional	100-year	Regional	100-year
7.073	212.41	211.97	212.42	211.98	-0.01	-0.01
7.072	212.48	212.25	212.18	212.00	0.30	0.25
7.071	212.49	212.26	212.20	211.92	0.29	0.34
7.0701	Williams Parkway Culvert					
7.07	211.91	210.91	211.82	210.89	0.09	0.02
7.069	210.64	209.92	210.61	209.92	0.03	0.00
7.0683	210.66	209.81	210.66	209.81	0.00	0.00
7.0682	Petro Canada Site - Bridge					
7.0681	210.48	209.78	210.48	209.78	0.00	0.00
7.068	209.53	209.06	209.53	209.06	0.00	0.00

The Torbram Road MCEA study (2019) indicates that the road is being overtopped at the Williams Parkway/Torbram Road intersection beyond the 50-year storm event. Additionally, the storm sewer outfall experienced flooding at the Gatewood Drive intersection during the 2-year flood event.

An analysis of several existing crossings upstream and downstream of the Williams Parkway crossing (between Jordan Boulevard and Corporation Drive, along this reach of the creek) indicates that road overtopping during Regional storm event occurs at each of the crossings due to large flows and limited capacity of the existing culvert, with the exception of the bridge crossing for the Petro Canada gas station located downstream of the Williams Parkway crossing. Refer to **Figure 1** for the locations of these crossings in **Appendix D**.

4.3.2 Spring Creek - Chinguacousy Trail and Williams Parkway Intersection

TRCA provided the existing HEC-RAS hydraulic model for the Spring Creek, and the hydraulic analysis was carried out to determine the existing culvert flow capacity. The existing geometry is revised to reflect the latest surface information near the Chinguacousy Trail and Williams Parkway intersection and is shown in **Appendix A**. The culvert at this intersection conveys the Spring Creek flow from north to south under Williams Parkway. The existing culvert is a box culvert type, and its location is shown in **Existing Condition Map** in **Appendix B**.

The specifications of the existing box culvert are as follows:

- Span (m) x Rise (m): 6.3 x 2.5
- Length (m): 25.0
- Upstream invert (m): 219.5
- Downstream invert (m): 219.5
- Obvert Level (m): 222.0

TABLE 4.2 COMPARISON OF WATER LEVELS: TRCA MODEL AND REVISED EXISTING CONDITION

HEC-RAS Stations	Water Level (m)					
	Existing Condition - TRCA		Existing Condition - PARSON Revised		Difference in W.L. (TRCA - Parsons)	
	Regional	100-year	Regional	100-year	Regional	100-year
23.55	223.45	222.24	223.37	222.25	0.08	-0.01
23.54	223.37	221.48	223.27	221.45	0.10	0.03
23.53	223.30	221.21	223.18	221.30	0.12	-0.09
23.525	Williams Parkway Culvert					
23.52	222.81	220.73	222.38	220.65	0.43	0.08
23.51	221.30	220.24	221.30	220.24	0.00	0.00
23.505	221.13	219.59	221.13	219.59	0.00	0.00

The results for the existing condition analysis show that the Regional water level overtopped the existing road level and, the results are shown in Table 5.2. The HEC-RAS modelling output files are provided in **Appendix D**.

Similarly, the opening section of the crossing was revised with the information provided by the City (**Appendix A**), and the results are shown in Table 5.2. The schematic and detailed outputs from HEC-RAS model are provided in **Appendix D**.

An analysis of several existing crossings upstream and downstream of the Williams Parkway crossing (along this reach of the creek) indicates the road overtopping during the Regional storm due to large flows and the limited capacity of the existing culvert. A quick analysis of the crossing was completed to determine how much larger the culvert opening would need to be in order to address the overtopping concerns. An approximate calculation found that with a minor road profile raise of 0.5m a bridge with a span of 21m would be required, which is a significant increase from existing conditions (~6m span) and will result in impacts to the rest of the Williams Parkway corridor. As the proposed roadway design can fit on the existing culvert without requiring any widening or extension, and as discussed and agreed upon with the City, no further changes are proposed to the existing culvert despite the overtopping. Refer to **Figure 1** for the locations of these crossings in **Appendix D**.

4.4 Proposed Condition

4.4.1 Mimico Creek - Williams Parkway and Torbram Road Intersection

The main concerns from the existing condition analysis for the Mimico Creek crossing are as follows:

- Overtopping of the Williams Parkway and Torbram Road intersection; and
- Storm sewer outfall flooding at the Gatewood Drive intersection during the 2-year flood event.

In order to alleviate these issues, different options were studied as part of the Torbram Road MCEA study. The "Stormwater Management and Hydraulic Analysis - Torbram Road from Bovaird Drive to Queen Street East (November 2019)" prepared and submitted by Parsons for the Torbram Road MCEA Study recommended "twin box culverts with widened channel". It should be noted that replacing the existing culvert with a twin box culvert as dry and wet cells was also previously recommended in the Williams Parkway Environmental Study Report (ESR) by Stantec (June 2012), which is mentioned in the Torbram Road MCEA Study (2019).

The twin box culverts have the same invert elevation at upstream (208.3 m) and downstream (207.87) ends and different spans and their sizes (span x rise) are 3600mm x 2400mm in 91.5m long and 3000mm x 2400mm in 95.5 m long. The approach channel is widened for almost 6.3m. Also, the channel widening to 6.6 m wide is considered at downstream channel down to near the Petro Canada Site – Bridge. This design alternative was considered due to the City's recommendation of having the twin culverts at the same invert for the maintenance consideration. The existing arch culvert cannot fully convey the flows at even less frequent storms including 50-year, 100-year and Regional storm. These storm events will be flooded at the intersection of Torbram Road and Williams Parkway. Therefore, the twin box culverts were carried forward as the recommended option at this crossing to convey the flows without overtopping the road at all the storm events. The detailed outputs from HEC-RAS model are provided in **Appendix D**. Modelling results are presented in **Table 4.3**. Complete modelling output files and cross-sections from the HEC-RAS model are included in **Appendix D**.

The modeling results show that widening the channel downstream of the twin culverts reduces the proposed water levels at both upstream and downstream cross-sections for the 100-year and Regional storm events. The proposed culverts can handle the Regional storm event without causing road overtopping. There is a minor increase in water level at downstream sections for both storm events. Further investigation during the detailed design phase can ensure the proposed water levels match the existing levels downstream of the culverts.

The Gatewood Drive storm sewer outfall is located approximately 15m east of the intersection of Gatewood and Torbram Road. The existing outfall pipe is a 750mm diameter storm sewer with invert elevation at 206.43m and it receives storm sewer flow from Gatewood Drive subdivision and Torbram Road sewers north and south of Gatewood Drive. The existing bottom elevation of the Mimico Creek at the outfall location is almost the same as sewer outlet pipe invert and sewer outlet

pipe is submerged in the storm events including 2-yr up to the Regional storm. The impact of the tail water condition on the existing sewer system would reduce the conveyance capacity of the sewer pipe system and cause the flooding issue on Gatewood Drive and Torbram Road intersection. The details analysis is provided in the report titled "Stormwater Management and Hydraulic Analysis - Torbram Road from Bovaird Drive to Queen Street East (November 2019)".

TABLE 4.3 COMPARISON OF WATER LEVELS: REVISED EXISTING AND PROPOSED OPTION

HEC-RAS Stations	Water Level (m)					
	Existing Condition		Proposed Condition			
	Revised Existing Model		Parsons Proposed		Difference in W.L. (Proposed-Existing)	
	Regional	100-yr	Regional	100-yr	Regional	100-yr
7.073	212.42	211.98	212.42	211.98	0	0
7.072	212.18	212.00	211.11	210.22	-1.07	-1.78
7.071	212.20	211.92	211.14	210.08	-1.06	-1.84
7.0701	Twin culverts – Williams Parkway					
7.07	211.82	210.89	210.6	209.84	-1.22	-1.05
7.069	210.61	209.92	210.49	209.68	-0.12	-0.24
7.0683	210.63	209.79	210.66	209.81	0.03	0.02
7.0682	Petro Canada Site – Bridge					
7.0681	210.45	209.76	210.48	209.78	0.03	0.02
7.068	209.51	209.04	209.53	209.06	0.02	0.02
7.067	207.44	206.84	207.44	206.84	0	0

5 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION CONDITIONS

The erosion and sediment control (ESC) practices should follow the Ontario Provincial Standards for Roads and Public Works (OPSS), the Erosion and Sediment Control Guidelines for Urban Construction (Golden Horseshoe, Dec 2006), and are to be developed during the detailed design stage.

Impacts on the surrounding environment related to roadway projects can be mitigated by proper erosion and sediment control measures.

It is recommended that a multi-barrier approach be undertaken during construction using the following measures as a minimum:

- Stabilize exposed soils with vegetation where possible to reduce the amount of sediments that would be conveyed further downstream to existing watercourses;
- Implement construction phasing to limit the duration of soil exposure;
- Install heavy-duty double silt fence at each water crossing;
- Double silt fence to be supported by straw-bale;
- Install rock check dams to reduce high flow velocities in the ditches/swales;
- Erosion and sediment control blankets for the road;
- Dewatering, temporary channel diversions; and
- Use erosion prevention controls and sediment control measures as necessary.

6 CONCLUSION

The Williams Parkway Municipal Class Environmental Assessment, from Dixie Road to Torbram Road in the City of Brampton, recommends a multi-use trail on both sides of the road, intersection improvements, and lane width reduction. This report documents the impacts of the proposed improvement works on the road drainage, water-crossing flood plain and the recommended stormwater management strategy.

The key findings of the drainage and stormwater management study are as follows:

- There are existing 1.5 m width sidewalks on both sides of the road. A 3-metre-wide asphalt multi-use trail is proposed to be constructed along both side of Williams Parkway. The outside travel lanes on Williams Parkway will be narrowed. The impact of the increase in imperviousness due to the proposed works has been assessed by conducting a hydrologic modelling. The modelling results show that the increase in the peak flow at different storm events (i.e; 2-year to 100-year and Regional Storm) results in insignificant impacts in the proposed conditions. Therefore, no stormwater management measures will be required to be provided for this project.
- The existing grass boulevards on both sides of the roadway will be maintained, where needed.
- Quality control has been provided throughout the Project limits in a form of Stormceptor EFO units. By using the Stormceptor EFOs the percent TSS removal achieved ranges from 85% to 87% (refer to Section 3.3). The units are placed at all storm sewer outlets that discharge into the existing watercourses, as well as before the discharging into the municipal systems. Alternative LID options to improve water quality control will be evaluated during the detailed design phase.
- The existing arch culvert at Williams Parkway and Torbram Road cannot fully convey the flows at less frequent storms, including 50-year, 100-year and the Regional storm, resulting in flooding of the intersection. The proposed culvert design will follow the study report titled "Stormwater Management and Hydraulic Analysis - Torbram Road from Bovaird Drive to Queen Street East" prepared and submitted by Parsons for the Torbram Road MCEA.

7 REFERENCES

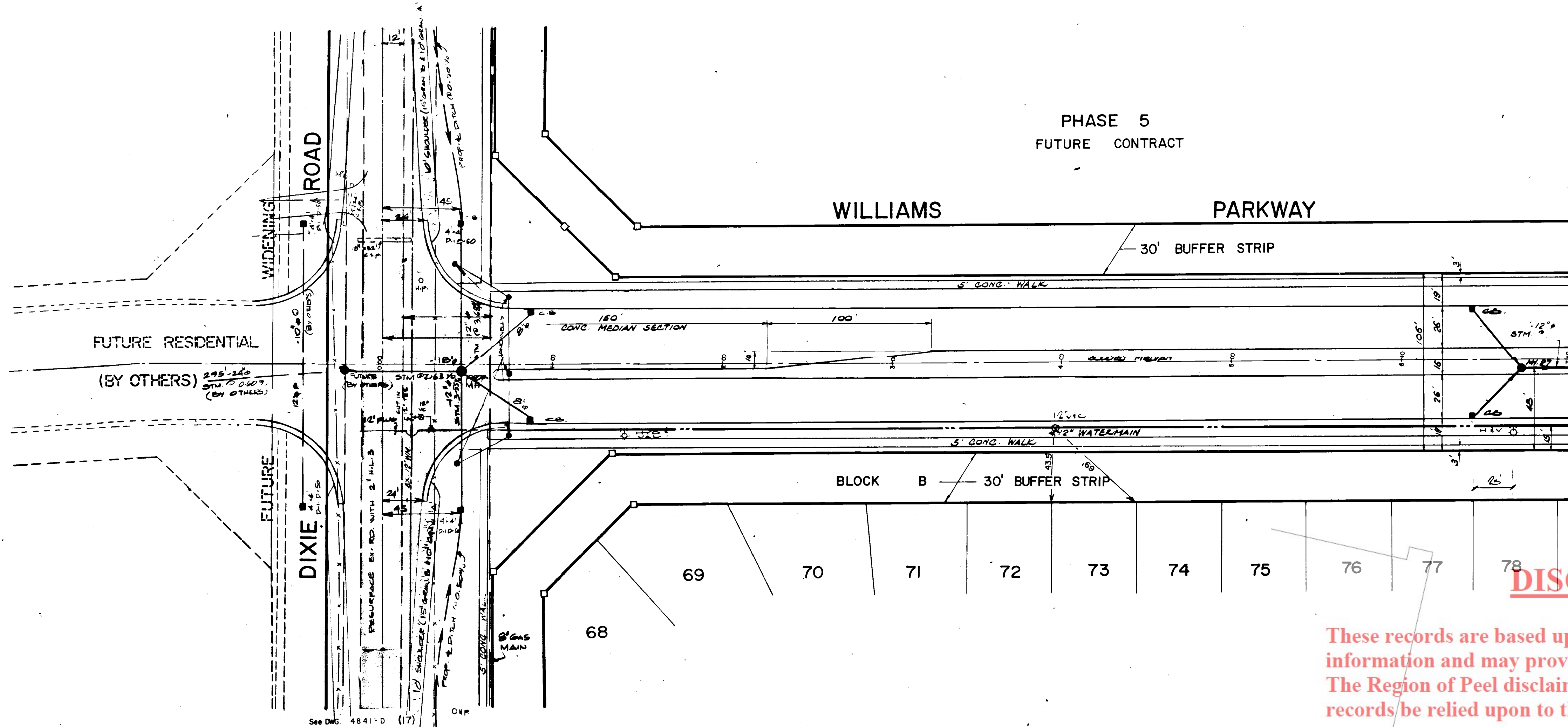
The following documents were used in preparation for this report:

- [1] Hydrologic maps and models and floodplain mapping for Mimico Creek
- [2] City of Brampton Subdivision Design Manual, December 2008
- [3] Williams Parkway Class EA Torbram Road to Humberwest Parkway Brampton, Ontario, Stantec, (June 2012)

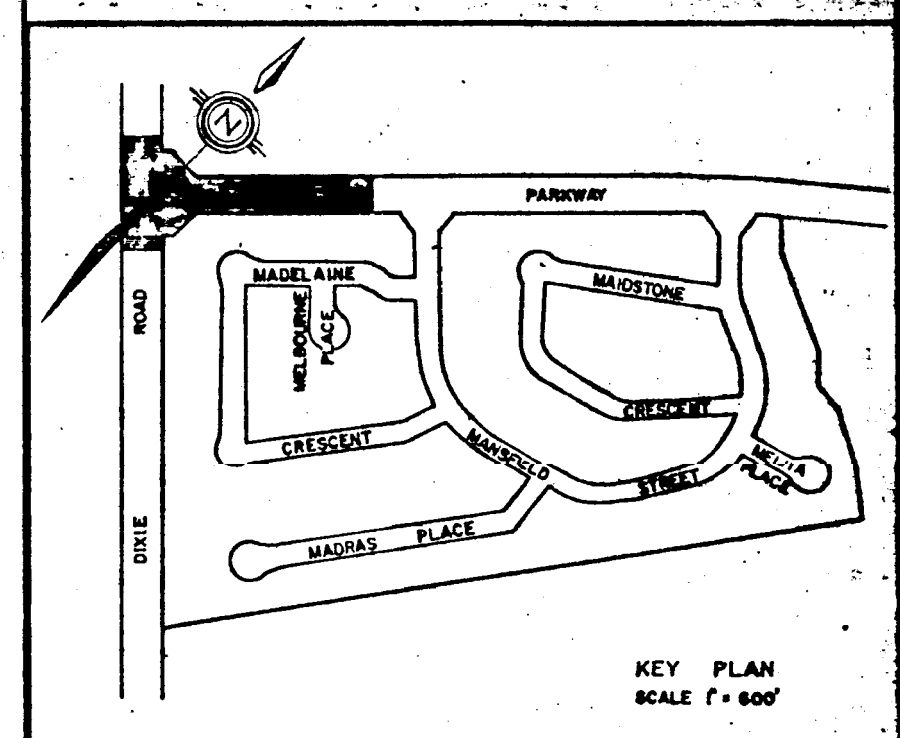
APPENDICES

APPENDIX A

Background Information



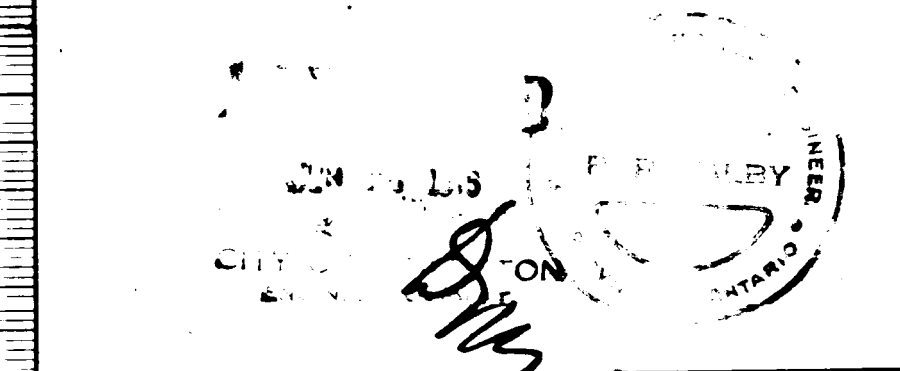
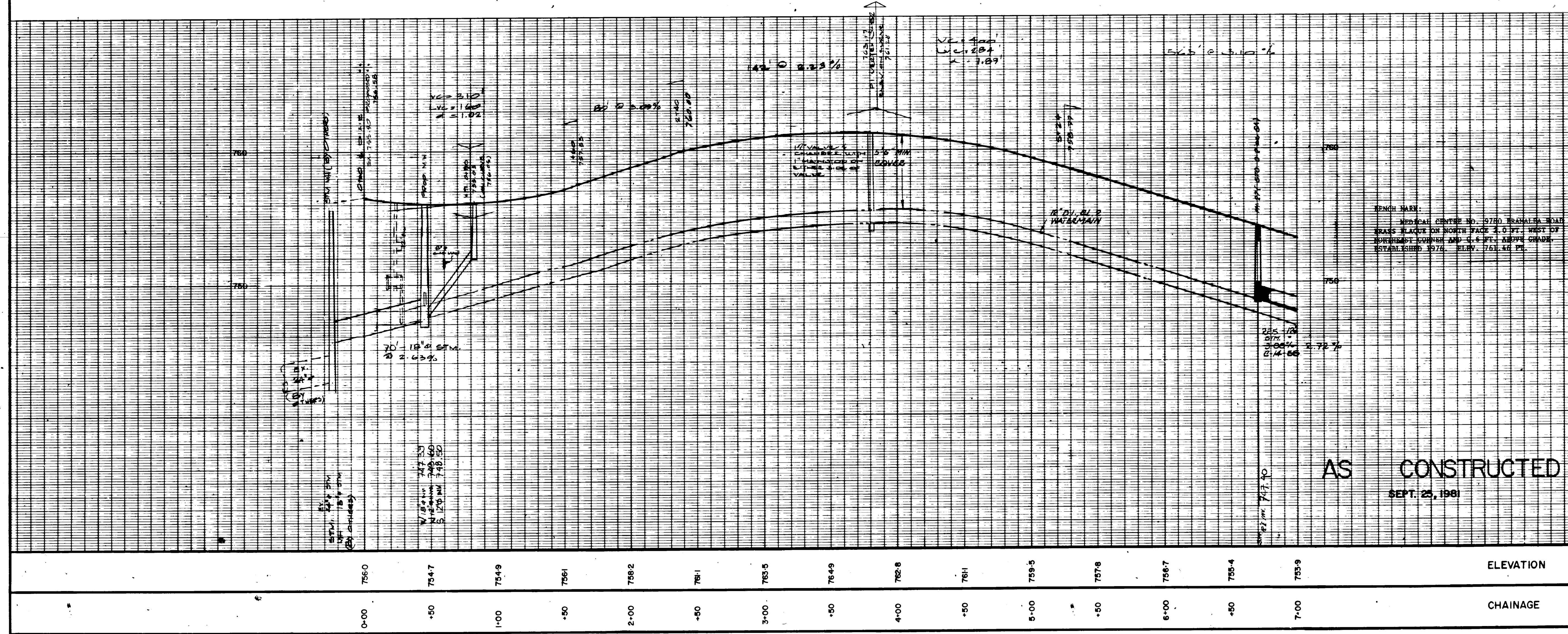
REVISIONS	Nº	DATE	BY
12" C.P. CHANGED TO 18" C.P. AND SEWER CROSSING GRADE CHANGED	1	9-27-76	DON
LEAD FROM DITCH INLET CHANGED 4 GRADES	2	10-19-76	DON
AS CONSTRUCTED SAN-STM INV.	3	SEPT 14/8	D.W.D
AS CONSTRUCTED	4	SEPT 25/91	D.W.D



- GENERAL NOTES:**
- UNLESS OTHERWISE NOTED ON THE DRAWINGS THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS. ALTERNATIVE MATERIAL SPECIFICATIONS ARE LISTED IN THE CONTRACT DOCUMENTS.
- SEWER PIPE SHALL BE TYPE AND CLASS INDICATED, OR APPROVED ALTERNATIVE MATERIAL AND PIPE CLASS.
 - CONCRETE PIPE LARGER THAN 18\"/>

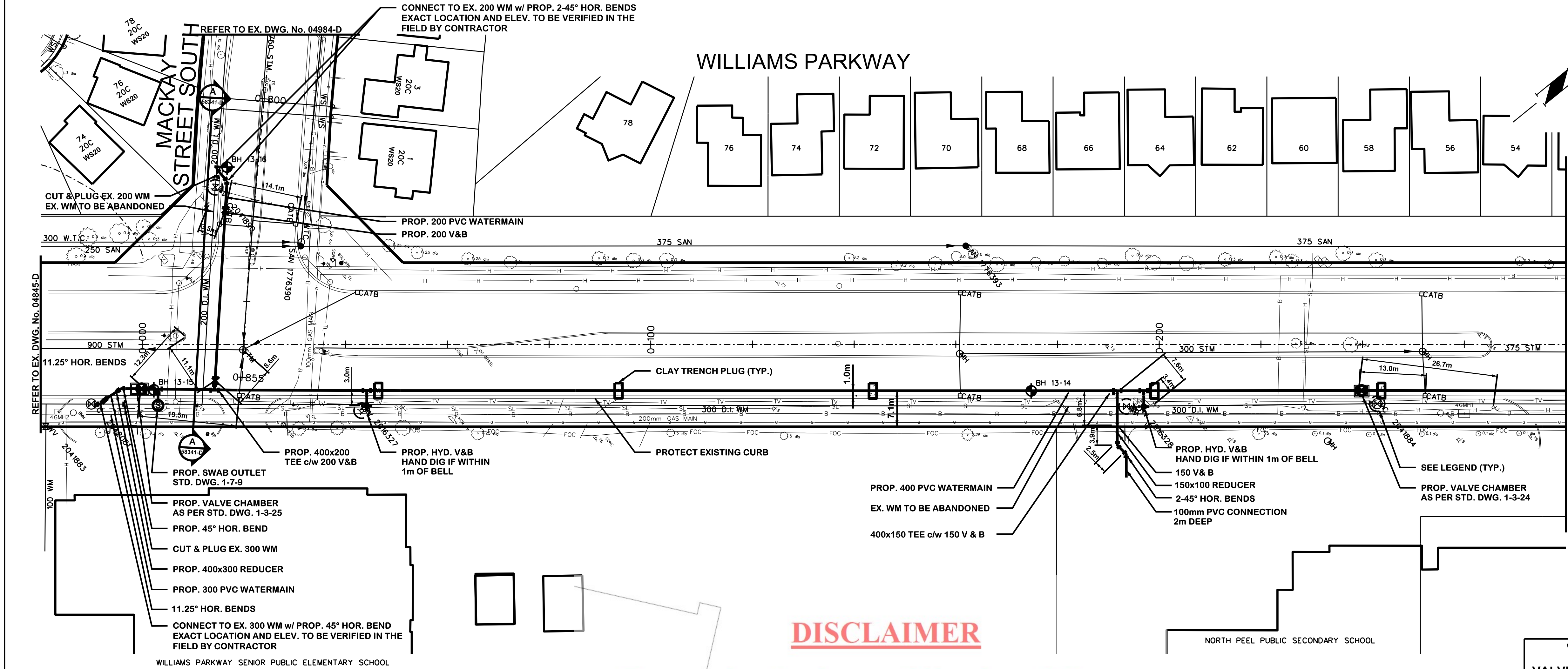
DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate. The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



CITY OF BRAMPTON	
DEVELOPMENTAL INVESTMENTS LTD.	
WILLIAMS PARKWAY STA. 0+00 TO 7+00	
RESIDENTIAL 10, STAGE 4	
paul theil associates limited consulting engineers 700 Balmoral Drive, Bramalea, Ont. L6Y 4R1	
DATE JAN 876	CONTRACT DWG. Nº 13
DRAWN R. J. J.	SCALE HORIZ. 1\"/>
CHECKED A. D.	FILE 4837-D
APPROVED P. J. J.	

4837-D



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 21, 2013	D.H.	GAS MAINS	AUG 07, 2013	L.A.
STORM SEWERS	MAY 21, 2013	D.H.	BELL U/G CABLE	AUG 07, 2013	L.A.
WATERMAINS	FEB 05, 2013	L.K.	HYDRO U/G CABLE	AUG 07, 2013	L.A.
TRANSIT			HYDRO ONE	JAN 16, 2013	J.G.
PARKS & REC.			CTV	AUG 07, 2013	L.A.
ONT. CLEAN WATER			COMMUNIC. CABLES	JAN 01, 2013	L.F.

REVISIONS		
DATE	DETAILS	INIT.
APRIL 19, 2016	ISSUED FOR 100% REVIEW	S.J.
MAY 24, 2016	ISSUED FOR TENDER	S.J.
JUNE 17, 2016	ISSUED FOR CONSTRUCTION	S.J.
DEC 16, 2016	AS RECORDED	A.G.

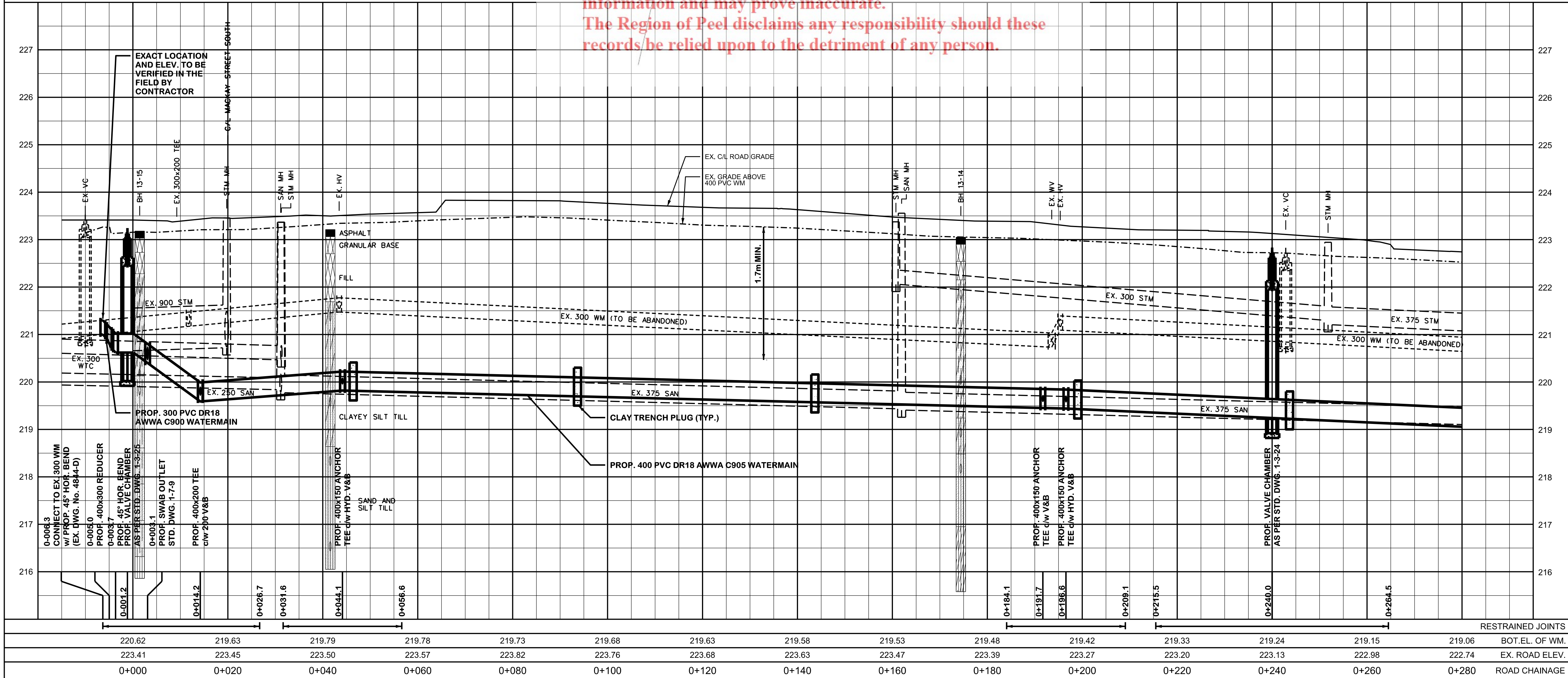
KEY PLAN (N.T.S.)

NOTE:
1. FOR GENERAL NOTES AND DETAILS SEE DWG. 51042-D

LEGEND:
EX. 20mm & LARGER COPPER W/S TO BE CUT AND TRANSFERRED OR EXTENDED TO THE NEW WM.
REPLACE EX. W/S WITH 20 OR 25mm COPPER
EX. HYD. V. & B. TO BE REMOVED AND HYDRANT TO BE RETURNED TO REGION YARD IN BRAMPTON.
2 COPPER RD. VALVES TO BE DISPOSED OF OFF SITE

WATERMAIN:
VALVES: AVK SERIES 65
HYDRANTS: MC AVITY M67

AECOM
THIS DRAWING TO BE USED FOR WATERMAIN CONSTRUCTION ONLY



General Notes
All Driveways Are ASPHALT Unless Otherwise Noted
All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
All Horizontal And Vertical Bends Are In Degrees
All Pipe Sizes In mm
20C Existing Water Service, Size In mm
WS20 Proposed Water Service, Size In mm
B.M. No. Description Location
The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction, Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING
THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON
CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

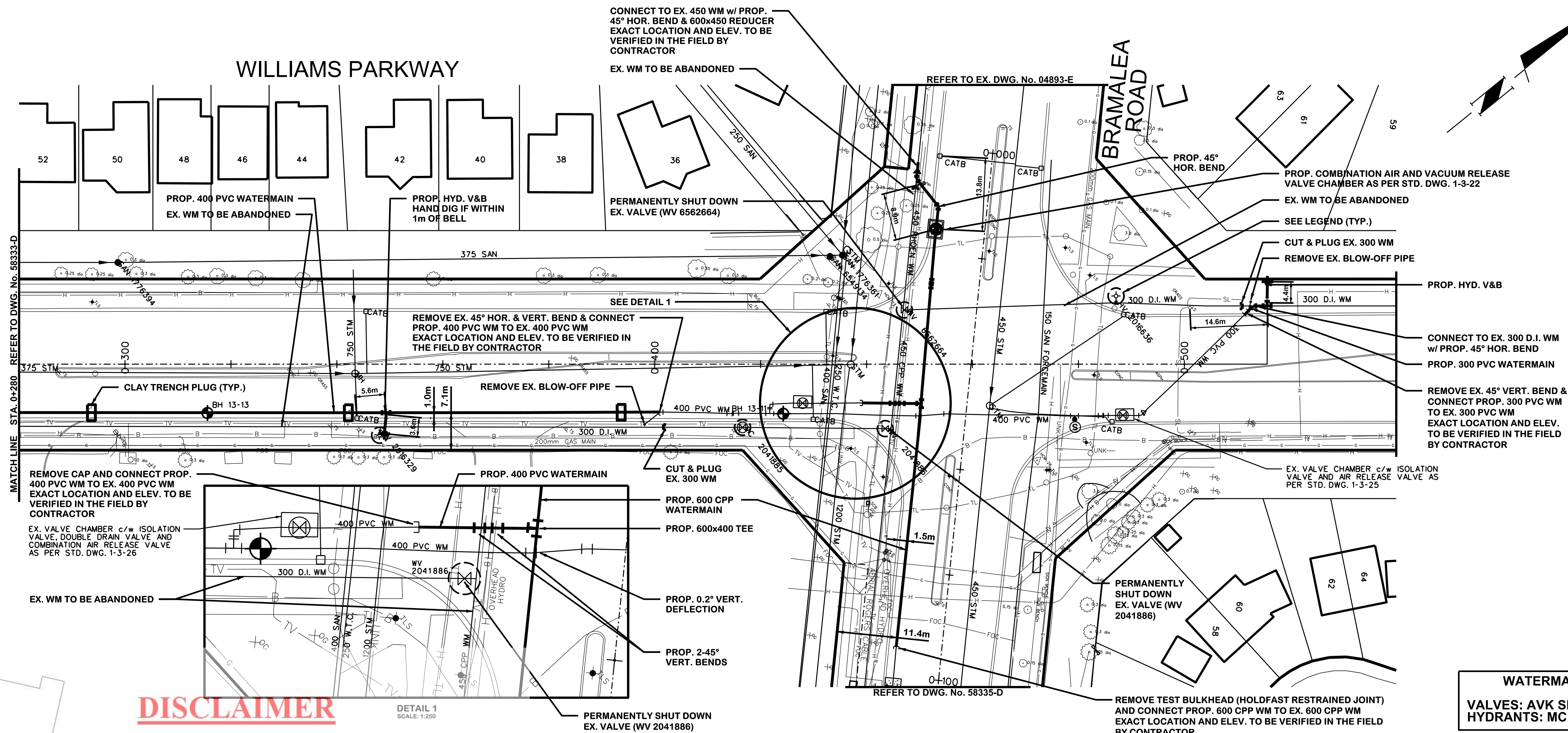
Designed by: Chkd. Approved by:

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

WILLIAMS PARKWAY
(FROM MACKAY STREET SOUTH TO BRAMALEA ROAD)
PROP. 400mm WATERMAIN

STA. 0+000	TO STA. 0+280
CAD Area B-46	Area B-21
Checked by I.I.	Drawn by S.J.
Date MARCH 2013	Sheet 1 of 9
Project No. 13-1375	Plan No. 58333-D



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 21, 2013	D.H.	GAS MAINS	AUG 07, 2013	L.A.
STORM SEWERS	MAY 21, 2013	D.H.	BELL UIG CABLE	AUG 07, 2013	L.A.
WATERMANS	FEB 06, 2013	L.K.	HYDRO UIG CABLE	AUG 07, 2013	L.A.
TRANSIT			HYDRO ONE	JAN 16, 2013	J.G.
PARKS & REC.			CTV	AUG 07, 2013	L.A.
ONT. CLEAN WATER			COMMUNIC. CABLES	JAN 01, 2013	L.F.

REVISIONS		
DATE	DETAILS	INIT.
APRIL 19, 2016	ISSUED FOR 100% REVIEW	S.J.
MAY 24, 2016	ISSUED FOR TENDER	S.J.
JUNE 17, 2016	ISSUED FOR CONSTRUCTION	S.J.
DEC 16, 2016	AS RECORDED	A.G.

NOTE:
1. FOR GENERAL NOTES AND DETAILS SEE DWG. 51042-D

LEGEND:

- EX. 20mm & LARGER COPPER W/S TO BE CUT AND TRANSFERRED OR EXTENDED TO THE NEW WM.
- REPLACE EX. W/S WITH 20 OR 25mm COPPER
- EX. HYD. V. & B. TO BE REMOVED AND HYDRANT TO BE RETURNED TO REGION YARD IN BRAMPTON, 2 COPPER RD. VALVES TO BE DISPOSED OF OFF SITE

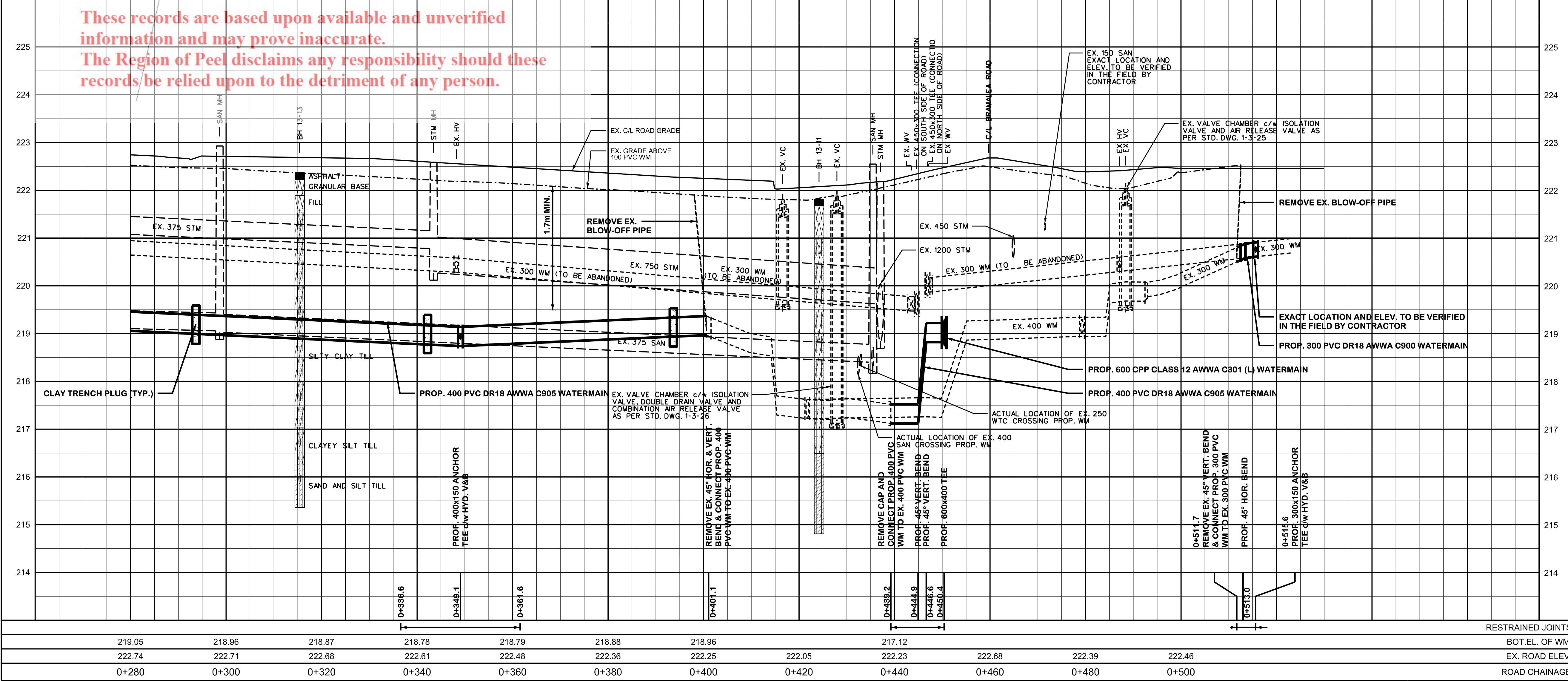
AECOM

THIS DRAWING TO BE USED FOR WATERMAIN CONSTRUCTION ONLY

WATERMAIN:
VALVES: AVK SERIES 65
HYDRANTS: MC AVITY M67

DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate.
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted
All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
All Horizontal And Vertical Bends Are In Degrees
All Pipes Size In mm
20C Existing Water Service, Size In mm
WS20 Proposed Water Service, Size In mm
B.M. No. Description Location
The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by: _____
Checked: _____
Approved by: _____

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBROPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m
1m 0 1 2 3m
HORIZONTAL SCALE
VERTICAL SCALE

Region of Peel
Working for you

WILLIAMS PARKWAY
(FROM MACKAY STREET SOUTH TO BRAMALEA ROAD)
PROP. 400mm WATERMAIN
PROP. 300mm WATERMAIN

STA. 0+280 TO STA. 0+400

CAD Area	B-46/B-47	Area	B-20/B-21	Project No.	13-1375
Checked by	I.I.	Drawn by	S.J.	Date	MARCH 2013
Date	MARCH 2013	Sheet	2 of 9	Plan No.	58334-D

GENERAL NOTES:
UNLESS OTHERWISE NOTED ON THE DRAWINGS THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS:

1. ALL SEWER PIPE SHALL BE CONCRETE.
2. CONCRETE PIPE SMALLER THAN 21" DIA. SHALL BE C14 CONCRETE PIPE 21" DIA. OR LARGER SHALL BE C-76
3. ALL SEWER PIPE SHALL HAVE RUBBER GASKET JOINTS.
4. ALL SEWERS SHALL BE CONSTRUCTED WITH CLASS 'B' BEDDING AS DETAILED ON DWG. S 3A.
5. ALL WATERMAINS SHALL HAVE 5'-6" COVER.
6. MANHOLE COVERS AND FRAMES SHALL BE CANADA IRON TYPE DS 579, OR APPROVED EQUAL.
7. MANHOLE STEPS SHALL BE STEELCO L.R. 101 OR APPROVED EQUAL.
8. CATCHBASIN GRATINGS AND FRAMES SHALL BE CANADA IRON TYPE DS 568, OR APPROVED EQUAL.
9. DUCTILE IRON WALL THICKNESS

PIPE DIA.	WALL THICKNESS
6"	0.24
8"	0.27
12"	0.32

10. GATE VALVES SHALL BE IRON BODY, BRONZE MOUNTED, SOLID WEDGE TYPE GATE JENKINS WITH '9' RINGS OR APPROVED EQUAL. VALVES SHALL OPEN LEFT WITH TWO INCH SQUARE OPERATING NUT.
11. VALVE BOXES SHALL BE CAST IRON AUGER SLEEVE SLIDING COMPLETE WITH VALVE GUIDE PLATES.
12. HYDRANTS SHALL BE MCWATY M-67 COMPRESSION TYPE WITH '9' RINGS, 6'-6" BURY CAST IRON FULLY BRONZE MOUNTED FOR 150 P.S.I. SERVICE PRESSURE WITH TWO 1 1/2" HOSE NOZZLES OR APPROVED EQUAL.

REVISIONS		
NO.	DATE	DESCRIPTION
1	10/71	AS CONSTRUCTED - SERVICES & ROAD
2	3/72	CONST. BRAMALEA & GLENRIDGE ROPS
3	3/72	SAN SEWER CLASS REVISED & ROAD GRADE
		REV. D. PER LATEST TWP. D.W.G.'S.

CHINGUA OUSY
SECONDARY
SCHOOL

FEB TO JULY 1972

WILLIAMS PARKWAY

BRAMALEA

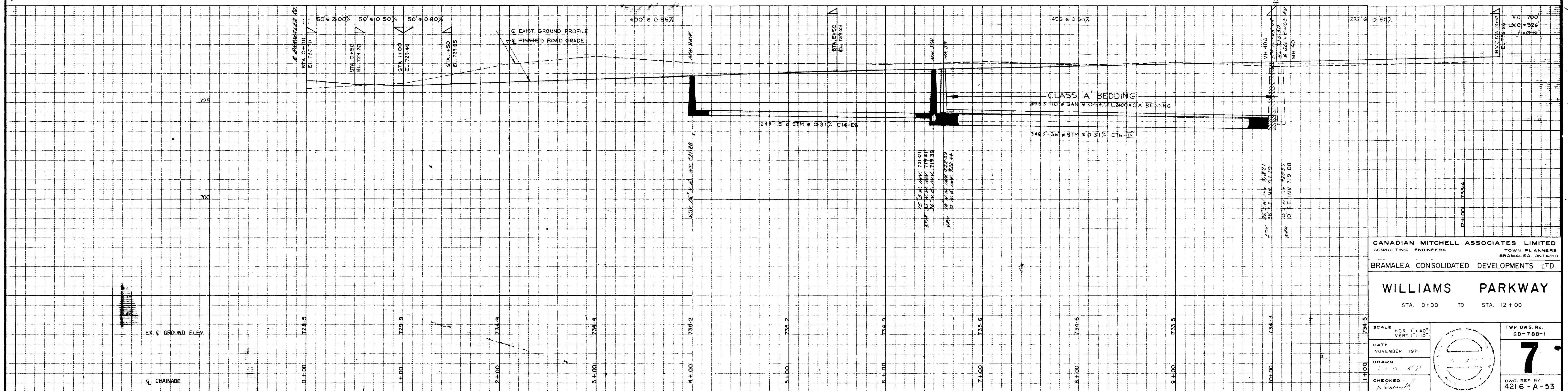
GLENRIDGE

ROAD

DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate.
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.

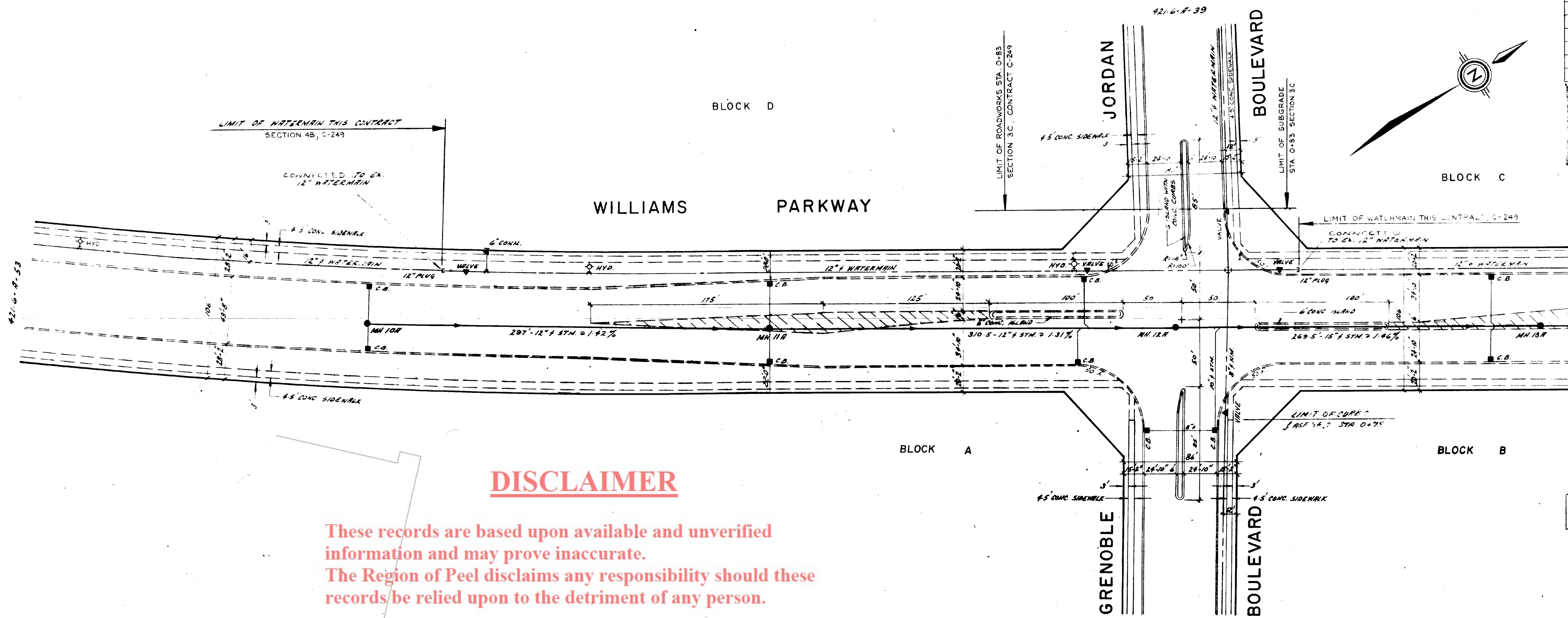
PEEL REGION - SERVICES ONLY



CANADIAN MITCHELL ASSOCIATES LIMITED
CONSULTING ENGINEERS
TOWN PLANNERS
BRAMALEA, ONTARIO

WILLIAMS PARKWAY
STA. 0+00 TO STA. 12+00

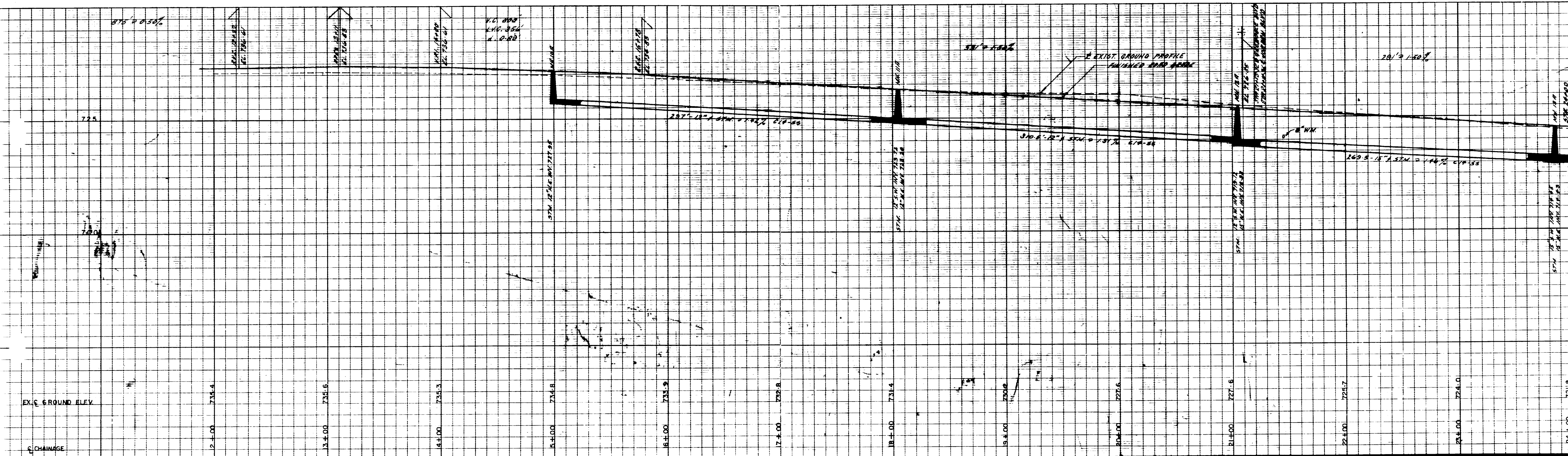
SCALE: HORIZ. 1"=40' VERT. 1"=10'
DATE: NOVEMBER 1971
DRAWN: K.D.
CHECKED: K.D.
TWP. DWG. NO.: SD-788-1
DWG. REF. NO.: 421-6-A-53



REVISIONS			
NO	DATE	DESCRIPTION	INITIAL
1	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
2	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
3	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
4	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
5	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
6	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
7	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
8	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
9	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.
10	10/71	AS CONSTRUCTED STM. SEN, C.B. & W.M.	K.D.

DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate. The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



CANADIAN MITCHELL ASSOCIATES LIMITED
CONSULTING ENGINEERS
TOWN PLANNERS
BRAMALEA, ONTARIO

BRAMALEA CONSOLIDATED DEVELOPMENTS LTD.

WILLIAMS PARKWAY
STA 12+00 TO STA 24+00

SCALE: HORIZ. 1"=40' VERT. 1"=10'

DATE: SEPT. 69

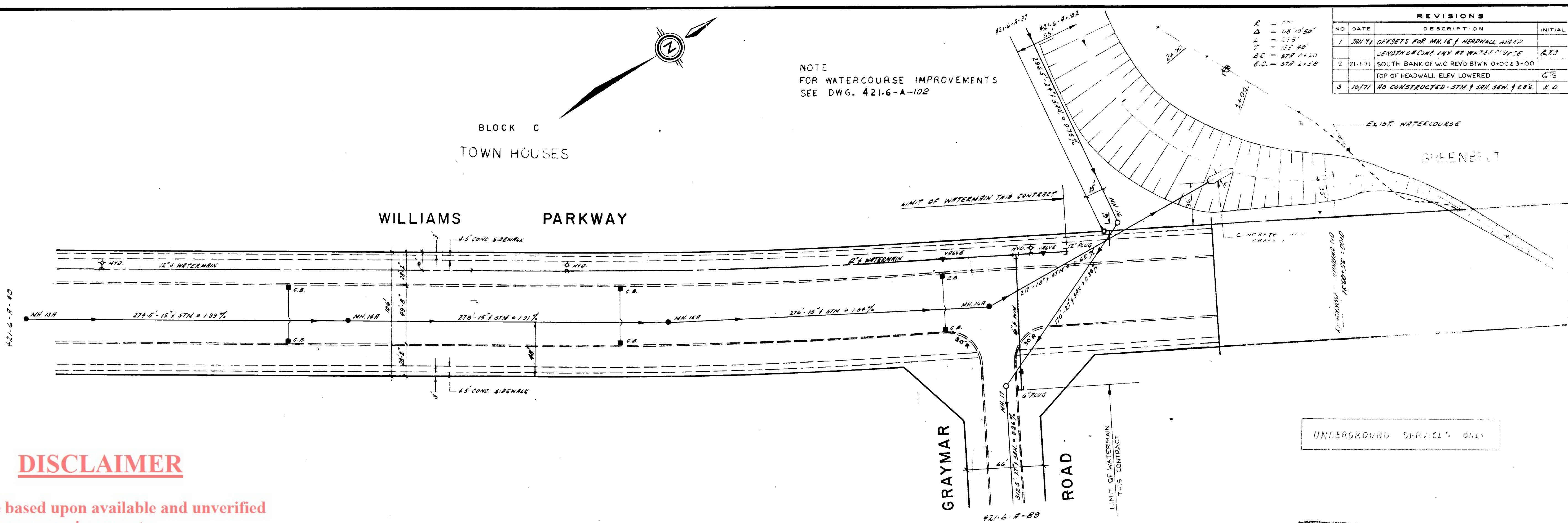
DRAWN: [Signature]

CHECKED: [Signature]

TWP DWG. No. SD-788-2

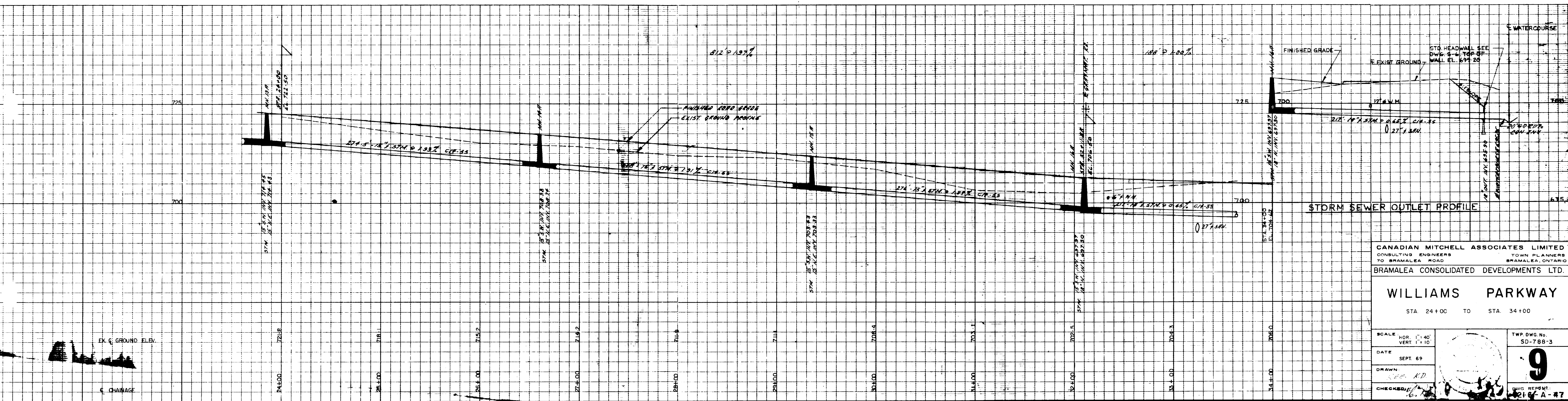
8

DWG. REF. No. 421-6-A-40

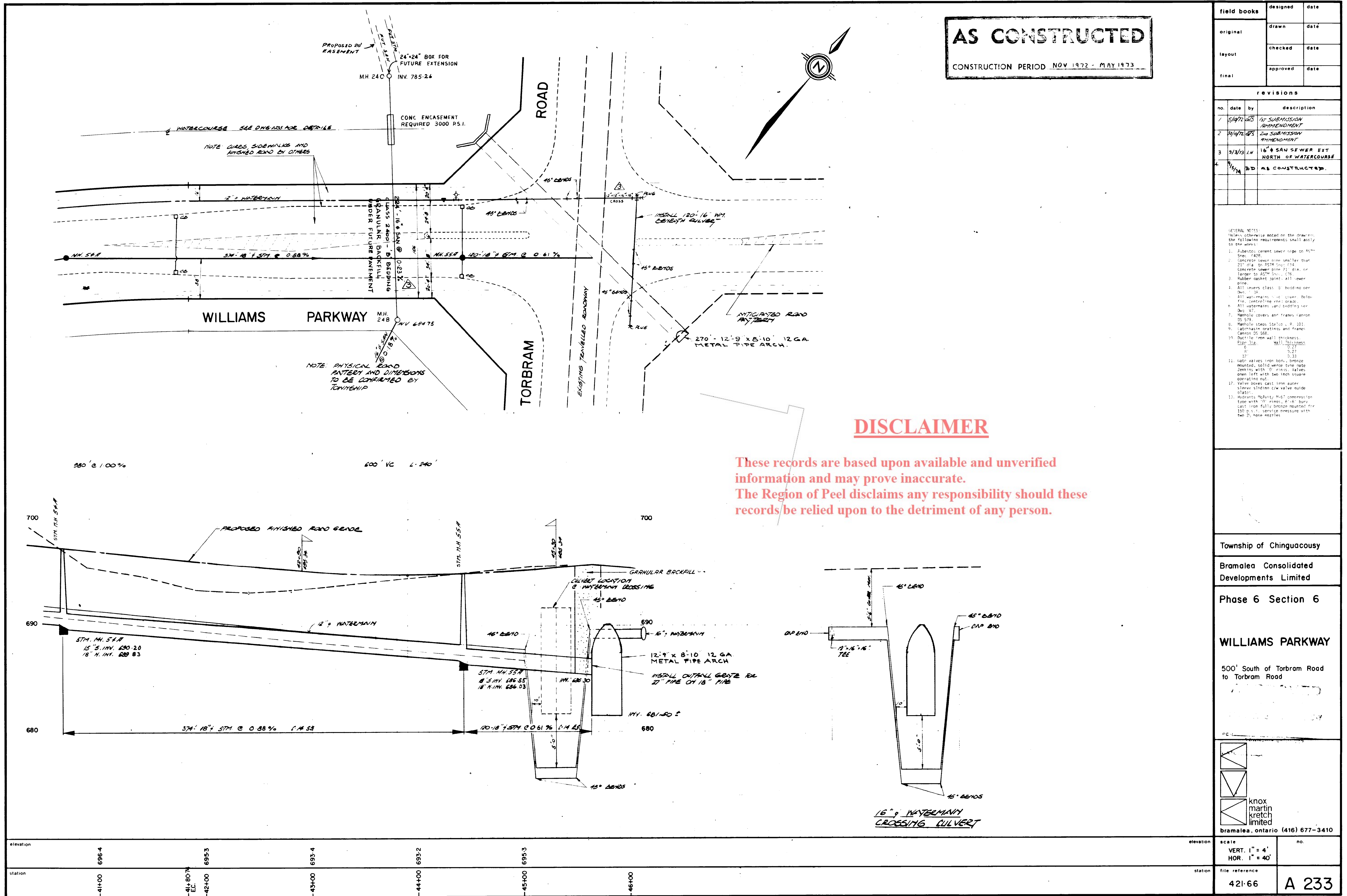


DISCLAIMER

These records are based upon available and unverified information and may prove inaccurate. The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.



[illegible]



IS THE FOLLOWING

IA, SHALL BE C14

SHALL BE C-74

GASKET JOINTS.

WITH CLASS "B"

COVER.

BE CANADA IRON

R, 101 OR APPROVED

HALL BE CANADA IRON

WALL THICKNESS

0.24

0.27

0.32

BRONZE MOUNTED,

THAT TWO RINGS OR

BE LEFT WITH TWO

UNDER SLEEVE SLIDING

COMPRESSION TYPE

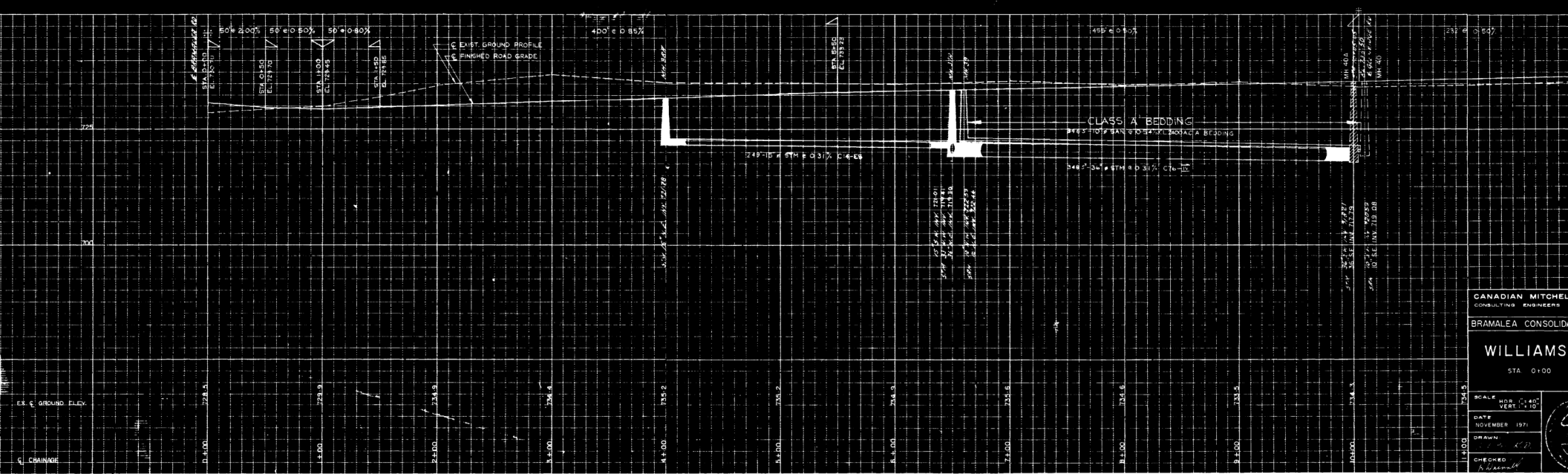
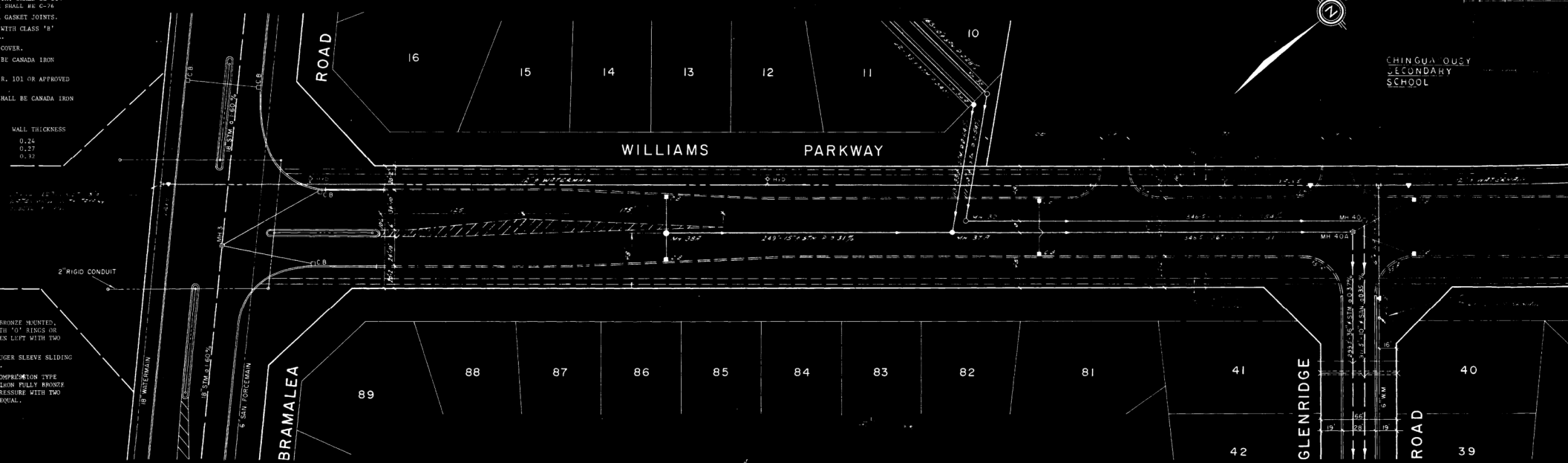
IRON FULLY BRONZE

MEASURE WITH TWO

QUANT.

REV		
NO	DATE	DESCRIPTION
1	10/10	AS CONSTRUCTED
2	10/10	COAST BRAMBLE
3	10/10	SAN SEVER CLASS
4	10/10	REV D PER LATE

CHINGUA OUSY
SECONDARY
SCHOOL

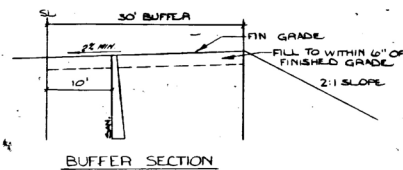
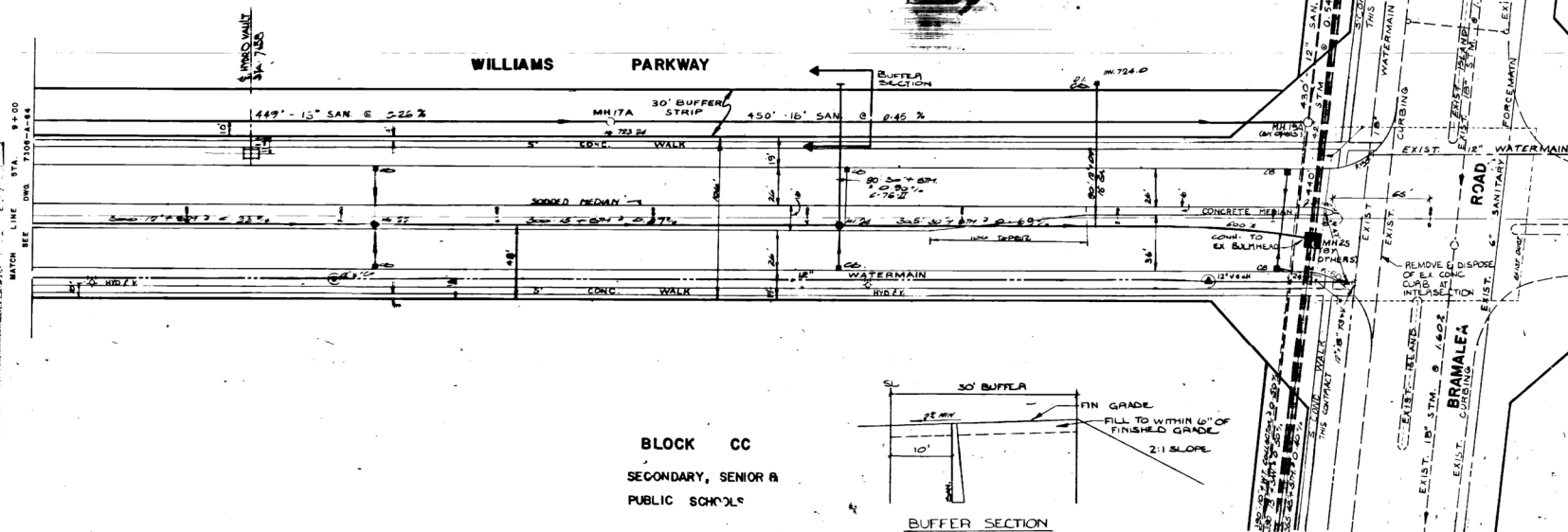


CANADIAN MITCHELL
CONSULTING ENGINEERS
BRAMALEA CONSOLIDATION
WILLIAMS
STA 0+00

SCALE: HORIZ. 1"=40'
VERT. 1"=10'

DATE: NOVEMBER 1971
DRAWN: [Signature]
CHECKED: [Signature]

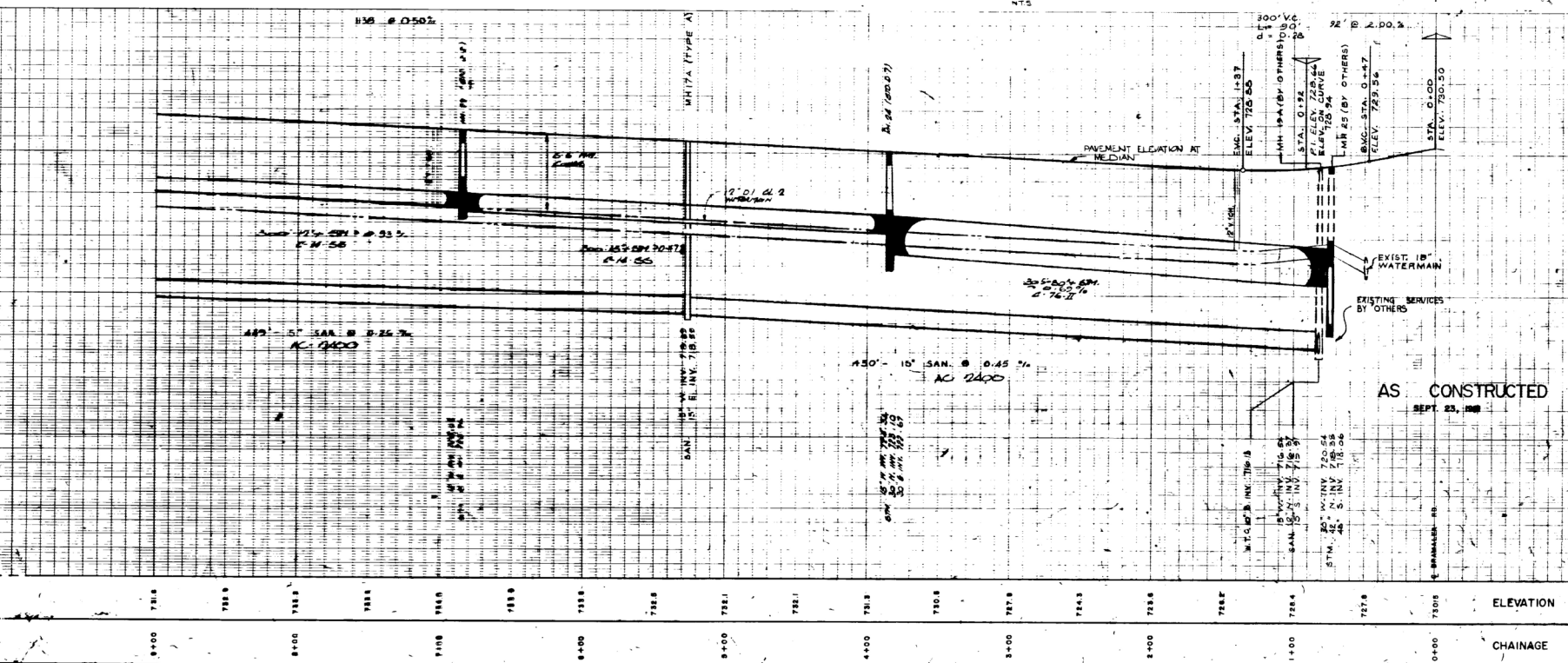
BLOCK W
SINGLE FAMILY



REVISIONS	Nº	DATE	BY
NOTE 5 & GENERAL NOTES	1	1/26/76	WJ
ENV. REQUIRED BY GEOTECH. NOTE	2	3/24/76	WJ
SOILS REMOVED AND 3' ADDITION OF REPAIRING FILL COLLECTED	3	4/14/76	WJ
WAST. DITCHWORK, SAY TO BE 2' DEEP	4	10/28/75	R.L.
BOSS 16" SAN. 12" B. SAN.	5	8/24/76	WJ
HYDRO VAULT ADDED	6	2/24/76	WJ
HYDRO VAULT RELOCATED AS PER CITY'S COMBINE	7	12/16/76	WJ
REVISED HYDRO VAULT GRADE JUMP	8	8/21/76	WJ

Unless otherwise noted on the drawings the following requirements shall apply to the works. Alternative material specifications are listed in the contract documents.

1. Concrete pipe smaller than 18" dia. shall be C-14-S5, concrete pipe 18" dia. or larger shall be C76 Class II.
2. All concrete sewer pipe shall have rubber gasket joints.
3. All sewers shall be constructed with type 1 bedding as detailed on drawing B-2 unless otherwise noted.
4. All watermains shall have 5/8" min. cover.
5. Manhole covers and frames shall be Canon Type BS579, or approved equal.
6. Manhole steps shall be Stelco LR 101 or approved equal.
7. Catchbasin gratings and frames shall be Canon Ltd. CR24 with bicycle proof tops.
8. Watermain and appurtenances as per Region of Peel material specifications for watermains and appurtenances.
9. 24" and 30" watermains shall be concrete ANMA C-301 with Bell and Spigot ends.
10. All sewers and connections under pavement, to be backfilled with granular material only.
11. All elevations shown are prior to proposed striping.
12. Wasting tile collector system shall be installed in common trench with the sanitary sewer.



BENCH MARK

MEDICAL CENTRE NO. 9780 BRAMALEA ROAD
BRASS PLAQUE ON NORTH FACE 2.0 FT. WEST OF
NORTHEAST CORNER AND 0.6 FT. ABOVE GRADE.
ESTABLISHED 1976. ELEV. 751.46 FT.

SEP 10 1975.

Engineering



CITY OF BRAMPTON

DEVELOPMENTAL INVESTMENTS LTD.
WILLIAMS PARKWAY
STA. 0+00 TO STA. 9+00
RESIDENTIAL 10

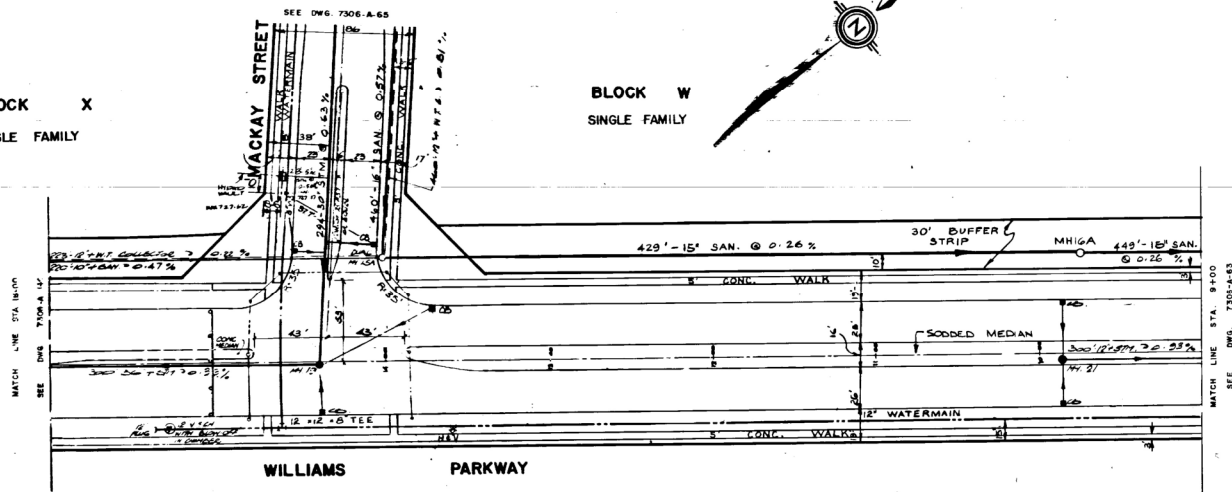
paul theil associates limited
consulting engineers
700 Balmoral Drive, Bramalea, Ontario.

DATE JULY 1974	CONTRACT DWG. NO. J3-129-1
DRAWN <i>[Signature]</i>	
CHECKED <i>[Signature]</i>	SCALE HORIZ. 1" = 40' VERT. 1" = 4'
APPROVED	FILE 7306-A-83

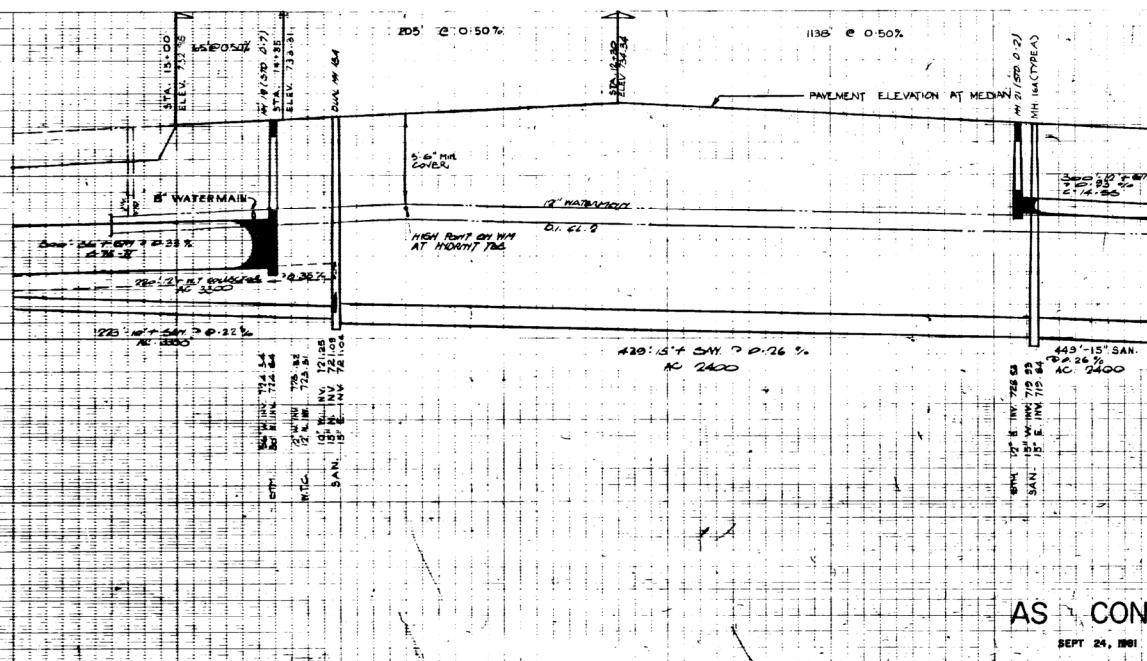


BLOCK X
SINGLE FAMILY

BLOCK W
SINGLE FAMILY



BLOCK CC
SECONDARY, SENIOR &
PUBLIC SCHOOLS



AS CONSTRUCTED

SEPT 24, 1981

REVISIONS	NO.	DATE	BY
NOTE: 3' IN REMAINING NOTES	1	DEC. 74	...
NEW REQUIREMENTS BY REMAINING NOTES	2	13 MAR. 75	...
STAY SAME AS 1 ADDITION	3	MAR. 75	...
NOTE: CONTAINING THE CLASSICAL ADDED	4	JULY 75	...
NOTE: CONTAINING THE CLASSICAL ADDED	5	15 SEP. 75	...
NOTE: CONTAINING THE CLASSICAL ADDED	6	15 SEP. 75	...
NOTE: CONTAINING THE CLASSICAL ADDED	7	15 SEP. 75	...
NOTE: CONTAINING THE CLASSICAL ADDED	8	15 SEP. 75	...
NOTE: CONTAINING THE CLASSICAL ADDED	9	15 SEP. 75	...

Unless otherwise noted on the drawings the following requirements shall apply to the works. Alternative material specifications are listed in the contract documents.

- Concrete pipe smaller than 18" dia. shall be C-14-55, concrete pipe 18" dia. or larger shall be C76 Class II.
- All concrete sewer pipe shall have rubber gasket joints.
- All sewers shall be constructed with type 'B' bedding as detailed on drawing D-2 unless otherwise noted.
- All watermain shall have 5'6" min. cover.
- Manhole covers and frames shall be Canon Type D579, or approved equal.
- Manhole steps shall be Stelco LR 101 or approved equal.
- Catchbasin gratings and frames shall be Canon Ltd. CR24 with bicycle proof tops.
- Watermain and appurtenances as per Region of Peel material specifications for watermain and appurtenances.
- 24" and 30" watermain shall be concrete ANKA C-301 with bell and spigot ends.
- All sewers and connections under pavement to be backfilled with granular material only.
- All elevations shown are prior to topsoil stripping.
- Weeping tile collector system shall be installed in common trench with the sanitary sewer.

BENCH MARK:

MEDICAL CENTRE NO. 9780 BRAMBLEA ROAD
BRASS PLATE ON NORTH 2.0 FT. WEST OF
NORTHEAST CORNER AND 0.6 FT. ABOVE GRADE.
ESTABLISHED 1976. ELEV. 761.46 FT.

APPROVED

10 SEP 1981

...



CITY OF BRAMPTON

DEVELOPMENTAL INVESTMENTS LTD.
WILLIAMS PARKWAY
STA. 9+00 TO STA. 16+00
RESIDENTIAL 10, STAGE 3.

paul theil associates limited
consulting engineers
700 Balmoral Drive, Bramalea, Ontario.

DATE	JULY 1974	CONTRACT NO. W
DRAWN	...	J3-129-2
CHECKED	...	SCALE: HORIZ. 1" = 40'
APPROVED	...	FILE 7306-A-64

REVISONS	N°	DATE	BY
4" C-14 10060 STM. AT 11' 10" DIA. 10" SUBGRADE TO BE GRADED AND ALIGNED W/O. C-SAN TO BE 6" DIA. PIPE.	1	5 JAN 75	<i>[Signature]</i>
CORRECTED 14 JULY 75 13.1 10060 REVISED " " " 13A" REMOVAL OF CONST. NOTES AS CONSTRUCTED	2	3 MAY 75	<i>[Signature]</i>
	3	23 SEPT 81	D.W.P.
	4	23 SEPT 81	D.W.D.

Unless otherwise noted on the drawings the following requirements shall apply to the works. Alternative material specifications are listed in the contract documents.

1. Concrete pipe smaller than 18" dia. shall be C-14-SS, concrete pipe 18" dia. or larger shall be C75 Class II.
2. All concrete sewer pipe shall have rubber gasket joints.
3. All sewers shall be constructed with type 'B' bedding as detailed on drawing D-2 unless otherwise noted.
4. All watermains shall have 5'6" min. cover.
5. Manhole covers and frames shall be Canon Type DS579, or approved equal.
6. Manhole steps shall be Stelco LR 101 or approved equal.
7. Catchbasin gratings and frames shall be Canon Ltd. CR24 with bicycle proof tops.
8. Watermains and appurtenances as per Region of Peel material specifications for watermains and appurtenances.
9. 24" and 30" watermains shall be concrete AMWA C-301 with Bell and Spigot ends.
10. All sewers and connections under pavement to be backfilled with granular material only.
11. All elevations shown are prior to topsoil stripping.
12. Weeping tile collector system shall be installed in common trench with the sanitary sewer.

BENCH MARK:

MEDICAL CENTRE NO. 9780 BRAMALEA ROAD
BRASS PLAQUE ON NORTH FACE 2.0 FT. WEST OF
NORTHEAST CORNER AND 0.6 FT. ABOVE GRADE.
ESTABLISHED 1976. ELEV. 761.46 FT.

CITY OF BRAMPTON

DEVELOPMENTAL INVESTMENTS LTD.

WILLIAMS PARKWAY

STA. 16+00 to 24+00

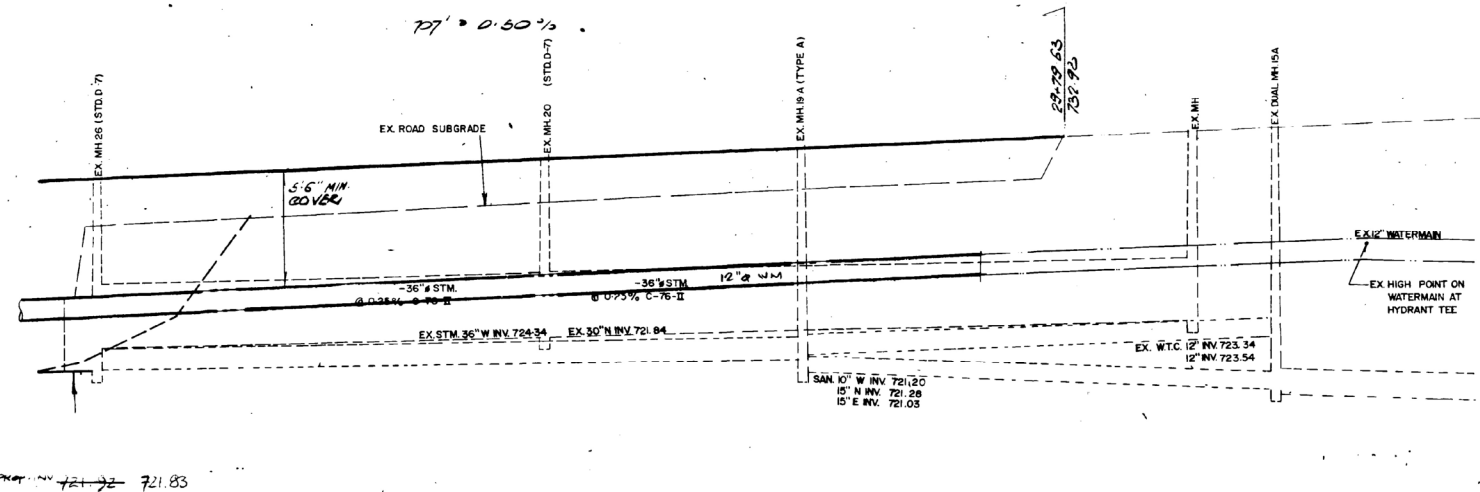
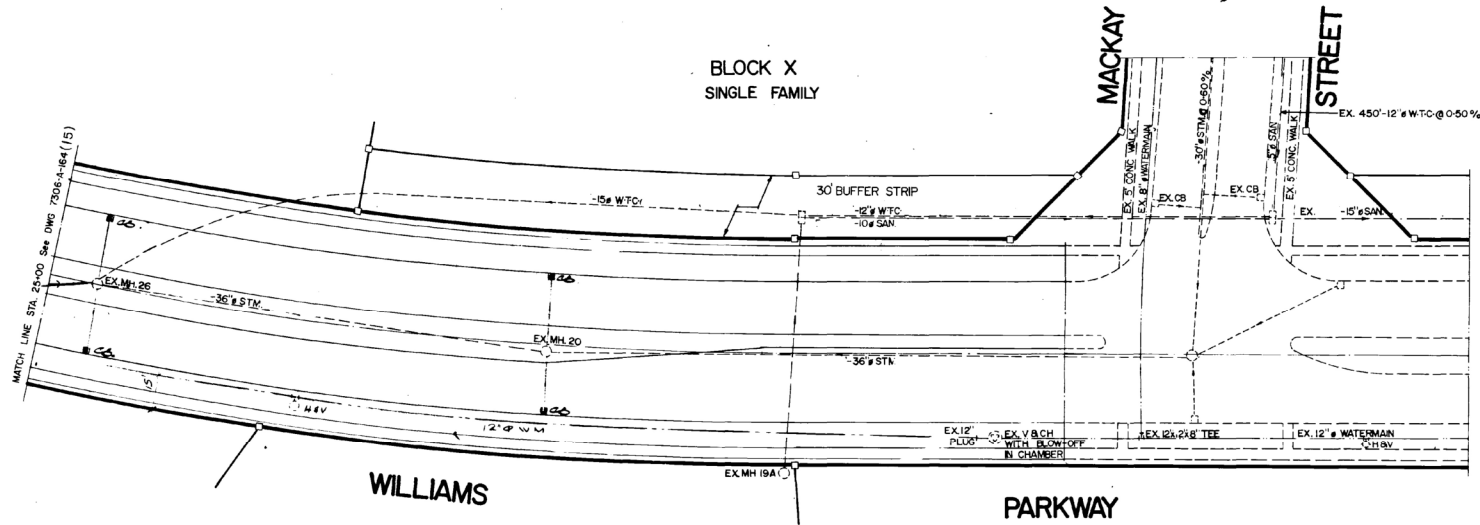
RESIDENTIAL IO, STAGE 3

paul theij associates limited

consulting engineers

700 Balmoral Drive, Bramalea, Ontario.

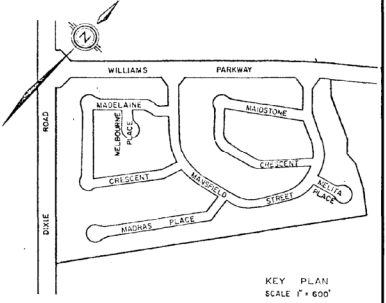
DATE JAN. 197	CONTRACT DWG N° J3-129-3
DRAWN S.D.P.	SCALE HORIZ. 1"=40' VERT. 1"=4'
CHECKED <i>[Signature]</i>	
APPROVED	
7306 - A-144	



BENCH MARK:
MEDICAL CENTRE NO. 9780 BRAMBLEA ROAD
BRASS PLAQUE ON NORTH FACE 2.0 FT. WEST OF
NORTHEAST CORNER AND 0.6 FT. ABOVE GRADE.
ESTABLISHED 1976. ELEV. 761.46 FT.

AS CONSTRUCTED
SEPT. 25, 1981

REVISIONS	Nº	DATE	BY
REVISED 42" Ø 5TH SEWER	1	AUG 25/81	H.S.S
A5 CONSTRUCTED SAN STG. INV.	2	SEPT 10/81	D.W.D
A5 CONSTRUCTED	3	SEPT 20/81	D.W.D



- GENERAL NOTES:
- UNLESS OTHERWISE NOTED ON THE DRAWINGS THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS. ALTERNATIVE MATERIAL SPECIFICATIONS ARE LISTED IN THE CONTRACT DOCUMENTS.
 - SEWER PIPE SHALL BE TYPE AND CLASS INDICATED, OR APPROVED ALTERNATIVE MATERIAL AND PIPE CLASS.
 - CONCRETE PIPE LARGER THAN 18\"/>
 - ALL CONCRETE SEWER PIPE SHALL HAVE RUBBER GASKET JOINTS.
 - ALL SEWERS SHALL BE CONSTRUCTED WITH TYPE B' BEDDING UNLESS OTHERWISE SPECIFIED.
 - ALL WATERMANS SHALL HAVE 5'6\"/>
 - MANHOLE COVERS AND FRAMES SHALL BE CASTON TYPE D5379, OR APPROVED EQUAL.
 - CATCHBAIN GRATES AND FRAMES SHALL BE 10\"/>
 - MANHOLE STEPS SHALL BE STEEL OR APPROVED EQUAL.
 - CATCHBAIN LEADS SHALL BE 18\"/>
 - WATERMANS SHALL BE DUCTILE IRON ANS1 CLASS 2 DEWENT LINED WITH TYTON JOINTS FOR SIZES 4\"/>
 - 2\" WATERMAIN SHALL BE TYPE K\" SOFT COPPER.
 - WATERMAIN AND APPURTENANCES AS PER REGION OF PIPE MATERIAL - SPECIFICATIONS FOR WATERMAIN AND APPURTENANCES.
 - WATERMAIN CONNECTIONS SHALL BE 1\"/>
 - THE PROPOSED ELEVATIONS AT BUILDINGS AND THE BASIC DIRECTION OF SURFACE DRAINAGE WILL BE SUBJECT TO DETAILED DESIGN WHEN HOUSE TYPES AND PLOT PLANS ARE AVAILABLE.
 - SUPPORT STORM SEWERS AT ALL CROSSINGS. REFER TO CITY OF BRAMPTON STD. DWG #335.

CITY OF BRAMPTON

DEVELOPMENTAL INVESTMENTS LTD.

WILLIAMS PARKWAY
STA. 25+00 TO 29+77.63

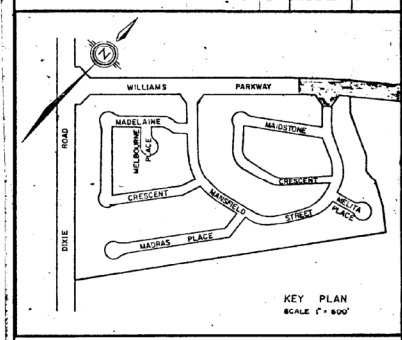
RESIDENTIAL 10, STAGE 4

paul theil associates limited
consulting engineers
700 Balmoral Drive, Bramalea, Ontario.

DATE	JANUARY 1976	CONTRACT DWG Nº	J3-129-7
DRAWN	[Signature]	SCALE HORIZ. 1\"/>	
CHECKED	[Signature]	FILE	7306-A-166
APPROVED	[Signature]		

ELEVATION	722.0	723.8	729.4	733.8	735.2	735.2	735.4	735.1	734.4	734.0	733.3
CHAINAGE	25+00	+50	26+00	+50	27+00	+50	28+00	+50	29+00	+50	29+63

REVISIONS	Nº	DATE	BY
1. REVISIONS	1	3-5-76	U.S.
2. REVISIONS	2	3-4-76	DOH
3. REVISIONS	3	4-15-76	H.S.S.
4. REVISIONS	4	5-12-76	H.S.S.
5. REVISIONS	5	6-10-76	H.S.S.
6. REVISIONS	6	6-10-76	H.S.S.
7. REVISIONS	7	7-10-76	H.S.S.
8. REVISIONS	8	7-10-76	H.S.S.



- GENERAL NOTES:**
- UNLESS OTHERWISE NOTED ON THE DRAWINGS THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS. ALTERNATIVE MATERIAL SPECIFICATIONS ARE LISTED IN THE CONTRACT DOCUMENTS.
 - SEWER PIPE SHALL BE TYPE AND CLASS INDICATED, OR APPROVED ALTERNATIVE MATERIAL AND PIPE CLASS.
 - CONCRETE PIPE LARGER THAN 18" DIA SHALL BE REINFORCED, CLASS C75.
 - ALL CONCRETE SEWER PIPE SHALL HAVE RUBBER GASKET JOINTS.
 - ALL SEWERS SHALL BE CONSTRUCTED WITH TYPE 8' BEDDING UNLESS OTHERWISE SPECIFIED.
 - ALL WATERMANS SHALL HAVE 5'6" MIN. COVER.
 - MANHOLE COVERS AND FRAMES SHALL BE CANTON TYPE 25579, OR APPROVED EQUAL.
 - CATCHBASIN GRATINGS AND FRAMES SHALL BE LTD CR24 WITH BICYCLE PROOF TOPS.
 - MANHOLE STEPS SHALL BE STEELCO LR 101 OR APPROVED EQUAL.
 - CATCHBASIN LEADS SHALL BE 8" DIA FOR SINGLE CATCHBASINS, 10" DIA FOR DOUBLE CATCHBASINS, UNLESS OTHERWISE NOTED IN THE DRAWINGS. ALL CATCHBASIN LEADS SHALL BE CONCRETE PIPE, CLASS C4, EXTRA STRENGTH.
 - WATERMAIN SHALL BE DUCTILE IRON ANSI CLASS 2 CEMENT LINED WITH TYTON JOINTS FOR SIZES 4"-12".
 - 2" WATERMAIN SHALL BE TYPE "K" SOFT COPPER.
 - WATERMAIN AND APPURTENANCES AS PER REGION OF PEEL MATERIAL SPECIFICATIONS FOR WATERMAIN AND APPURTENANCES.
 - WATERMAIN CONNECTIONS SHALL BE 1" DIA DOUBLE SERVICE AND 3/4" DIA SINGLE SERVICE OF TYPE "K" SOFT SEAMLESS COPPER TUBING.
 - THE PROPOSED ELEVATIONS AT BUILDINGS AND THE BASIC DIRECTION OF SURFACE DRAINAGE WILL BE SUBJECT TO DETAILED DESIGN WHEN HOUSE TYPES AND PLOT PLANS ARE AVAILABLE.
 - SUPPORT STORM SEWERS AT ALL CROSSINGS REFER TO CITY OF BRAMPTON STD DWG #555.
 - DESIGNED GRADE 1.33% AS CONSTRUCTED GRADE.

MIN 25 1978

CITY OF BRAMPTON
ENGINEERING DEPT.

CITY OF BRAMPTON

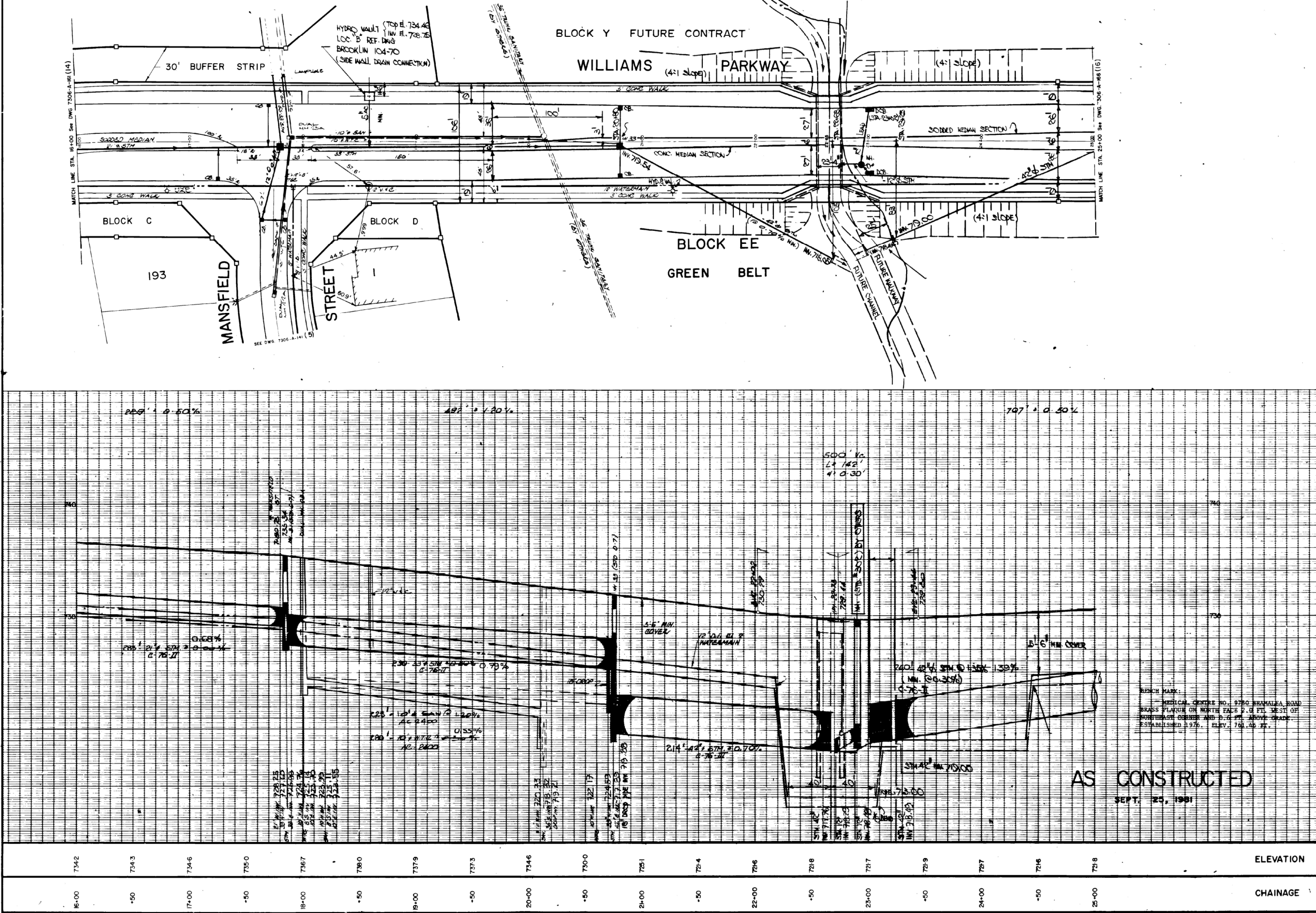
DEVELOPMENTAL INVESTMENTS LTD.

WILLIAMS PARKWAY
STA. 16+00 TO 25+00

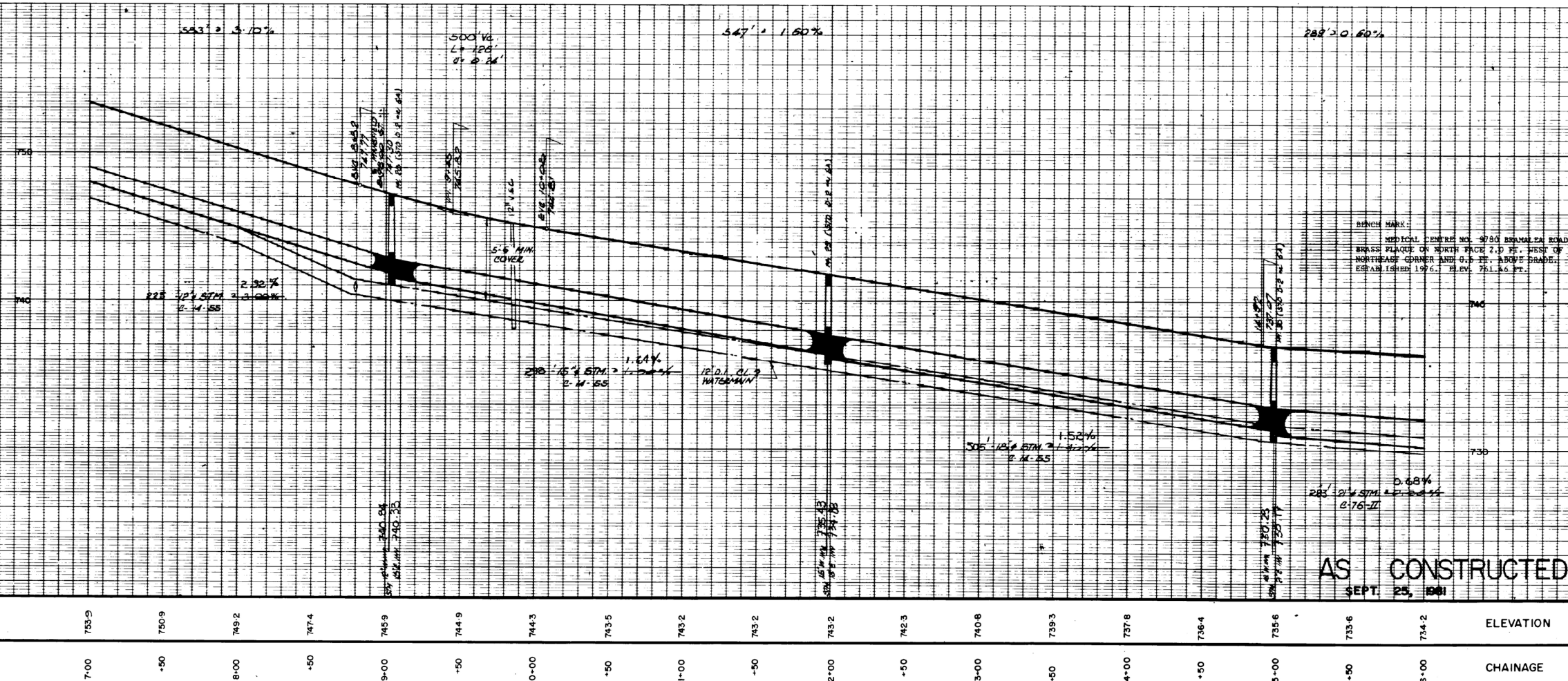
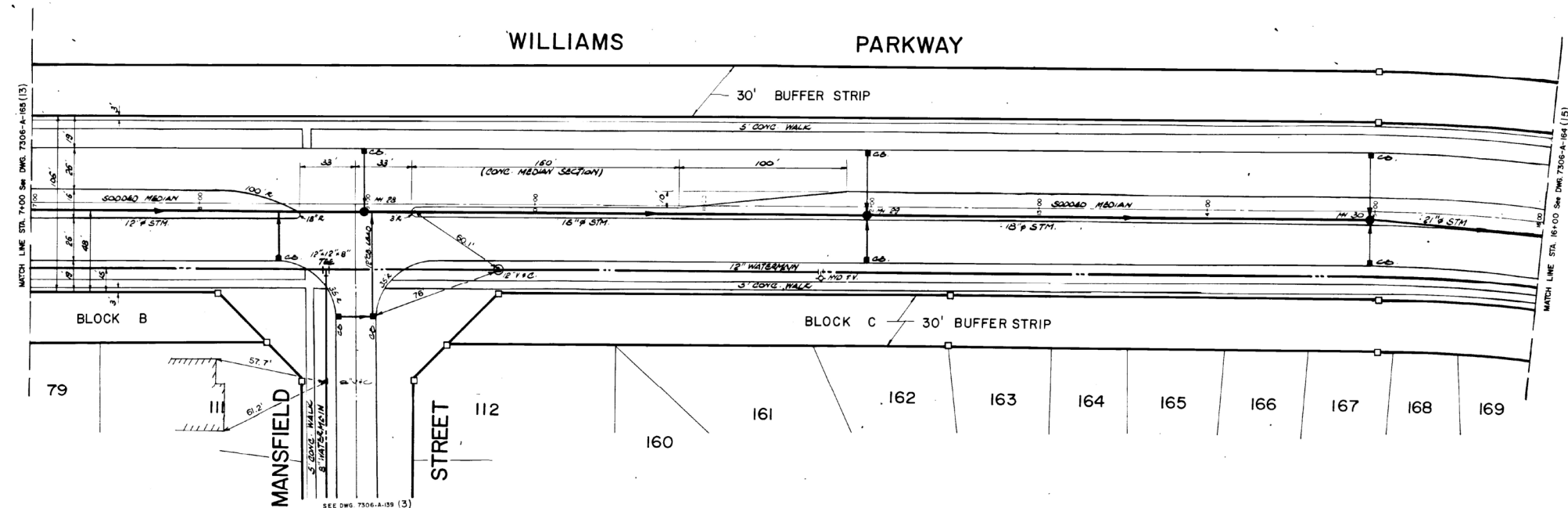
RESIDENTIAL 10, STAGE 4

paul theil associates limited
consulting engineers
700 Balmoral Drive, Bramalea, Ontario.

DATE	JANUARY 1976	CONTRACT DWG. Nº	J3-129-6
DRAWN	[Signature]	SCALE	HORIZ. 1"=40' VERT. 1"=4'
CHECKED	AD	FILE	7306-A-164
APPROVED	[Signature]		



PHASE 5
FUTURE CONTRACT



REVISIONS AS CONSTRUCTED JAN 20/01 PW.D AS CONSTRUCTED 2 SEPT 25/01 D.W.D	NO DATE BY 1 SEPT 01/01 PW.D 2 SEPT 25/01 D.W.D
---	---

KEY PLAN
SCALE 1:600

GENERAL NOTES:

- UNLESS OTHERWISE NOTED ON THE DRAWINGS THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS. ALTERNATIVE MATERIAL SPECIFICATIONS ARE LISTED IN THE CONTRACT DOCUMENTS.
- SEWER PIPE SHALL BE TYPE AND CLASS INDICATED, OR APPROVED ALTERNATIVE MATERIAL AND PIPE CLASS.
- CONCRETE PIPE LARGER THAN 18" DIA SHALL BE REINFORCED, CLASS C76.
- ALL CONCRETE SEWER PIPE SHALL HAVE RUBBER GASKET JOINTS.
- ALL SEWERS SHALL BE CONSTRUCTED WITH TYPE B BEDDING UNLESS OTHERWISE SPECIFIED.
- ALL WATERMANS SHALL HAVE 5'-6" MIN COVER.
- MANHOLE COVERS AND FRAMES SHALL BE CAST IRON TYPE 55579, OR APPROVED EQUAL.
- CATCHBASIN GRATINGS AND FRAMES SHALL BE LID CR24 WITH BOYCE PROOF TOPS.
- MANHOLE STEPS SHALL BE STEELCO LRI OR APPROVED EQUAL.
- CATCHBASIN LEADS SHALL BE 8" DIA FOR SINGLE CATCHBASINS, 10" DIA FOR DOUBLE CATCHBASINS, UNLESS OTHERWISE NOTED IN THE DRAWINGS. ALL CATCHBASIN LEADS SHALL BE CONCRETE PIPE, CLASS CH, EXTRA STRENGTH.
- WATERMAIN SHALL BE DUCTILE IRON ANSI CLASS 2 CEMENT LINER WITH TYTON JOINTS FOR SIZES 4"-12".
- 2" WATERMAIN SHALL BE TYPE "K" SOFT COPPER.
- WATERMAIN AND APPURTENANCES AS PER REGION OF PEEL MATERIAL SPECIFICATIONS FOR WATERMAIN AND APPURTENANCES.
- WATERMAIN CONNECTIONS SHALL BE 1" DIA DOUBLE SERVICE AND 3/4" DIA SINGLE SERVICE OF TYPE K SOFT SEAMLESS COPPER TUBING.
- THE PROPOSED ELEVATIONS AT BUILDINGS AND THE BASIC DIRECTION OF SURFACE DRAINAGE WILL BE SUBJECT TO DETAILED DESIGN WHEN HOUSE TYPES AND PLOT PLANS ARE AVAILABLE.
- SUPPORT STORM SEWERS AT ALL CROSSINGS REFER TO CITY OF BRAMPTON STD DWG 355.
- 0.80% - DESIGNED GRADE
0.69% - AS CONSTRUCTED GRADE

APR 28 2001

CITY OF BRAMPTON

ENGINEERING

[Signature]

CITY OF BRAMPTON

DEVELOPMENTAL INVESTMENTS LTD.

WILLIAMS PARKWAY

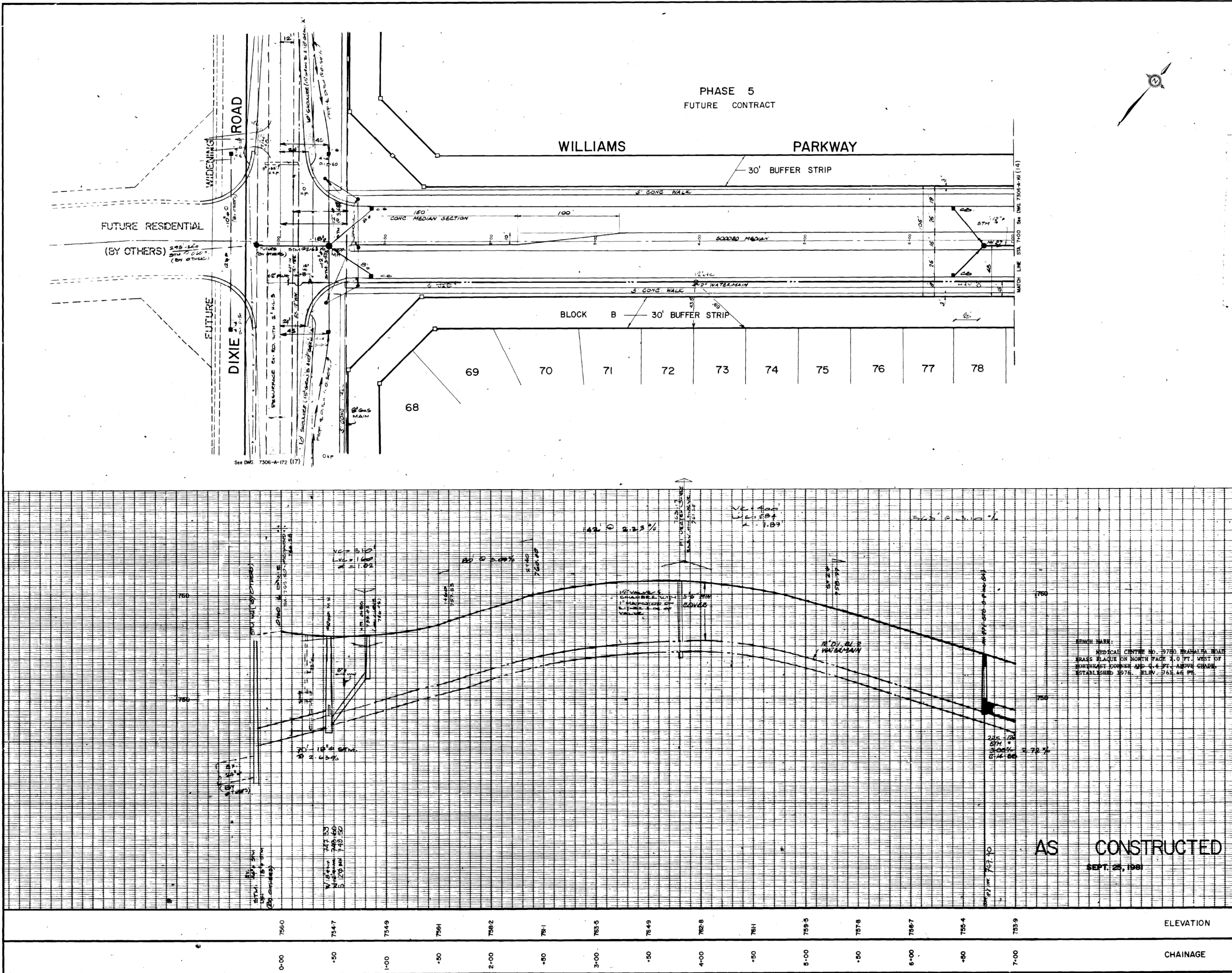
STA. 7+00 TO 16+00

RESIDENTIAL 10, STAGE 4

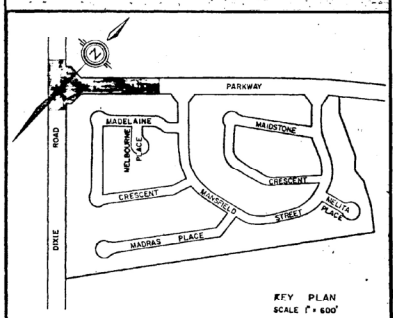
paul theil associates limited
 consulting engineers

700 Balmoral Drive, Bramalea, Ontario.

DATE JAN. 1976	CONTRACT DWG. NO J3-129-5
DRAWN <i>[Signature]</i>	SCALE HORIZ. 1" = 40' VERT. 1" = 4'
CHECKED <i>[Signature]</i>	FILE 7306-A-181
APPROVED <i>[Signature]</i>	



REVISIONS	Nº	DATE	BY
12" C.P. CHANGED TO 18" C.P. AND SENSE CROSSING GRADE CHANGED	1	9-27-76	DND
LEAD FROM DITCH INLET CHANGED 6 GRADINGS AS CONSTRUCTED SAN-5M IN. 3 SEPT 1978 DND	2	10-19-76	DND
AS CONSTRUCTED	4	SEPT 25/78	DND



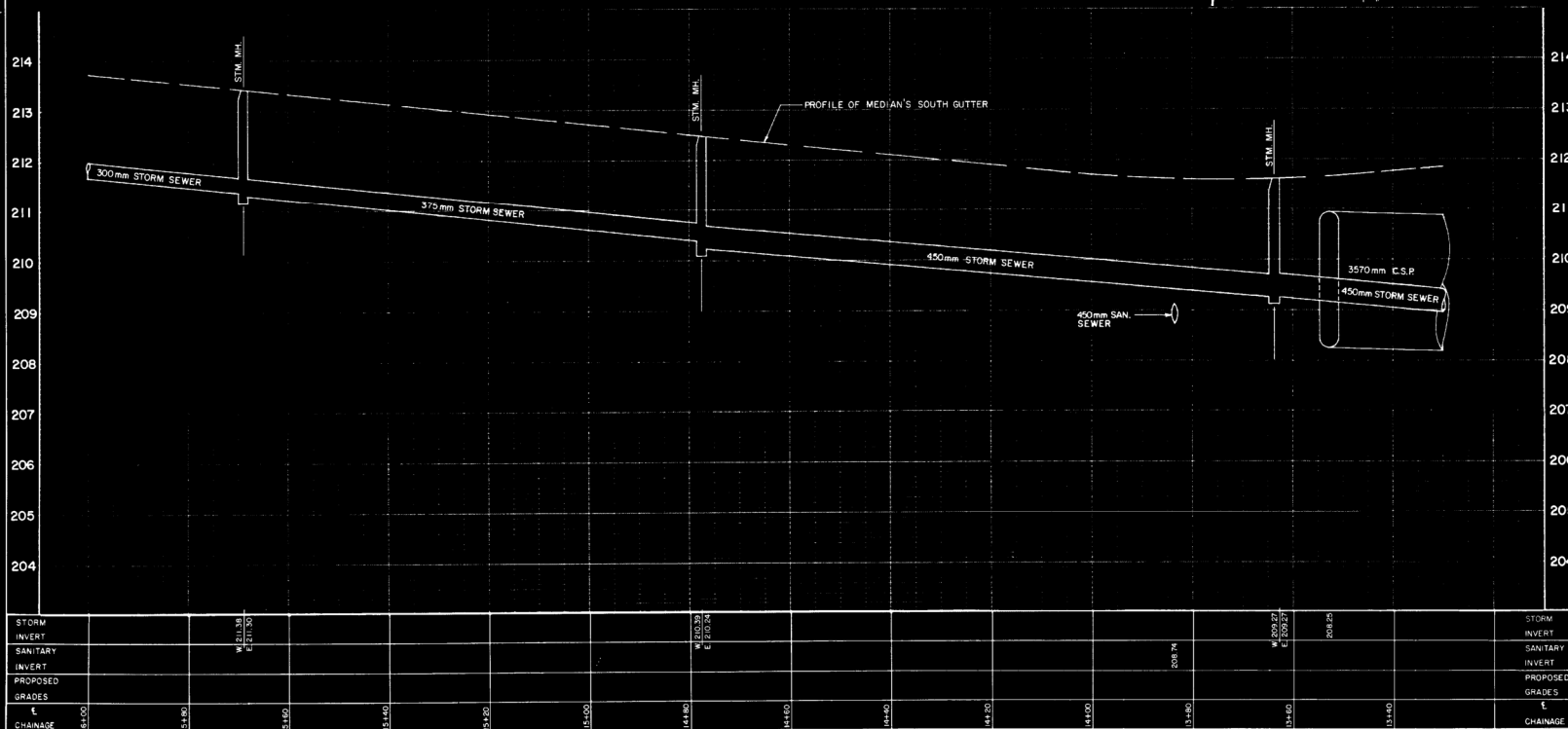
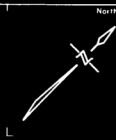
- GENERAL NOTES:
- UNLESS OTHERWISE NOTED ON THE DRAWINGS THE FOLLOWING REQUIREMENTS SHALL APPLY TO THE WORKS. ALTERNATIVE MATERIAL SPECIFICATIONS ARE LISTED IN THE CONTRACT DOCUMENTS.
- SEWER PIPE SHALL BE TYPE AND CLASS INDICATED, OR APPROVED ALTERNATIVE MATERIAL AND PER CLASS.
 - CONCRETE PIPE LARGER THAN 18" DIA SHALL BE REINFORCED, CLASS C76.
 - ALL CONCRETE SEWER PIPE SHALL HAVE RUBBER GASKET JOINTS.
 - ALL SEWERS SHALL BE CONSTRUCTED WITH TYPE B BEDDING UNLESS OTHERWISE SPECIFIED.
 - ALL WATERMANS SHALL HAVE 5/8" MIN. COVER.
 - MANHOLE COVERS AND FRAMES SHALL BE CANTON TYPE D5579, OR APPROVED EQUAL.
 - CATCHBASIN GRATINGS AND FRAMES SHALL BE LTD. CR24 WITH BOYCE PROOF TOPS.
 - MANHOLE STEPS SHALL BE STEELCO LR 101 OR APPROVED EQUAL.
 - CATCHBASIN LEADS SHALL BE 8" DIA. FOR SINGLE CATCHBASINS, 10" DIA. FOR DOUBLE CATCHBASINS, UNLESS OTHERWISE NOTED IN THE DRAWINGS. ALL CATCHBASIN LEADS SHALL BE CONCRETE PIPE, CLASS C14, EXTRA STRENGTH.
 - WATERMAIN SHALL BE DUCTILE IRON ANS1 CLASS 2 CEMENT LINED WITH TYTON JOINTS FOR SIZES 4"-12".
 - 2" WATERMAIN SHALL BE TYPE "K" SOFT COPPER.
 - WATERMAIN AND APPURTENANCES AS PER REGION OF PEEL MATERIAL SPECIFICATIONS FOR WATERMAIN AND APPURTENANCES.
 - WATERMAIN CONNECTIONS SHALL BE 1" DIA. DOUBLE SERVICE AND 3/4" SINGLE SERVICE OF TYPE K SOFT SEAMLESS COPPER TUBING.
 - THE PROPOSED ELEVATIONS AT BUILDINGS AND THE BASIC DIRECTION OF SURFACE DRAINAGE WILL BE SUBMITTED TO DETAILED DESIGN WHEN HOUSE TYPES AND LOT PLANS ARE AVAILABLE.
 - SUPPORT STORM SEWERS AT ALL CROSSINGS REFER TO CITY OF BRAMPTON STD DWS #355.
 - 2.72% - AS CONSTRUCTED GRADE
3.00% - DESIGNED GRADE.

CITY OF BRAMPTON	
DEVELOPMENTAL INVESTMENTS LTD.	
WILLIAMS PARKWAY STA. 0+00 TO 7+00	
RESIDENTIAL 10, STAGE 4	
paul theil associates limited consulting engineers 700 Balmoral Drive, Bramalea, Ontgrio.	
DATE JAN 876	CONTRACT DWS Nº
DRAWN <i>[Signature]</i>	J3-129-4
CHECKED <i>[Signature]</i>	SCALE HORIZ. 1"=40'
APPROVED <i>[Signature]</i>	FILE 7306-A-185

WILLIAMS PARKWAY

RD.

TORBRAM



214
213
212
211
210
209
208
207
206
205
204

No.	By	Date	Revision	Checked

CITY OF BRAMPTON
PUBLIC WORKS DEPARTMENT

COMMISSIONER OF PUBLIC WORKS: L.T. AGAR, P. ENG.

WILLIAMS PARKWAY
STATION 13+30 TO 16+00
FROM TORBRAM ROAD TO 240m W.

STORM INVERT	16+00	14+80	13+80	12+80	11+80	10+80	9+80	8+80	7+80	6+80	5+80	4+80	3+80	2+80	1+80	0+80
SANITARY INVERT																
PROPOSED GRADES																
CHAINAGE	16+00	14+80	13+80	12+80	11+80	10+80	9+80	8+80	7+80	6+80	5+80	4+80	3+80	2+80	1+80	0+80

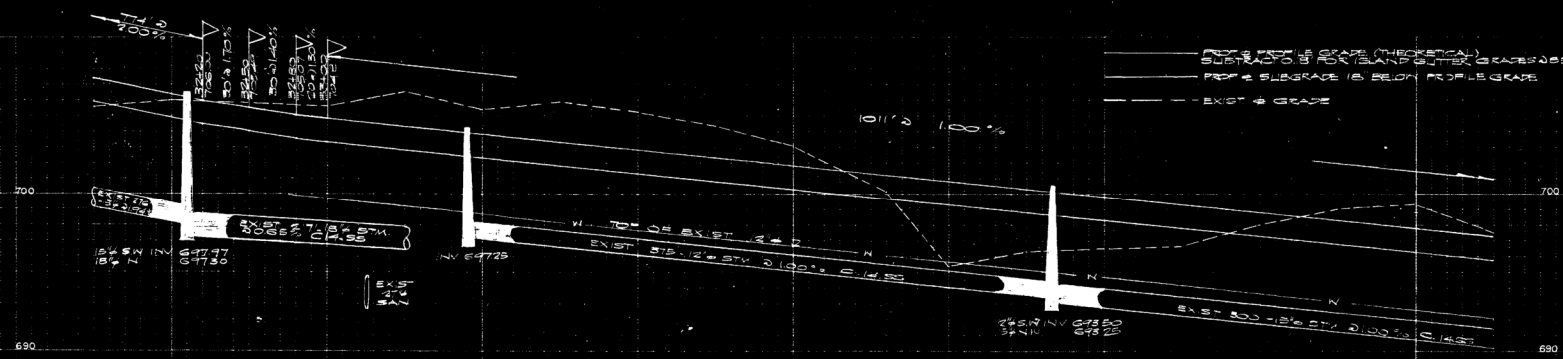
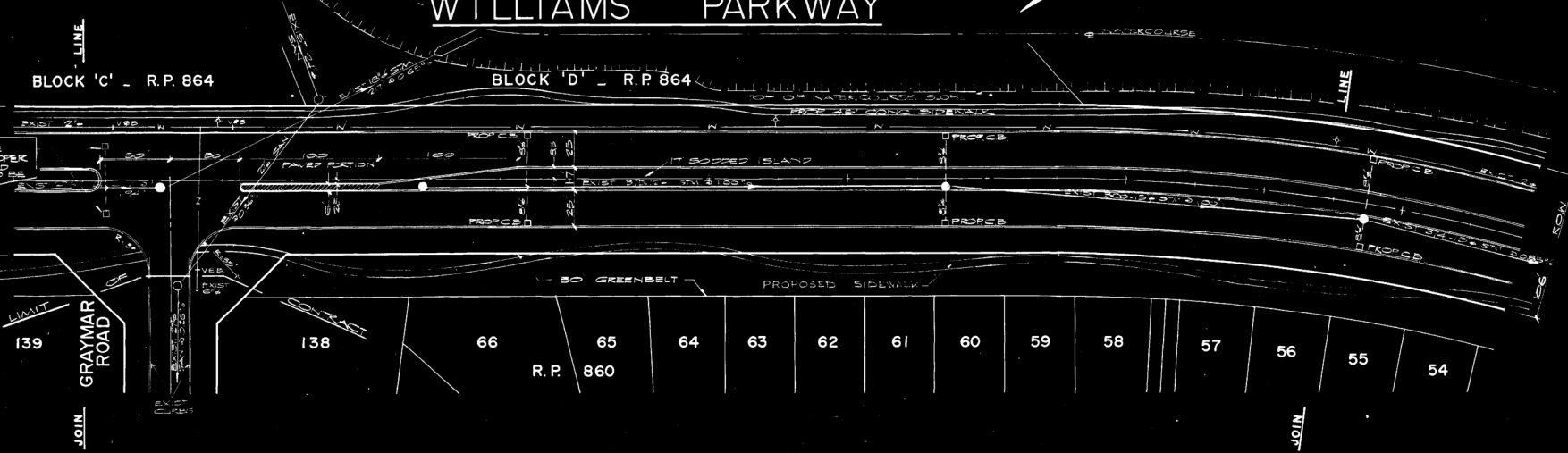
Designed By: S. CHOW	Date: 8-2-00	Contract No:	
Drawn By: G.G. PEARSON	Checked By: C.R.M.	Drawing No:	K3-112
Scale: 1:150 (h) 1:500	Date: 8-2-00	Sheet No:	10

WILLIAMS PARKWAY



BLOCK 'C' - R.P. 864

BLOCK 'D' - R.P. 864



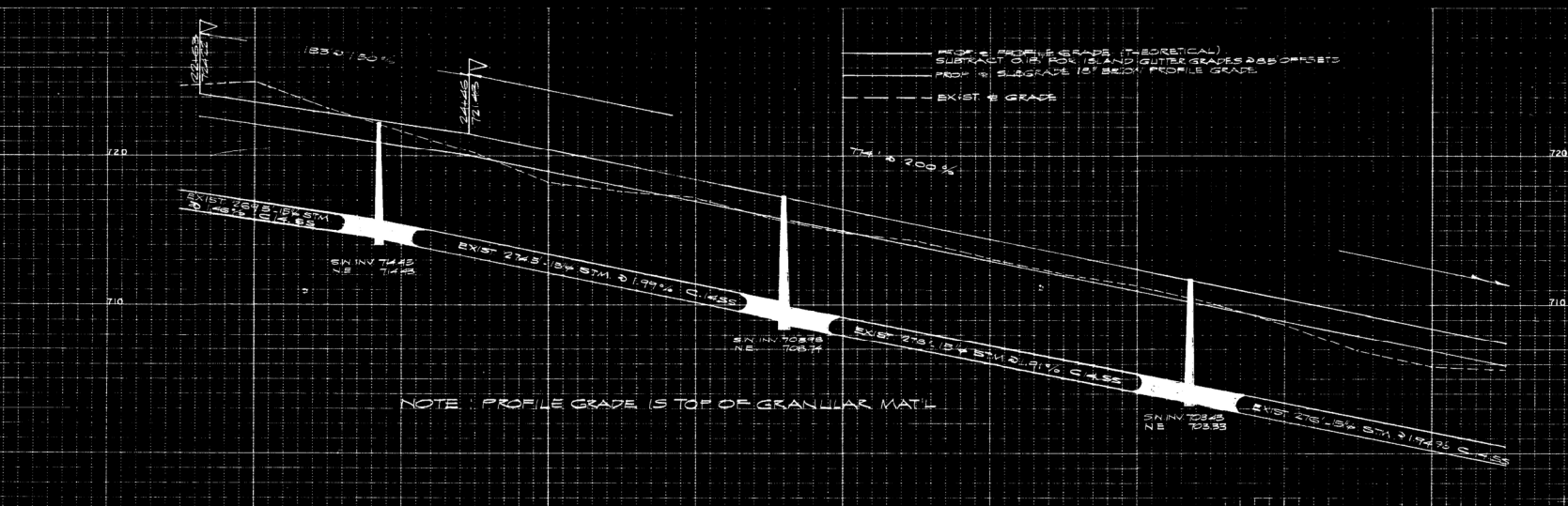
NOTE: PROFILE GRADE IS TOP OF GRANULAR MAT'L

NO.	DATE	REVISIONS	BY
TOWNSHIP OF CHINGUACOUSY ENGINEERING DEPARTMENT			
WILLIAMS PARKWAY			
CONTRACT No. 73-1-A			
DRAWN BY J.V. RICE MARCH '73		PROJECT ENGINEER D.J. THORNTON REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA	CHECKED BY D.V. & R.S. FILLER BOOK S DRAWING NO. C-73-7
SCALES HORIZ. 1" = 40' VERT. 1" = 4'		SHEET 2 OF 6 SHEETS	

31+50	705.59	EC	32+00	705.99	EC	33+00	705.64	34+00	709.42	35+00	702.24	36+00	703.12	37+00	699.39	38+00	696.53	39+00	694.05	40+00	692.33	41+00	697.54
+50			+50			+50		+50		+50		+50		+50		+50		+50		+50		+50	

[illegible]

ALL EXIST' CATERPILLARS EAST OF STA. 2400
TO BE RELOCATED TO PROPER LINE & GRADE AND
CONVERTED TO BE EXPOSED



BENCH MARK
TOP OF BOLT, SOUTH SIDE HYDRANT BASE AT NORTH-WEST
CORNER WILLIAMS PARKWAY & GRENABLE BLVD. ELEV. 728.95

[illegible]

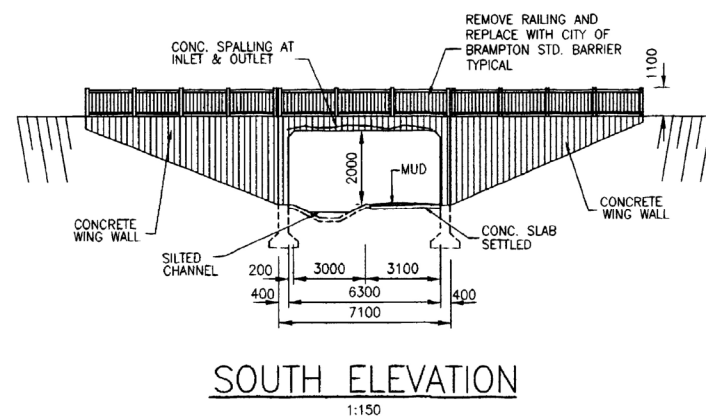
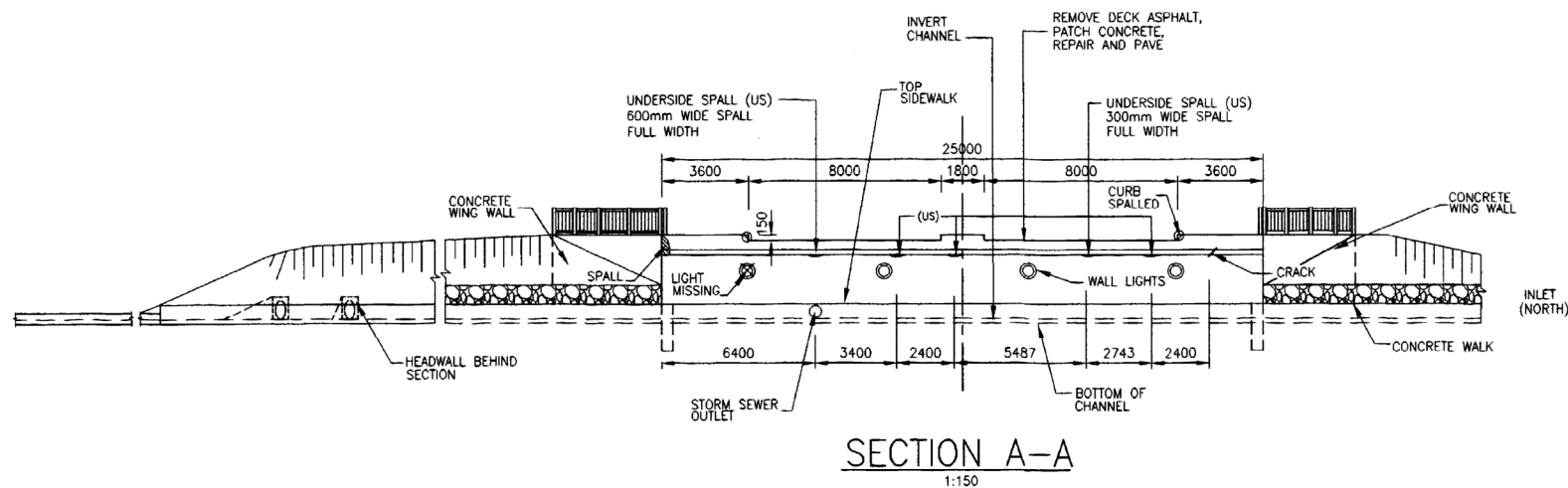
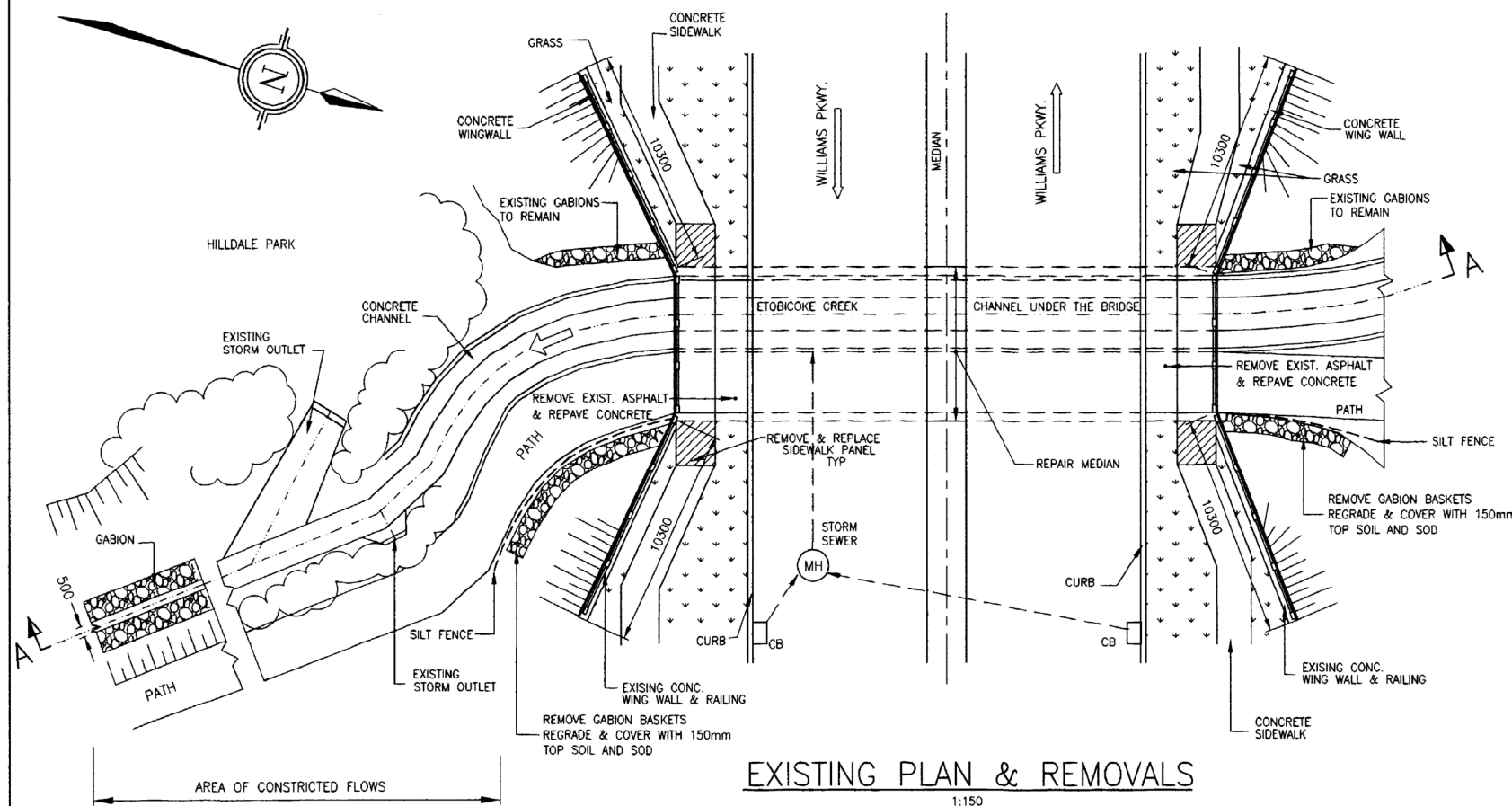
TOWNSHIP OF CHINGUACOUSY
ENGINEERING DEPARTMENT

WILLIAMS PARKWAY

CONTRACT No. 73-1-A

CHAINAGE	EXIST. ELEV.
22 +50	724.75
23 +00	725.04
+50	723.25
24 +00	721.69
+50	720.22
25 +00	718.26
+50	717.60
26 +00	717.19
+50	715.84
27 +00	714.80
+50	714.38
+75.36	B.C.
28 +00	713.08
+50	712.10
+50	710.10
29 +00	711.31
+50	708.70
+50	706.86
31 +00	705.06
+50	703.59
+75.21	E.C.

DRAWN BY J.V.	PROJECT ENGINEER 	CHECKED BY DJT & RJS
DATE MARCH '73	CIVIL D. J. THORNTON	FIELD BOOK SI
SCALES HORIZ 1" = 40' VERT 1" = 4'		DRAWING NO. C-73-7
		SHEET 1 OF 6 SHEETS



GENERAL NOTES:

1. CLASS OF CONCRETE - 30MPa
2. REINFORCING STEEL SHALL BE GRADE 400. SUFFIX "C" DENOTES COATED BARS.
3. ALL DESIGN REQUIREMENTS SHALL BE IN ACCORDANCE WITH CANADIAN HIGHWAY BRIDGE DESIGN CODE, 3RD EDITION, 1991
4. UNLESS SHOWN OTHERWISE, TENSION LAP LENGTHS NOT INDICATED ON THE CONTRACT DRAWINGS SHALL BE CLASS B.
5. BAR HOOKS SHALL BE MINIMUM LENGTH UNLESS INDICATED OTHERWISE.
6. CLEAR COVER TO REINFORCING STEEL 70±20 UNLESS OTHERWISE NOTED.
7. SAWCUTS IN CONCRETE SHALL BE 25mm DEEP OR TO FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
8. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE EXISTING WORK AND ALL DETAILS ON SITE AND REPORT DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
9. FOR STAGING DETAILS AND MAINTENANCE OF TRAFFIC SEE TEMPORARY TRAFFIC CONTROL DRAWING, SHEET NO. 6.

APPLICABLE STANDARD DRAWINGS

- OPSD-3901.01 MODIFICATION OF ROUND VERTICAL DECK DRAIN
- OPSD-3906.02 BRIDGE DECK WATERPROOFING
- OPSD-3906.03 BRIDGE DECK WATERPROOFING DETAILS
- OPSD-3951.00 DRAINAGE OF ASPHALT WEARING SURFACE ON EXISTING DECKS
- OPSD-4010.00 GUIDE RAIL & CHANNEL ANCHORAGE

LIST OF DRAWINGS

- SHEET 1 GENERAL ARRANGEMENT
- SHEET 2 CHANNEL REPAIRS
- SHEET 3 REPAIR PLAN AND DETAILS
- SHEET 4 PARAPET WALL
- SHEET 5 RAILING FOR PARAPET WALL
- SHEET 6 TEMPORARY TRAFFIC CONTROL

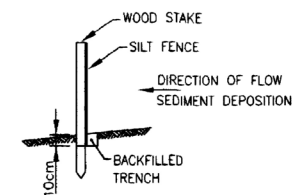
SCOPE & SUGGESTED SEQUENCE OF WORK ON DECK

STAGE 1

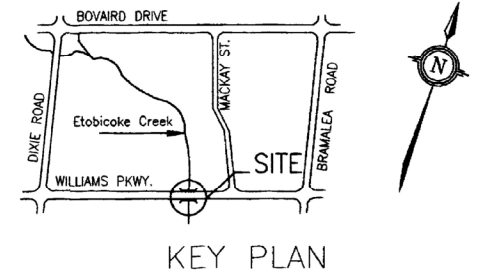
1. PLACE TRAFFIC CONTROLS FOR STAGE 1 CONSTRUCTION.
2. REMOVE DECK ASPHALT, PATCH CONCRETE, REPAIR AND REPAVE.
3. REMOVE EXISTING PARAPET WALLS & RAILINGS.
4. INSTALL NEW CONCRETE PARAPET WALLS & RAILINGS.
5. REMOVE AND REPLACE SETTLED SIDEWALK PANELS.
6. REPAIR CHANNEL, SIDEWALK UNDER BRIDGE, SPALLING OF BRIDGE SOFFIT AT OUTLET AND SPALLING AREAS UNDERSIDE OF DECK.
7. REMOVE GABION BASKETS, COVER WITH TOPSOIL AND SOD.
8. APPLY MCI AND SEALER TO CONCRETE SURFACES OF SIDEWALKS, PARAPET WALLS, INSIDE OF CULVERT.
9. INSTALL "LOW OVERHEAD" SIGN OVER PATHWAY.

STAGE 2

1. MOVE TRAFFIC CONTROLS FOR STAGE 2 CONSTRUCTION.
2. REPEAT STEPS 2 TO 5 FROM STAGE 1 CONSTRUCTION.
3. REMOVE TEMPORARY BARRIER
4. RESTORE TRAFFIC TO ENTIRE STRUCTURE.



SILT FENCE INSTALLATION N.T.S.



NOTE:

THIS DRAWING WAS PRODUCED BY PLANMAC INC. IN DIGITAL FORMAT FROM SURVEY NOTES MADE JUNE 23, 2002 AND JULY 8, 2002

CREEK BED PROTECTION

1. NO WORK WILL BE ALLOWED ADJACENT TO OR IN THE CREEK BED BETWEEN 1 APRIL & 1 JULY
2. PROVIDE TEMPORARY SCAFFOLDING WITH IMPERMEABLE SURFACE TO PREVENT CONCRETE REMOVALS FROM ENTERING CREEK
3. TEMPORARY SCAFFOLDING TO BE REMOVED PRIOR TO FORCAST RAIN STORMS

NO.	P.Z.	DATE	REVISIONS	COMMENTS	CHECKED
2	H.C.	30/9/03	AS CONSTRUCTED		M.R.K.
1	P.Z.	19/11/02	REVISED AS PER TRCA COMMENTS		M.R.K.



CITY OF BRAMPTON WORKS & TRANSPORTATION

COMMISSIONER OF WORKS & TRANSPORTATION A. D. MacMILLAN, P. ENG.

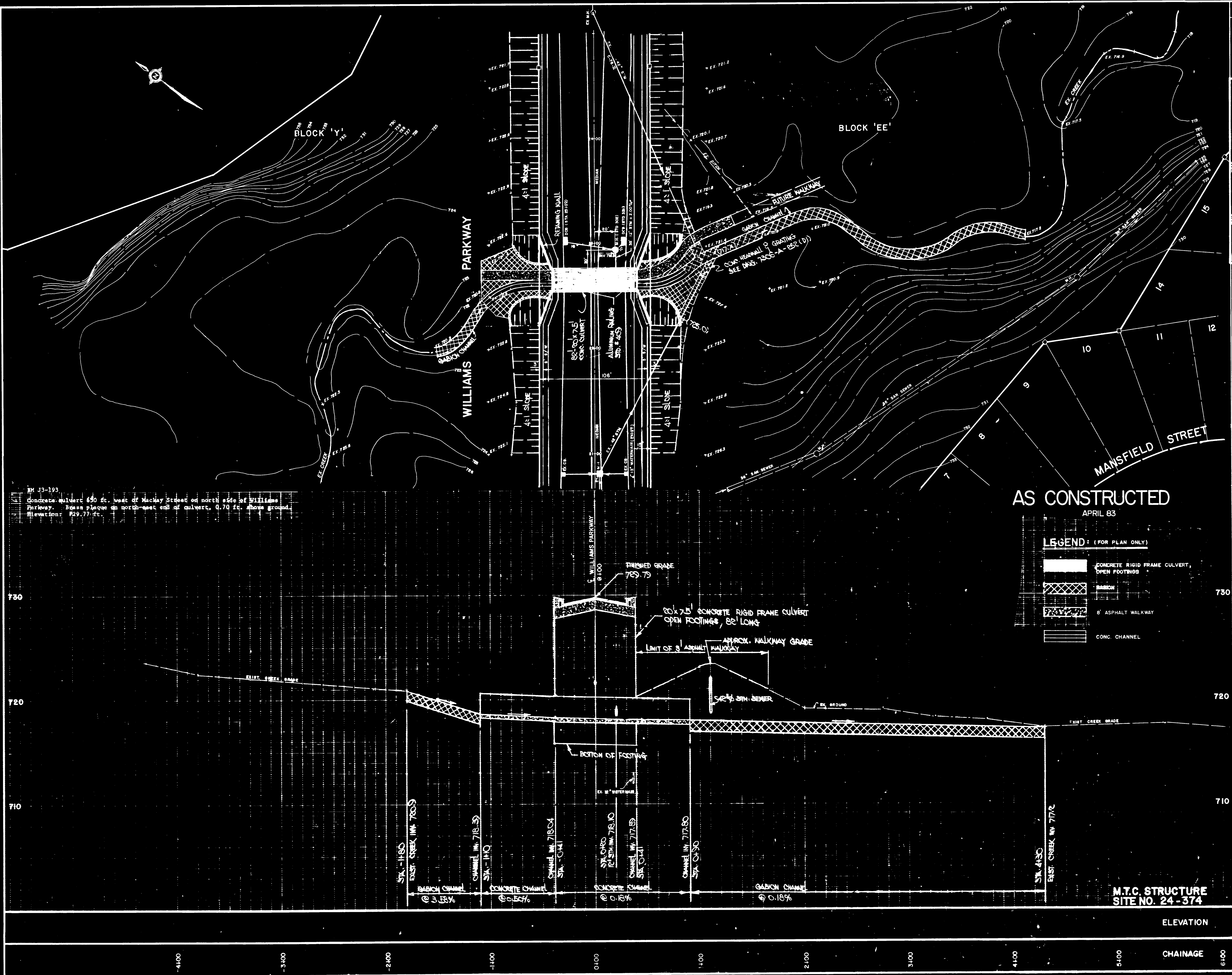
PLANMAC INC.
CONSULTING ENGINEERS & PLANNERS
15 North Queen St., Suite 105
Toronto, Ontario, M5B 8C1
CANADA
Tel: (416) 628-6300 FAX: (416) 622-6710



WILLIAMS PKWY BRIDGE
OVER ETOBICOKE CREEK TRIBUTARY
STRUCTURE NO. 391043/ 0.2km WEST OF MACKAY ST.

PROPOSED REHABILITATION GENERAL ARRANGEMENT

SURVEYED BY: A.S. & P.Z.	DATE:	CONTRACT NO. 2002-051	DRAWING NO.	SHEET NO.
DRAWN BY: A.S.	CHECKED BY: M.R.K.		BR-15	1 of 6
DESIGNED BY: R.D.F.	CHECKED BY: R.I.M.			
SCALE: AS NOTED	DATE: 30 SEPT. 03			



REVISIONS		№	DATE	BY

KEY PLAN 1" = 600'

AS CONSTRUCTED
APRIL 83

LEGEND: (FOR PLAN ONLY)

- CONCRETE RIGID FRAME CULVERT, OPEN FOOTINGS
- MASSON
- 8' ASPHALT WALKWAY
- CONC. CHANNEL

CITY OF BRAMPTON
DEVELOPMENTAL INVESTMENTS LTD.
WILLIAMS PARKWAY
CULVERT & WATERCOURSE
RESIDENTIAL 10,

paul theil associates limited
consulting engineers
700 Balmoral Drive, Bramalea, Ontario.

DATE	AUG 1976	CONTRACT DWG №
DRAWN	M.S.S.	J3-6-8
CHECKED	Michael S. S.	SCALE 1" = 40' HORIZ 1" = 4' VERT
APPROVED	Paul Theil	FILE 7306-A-250

APPENDIX B

Hydrologic Analysis

APPENDIX B: HYDROLOGIC ANALYSIS

Figure B.1: Existing Drainage Area Map for Williams Parkway Road

Figure B.2: Existing Drainage Area Map for Williams Parkway Road

Figure B.3: Existing Drainage Area Map for Williams Parkway Road

Figure B.4: Existing Drainage Area Map for Williams Parkway Road

Figure B.5: Existing Drainage Area Map for Williams Parkway Road

Figure B.6: Existing Drainage Area Map for Williams Parkway Road

Figure B.7: Existing Drainage Area Map for Williams Parkway Road

Table B.1: Original VO Input Parameters - TRCA model - Mimico and Etobicoke

Table B.2: Modified TRCA VO Model - Catchment Parameters within the Study Limits -Existing Condition

Table B.2A Existing Condition Storm Design Sheet

Table B.2B Existing Condition Spread Analysis Sheet

VO Modelling Schematic-1 - Existing Condition

Output File – Existing Condition

Figure B.8: Proposed Drainage Area Map for Williams Parkway Road

Figure B.9: Proposed Drainage Area Map for Williams Parkway Road

Figure B.10: Proposed Drainage Area Map for Williams Parkway Road

Figure B.11: Proposed Drainage Area Map for Williams Parkway Road

Figure B.12: Proposed Drainage Area Map for Williams Parkway Road

Figure B.13: Proposed Drainage Area Map for Williams Parkway Road

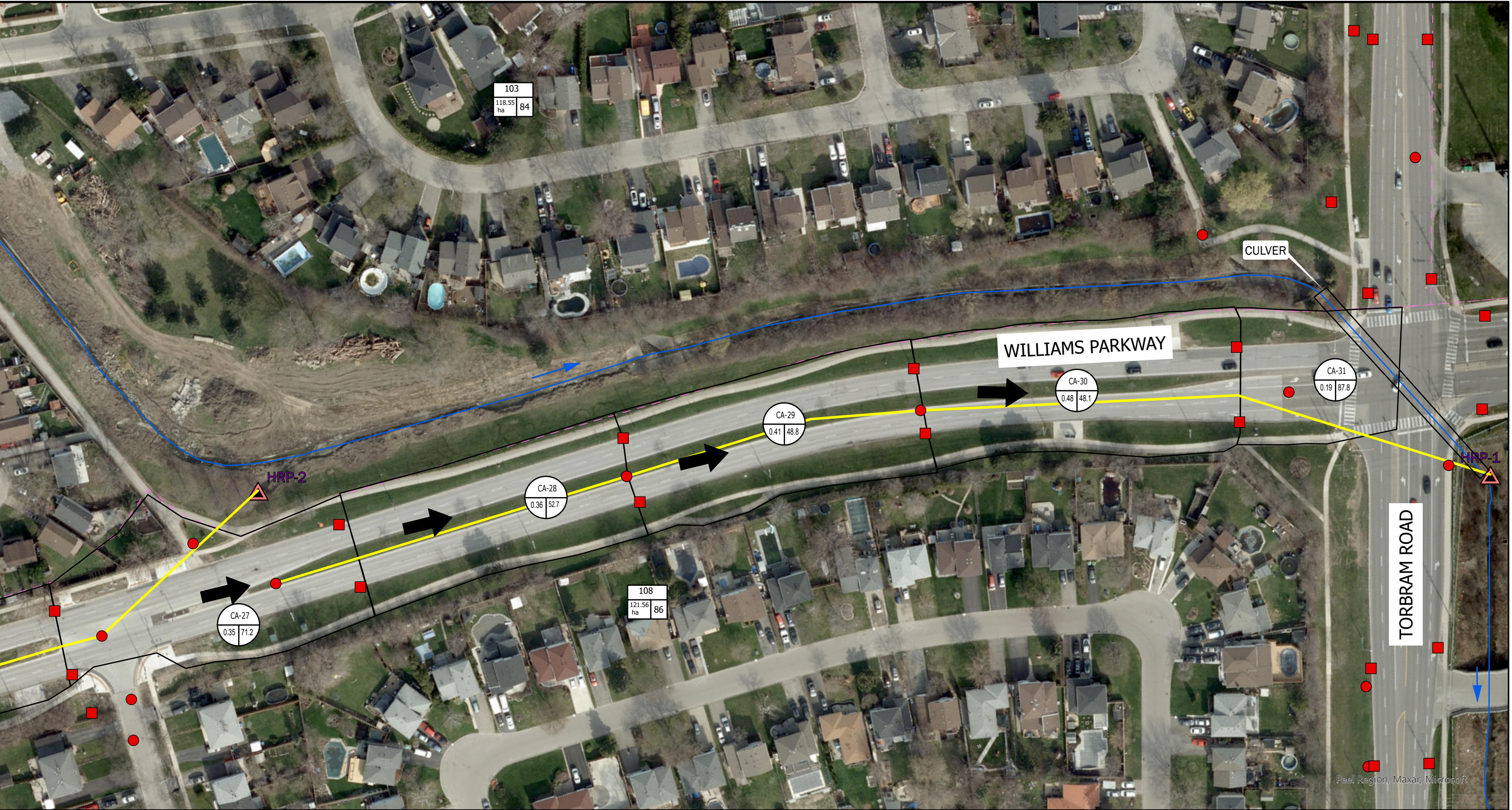
Figure B.14: Proposed Drainage Area Map for Williams Parkway Road

Table B.3: Modified TRCA VO Model - Catchment Parameters within the Study Limits - Proposed Condition

VO Modelling Schematic-2 – Proposed Condition

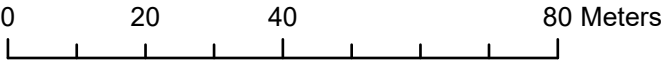
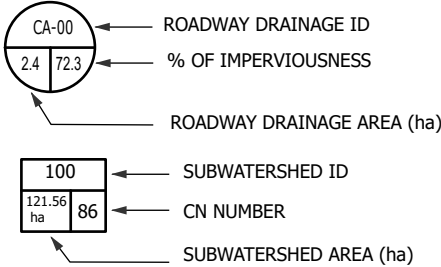
Output File – Proposed Condition

EXISTING CONDITION



Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- ▲ HRP
- Subcatchment
- Spring Creek
- Mimico Creek
- Mimico_Catchments



Project: Williams Parkway EA, Brampton

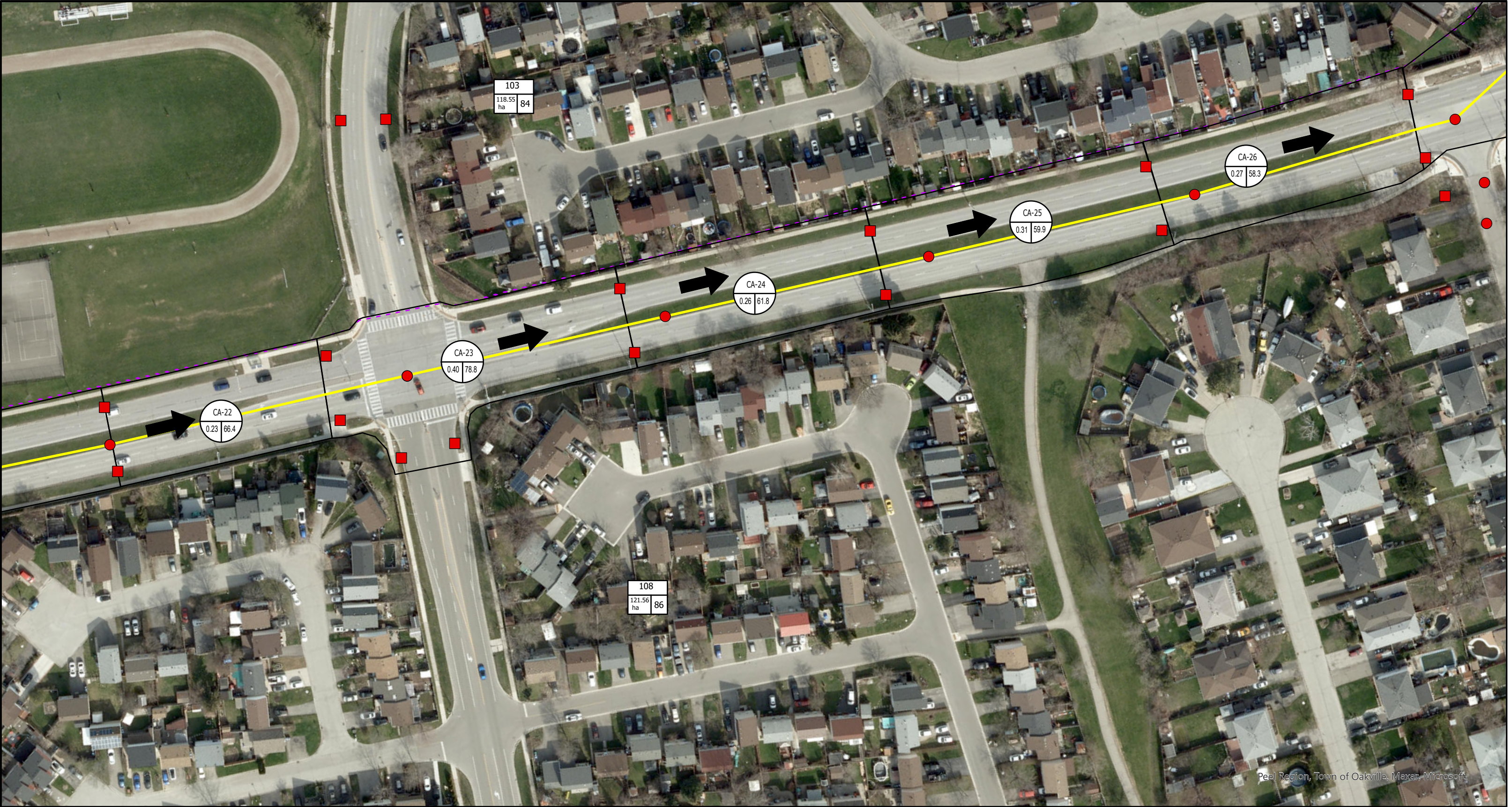
Figure B1: Drainage Area Map: Existing Condition

Prepared by: DT

Date: 6/27/2023

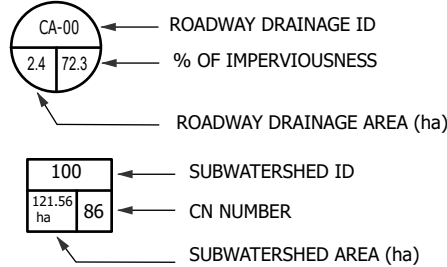
Version:
1

Figure:
B1



Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- ▲ HRP
- Subcatchment
- Spring Creek
- Mimico Creek
- - - Mimico_Catchments



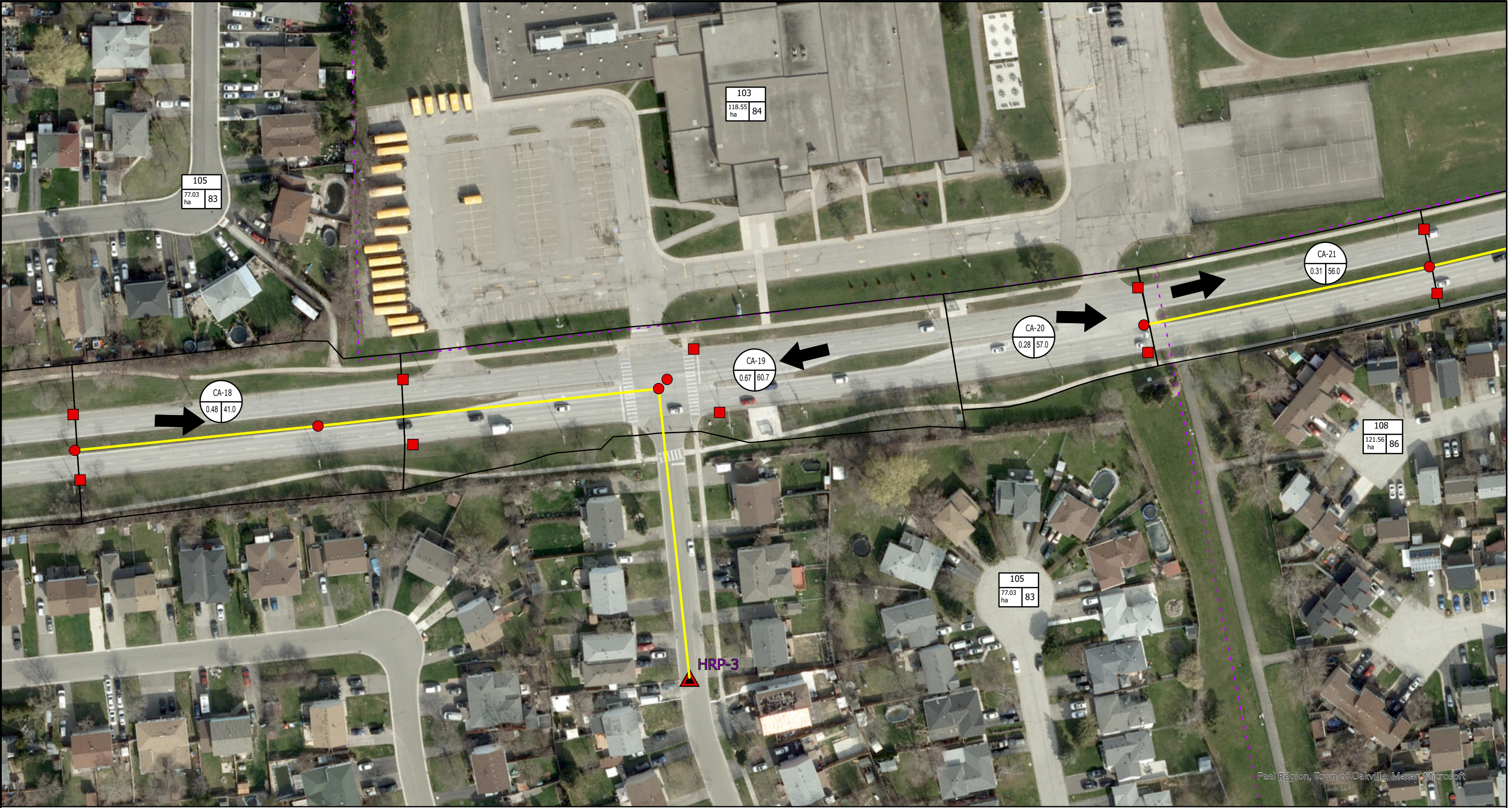
Project: Williams Parkway EA, Brampton

Figure B2: Drainage Area Map: Existing Condition

Prepared by: DT

Date: 6/27/2023

Version: 1
Figure: B2



Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- HRPs

- Subcatchment
- Spring Creek
- Mimico Creek
- Mimico_Catchments

CA-00
2.4 72.3

ROADWAY DRAINAGE ID

% OF IMPERVIOUSNESS

ROADWAY DRAINAGE AREA (ha)

100
121.56
ha 86

SUBWATERSHED ID

CN NUMBER

SUBWATERSHED AREA (ha)

0 20 40 80 Meters

Project: Williams Parkway EA, Brampton

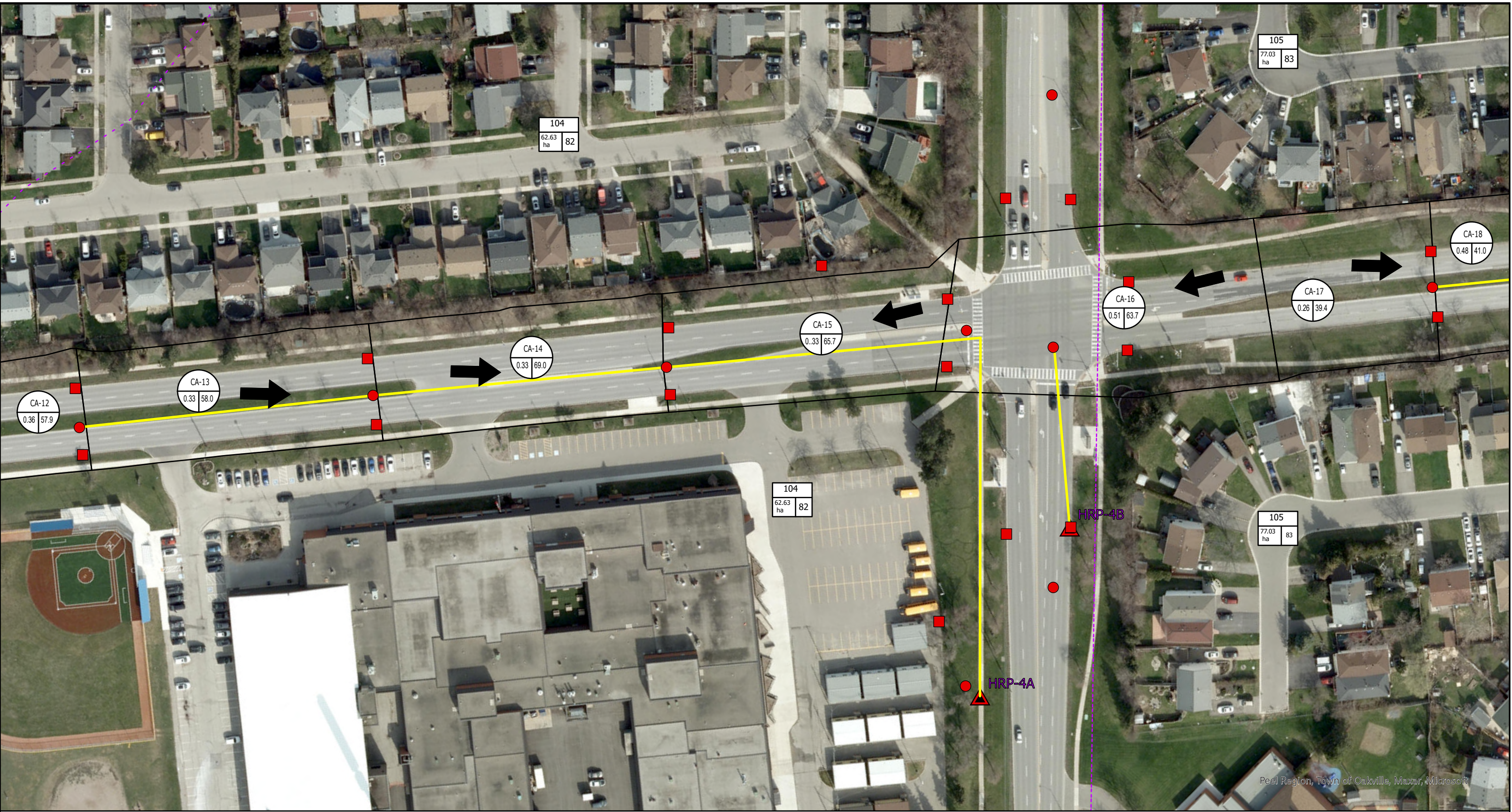
Figure B3: Drainage Area Map: Existing Condition

Prepared by: DT

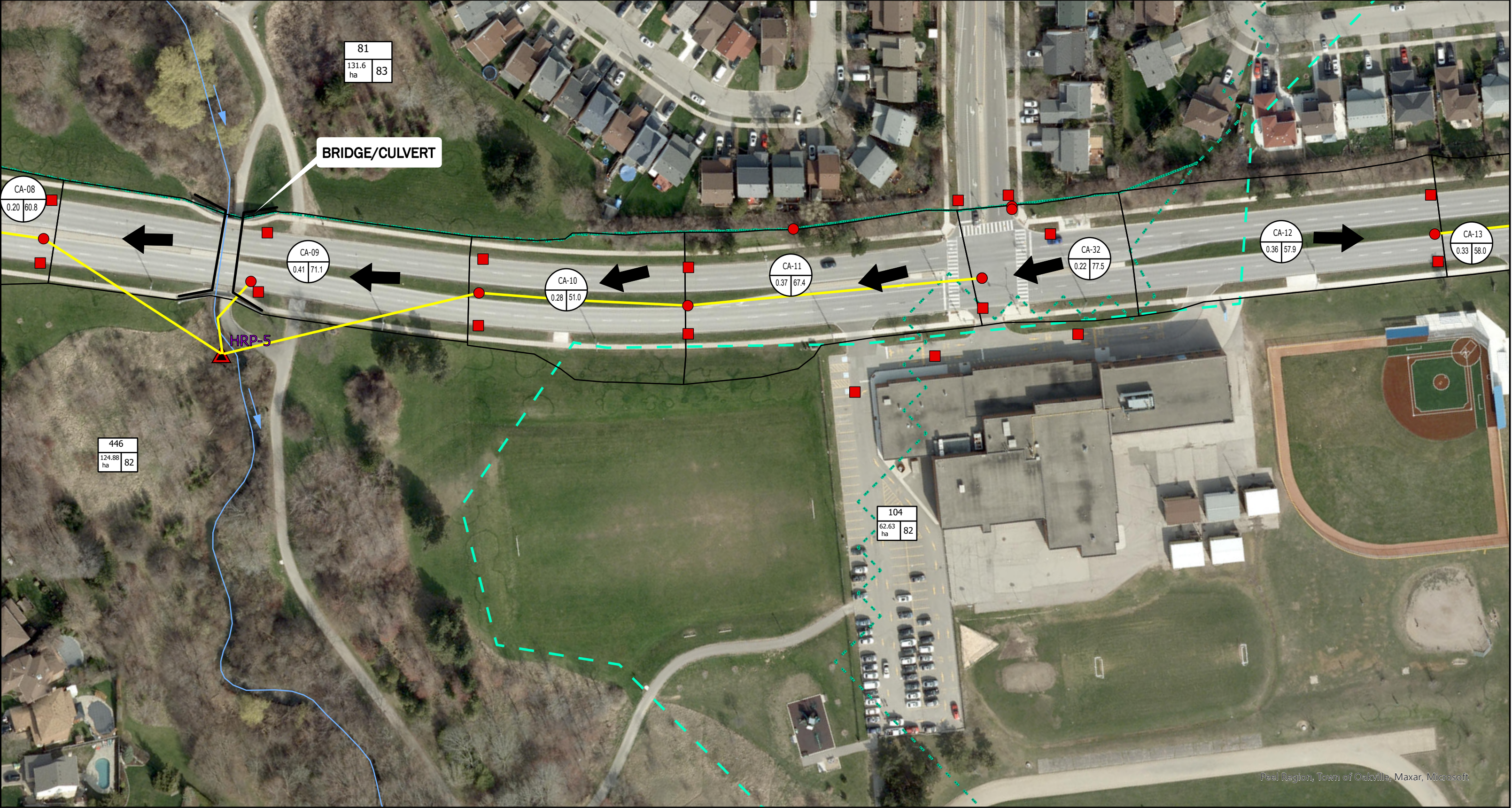
Date: 6/27/2023

Version: 1

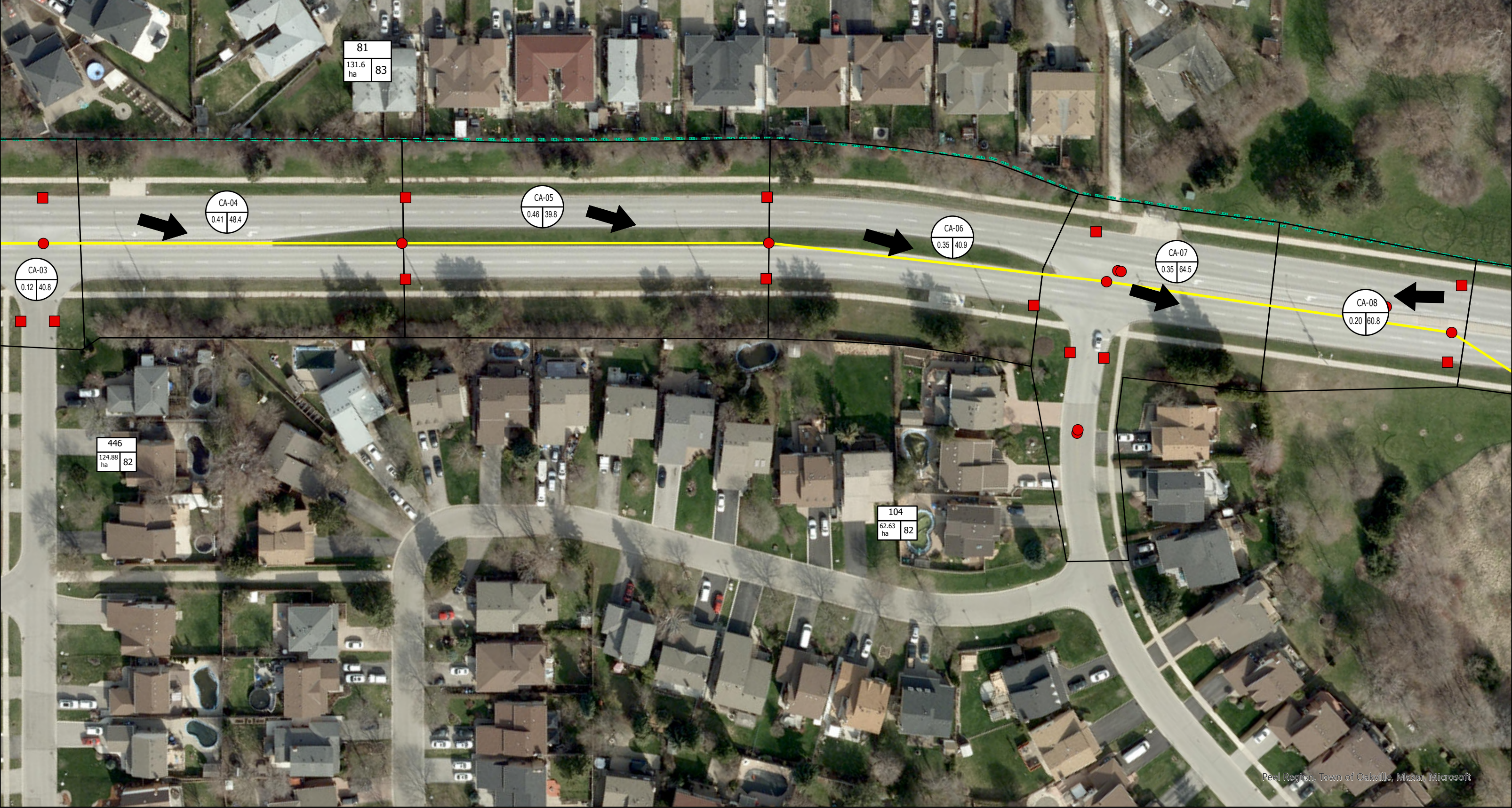
Figure: B3



Legend Catchbasin STM Manhole Storm Pipe HRPs Subcatchment Spring Creek Mimico Creek Mimico_Catchments	CA-00 2.472.3 ROADWAY DRAINAGE ID % OF IMPERVIOUSNESS ROADWAY DRAINAGE AREA (ha) 100 121.5686 SUBWATERSHED ID CN NUMBER SUBWATERSHED AREA (ha)	0204080 Meters	Project: Williams Parkway EA, Brampton	
	Figure B4: Drainage Area Map: Existing Condition			
	Prepared by: DT		Date: 6/27/2024 Version: 1Figure: B4	

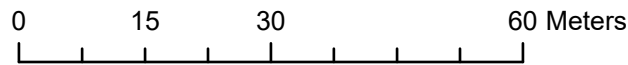
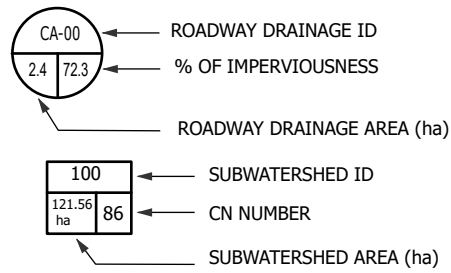


Peel Region, Town of Oakville, Maxar, Microsoft



Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- HRPs
- Subcatchment
- Spring Creek
- Mimico Creek
- Etobicoke_Catchments
- Mimico_Catchments



Project: Williams Parkway EA, Brampton

Figure B6: Drainage Area Map: Existing Condition

Prepared by: DT

Date: 6/27/2023

Version: 1
Figure: B6



Peel Region, Town of Oakville, Maxar, Microsoft

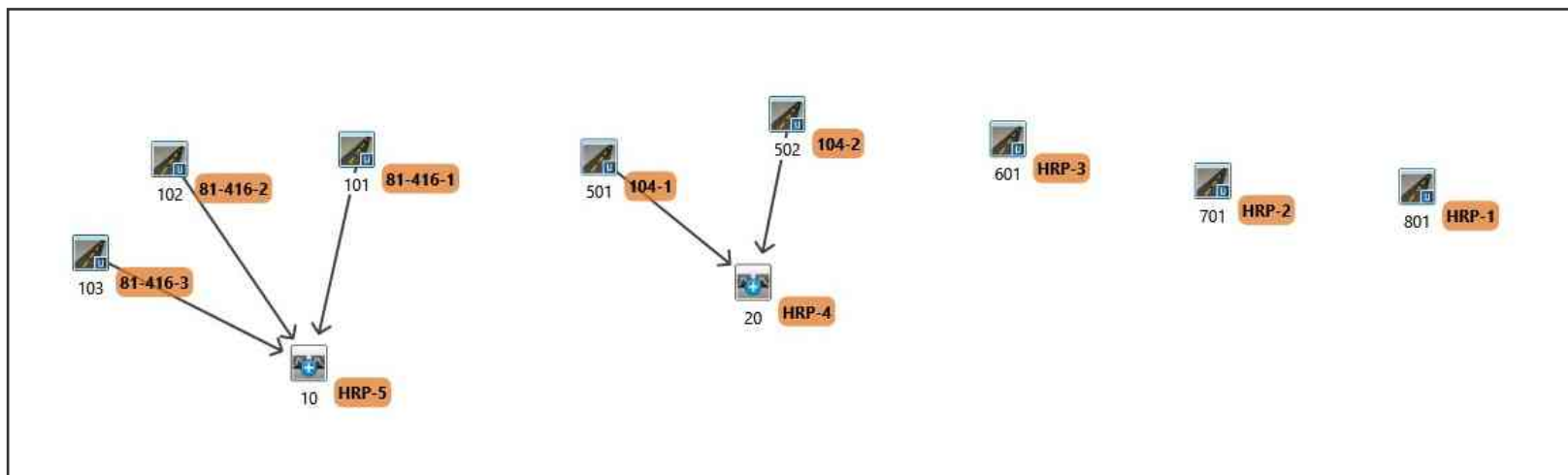
Table B.1: Original VO2 Input Parameters - TRCA model - Mimico and Etobicoke

Watershed	Catchment ID	Tributary Name	VO_ID	Type	Area (ha)	% XIMP	% TIMP
Etobicoke	81	Spring Creek	81	StandHyd	131.6	36.7	45.1
Etobicoke	446	Spring Creek	446	StandHyd	124.88	28.3	34.2
Total Area			256.48				
Mimico	103	Mimico Creek	103	StandHyd	118.55	38.0	38.0
Mimico	104	Mimico Creek	104	StandHyd	62.36	45.0	45.0
Mimico	105	Mimico Creek	105	StandHyd	77.03	45.0	45.0
Mimico	108	Mimico Creek	108	StandHyd	121.56	53.0	53.0
Total Area			379.5				

Table B.2: Modified TRCA VO Model - Catchment Parameters within the Study Limits - Existing Condition

TRCA				PARSONS			
Watershed	Catchment ID/Object ID	Type	Area (ha)	VO ID	Area, ha	% XIMP	% TIMP
Mimico	103 & 108	StandHyd	118.55 & 121.56	801	1.60	61.73	61.73
				701	2.06	62.58	62.58
	105		63.1	601	1.41	47.02	47.02
	104 & 105		63.1 & 63.4	502	0.51	63.67	63.67
	104		62.4	501	1.35	62.85	62.85
Etobicoke	81 & 446		131.59 & 124.89	101	2.78	48.00	48.00
				102	0.414	71.12	71.12
				103	0.87	65.00	65.00

Visual OTTHYMO Modelling Schematic-1 Existing Condition



=====

V V I SSSS U U A L (v 6.2.2015)

V V I SS U U A A L

V V I SS U U A A L

V V I SS U U A A L

V V I SSSS UUUU A A LLLL

000 TTTT TTTT H H Y Y M M 000 TM

O O T T H H Y Y M M O O

O O T T H H Y Y M M O O

000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc

Copyright 2007 - 2022 Smart City Water Inc

All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voind.dat

Output filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\cd30

0a75-158f-4162-9247-d70d4682639d\sce

Summary filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\cd30

0a75-158f-4162-9247-d70d4682639d\sce

DATE: 06/24/2024 TIME: 12:17:49

USER:

COMMENTS: _____

** SIMULATION : 10 Year 12 Hour AES (Bloor, T **

READ STORM | Filename: C:\Users\p004074G\AppData\Local\Temp\

1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		
TOTALS							
Max.Eff.Inten.(mm/hr)=	28.84	10.68					
over (min)	5.00	25.00					
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)					
Unit Hyd. Tpeak (min)=	5.00	20.00					
Unit Hyd. peak (cms)=	0.19	0.06					
PEAK FLOW (cms)=	0.11	0.04	0.141 (iii)				
TIME TO PEAK (hrs)=	5.25	5.33	5.25				
RUNOFF VOLUME (mm)=	60.71	17.45	38.21				
TOTAL RAINFALL (mm)=	62.71	62.71	62.71				
RUNOFF COEFFICIENT =	0.97	0.28	0.61				
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:							
CN* = 65.6 Ia = Dep. Storage (Above)							
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL							
THAN THE STORAGE COEFFICIENT.							
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.							

CALIB

STANDHYD (0102) | Area (ha)= 0.41

cfcbccbd-6ef4-434c-9e63-f8e28115e34b\7ad2b545

Ptotal= 62.71 mm | Comments: 10 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	10.66	6.50	4.39	9.75	0.63
0.25	0.63	3.50	10.66	6.75	4.39	10.00	0.63
0.50	0.63	3.75	10.66	7.00	4.39	10.25	0.63
0.75	0.63	4.00	10.66	7.25	2.51	10.50	0.63
1.00	0.63	4.25	28.84	7.50	2.51	10.75	0.63
1.25	0.63	4.50	28.84	7.75	2.51	11.00	0.63
1.50	0.63	4.75	28.84	8.00	2.51	11.25	0.63
1.75	0.63	5.00	28.84	8.25	1.25	11.50	0.63
2.00	0.63	5.25	8.15	8.50	1.25	11.75	0.63
2.25	3.76	5.50	8.15	8.75	1.25	12.00	0.63
2.50	3.76	5.75	8.15	9.00	1.25		
2.75	3.76	6.00	8.15	9.25	0.63		
3.00	3.76	6.25	4.39	9.50	0.63		

CALIB

STANDHYD (0101) | Area (ha)= 2.78

ID= 1 DT= 5.0 min | Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.33	1.44
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.75	2.00
Length	(m)=	136.01	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63

3.000 3.76 | 6.083 8.15 | 9.167 1.25 | 12.25 0.63
3.083 3.76 | 6.167 8.15 | 9.250 1.25 |
Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
PEAK FLOW (cms)= 0.02 0.01
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 53.36
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56
TOTALS
0.030 (iii)

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103)
ID= 1 DT= 5.0 min
Area (ha)= 0.87
Total Imp(%)= 65.00 Dir. Conn.(%)= 65.00

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.56 0.30
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 3.76 6.250 8.15 | 9.33 0.63
0.167 0.00 3.250 3.76 6.333 4.39 | 9.42 0.63
0.250 0.00 3.333 10.66 6.417 4.39 | 9.50 0.63
0.333 0.63 3.417 10.66 6.500 4.39 | 9.58 0.63
0.417 0.63 3.500 10.66 6.583 4.39 | 9.67 0.63
0.500 0.63 3.583 10.66 6.667 4.39 | 9.75 0.63
0.583 0.63 3.667 10.66 6.750 4.39 | 9.83 0.63
0.667 0.63 3.750 10.66 6.833 4.39 | 9.92 0.63
0.750 0.63 3.833 10.66 6.917 4.39 | 10.00 0.63

0.833 0.63 | 3.917 10.66 | 7.000 4.39 | 10.08 0.63
0.917 0.63 | 4.000 10.66 | 7.083 4.39 | 10.17 0.63
1.000 0.63 | 4.083 10.66 | 7.167 4.39 | 10.25 0.63
1.083 0.63 | 4.167 10.66 | 7.250 4.39 | 10.33 0.63
1.167 0.63 | 4.250 10.66 | 7.333 2.51 | 10.42 0.63
1.250 0.63 | 4.333 28.84 | 7.417 2.51 | 10.50 0.63
1.333 0.63 | 4.417 28.84 | 7.500 2.51 | 10.58 0.63
1.417 0.63 | 4.500 28.84 | 7.583 2.51 | 10.67 0.63
1.500 0.63 | 4.583 28.84 | 7.667 2.51 | 10.75 0.63
1.583 0.63 | 4.667 28.84 | 7.750 2.51 | 10.83 0.63
1.667 0.63 | 4.750 28.84 | 7.833 2.51 | 10.92 0.63
1.750 0.63 | 4.833 28.84 | 7.917 2.51 | 11.00 0.63
1.833 0.63 | 4.917 28.84 | 8.000 2.51 | 11.08 0.63
1.917 0.63 | 5.000 28.84 | 8.083 2.51 | 11.17 0.63
2.000 0.63 | 5.083 28.84 | 8.167 2.51 | 11.25 0.63
2.083 0.63 | 5.167 28.84 | 8.250 2.51 | 11.33 0.63
2.167 0.63 | 5.250 28.84 | 8.333 1.25 | 11.42 0.63
2.250 0.63 | 5.333 8.15 | 8.417 1.25 | 11.50 0.63
2.333 3.76 | 5.417 8.15 | 8.500 1.25 | 11.58 0.63
2.417 3.76 | 5.500 8.15 | 8.583 1.25 | 11.67 0.63
2.500 3.76 | 5.583 8.15 | 8.667 1.25 | 11.75 0.63
2.583 3.76 | 5.667 8.15 | 8.750 1.25 | 11.83 0.63
2.667 3.76 | 5.750 8.15 | 8.833 1.25 | 11.92 0.63
2.750 3.76 | 5.833 8.15 | 8.917 1.25 | 12.00 0.63
2.833 3.76 | 5.917 8.15 | 9.000 1.25 | 12.08 0.63
2.917 3.76 | 6.000 8.15 | 9.083 1.25 | 12.17 0.63
3.000 3.76 | 6.083 8.15 | 9.167 1.25 | 12.25 0.63
3.083 3.76 | 6.167 8.15 | 9.250 1.25 |

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS

PEAK FLOW (cms)= 0.05 0.02
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 53.36
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56 0.83
0.060 (iii)

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3
ID1= 1 (0101): 2.78 0.141 5.25 38.21
+ ID2= 2 (0102): 0.41 0.030 5.25 53.36
ID = 3 (0010): 3.19 0.171 5.25 40.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1
ID1= 3 (0010): 3.19 0.171 5.25 40.18
+ ID2= 2 (0103): 0.87 0.060 5.25 51.82
ID = 1 (0010): 4.06 0.231 5.25 42.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0501)
ID= 1 DT= 5.0 min
Area (ha)= 1.35
Total Imp(%)= 62.85 Dir. Conn.(%)= 62.85

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.85 0.50
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 3.76 6.250 8.15 | 9.33 0.63
0.167 0.00 3.250 3.76 6.333 4.39 | 9.42 0.63
0.250 0.00 3.333 10.66 6.417 4.39 | 9.50 0.63
0.333 0.63 3.417 10.66 6.500 4.39 | 9.58 0.63
0.417 0.63 3.500 10.66 6.583 4.39 | 9.67 0.63
0.500 0.63 3.583 10.66 6.667 4.39 | 9.75 0.63
0.583 0.63 3.667 10.66 6.750 4.39 | 9.83 0.63
0.667 0.63 3.750 10.66 6.833 4.39 | 9.92 0.63
0.750 0.63 3.833 10.66 6.917 4.39 | 10.00 0.63

0.833 0.63 | 3.917 10.66 | 7.000 4.39 | 10.08 0.63
0.917 0.63 | 4.000 10.66 | 7.083 4.39 | 10.17 0.63
1.000 0.63 | 4.083 10.66 | 7.167 4.39 | 10.25 0.63
1.083 0.63 | 4.167 10.66 | 7.250 4.39 | 10.33 0.63
1.167 0.63 | 4.250 10.66 | 7.333 2.51 | 10.42 0.63
1.250 0.63 | 4.333 28.84 | 7.417 2.51 | 10.50 0.63
1.333 0.63 | 4.417 28.84 | 7.500 2.51 | 10.58 0.63
1.417 0.63 | 4.500 28.84 | 7.583 2.51 | 10.67 0.63
1.500 0.63 | 4.583 28.84 | 7.667 2.51 | 10.75 0.63
1.583 0.63 | 4.667 28.84 | 7.750 2.51 | 10.83 0.63
1.667 0.63 | 4.750 28.84 | 7.833 2.51 | 10.92 0.63
1.750 0.63 | 4.833 28.84 | 7.917 2.51 | 11.00 0.63
1.833 0.63 | 4.917 28.84 | 8.000 2.51 | 11.08 0.63
1.917 0.63 | 5.000 28.84 | 8.083 2.51 | 11.17 0.63
2.000 0.63 | 5.083 28.84 | 8.167 2.51 | 11.25 0.63
2.083 0.63 | 5.167 28.84 | 8.250 2.51 | 11.33 0.63
2.167 0.63 | 5.250 28.84 | 8.333 1.25 | 11.42 0.63
2.250 0.63 | 5.333 8.15 | 8.417 1.25 | 11.50 0.63
2.333 3.76 | 5.417 8.15 | 8.500 1.25 | 11.58 0.63
2.417 3.76 | 5.500 8.15 | 8.583 1.25 | 11.67 0.63
2.500 3.76 | 5.583 8.15 | 8.667 1.25 | 11.75 0.63
2.583 3.76 | 5.667 8.15 | 8.750 1.25 | 11.83 0.63
2.667 3.76 | 5.750 8.15 | 8.833 1.25 | 11.92 0.63
2.750 3.76 | 5.833 8.15 | 8.917 1.25 | 12.00 0.63
2.833 3.76 | 5.917 8.15 | 9.000 1.25 | 12.08 0.63
2.917 3.76 | 6.000 8.15 | 9.083 1.25 | 12.17 0.63
3.000 3.76 | 6.083 8.15 | 9.167 1.25 | 12.25 0.63
3.083 3.76 | 6.167 8.15 | 9.250 1.25 |

Max.Eff.Inten.(mm/hr)= 28.84 20.34
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS

PEAK FLOW (cms)= 0.07 0.02
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 50.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.52 0.80
0.092 (iii)

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min

Area (ha)= 0.51
Total Imp(%)= 63.67 Dir. Conn.(%)= 63.67

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.32 0.18
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63

2.833 3.76 5.917 8.15 9.000 1.25 12.08 0.63
2.917 3.76 6.000 8.15 9.083 1.25 12.17 0.63
3.000 3.76 6.083 8.15 9.167 1.25 12.25 0.63
3.083 3.76 6.167 8.15 9.250 1.25

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.03 0.01
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56

TOTALS

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0501):	1.35	0.092	5.25	50.33
+ ID2= 2 (0502):	0.51	0.035	5.25	51.47
ID = 3 (0020):	1.85	0.127	5.25	50.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min

Area (ha)= 1.41
Total Imp(%)= 47.02 Dir. Conn.(%)= 47.02

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.66 0.75
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63

Max.Eff.Inten.(mm/hr)= 28.84 20.34
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.05 0.04

TOTALS

0.089 (iii)

TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 60.71 32.80 45.91
TOTAL RAINFALL (mm)= 62.71 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.52 0.73

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min

Area (ha)= 2.06
Total Imp(%)= 62.58 Dir. Conn.(%)= 62.58

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.29 0.77
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63

1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.10 0.04
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56

TOTALS

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 1.79
STANDHYD (0801)	Total Imp(%)= 61.73 Dir. Conn.(%)= 61.73
ID= 1 DT= 5.0 min	

IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)= 1.11 0.69	
Dep. Storage (mm)= 2.00 1.50	
Average Slope (%)= 1.33 2.00	
Length (m)= 109.27 40.00	
Mannings n = 0.013 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.09 0.03
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56

TOTALS

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

COMMENTS:

** SIMULATION : 100 Year 12 Hour AES (Bloor, **

READ STORM	Filename: C:\Users\p004074G\AppData
	ata\Local\Temp\
	cfcbbcbdd-6ef4-434c-9e63-f8e28115e34b\d5379e32
Ptotal= 88.54 mm	Comments: 100 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	15.05	6.50	6.20	9.75	0.89
0.25	0.89	3.50	15.05	6.75	6.20	10.00	0.89
0.50	0.89	3.75	15.05	7.00	6.20	10.25	0.89
0.75	0.89	4.00	15.05	7.25	3.54	10.50	0.89
1.00	0.89	4.25	40.71	7.50	3.54	10.75	0.89
1.25	0.89	4.50	40.71	7.75	3.54	11.00	0.89
1.50	0.89	4.75	40.71	8.00	3.54	11.25	0.89
1.75	0.89	5.00	40.71	8.25	1.77	11.50	0.89
2.00	0.89	5.25	11.51	8.50	1.77	11.75	0.89
2.25	5.31	5.50	11.51	8.75	1.77	12.00	0.89
2.50	5.31	5.75	11.51	9.00	1.77		
2.75	5.31	6.00	11.51	9.25	0.89		
3.00	5.31	6.25	6.20	9.50	0.89		

CALIB	Area (ha)= 2.78
STANDHYD (0101)	Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00
ID= 1 DT= 5.0 min	

IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)= 1.33 1.44	
Dep. Storage (mm)= 2.00 5.00	
Average Slope (%)= 1.75 2.00	
Length (m)= 136.01 40.00	
Mannings n = 0.013 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voain.dat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\WH5\cd9a1a77-9ff1-45df-b597-776898829552\0dc2
c3eb-e73e-4ed9-af78-9c80c2ffba53\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\WH5\cd9a1a77-9ff1-45df-b597-776898829552\0dc2
c3eb-e73e-4ed9-af78-9c80c2ffba53\sce

DATE: 06/24/2024 TIME: 12:17:48

USER:

RUNOFF VOLUME (mm)= 86.54 32.20 58.28
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.36 0.66

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min

Area (ha)= 0.41
Total Imp(%)= 71.12 Dir. Conn.(%)= 71.12

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.29 0.12
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 19.81
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.15 0.07
TIME TO PEAK (hrs)= 5.25 5.33

TOTALS 0.215 (iii) 5.25

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.03 0.01
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 78.11
TOTAL RAINFALL (mm)= 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.88

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.56 0.30
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.06 0.02 0.088 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 76.35
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.86

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 1 (0101): 2.78 0.215 5.25 58.28
+ ID2= 2 (0102): 0.41 0.043 5.25 78.11
ID = 3 (0010): 3.19 0.258 5.25 60.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 3 (0010): 3.19 0.258 5.25 60.86
+ ID2= 2 (0103): 0.87 0.088 5.25 76.35
ID = 1 (0010): 4.06 0.346 5.25 64.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0501)
ID= 1 DT= 5.0 min
Area (ha)= 1.35
Total Imp(%)= 62.85 Dir. Conn.(%)= 62.85
IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.85 0.50
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 5.31 6.250 11.51 9.33 0.89
0.167 0.00 3.250 5.31 6.333 6.20 9.42 0.89
0.250 0.00 3.333 15.05 6.417 6.20 9.50 0.89
0.333 0.89 3.417 15.05 6.500 6.20 9.58 0.89
0.417 0.89 3.500 15.05 6.583 6.20 9.67 0.89
0.500 0.89 3.583 15.05 6.667 6.20 9.75 0.89
0.583 0.89 3.667 15.05 6.750 6.20 9.83 0.89
0.667 0.89 3.750 15.05 6.833 6.20 9.92 0.89
0.750 0.89 3.833 15.05 6.917 6.20 10.00 0.89
0.833 0.89 3.917 15.05 7.000 6.20 10.08 0.89
0.917 0.89 4.000 15.05 7.083 6.20 10.17 0.89
1.000 0.89 4.083 15.05 7.167 6.20 10.25 0.89
1.083 0.89 4.167 15.05 7.250 6.20 10.33 0.89
1.167 0.89 4.250 15.05 7.333 3.54 10.42 0.89
1.250 0.89 4.333 40.71 7.417 3.54 10.50 0.89
1.333 0.89 4.417 40.71 7.500 3.54 10.58 0.89
1.417 0.89 4.500 40.71 7.583 3.54 10.67 0.89
1.500 0.89 4.583 40.71 7.667 3.54 10.75 0.89
1.583 0.89 4.667 40.71 7.750 3.54 10.83 0.89
1.667 0.89 4.750 40.71 7.833 3.54 10.92 0.89
1.750 0.89 4.833 40.71 7.917 3.54 11.00 0.89
1.833 0.89 4.917 40.71 8.000 3.54 11.08 0.89
1.917 0.89 5.000 40.71 8.083 3.54 11.17 0.89
2.000 0.89 5.083 40.71 8.167 3.54 11.25 0.89
2.083 0.89 5.167 40.71 8.250 3.54 11.33 0.89
2.167 0.89 5.250 40.71 8.333 1.77 11.42 0.89
2.250 0.89 5.333 11.51 8.417 1.77 11.50 0.89
2.333 5.31 5.417 11.51 8.500 1.77 11.58 0.89
2.417 5.31 5.500 11.51 8.583 1.77 11.67 0.89
2.500 5.31 5.583 11.51 8.667 1.77 11.75 0.89
2.583 5.31 5.667 11.51 8.750 1.77 11.83 0.89
2.667 5.31 5.750 11.51 8.833 1.77 11.92 0.89
2.750 5.31 5.833 11.51 8.917 1.77 12.00 0.89
2.833 5.31 5.917 11.51 9.000 1.77 12.08 0.89
2.917 5.31 6.000 11.51 9.083 1.77 12.17 0.89
3.000 5.31 6.083 11.51 9.167 1.77 12.25 0.89
3.083 5.31 6.167 11.51 9.250 1.77

Max.Eff.Inten.(mm/hr)= 40.71 32.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS

PEAK FLOW (cms)= 0.10 0.04 0.136 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 54.99 74.81
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.62 0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min
Area (ha)= 0.51
Total Imp(%)= 63.67 Dir. Conn.(%)= 63.67
IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.32 0.18
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 5.31 6.250 11.51 9.33 0.89
0.167 0.00 3.250 5.31 6.333 6.20 9.42 0.89
0.250 0.00 3.333 15.05 6.417 6.20 9.50 0.89
0.333 0.89 3.417 15.05 6.500 6.20 9.58 0.89
0.417 0.89 3.500 15.05 6.583 6.20 9.67 0.89
0.500 0.89 3.583 15.05 6.667 6.20 9.75 0.89
0.583 0.89 3.667 15.05 6.750 6.20 9.83 0.89
0.667 0.89 3.750 15.05 6.833 6.20 9.92 0.89
0.750 0.89 3.833 15.05 6.917 6.20 10.00 0.89
0.833 0.89 3.917 15.05 7.000 6.20 10.08 0.89
0.917 0.89 4.000 15.05 7.083 6.20 10.17 0.89
1.000 0.89 4.083 15.05 7.167 6.20 10.25 0.89
1.083 0.89 4.167 15.05 7.250 6.20 10.33 0.89
1.167 0.89 4.250 15.05 7.333 3.54 10.42 0.89
1.250 0.89 4.333 40.71 7.417 3.54 10.50 0.89
1.333 0.89 4.417 40.71 7.500 3.54 10.58 0.89
1.417 0.89 4.500 40.71 7.583 3.54 10.67 0.89
1.500 0.89 4.583 40.71 7.667 3.54 10.75 0.89

1.583 0.89 4.667 40.71 7.750 3.54 10.83 0.89
1.667 0.89 4.750 40.71 7.833 3.54 10.92 0.89
1.750 0.89 4.833 40.71 7.917 3.54 11.00 0.89
1.833 0.89 4.917 40.71 8.000 3.54 11.08 0.89
1.917 0.89 5.000 40.71 8.083 3.54 11.17 0.89
2.000 0.89 5.083 40.71 8.167 3.54 11.25 0.89
2.083 0.89 5.167 40.71 8.250 3.54 11.33 0.89
2.167 0.89 5.250 40.71 8.333 1.77 11.42 0.89
2.250 0.89 5.333 11.51 8.417 1.77 11.50 0.89
2.333 5.31 5.417 11.51 8.500 1.77 11.58 0.89
2.417 5.31 5.500 11.51 8.583 1.77 11.67 0.89
2.500 5.31 5.583 11.51 8.667 1.77 11.75 0.89
2.583 5.31 5.667 11.51 8.750 1.77 11.83 0.89
2.667 5.31 5.750 11.51 8.833 1.77 11.92 0.89
2.750 5.31 5.833 11.51 8.917 1.77 12.00 0.89
2.833 5.31 5.917 11.51 9.000 1.77 12.08 0.89
2.917 5.31 6.000 11.51 9.083 1.77 12.17 0.89
3.000 5.31 6.083 11.51 9.167 1.77 12.25 0.89
3.083 5.31 6.167 11.51 9.250 1.77

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS
PEAK FLOW (cms)= 0.04 0.01 0.051 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 75.95
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.86

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)
1 + 2 = 3
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 1 (0501): 1.35 0.136 5.25 74.81
+ ID2= 2 (0502): 0.51 0.051 5.25 75.95
ID = 3 (0020): 1.85 0.187 5.25 75.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min

Area (ha)= 1.41
Total Imp(%)= 47.02 Dir. Conn.(%)= 47.02

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.66 0.75
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89

0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.15 0.06 0.207 (iii)
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 75.65
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.85

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.66
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.08 0.06 0.134 (iii)
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 54.99 69.82
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.62 0.79

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min

Area (ha)= 2.06
Total Imp(%)= 62.58 Dir. Conn.(%)= 62.58

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.29 0.77
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89

THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min

Area (ha)= 1.79
Total Imp(%)= 61.73 Dir. Conn.(%)= 61.73

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.11 0.69
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89

2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.13 0.06 0.180 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 75.40
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A L
V V I SSSSS UUUUU A A LLLLL
000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y M M 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\0855
988a-adfe-4676-89b9-3b96ce902102\sce

Summary filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\0855
988a-adfe-4676-89b9-3b96ce902102\sce

DATE: 06/24/2024

TIME: 12:17:47

USER:

COMMENTS: _____

** SIMULATION : 2 Year 12 Hour AES (Bloor, TR **

READ STORM File: C:\Users\p004074G\AppData\Local\Temp\cfcbbcbdd-6ef4-434c-9e63-f8e28115e34b\13526e56
Ptotal= 42.00 mm Comments: 2 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	7.14	6.50	2.94	9.75	0.42
0.25	0.42	3.50	7.14	6.75	2.94	10.00	0.42
0.50	0.42	3.75	7.14	7.00	2.94	10.25	0.42
0.75	0.42	4.00	7.14	7.25	1.68	10.50	0.42
1.00	0.42	4.25	19.32	7.50	1.68	10.75	0.42
1.25	0.42	4.50	19.32	7.75	1.68	11.00	0.42
1.50	0.42	4.75	19.32	8.00	1.68	11.25	0.42
1.75	0.42	5.00	19.32	8.25	0.84	11.50	0.42
2.00	0.42	5.25	5.46	8.50	0.84	11.75	0.42
2.25	2.52	5.50	5.46	8.75	0.84	12.00	0.42
2.50	2.52	5.75	5.46	9.00	0.84		
2.75	2.52	6.00	5.46	9.25	0.42		
3.00	2.52	6.25	2.94	9.50	0.42		

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min
Area (ha)= 2.78
Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.33 1.44
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42

2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 4.86
over (min) 5.00 30.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.07 0.02 0.087 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 8.04 23.38
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.19 0.56

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min
Area (ha)= 0.41
Total Imp(%)= 71.12 Dir. Conn.(%)= 71.12

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.29 0.12
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42

0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.02 0.00 0.019 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 33.98
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.81

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0103)	Area (ha)= 0.87
ID= 1 DT= 5.0 min	Total Imp(%)= 65.00 Dir. Conn.(%)= 65.00

IMPERVIOUS			PERVIOUS (i)		
Surface Area	(ha)=	0.56		0.30	
Dep. Storage	(mm)=	2.00		1.50	
Average Slope	(%)=	1.62		2.00	
Length	(m)=	76.12		40.00	
Mannings n	=	0.013		0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----											
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42				
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42				
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42				
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42				
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42				
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42				
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42				
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42				
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42				
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42				
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42				
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42				
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42				
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42				
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42				
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42				
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42				
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42				
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42				
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42				
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42				
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42				
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42				
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42				
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42				
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42				
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42				
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42				
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42				

2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.03 0.01 0.038 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.72
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.78

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0501)	Area (ha)= 1.35
ID= 1 DT= 5.0 min	Total Imp(%)= 62.85 Dir. Conn.(%)= 62.85

IMPERVIOUS			PERVIOUS (i)		
Surface Area	(ha)=	0.85		0.50	
Dep. Storage	(mm)=	2.00		6.00	
Average Slope	(%)=	0.29		2.00	
Length	(m)=	94.83		40.00	
Mannings n	=	0.013		0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----											
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42				
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42				
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42				
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42				
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42				
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42				
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42				
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42				
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42				
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42				
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42				
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42				
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42				
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42				
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42				
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42				
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42				
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42				
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42				
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42				
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42				
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42				
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42				
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42				
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42				
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42				
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42				
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42				
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42				

ADD HYD (0010)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):	2.78	0.087	5.25	23.38
+ ID2= 2 (0102):	0.41	0.019	5.25	33.98
ID = 3 (0010):	3.19	0.106	5.25	24.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0010):	3.19	0.106	5.25	24.76
+ ID2= 2 (0103):	0.87	0.038	5.25	32.72
ID = 1 (0010):	4.06	0.145	5.25	26.46

2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 10.69
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.05 0.01 0.058 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 16.76 31.36
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.40 0.75

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min
Area (ha)= 0.51
Total Imp(%)= 63.67 Dir. Conn.(%)= 63.67

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.32 0.18
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42

0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.02 0.00 0.022 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.43
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.77

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)
1 + 2 = 3
ID1= 1 (0501): 1.35 0.058 5.25 31.36
+ ID2= 2 (0502): 0.51 0.022 5.25 32.43
=====

ID = 3 (0020): 1.85 0.080 5.25 31.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min
Area (ha)= 1.41
Total Imp(%)= 47.02 Dir. Conn.(%)= 47.02

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.66 0.75
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42

1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 10.69
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.04 0.02 0.054 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 16.76 27.68
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.40 0.66

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min
Area (ha)= 2.06
Total Imp(%)= 62.58 Dir. Conn.(%)= 62.58

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.29 0.77

Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36

over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.07 0.02 0.090 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.22
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.77

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 61.73 Dir. Conn.(%)= 61.73

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.11 0.69
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42

1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.06 0.02 0.078 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.04
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.76

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L

V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\0a4
5b9e-cf0d-4252-bb80-6c27781ebb05\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\0a4
5b9e-cf0d-4252-bb80-6c27781ebb05\sce

DATE: 06/24/2024 TIME: 12:17:49

USER:

COMMENTS:

** SIMULATION : 25 Year 12 Hour AES (Bloor, T **

READ STORM
Filename: C:\Users\p004074G\AppData\Local\Temp\
cfcbccbd-6ef4-434c-9e63-f8e28115e34b\ab0d04d0
Ptotal= 73.10 mm
Comments: 25 Year 12 Hour AES (Bloor, TRCA)

TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr

0.00	0.00	3.25	12.43	6.50	5.12	9.75	0.73
0.25	0.73	3.50	12.43	6.75	5.12	10.00	0.73
0.50	0.73	3.75	12.43	7.00	5.12	10.25	0.73
0.75	0.73	4.00	12.43	7.25	2.92	10.50	0.73
1.00	0.73	4.25	33.63	7.50	2.92	10.75	0.73
1.25	0.73	4.50	33.63	7.75	2.92	11.00	0.73
1.50	0.73	4.75	33.63	8.00	2.92	11.25	0.73
1.75	0.73	5.00	33.63	8.25	1.46	11.50	0.73
2.00	0.73	5.25	9.50	8.50	1.46	11.75	0.73
2.25	4.39	5.50	9.50	8.75	1.46	12.00	0.73
2.50	4.39	5.75	9.50	9.00	1.46		
2.75	4.39	6.00	9.50	9.25	0.73		
3.00	4.39	6.25	5.12	9.50	0.73		

CALIB	
STANDHYD (0101)	
ID= 1 DT= 5.0 min	

Area (ha)=	2.78
Total Imp(%)=	48.00
Dir. Conn.(%)=	48.00
IMPERVIOUS	
PERVIOUS (i)	
Surface Area (ha)=	1.33
Dep. Storage (mm)=	2.00
Average Slope (%)=	1.75
Length (m)=	136.01
Mannings n	0.013

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73

1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)=	33.63	14.02
over (min)	5.00	25.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS

PEAK FLOW (cms)=	0.12	0.05	0.170 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	71.10	23.04	46.10
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.97	0.32	0.63

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0102)	
ID= 1 DT= 5.0 min	

Area (ha)=	0.41
Total Imp(%)=	71.12
Dir. Conn.(%)=	71.12

IMPERVIOUS	
PERVIOUS (i)	
Surface Area (ha)=	0.29
Dep. Storage (mm)=	2.00
	1.50

Average Slope (%)=	2.50	2.00
Length (m)=	52.54	40.00
Mannings n	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)=	33.63	25.46
over (min)	5.00	20.00

Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS

PEAK FLOW (cms)=	0.03	0.01	0.035 (iii)
TIME TO PEAK (hrs)=	5.25	5.25	5.25
RUNOFF VOLUME (mm)=	71.10	44.03	63.26
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.97	0.60	0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0103)	
ID= 1 DT= 5.0 min	

Area (ha)=	0.87
Total Imp(%)=	65.00
Dir. Conn.(%)=	65.00

IMPERVIOUS	
PERVIOUS (i)	
Surface Area (ha)=	0.56
Dep. Storage (mm)=	2.00
	1.50
Average Slope (%)=	1.62
Length (m)=	76.12
Mannings n	0.013
	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73

IMPERVIOUS PERVIOUS (i)

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS
PEAK FLOW (cms)= 0.03 0.01 0.041 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 71.10 44.03 61.25
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)
1 + 2 = 3
ID1= 1 (0501): 1.35 0.109 5.25 60.10
+ ID2= 2 (0502): 0.51 0.041 5.25 61.25
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min
Area (ha)= 1.41
Total Imp(%)= 47.02 Dir. Conn.(%)= 47.02

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.66 0.75
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr

0.083 0.00 3.167 4.39 6.250 9.50 9.33 0.73
0.167 0.00 3.250 4.39 6.333 5.12 9.42 0.73
0.250 0.00 3.333 12.43 6.417 5.12 9.50 0.73
0.333 0.73 3.417 12.43 6.500 5.12 9.58 0.73
0.417 0.73 3.500 12.43 6.583 5.12 9.67 0.73
0.500 0.73 3.583 12.43 6.667 5.12 9.75 0.73
0.583 0.73 3.667 12.43 6.750 5.12 9.83 0.73
0.667 0.73 3.750 12.43 6.833 5.12 9.92 0.73
0.750 0.73 3.833 12.43 6.917 5.12 10.00 0.73
0.833 0.73 3.917 12.43 7.000 5.12 10.08 0.73
0.917 0.73 4.000 12.43 7.083 5.12 10.17 0.73
1.000 0.73 4.083 12.43 7.167 5.12 10.25 0.73
1.083 0.73 4.167 12.43 7.250 5.12 10.33 0.73
1.167 0.73 4.250 12.43 7.333 5.12 10.42 0.73
1.250 0.73 4.333 33.63 7.417 2.92 10.50 0.73
1.333 0.73 4.417 33.63 7.500 2.92 10.58 0.73
1.417 0.73 4.500 33.63 7.583 2.92 10.67 0.73
1.500 0.73 4.583 33.63 7.667 2.92 10.75 0.73
1.583 0.73 4.667 33.63 7.750 2.92 10.83 0.73
1.667 0.73 4.750 33.63 7.833 2.92 10.92 0.73
1.750 0.73 4.833 33.63 7.917 2.92 11.00 0.73
1.833 0.73 4.917 33.63 8.000 2.92 11.08 0.73
1.917 0.73 5.000 33.63 8.083 2.92 11.17 0.73
2.000 0.73 5.083 33.63 8.167 2.92 11.25 0.73
2.083 0.73 5.167 33.63 8.250 2.92 11.33 0.73
2.167 0.73 5.250 33.63 8.333 1.46 11.42 0.73
2.250 0.73 5.333 9.50 8.417 1.46 11.50 0.73
2.333 4.39 5.417 9.50 8.500 1.46 11.58 0.73
2.417 4.39 5.500 9.50 8.583 1.46 11.67 0.73
2.500 4.39 5.583 9.50 8.667 1.46 11.75 0.73
2.583 4.39 5.667 9.50 8.750 1.46 11.83 0.73
2.667 4.39 5.750 9.50 8.833 1.46 11.92 0.73
2.750 4.39 5.833 9.50 8.917 1.46 12.00 0.73
2.833 4.39 5.917 9.50 9.000 1.46 12.08 0.73
2.917 4.39 6.000 9.50 9.083 1.46 12.17 0.73
3.000 4.39 6.083 9.50 9.167 1.46 12.25 0.73
3.083 4.39 6.167 9.50 9.250 1.46

Max.Eff.Inten.(mm/hr)= 33.63 25.27
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.06 0.05 0.107 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 71.10 41.52 55.42
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.57 0.76

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min
Area (ha)= 2.06
Total Imp(%)= 62.58 Dir. Conn.(%)= 62.58

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.29 0.77
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 4.39 6.250 9.50 9.33 0.73
0.167 0.00 3.250 4.39 6.333 5.12 9.42 0.73
0.250 0.00 3.333 12.43 6.417 5.12 9.50 0.73
0.333 0.73 3.417 12.43 6.500 5.12 9.58 0.73
0.417 0.73 3.500 12.43 6.583 5.12 9.67 0.73
0.500 0.73 3.583 12.43 6.667 5.12 9.75 0.73
0.583 0.73 3.667 12.43 6.750 5.12 9.83 0.73
0.667 0.73 3.750 12.43 6.833 5.12 9.92 0.73
0.750 0.73 3.833 12.43 6.917 5.12 10.00 0.73
0.833 0.73 3.917 12.43 7.000 5.12 10.08 0.73
0.917 0.73 4.000 12.43 7.083 5.12 10.17 0.73
1.000 0.73 4.083 12.43 7.167 5.12 10.25 0.73
1.083 0.73 4.167 12.43 7.250 5.12 10.33 0.73
1.167 0.73 4.250 12.43 7.333 2.92 10.42 0.73
1.250 0.73 4.333 33.63 7.417 2.92 10.50 0.73
1.333 0.73 4.417 33.63 7.500 2.92 10.58 0.73
1.417 0.73 4.500 33.63 7.583 2.92 10.67 0.73
1.500 0.73 4.583 33.63 7.667 2.92 10.75 0.73
1.583 0.73 4.667 33.63 7.750 2.92 10.83 0.73
1.667 0.73 4.750 33.63 7.833 2.92 10.92 0.73
1.750 0.73 4.833 33.63 7.917 2.92 11.00 0.73
1.833 0.73 4.917 33.63 8.000 2.92 11.08 0.73
1.917 0.73 5.000 33.63 8.083 2.92 11.17 0.73
2.000 0.73 5.083 33.63 8.167 2.92 11.25 0.73

2.083 0.73 5.167 33.63 8.250 2.92 11.33 0.73
2.167 0.73 5.250 33.63 8.333 1.46 11.42 0.73
2.250 0.73 5.333 9.50 8.417 1.46 11.50 0.73
2.333 4.39 5.417 9.50 8.500 1.46 11.58 0.73
2.417 4.39 5.500 9.50 8.583 1.46 11.67 0.73
2.500 4.39 5.583 9.50 8.667 1.46 11.75 0.73
2.583 4.39 5.667 9.50 8.750 1.46 11.83 0.73
2.667 4.39 5.750 9.50 8.833 1.46 11.92 0.73
2.750 4.39 5.833 9.50 8.917 1.46 12.00 0.73
2.833 4.39 5.917 9.50 9.000 1.46 12.08 0.73
2.917 4.39 6.000 9.50 9.083 1.46 12.17 0.73
3.000 4.39 6.083 9.50 9.167 1.46 12.25 0.73
3.083 4.39 6.167 9.50 9.250 1.46

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.12 0.05 0.168 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 71.10 44.03 60.97
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.83

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 61.73 Dir. Conn.(%)= 61.73

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.11 0.69
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.10 0.04 0.146 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 71.10 44.03 60.74
TOTAL RAINFALL (mm)= 73.10 73.10 73.10

RUNOFF COEFFICIENT = 0.97 0.60 0.83

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

V V I SSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A L
V V I SS U U A A L
VV I SSSS UUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000

```

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\c5f0
c9f4-f591-41d8-bfe3-de743a9b42df\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\c5f0
c9f4-f591-41d8-bfe3-de743a9b42df\sce

DATE: 06/24/2024 TIME: 12:17:48

USER:

COMMENTS: _____

** SIMULATION : 5 Year 12 Hour AES (Bloor, TR **

READ STORM Filename: C:\Users\p004074G\AppData
ata\Local\Temp\
cfbcbbd-6ef4-434c-9e63-f8e28115e34b\e7069398
Ptotal= 54.38 mm Comments: 5 Year 12 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	3.25	9.25	6.50	3.81	9.75	0.54
0.25	0.54	3.50	9.25	6.75	3.81	10.00	0.54
0.50	0.54	3.75	9.25	7.00	3.81	10.25	0.54
0.75	0.54	4.00	9.25	7.25	2.18	10.50	0.54
1.00	0.54	4.25	25.02	7.50	2.18	10.75	0.54
1.25	0.54	4.50	25.02	7.75	2.18	11.00	0.54
1.50	0.54	4.75	25.02	8.00	2.18	11.25	0.54
1.75	0.54	5.00	25.02	8.25	1.09	11.50	0.54
2.00	0.54	5.25	7.07	8.50	1.09	11.75	0.54
2.25	3.26	5.50	7.07	8.75	1.09	12.00	0.54
2.50	3.26	5.75	7.07	9.00	1.09		
2.75	3.26	6.00	7.07	9.25	0.54		
3.00	3.26	6.25	3.81	9.50	0.54		

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min
Area (ha)= 2.78
Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00

IMPERVIOUS PERVIOUS (i)
(ha)= 1.33 1.44
(mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54

0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 8.23
over (min) 5.00 30.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.09 0.03 0.119 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 13.36 32.08
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.25 0.59

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0102)	Area (ha)= 0.41		
ID= 1 DT= 5.0 min	Total Imp(%)= 71.12	Dir. Conn.(%)= 71.12	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.29	0.12
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	2.50	2.00
Length (m)=	52.54	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54

2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)=	25.02	16.91
over (min)	5.00	25.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS			
PEAK FLOW (cms)=	0.02	0.00	0.025 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	52.38	28.62	45.49
TOTAL RAINFALL (mm)=	54.38	54.38	54.38
RUNOFF COEFFICIENT =	0.96	0.53	0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0103)	Area (ha)= 0.87		
ID= 1 DT= 5.0 min	Total Imp(%)= 65.00	Dir. Conn.(%)= 65.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.56	0.30
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	1.62	2.00
Length (m)=	76.12	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)=	25.02	16.91
over (min)	5.00	25.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS			
PEAK FLOW (cms)=	0.04	0.01	0.051 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	52.38	28.62	44.05
TOTAL RAINFALL (mm)=	54.38	54.38	54.38
RUNOFF COEFFICIENT =	0.96	0.53	0.81

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	2.78	0.119	5.25	32.08
+ ID2= 2 (0102):	0.41	0.025	5.25	45.49
=====				
ID = 3 (0010):	3.19	0.144	5.25	33.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0010):	3.19	0.144	5.25	33.82
+ ID2= 2 (0103):	0.87	0.051	5.25	44.05
=====				
ID = 1 (0010):	4.06	0.196	5.25	36.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0501)	Area (ha)= 1.35		
ID= 1 DT= 5.0 min	Total Imp(%)= 62.85	Dir. Conn.(%)= 62.85	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.85	0.50
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.29	2.00
Length (m)=	94.83	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.48
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.06 0.02 0.078 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 26.09 42.60
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.48 0.78

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min

Area (ha)= 0.51
Total Imp(%)= 63.67 Dir. Conn.(%)= 63.67

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.32 0.18
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54

2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.02 0.01 0.030 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 28.62 43.72
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.80

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ID= 1 DT= 5.0 min | Total Imp(%)= 47.02 Dir. Conn.(%)= 47.02

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.66 0.75
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54

ADD HYD (0020)
1 + 2 = 3

AREA	QPEAK	TPEAK	R.V.
(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0501): 1.35	0.078	5.25	42.60
+ ID2= 2 (0502): 0.51	0.030	5.25	43.72
=====			
ID = 3 (0020): 1.85	0.108	5.25	42.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601) | Area (ha)= 1.41

3.000 3.26 | 6.083 7.07 | 9.167 1.09 | 12.25 0.54
3.083 3.26 | 6.167 7.07 | 9.250 1.09 |
Max.Eff.Inten.(mm/hr)= 25.02 16.48
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
PEAK FLOW (cms)= 0.05 0.03 *TOTALS*
TIME TO PEAK (hrs)= 5.25 5.33 0.074 (iii)
RUNOFF VOLUME (mm)= 52.38 26.09 38.44
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.48 0.71

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min
Area (ha)= 2.06
Total Imp(%)= 62.58 Dir. Conn.(%)= 62.58

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.29 0.77
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 3.26 6.250 7.07 9.33 0.54
0.167 0.00 3.250 3.26 6.333 3.81 9.42 0.54
0.250 0.00 3.333 9.25 6.417 3.81 9.50 0.54
0.333 0.54 3.417 9.25 6.500 3.81 9.58 0.54
0.417 0.54 3.500 9.25 6.583 3.81 9.67 0.54
0.500 0.54 3.583 9.25 6.667 3.81 9.75 0.54
0.583 0.54 3.667 9.25 6.750 3.81 9.83 0.54
0.667 0.54 3.750 9.25 6.833 3.81 9.92 0.54
0.750 0.54 3.833 9.25 6.917 3.81 10.00 0.54

0.833 0.54 | 3.917 9.25 | 7.000 3.81 | 10.08 0.54
0.917 0.54 | 4.000 9.25 | 7.083 3.81 | 10.17 0.54
1.000 0.54 | 4.083 9.25 | 7.167 3.81 | 10.25 0.54
1.083 0.54 | 4.167 9.25 | 7.250 3.81 | 10.33 0.54
1.167 0.54 | 4.250 9.25 | 7.333 3.81 | 10.42 0.54
1.250 0.54 | 4.333 25.02 | 7.417 2.18 | 10.50 0.54
1.333 0.54 | 4.417 25.02 | 7.500 2.18 | 10.58 0.54
1.417 0.54 | 4.500 25.02 | 7.583 2.18 | 10.67 0.54
1.500 0.54 | 4.583 25.02 | 7.667 2.18 | 10.75 0.54
1.583 0.54 | 4.667 25.02 | 7.750 2.18 | 10.83 0.54
1.667 0.54 | 4.750 25.02 | 7.833 2.18 | 10.92 0.54
1.750 0.54 | 4.833 25.02 | 7.917 2.18 | 11.00 0.54
1.833 0.54 | 4.917 25.02 | 8.000 2.18 | 11.08 0.54
1.917 0.54 | 5.000 25.02 | 8.083 2.18 | 11.17 0.54
2.000 0.54 | 5.083 25.02 | 8.167 2.18 | 11.25 0.54
2.083 0.54 | 5.167 25.02 | 8.250 2.18 | 11.33 0.54
2.167 0.54 | 5.250 25.02 | 8.333 1.09 | 11.42 0.54
2.250 0.54 | 5.333 7.07 | 8.417 1.09 | 11.50 0.54
2.333 3.26 | 5.417 7.07 | 8.500 1.09 | 11.58 0.54
2.417 3.26 | 5.500 7.07 | 8.583 1.09 | 11.67 0.54
2.500 3.26 | 5.583 7.07 | 8.667 1.09 | 11.75 0.54
2.583 3.26 | 5.667 7.07 | 8.750 1.09 | 11.83 0.54
2.667 3.26 | 5.750 7.07 | 8.833 1.09 | 11.92 0.54
2.750 3.26 | 5.833 7.07 | 8.917 1.09 | 12.00 0.54
2.833 3.26 | 5.917 7.07 | 9.000 1.09 | 12.08 0.54
2.917 3.26 | 6.000 7.07 | 9.083 1.09 | 12.17 0.54
3.000 3.26 | 6.083 7.07 | 9.167 1.09 | 12.25 0.54
3.083 3.26 | 6.167 7.07 | 9.250 1.09 |

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
PEAK FLOW (cms)= 0.09 0.03 *TOTALS*
TIME TO PEAK (hrs)= 5.25 5.33 0.120 (iii)
RUNOFF VOLUME (mm)= 52.38 28.62 43.48
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.80

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 61.73 Dir. Conn.(%)= 61.73

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.11 0.69
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 3.26 6.250 7.07 9.33 0.54
0.167 0.00 3.250 3.26 6.333 3.81 9.42 0.54
0.250 0.00 3.333 9.25 6.417 3.81 9.50 0.54
0.333 0.54 3.417 9.25 6.500 3.81 9.58 0.54
0.417 0.54 3.500 9.25 6.583 3.81 9.67 0.54
0.500 0.54 3.583 9.25 6.667 3.81 9.75 0.54
0.583 0.54 3.667 9.25 6.750 3.81 9.83 0.54
0.667 0.54 3.750 9.25 6.833 3.81 9.92 0.54
0.750 0.54 3.833 9.25 6.917 3.81 10.00 0.54
0.833 0.54 3.917 9.25 7.000 3.81 10.08 0.54
0.917 0.54 4.000 9.25 7.083 3.81 10.17 0.54
1.000 0.54 4.083 9.25 7.167 3.81 10.25 0.54
1.083 0.54 4.167 9.25 7.250 3.81 10.33 0.54
1.167 0.54 4.250 9.25 7.333 2.18 10.42 0.54
1.250 0.54 4.333 25.02 7.417 2.18 10.50 0.54
1.333 0.54 4.417 25.02 7.500 2.18 10.58 0.54
1.417 0.54 4.500 25.02 7.583 2.18 10.67 0.54
1.500 0.54 4.583 25.02 7.667 2.18 10.75 0.54
1.583 0.54 4.667 25.02 7.750 2.18 10.83 0.54
1.667 0.54 4.750 25.02 7.833 2.18 10.92 0.54
1.750 0.54 4.833 25.02 7.917 2.18 11.00 0.54
1.833 0.54 4.917 25.02 8.000 2.18 11.08 0.54
1.917 0.54 5.000 25.02 8.083 2.18 11.17 0.54
2.000 0.54 5.083 25.02 8.167 2.18 11.25 0.54
2.083 0.54 5.167 25.02 8.250 2.18 11.33 0.54
2.167 0.54 5.250 25.02 8.333 1.09 11.42 0.54
2.250 0.54 5.333 7.07 8.417 1.09 11.50 0.54
2.333 3.26 5.417 7.07 8.500 1.09 11.58 0.54
2.417 3.26 5.500 7.07 8.583 1.09 11.67 0.54
2.500 3.26 5.583 7.07 8.667 1.09 11.75 0.54
2.583 3.26 5.667 7.07 8.750 1.09 11.83 0.54
2.667 3.26 5.750 7.07 8.833 1.09 11.92 0.54
2.750 3.26 5.833 7.07 8.917 1.09 12.00 0.54

2.833 3.26 | 5.917 7.07 | 9.000 1.09 | 12.08 0.54
2.917 3.26 | 6.000 7.07 | 9.083 1.09 | 12.17 0.54
3.000 3.26 | 6.083 7.07 | 9.167 1.09 | 12.25 0.54
3.083 3.26 | 6.167 7.07 | 9.250 1.09 |

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
PEAK FLOW (cms)= 0.08 0.03 *TOTALS*
TIME TO PEAK (hrs)= 5.25 5.33 0.104 (iii)
RUNOFF VOLUME (mm)= 52.38 28.62 43.28
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.80

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y M M M M O O
O O T T H H Y Y M M O O
000 T T H H Y M M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voin.dat
Output filename:
C:\Users\p0040746\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\f83e

3919-6d6e-4190-ae00-fc435deceb5e\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\83e
3919-6d6e-4190-ae00-fc435deceb5e\sce

DATE: 06/24/2024 TIME: 12:17:49

USER:

COMMENTS: _____

** SIMULATION : 50 Year 12 Hour AES (Bloor, T **

READ STORM	Filename: C:\Users\p004074G\AppData\Local\Temp\cfbcbbd-6ef4-434c-9e63-f8e28115e34b\cc7e037c
Ptotal= 80.82 mm	Comments: 50 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr		hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	13.74	6.50	5.66	9.75	0.81	
0.25	0.81	3.50	13.74	6.75	5.66	10.00	0.81	
0.50	0.81	3.75	13.74	7.00	5.66	10.25	0.81	
0.75	0.81	4.00	13.74	7.25	3.23	10.50	0.81	
1.00	0.81	4.25	37.17	7.50	3.23	10.75	0.81	
1.25	0.81	4.50	37.17	7.75	3.23	11.00	0.81	
1.50	0.81	4.75	37.17	8.00	3.23	11.25	0.81	
1.75	0.81	5.00	37.17	8.25	1.62	11.50	0.81	
2.00	0.81	5.25	10.50	8.50	1.62	11.75	0.81	
2.25	4.85	5.50	10.50	8.75	1.62	12.00	0.81	
2.50	4.85	5.75	10.50	9.00	1.62			
2.75	4.85	6.00	10.50	9.25	0.81			
3.00	4.85	6.25	5.66	9.50	0.81			

CALIB	
STANDHYD (0101)	Area (ha)= 2.78
ID= 1 DT= 5.0 min	Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.33	1.44
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.75	2.00
Length (m)=	136.01	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----									
TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr		hrs	mm/hr	hrs	mm/hr	
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81		
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81		
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81		
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81		
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81		
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81		
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81		
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81		
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81		
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81		
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81		
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81		
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81		
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81		
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81		
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81		
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81		
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81		
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81		
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81		
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81		
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81		
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81		
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81		
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81		
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81		
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81		
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81		
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81		
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81		
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81		
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81		
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81		
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81		
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81		
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81		

3.083 4.85 6.167 10.50 9.250 1.62 |

Max.Eff.Inten.(mm/hr)=	37.17	17.01
over (min)	5.00	25.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06
TOTALS		
PEAK FLOW (cms)=	0.14	0.06 0.193 (iii)
TIME TO PEAK (hrs)=	5.25	5.33 5.25
RUNOFF VOLUME (mm)=	78.82	27.50 52.13
TOTAL RAINFALL (mm)=	80.82	80.82 80.82
RUNOFF COEFFICIENT =	0.98	0.34 0.65

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0102)	Area (ha)= 0.41
ID= 1 DT= 5.0 min	Total Imp(%)= 71.12 Dir. Conn.(%)= 71.12

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.29	0.12
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	2.50	2.00
Length (m)=	52.54	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----									
TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN	
hrs	mm/hr	hrs	mm/hr		hrs	mm/hr	hrs	mm/hr	
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81		
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81		
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81		
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81		
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81		
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81		
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81		
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81		
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81		
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81		

0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81		
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81		
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81		
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81		
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81		
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81		
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81		
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81		
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81		
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81		
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81		
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81		
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81		
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81		
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81		
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81		
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81		
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81		
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81		
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81		
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81		
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81		
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81		
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81		
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81		
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81		
3.083	4.85	6.167	10.50	9.250	1.62				

Max.Eff.Inten.(mm/hr)=	37.17	29.06
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06
TOTALS		
PEAK FLOW (cms)=	0.03	0.01 0.039 (iii)
TIME TO PEAK (hrs)=	5.25	5.25 5.25
RUNOFF VOLUME (mm)=	78.82	50.68 70.67
TOTAL RAINFALL (mm)=	80.82	80.82 80.82
RUNOFF COEFFICIENT =	0.98	0.63 0.87

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

| STANDHYD (0103) | Area (ha)= 0.87
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 65.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.56 0.30
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 4.85 6.250 10.50 9.33 0.81
0.167 0.00 3.250 4.85 6.333 5.66 9.42 0.81
0.250 0.00 3.333 13.74 6.417 5.66 9.50 0.81
0.333 0.81 3.417 13.74 6.500 5.66 9.58 0.81
0.417 0.81 3.500 13.74 6.583 5.66 9.67 0.81
0.500 0.81 3.583 13.74 6.667 5.66 9.75 0.81
0.583 0.81 3.667 13.74 6.750 5.66 9.83 0.81
0.667 0.81 3.750 13.74 6.833 5.66 9.92 0.81
0.750 0.81 3.833 13.74 6.917 5.66 10.00 0.81
0.833 0.81 3.917 13.74 7.000 5.66 10.08 0.81
0.917 0.81 4.000 13.74 7.083 5.66 10.17 0.81
1.000 0.81 4.083 13.74 7.167 5.66 10.25 0.81
1.083 0.81 4.167 13.74 7.250 5.66 10.33 0.81
1.167 0.81 4.250 13.74 7.333 3.23 10.42 0.81
1.250 0.81 4.333 37.17 7.417 3.23 10.50 0.81
1.333 0.81 4.417 37.17 7.500 3.23 10.58 0.81
1.417 0.81 4.500 37.17 7.583 3.23 10.67 0.81
1.500 0.81 4.583 37.17 7.667 3.23 10.75 0.81
1.583 0.81 4.667 37.17 7.750 3.23 10.83 0.81
1.667 0.81 4.750 37.17 7.833 3.23 10.92 0.81
1.750 0.81 4.833 37.17 7.917 3.23 11.00 0.81
1.833 0.81 4.917 37.17 8.000 3.23 11.08 0.81
1.917 0.81 5.000 37.17 8.083 3.23 11.17 0.81
2.000 0.81 5.083 37.17 8.167 3.23 11.25 0.81
2.083 0.81 5.167 37.17 8.250 3.23 11.33 0.81
2.167 0.81 5.250 37.17 8.333 1.62 11.42 0.81
2.250 0.81 5.333 10.50 8.417 1.62 11.50 0.81
2.333 4.85 5.417 10.50 8.500 1.62 11.58 0.81
2.417 4.85 5.500 10.50 8.583 1.62 11.67 0.81
2.500 4.85 5.583 10.50 8.667 1.62 11.75 0.81
2.583 4.85 5.667 10.50 8.750 1.62 11.83 0.81
2.667 4.85 5.750 10.50 8.833 1.62 11.92 0.81
2.750 4.85 5.833 10.50 8.917 1.62 12.00 0.81
2.833 4.85 5.917 10.50 9.000 1.62 12.08 0.81

2.917 4.85 | 6.000 10.50 | 9.083 1.62 | 12.17 0.81
3.000 4.85 | 6.083 10.50 | 9.167 1.62 | 12.25 0.81
3.083 4.85 | 6.167 10.50 | 9.250 1.62 |

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS
PEAK FLOW (cms)= 0.06 0.02 0.080 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68 68.96
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63 0.85

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0010) |
| 1 + 2 = 3 |
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0101): 2.78 0.193 5.25 52.13
+ ID2= 2 (0102): 0.41 0.039 5.25 70.67
===== ID = 3 (0010): 3.19 0.231 5.25 54.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0010) |
| 3 + 2 = 1 |
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 3 (0010): 3.19 0.231 5.25 54.54
+ ID2= 2 (0103): 0.87 0.080 5.25 68.96
===== ID = 1 (0010): 4.06 0.311 5.25 57.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |

| STANDHYD (0501) | Area (ha)= 1.35
| ID= 1 DT= 5.0 min | Total Imp(%)= 62.85 Dir. Conn.(%)= 62.85

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.85 0.50
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 4.85 6.250 10.50 9.33 0.81
0.167 0.00 3.250 4.85 6.333 5.66 9.42 0.81
0.250 0.00 3.333 13.74 6.417 5.66 9.50 0.81
0.333 0.81 3.417 13.74 6.500 5.66 9.58 0.81
0.417 0.81 3.500 13.74 6.583 5.66 9.67 0.81
0.500 0.81 3.583 13.74 6.667 5.66 9.75 0.81
0.583 0.81 3.667 13.74 6.750 5.66 9.83 0.81
0.667 0.81 3.750 13.74 6.833 5.66 9.92 0.81
0.750 0.81 3.833 13.74 6.917 5.66 10.00 0.81
0.833 0.81 3.917 13.74 7.000 5.66 10.08 0.81
0.917 0.81 4.000 13.74 7.083 5.66 10.17 0.81
1.000 0.81 4.083 13.74 7.167 5.66 10.25 0.81
1.083 0.81 4.167 13.74 7.250 5.66 10.33 0.81
1.167 0.81 4.250 13.74 7.333 3.23 10.42 0.81
1.250 0.81 4.333 37.17 7.417 3.23 10.50 0.81
1.333 0.81 4.417 37.17 7.500 3.23 10.58 0.81
1.417 0.81 4.500 37.17 7.583 3.23 10.67 0.81
1.500 0.81 4.583 37.17 7.667 3.23 10.75 0.81
1.583 0.81 4.667 37.17 7.750 3.23 10.83 0.81
1.667 0.81 4.750 37.17 7.833 3.23 10.92 0.81
1.750 0.81 4.833 37.17 7.917 3.23 11.00 0.81
1.833 0.81 4.917 37.17 8.000 3.23 11.08 0.81
1.917 0.81 5.000 37.17 8.083 3.23 11.17 0.81
2.000 0.81 5.083 37.17 8.167 3.23 11.25 0.81
2.083 0.81 5.167 37.17 8.250 3.23 11.33 0.81
2.167 0.81 5.250 37.17 8.333 1.62 11.42 0.81
2.250 0.81 5.333 10.50 8.417 1.62 11.50 0.81
2.333 4.85 5.417 10.50 8.500 1.62 11.58 0.81
2.417 4.85 5.500 10.50 8.583 1.62 11.67 0.81
2.500 4.85 5.583 10.50 8.667 1.62 11.75 0.81
2.583 4.85 5.667 10.50 8.750 1.62 11.83 0.81
2.667 4.85 5.750 10.50 8.833 1.62 11.92 0.81
2.750 4.85 5.833 10.50 8.917 1.62 12.00 0.81
2.833 4.85 5.917 10.50 9.000 1.62 12.08 0.81

2.917 4.85 | 6.000 10.50 | 9.083 1.62 | 12.17 0.81
3.000 4.85 | 6.083 10.50 | 9.167 1.62 | 12.25 0.81
3.083 4.85 | 6.167 10.50 | 9.250 1.62 |

Max.Eff.Inten.(mm/hr)= 37.17 28.96
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS
PEAK FLOW (cms)= 0.09 0.03 0.122 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 78.82 48.19 67.43
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.60 0.83

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB |
| STANDHYD (0502) | Area (ha)= 0.51
| ID= 1 DT= 5.0 min | Total Imp(%)= 63.67 Dir. Conn.(%)= 63.67

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.32 0.18
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 4.85 6.250 10.50 9.33 0.81
0.167 0.00 3.250 4.85 6.333 5.66 9.42 0.81
0.250 0.00 3.333 13.74 6.417 5.66 9.50 0.81
0.333 0.81 3.417 13.74 6.500 5.66 9.58 0.81
0.417 0.81 3.500 13.74 6.583 5.66 9.67 0.81
0.500 0.81 3.583 13.74 6.667 5.66 9.75 0.81
0.583 0.81 3.667 13.74 6.750 5.66 9.83 0.81
0.667 0.81 3.750 13.74 6.833 5.66 9.92 0.81

0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	5.66	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.03 0.01 0.046 (iii)
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68 68.58
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63 0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)				
1 + 2 = 3				
		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
ID1= 1 (0501):		1.35	0.122	5.25
+ ID2= 2 (0502):		0.51	0.046	5.25
=====				
ID = 3 (0020):		1.85	0.169	5.25
				67.43
				68.58
				67.74

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		Area (ha)= 1.41	
STANDHYD (0601)		Total Imp(%)= 47.02	Dir. Conn.(%)= 47.02
ID= 1 DT= 5.0 min			

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.66	0.75
Dep. Storage	(mm)=	2.00	6.00
Average Slope	(%)=	0.86	2.00
Length	(m)=	96.99	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81

1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 28.96
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.07 0.05 0.121 (iii)
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 78.82 48.19 62.58
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.60 0.77

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

CALIB		Area (ha)= 2.06	
STANDHYD (0701)		Total Imp(%)= 62.58	Dir. Conn.(%)= 62.58
ID= 1 DT= 5.0 min			
		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.29	0.77
Dep. Storage	(mm)=	2.00	1.50
Average Slope	(%)=	0.41	2.00
Length	(m)=	117.10	40.00
Mannings n	=	0.013	0.250

PEAK FLOW (cms)= 0.13 0.05 0.188 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68 68.28
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63 0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 61.73 Dir. Conn.(%)= 61.73

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.11 0.69
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 4.85 6.250 10.50 9.33 0.81
0.167 0.00 3.250 4.85 6.333 5.66 9.42 0.81
0.250 0.00 3.333 13.74 6.417 5.66 9.50 0.81
0.333 0.81 3.417 13.74 6.500 5.66 9.58 0.81
0.417 0.81 3.500 13.74 6.583 5.66 9.67 0.81
0.500 0.81 3.583 13.74 6.667 5.66 9.75 0.81
0.583 0.81 3.667 13.74 6.750 5.66 9.83 0.81
0.667 0.81 3.750 13.74 6.833 5.66 9.92 0.81
0.750 0.81 3.833 13.74 6.917 5.66 10.00 0.81
0.833 0.81 3.917 13.74 7.000 5.66 10.08 0.81
0.917 0.81 4.000 13.74 7.083 5.66 10.17 0.81
1.000 0.81 4.083 13.74 7.167 5.66 10.25 0.81
1.083 0.81 4.167 13.74 7.250 5.66 10.33 0.81
1.167 0.81 4.250 13.74 7.333 3.23 10.42 0.81
1.250 0.81 4.333 37.17 7.417 3.23 10.50 0.81
1.333 0.81 4.417 37.17 7.500 3.23 10.58 0.81
1.417 0.81 4.500 37.17 7.583 3.23 10.67 0.81
1.500 0.81 4.583 37.17 7.667 3.23 10.75 0.81

1.583 0.81 4.667 37.17 7.750 3.23 10.83 0.81
1.667 0.81 4.750 37.17 7.833 3.23 10.92 0.81
1.750 0.81 4.833 37.17 7.917 3.23 11.00 0.81
1.833 0.81 4.917 37.17 8.000 3.23 11.08 0.81
1.917 0.81 5.000 37.17 8.083 3.23 11.17 0.81
2.000 0.81 5.083 37.17 8.167 3.23 11.25 0.81
2.083 0.81 5.167 37.17 8.250 3.23 11.33 0.81
2.167 0.81 5.250 37.17 8.333 1.62 11.42 0.81
2.250 0.81 5.333 10.50 8.417 1.62 11.50 0.81
2.333 4.85 5.417 10.50 8.500 1.62 11.58 0.81
2.417 4.85 5.500 10.50 8.583 1.62 11.67 0.81
2.500 4.85 5.583 10.50 8.667 1.62 11.75 0.81
2.583 4.85 5.667 10.50 8.750 1.62 11.83 0.81
2.667 4.85 5.750 10.50 8.833 1.62 11.92 0.81
2.750 4.85 5.833 10.50 8.917 1.62 12.00 0.81
2.833 4.85 5.917 10.50 9.000 1.62 12.08 0.81
2.917 4.85 6.000 10.50 9.083 1.62 12.17 0.81
3.000 4.85 6.083 10.50 9.167 1.62 12.25 0.81
3.083 4.85 6.167 10.50 9.250 1.62

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.11 0.05 0.163 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68 68.05
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63 0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

V V I SSSS U U A L (v 6.2.2015)
V V I SS U U A A L

V V I SS U U A A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y M M O O
O O T T H H Y Y M M O O
000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voain.dat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\79e1
0b7d-1bdb-4033-8753-d3bdeb76c577\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\79e1
0b7d-1bdb-4033-8753-d3bdeb76c577\sce

DATE: 06/24/2024 TIME: 12:17:48

USER:

COMMENTS:

** SIMULATION : Hazel **

READ STORM
Filename: C:\Users\p004074G\AppData\Local\Temp\
cfbcbbd-6ef4-434c-9e63-f8e28115e34b\d07e3020
Ptotal=212.00 mm
Comments: Hazel

TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr

0.00 6.00 3.00 13.00 6.00 23.00 9.00 53.00
1.00 4.00 4.00 17.00 7.00 13.00 10.00 38.00
2.00 6.00 5.00 13.00 8.00 13.00 11.00 13.00

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min
Area (ha)= 2.78
Total Imp(%)= 48.00 Dir. Conn.(%)= 48.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.33 1.44
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 6.00 3.083 13.00 6.083 23.00 9.08 53.00
0.167 6.00 3.167 13.00 6.167 23.00 9.17 53.00
0.250 6.00 3.250 13.00 6.250 23.00 9.25 53.00
0.333 6.00 3.333 13.00 6.333 23.00 9.33 53.00
0.417 6.00 3.417 13.00 6.417 23.00 9.42 53.00
0.500 6.00 3.500 13.00 6.500 23.00 9.50 53.00
0.583 6.00 3.583 13.00 6.583 23.00 9.58 53.00
0.667 6.00 3.667 13.00 6.667 23.00 9.67 53.00
0.750 6.00 3.750 13.00 6.750 23.00 9.75 53.00
0.833 6.00 3.833 13.00 6.833 23.00 9.83 53.00
0.917 6.00 3.917 13.00 6.917 23.00 9.92 53.00
1.000 6.00 4.000 13.00 7.000 23.00 10.00 53.00
1.083 4.00 4.083 17.00 7.083 13.00 10.08 38.00
1.167 4.00 4.167 17.00 7.167 13.00 10.17 38.00
1.250 4.00 4.250 17.00 7.250 13.00 10.25 38.00
1.333 4.00 4.333 17.00 7.333 13.00 10.33 38.00
1.417 4.00 4.417 17.00 7.417 13.00 10.42 38.00
1.500 4.00 4.500 17.00 7.500 13.00 10.50 38.00
1.583 4.00 4.583 17.00 7.583 13.00 10.58 38.00
1.667 4.00 4.667 17.00 7.667 13.00 10.67 38.00
1.750 4.00 4.750 17.00 7.750 13.00 10.75 38.00
1.833 4.00 4.833 17.00 7.833 13.00 10.83 38.00
1.917 4.00 4.917 17.00 7.917 13.00 10.92 38.00
2.000 4.00 5.000 17.00 8.000 13.00 11.00 38.00
2.083 6.00 5.083 13.00 8.083 13.00 11.08 13.00
2.167 6.00 5.167 13.00 8.167 13.00 11.17 13.00

2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 41.22
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.20 0.15 0.348 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 125.95 166.29
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.59 0.78

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min
Area (ha)= 0.41
Total Imp(%)= 71.12 Dir. Conn.(%)= 71.12

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.29 0.12
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00

0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.04 0.02 0.059 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 199.45
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.94

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

- CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103)
ID= 1 DT= 5.0 min
Area (ha)= 0.87
Total Imp(%)= 65.00 Dir. Conn.(%)= 65.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.56 0.30
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00

2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.08 0.04 0.123 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 197.23
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.93

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 1 (0101): 2.78 0.348 10.00 166.29
+ ID2= 2 (0102): 0.41 0.059 10.00 199.45
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 3 (0010): 3.19 0.408 10.00 170.60
+ ID2= 2 (0103): 0.87 0.123 10.00 197.23

=====

ID = 1 (0010): 4.06 0.531 10.00 176.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0501)	Area (ha)= 1.35
ID= 1 DT= 5.0 min	Total Imp(%)= 62.85 Dir. Conn.(%)= 62.85

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.85	0.50
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.29	2.00
Length (m)=	94.83	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00

2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.54
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS

PEAK FLOW (cms)=	0.12	0.07	0.191 (iii)
TIME TO PEAK (hrs)=	10.00	10.08	10.00
RUNOFF VOLUME (mm)=	210.00	171.56	195.71
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	= 0.99	0.81	0.92

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0502)	Area (ha)= 0.51
ID= 1 DT= 5.0 min	Total Imp(%)= 63.67 Dir. Conn.(%)= 63.67

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.32	0.18
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	0.23	2.00
Length (m)=	58.04	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00

0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS

PEAK FLOW (cms)=	0.05	0.02	0.072 (iii)
TIME TO PEAK (hrs)=	10.00	10.08	10.00
RUNOFF VOLUME (mm)=	210.00	173.55	196.74
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	= 0.99	0.82	0.93

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0020)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0501):	1.35	0.191	10.00	195.71
+ ID2= 2 (0502):	0.51	0.072	10.00	196.74
=====				
ID = 3 (0020):	1.85	0.263	10.00	195.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0601)	Area (ha)= 1.41
ID= 1 DT= 5.0 min	Total Imp(%)= 47.02 Dir. Conn.(%)= 47.02

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.66	0.75
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.86	2.00
Length (m)=	96.99	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00

1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.54
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.10 0.10 0.197 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 171.56 189.63
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.81 0.89

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0701)	Area (ha)= 2.06		
ID= 1 DT= 5.0 min	Total Imp(%)= 62.58	Dir. Conn.(%)= 62.58	

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.29	0.77	
Dep. Storage (mm)=	2.00	1.50	

Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)

Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS
PEAK FLOW (cms)= 0.19 0.10 0.291 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 196.35
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.93

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0801)	Area (ha)= 1.79		
ID= 1 DT= 5.0 min	Total Imp(%)= 61.73	Dir. Conn.(%)= 61.73	

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.11	0.69	
Dep. Storage (mm)=	2.00	1.50	
Average Slope (%)=	1.33	2.00	
Length (m)=	109.27	40.00	
Mannings n	0.013	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00

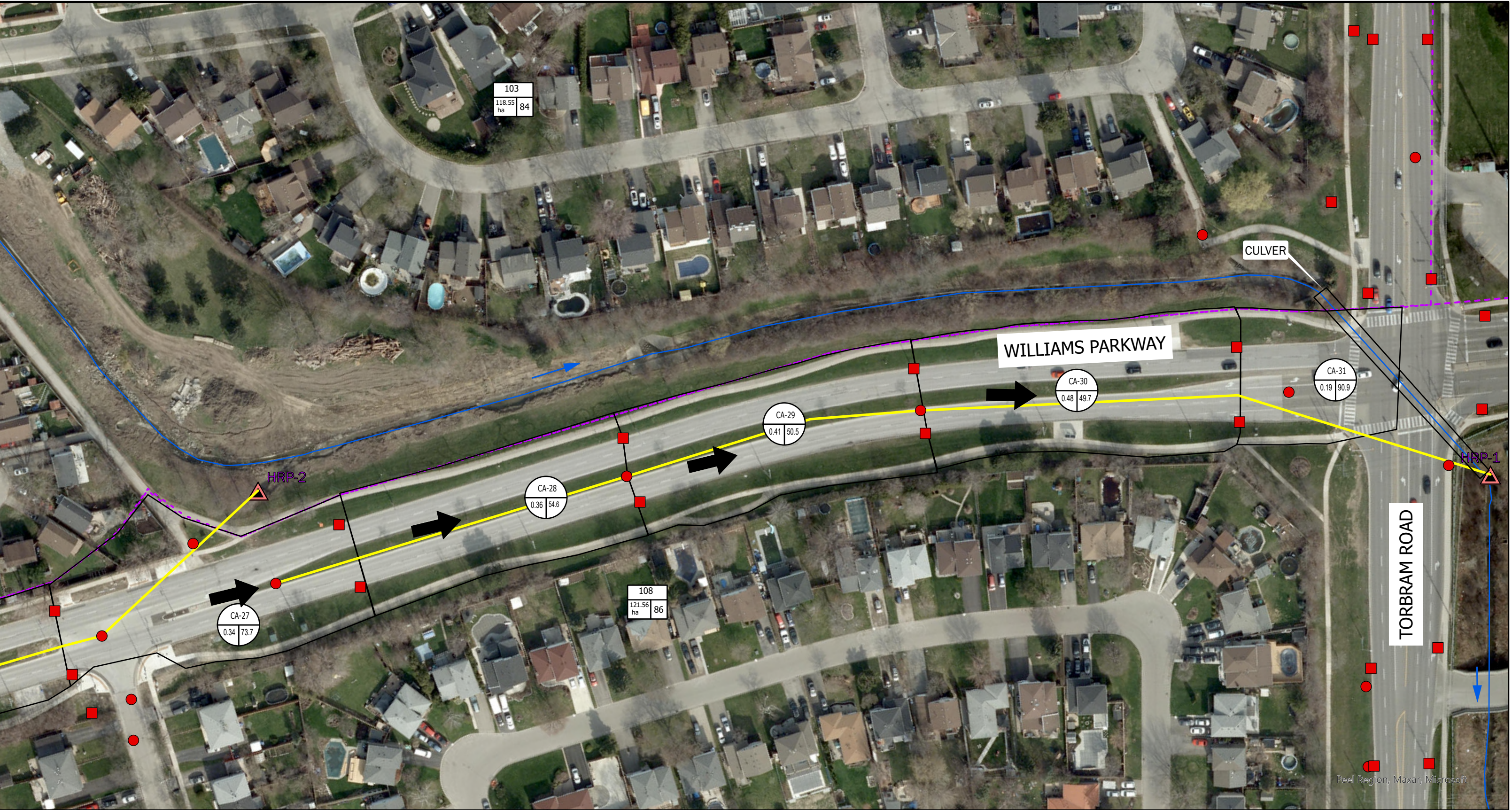
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.16 0.09 0.253 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 196.04
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.92

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

PROPOSED CONDITION



Legend

- Catchbasin

STM Manhole

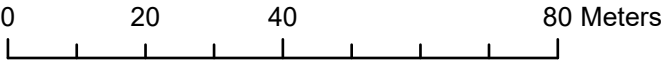
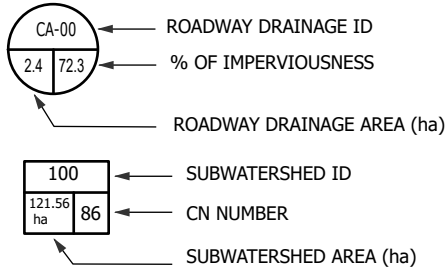
Storm Pipe

HRPs
- Subcatchment

Spring Creek

Mimico Creek

Mimico_Catchments



Project: Williams Parkway EA, Brampton

Figure B8: Drainage Area Map: Proposed Condition

Prepared by: DT

Date: 6/27/2024

Version: 1
Figure: B8



Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- HRPs

- Subcatchment
- Spring Creek
- Mimico Creek
- Mimico_Catchments

CA-00

2.4

72.3

ROADWAY DRAINAGE ID

% OF IMPERVIOUSNESS

ROADWAY DRAINAGE AREA (ha)

100

121.56

ha

86

SUBWATERSHED ID

CN NUMBER

SUBWATERSHED AREA (ha)

0204080

Meters

Project: Williams Parkway EA, Brampton

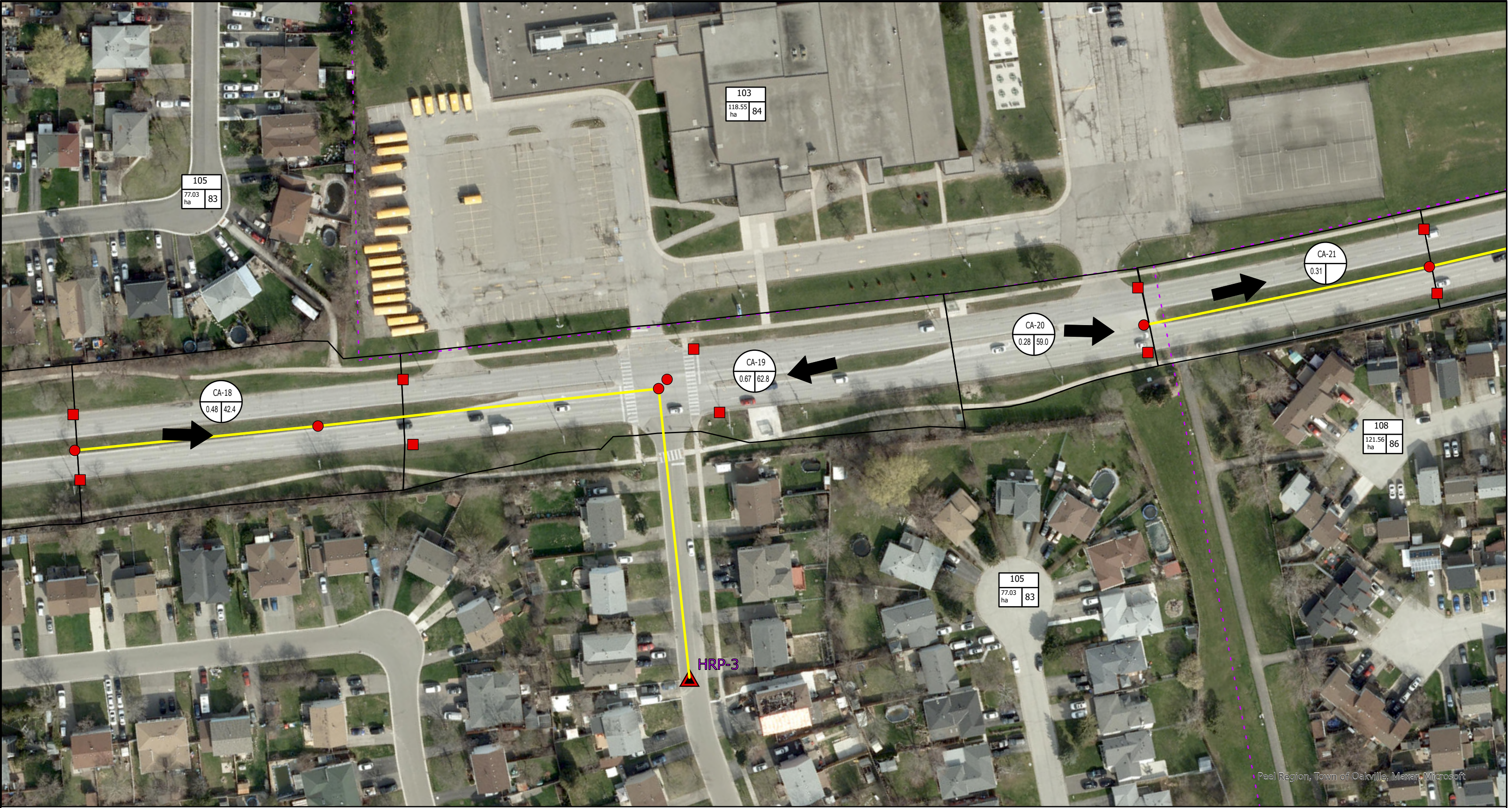
Figure B9: Drainage Area Map: Proposed Condition

Prepared by: DT

Date: 6/28/2023

Version: 1

Figure: B9



Legend

Catchbasin

STM Manhole

Storm Pipe

HRPs

Subcatchment

Spring Creek

Mimico Creek

Mimico_Catchments

CA-00

2.4

72.3

ROADWAY DRAINAGE ID

% OF IMPERVIOUSNESS

ROADWAY DRAINAGE AREA (ha)

100

121.56

ha

86

SUBWATERSHED ID

CN NUMBER

SUBWATERSHED AREA (ha)

0204080

Meters

Project: Williams Parkway EA, Brampton

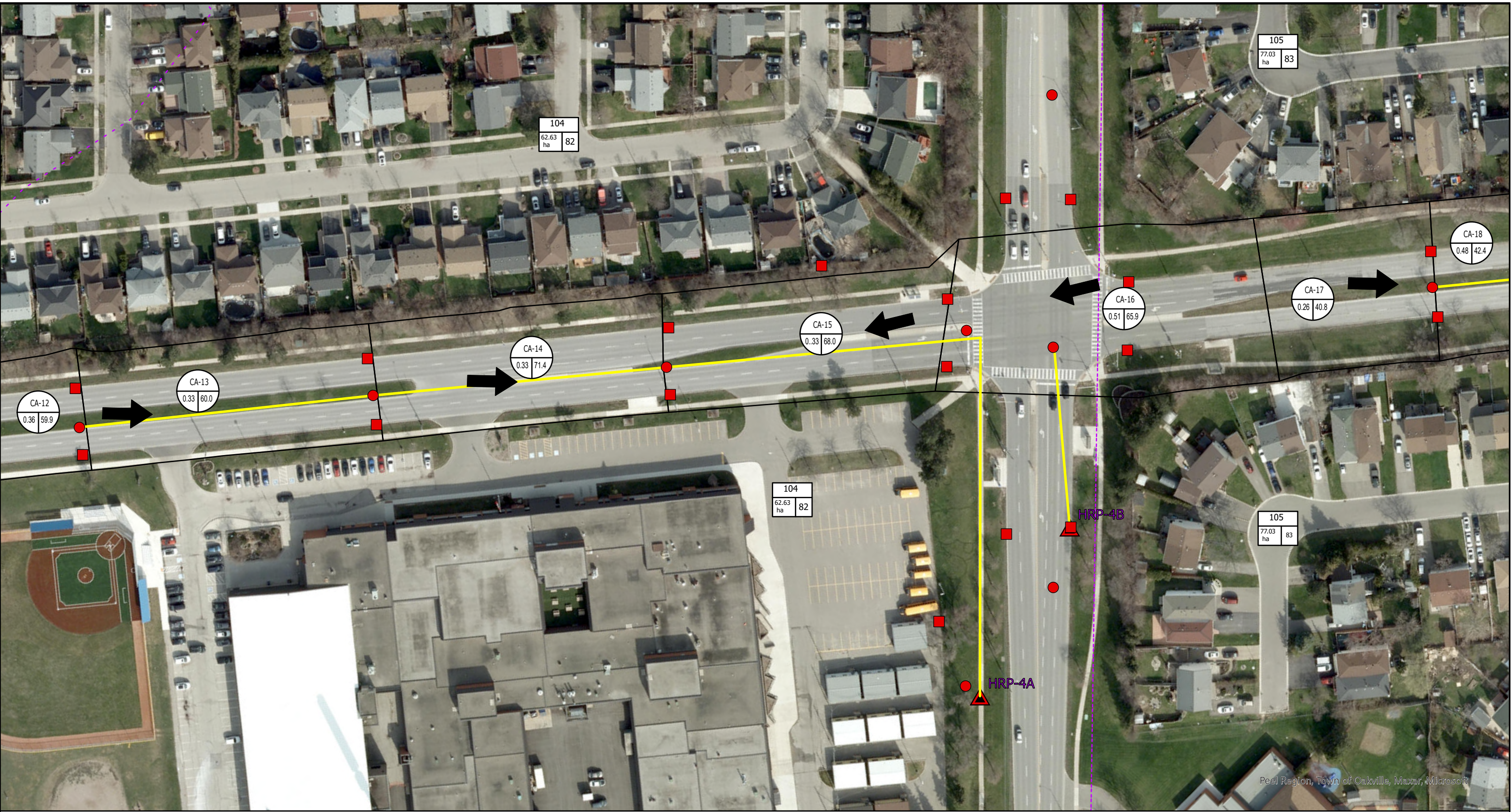
Figure B10: Drainage Area Map: Proposed Condition

Prepared by: DT

Date: 6/28/2023

Version: 1

Figure: B10



Peel Region, Town of Oakville, Maxar, Microsoft

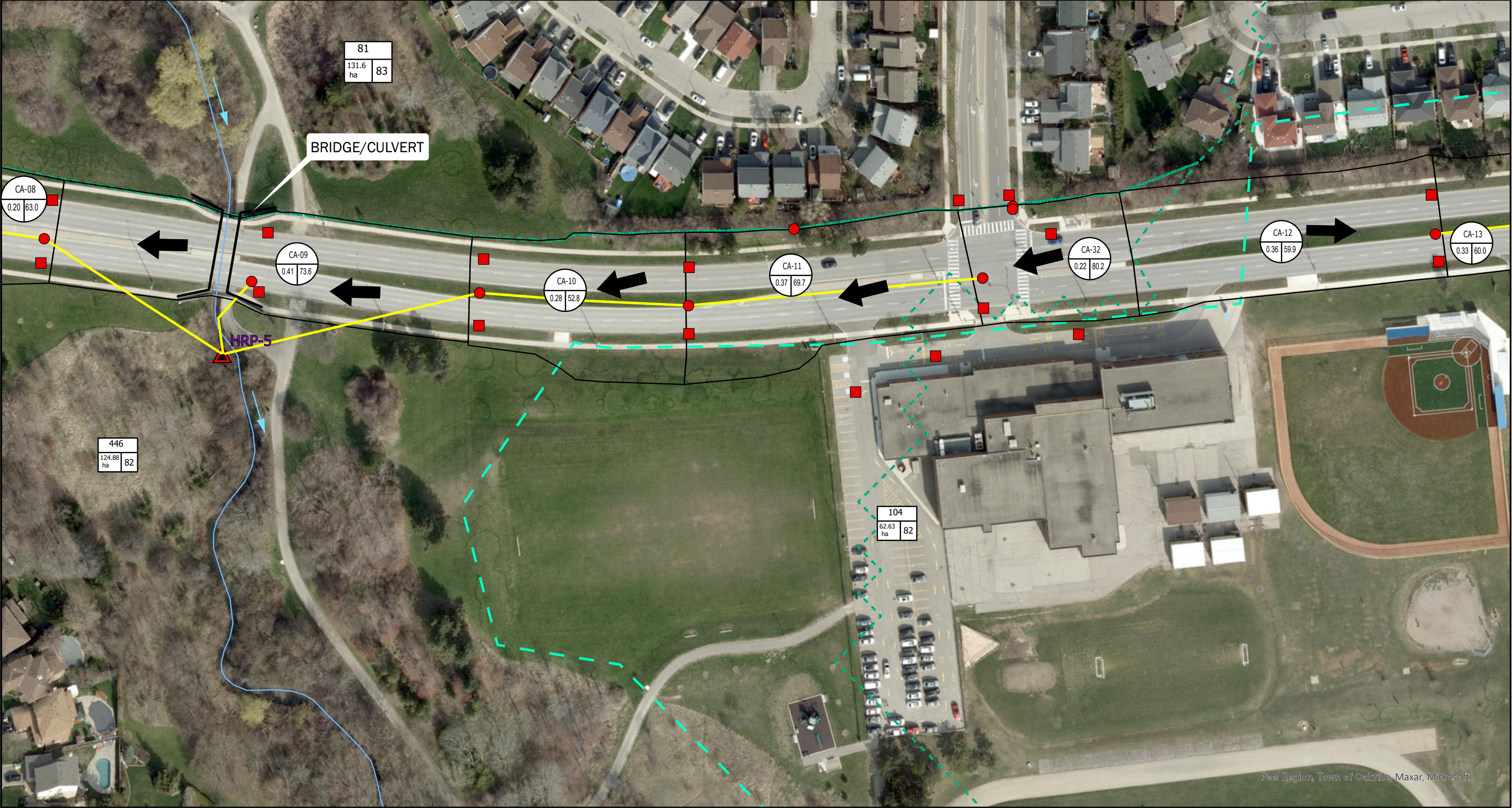
Project: Williams Parkway EA, Brampton

Figure B11: Drainage Area Map: Proposed Condition

Prepared by: DT

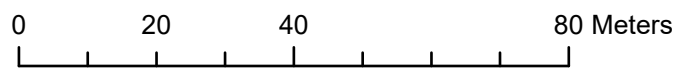
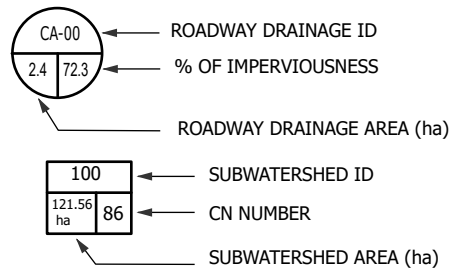
Date: 6/27/2024

Version: 1
Figure: B11

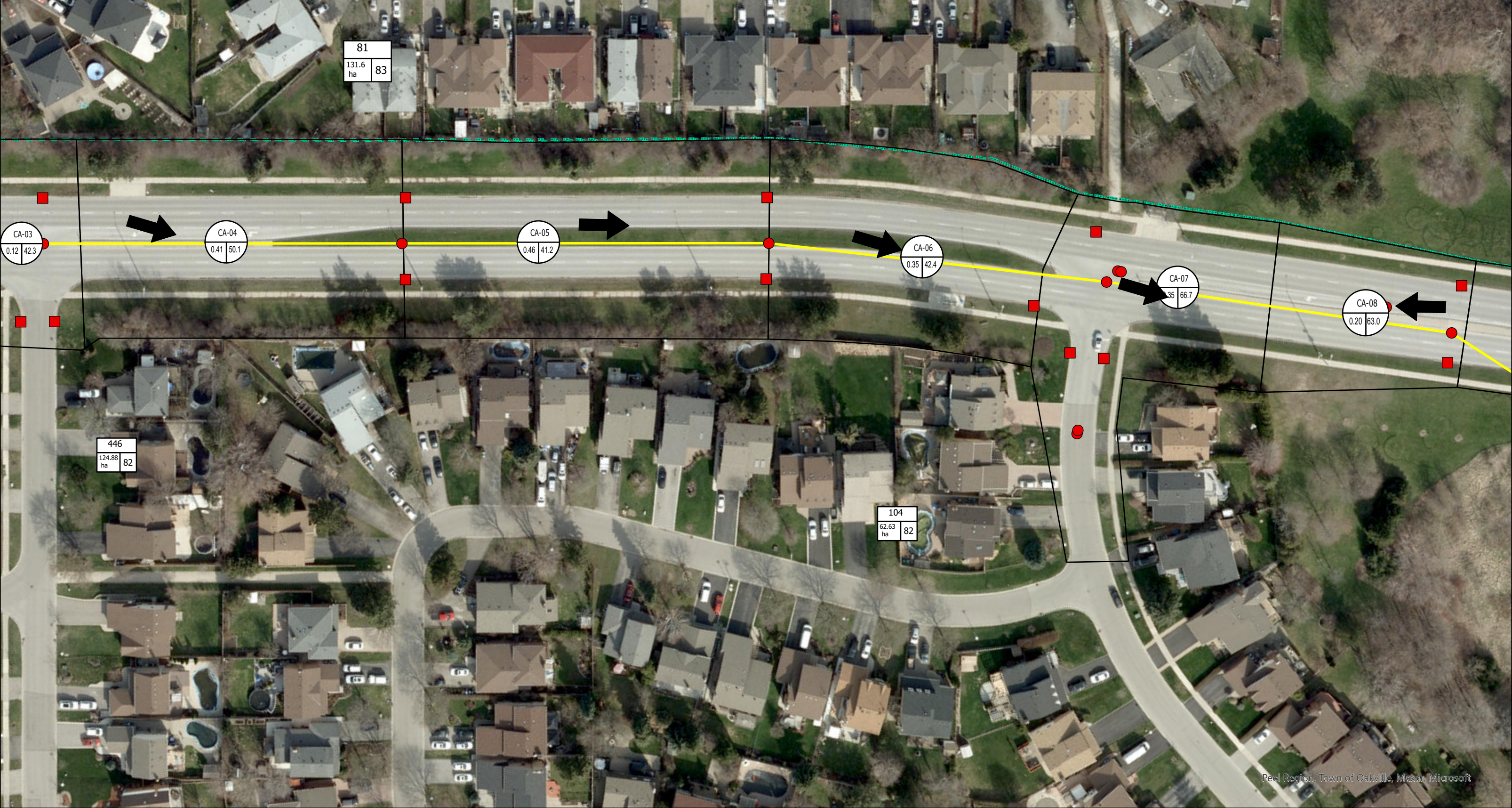


Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- HRPs
- Subcatchment
- Spring Creek
- Mimico Creek
- Etobicoke_Catchments
- Mimico_Catchments



Project: Williams Parkway EA, Brampton		
Figure 12: Drainage Area Map: Proposed Condition		
Prepared by: DT	Date: 6/28/2023	
	Version: 1	Figure: B12



Legend

Catchbasin

STM Manhole

Storm Pipe

HRPs

Subcatchment

Spring Creek

Mimico Creek

Etobicoke_Catchments

Mimico_Catchments

CA-00

2.4 | 72.3

ROADWAY DRAINAGE ID

% OF IMPERVIOUSNESS

ROADWAY DRAINAGE AREA (ha)

100

121.56 | 86

SUBWATERSHED ID

CN NUMBER

SUBWATERSHED AREA (ha)

0153060

153060

0 15 30 45 60 Meters

Project: Williams Parkway EA, Brampton

Figure 13: Drainage Area Map: Proposed Condition

Prepared by: DT

Date: 6/28/2023

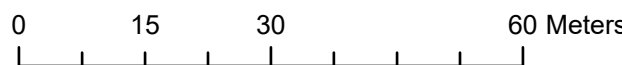
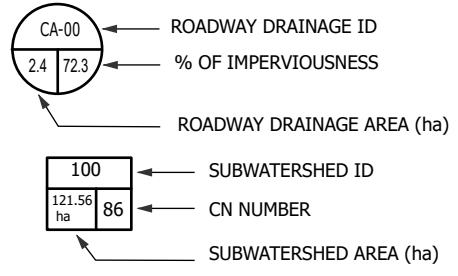
Version: 1

Figure: B13



Legend

- Catchbasin
- STM Manhole
- Storm Pipe
- ▲ HRPs
- Subcatchment
- Spring Creek
- Mimico Creek
- Etobicoke_Catchments
- Mimico_Catchments



Project: Williams Parkway EA, Brampton		
Figure 14: Drainage Area Map: Proposed Condition		
Prepared by: DT	Date: 6/28/2023	
	Version: 1	Figure: B14

Table B.3: Modified TRCA VO Model - Catchment Parameters within the Study Limits - Proposed Condition

TRCA				PARSONS			
Watershed	Catchment ID/Object ID	Type	Area (ha)	VO ID	Area, ha	% XIMP	% TIMP
Mimico	103 & 108	StandHyd	118.55 & 121.56	801	1.60	63.90	63.90
				701	2.06	64.80	64.80
	105		63.1	601	1.41	48.70	48.70
	104 & 105		63.1 & 63.4	502	0.51	65.90	65.90
	104		62.4	501	1.35	64.80	64.80
Etobicoke	81 & 446		131.59 & 124.89	101	2.78	49.00	49.00
		102		0.41	73.60	73.60	
		103		0.87	67.60	67.60	

=====

V V I SSSS U U A L (v 6.2.2015)

V V I SS U U A A L

V V I SS U U A A L

V V I SS U U A A L

V V I SSSS UUUU A A LLLL

000 TTTT TTTT H H Y Y M M 000 TM

O O T T H H Y Y M M O O

O O T T H H Y Y M M O O

000 T T H H Y Y M M 000

Developed and Distributed by Smart City Water Inc

Copyright 2007 - 2022 Smart City Water Inc

All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voind.dat

Output filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\e9cc8ad6-af81-49a6-8865-afc3724971a0\sce

Summary filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\e9cc8ad6-af81-49a6-8865-afc3724971a0\sce

DATE: 06/24/2024 TIME: 11:21:34

USER:

COMMENTS: _____

** SIMULATION : 10 Year 12 Hour AES (Bloor, T **

READ STORM | Filename: C:\Users\p004074G\AppData\Local\Temp\

1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 10.68

over (min) 5.00 25.00

Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)

Unit Hyd. Tpeak (min)= 5.00 20.00

Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.11 0.03 0.143 (iii)

TIME TO PEAK (hrs)= 5.25 5.33 5.25

RUNOFF VOLUME (mm)= 60.71 17.45 38.64

TOTAL RAINFALL (mm)= 62.71 62.71 62.71

RUNOFF COEFFICIENT = 0.97 0.28 0.62

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 65.6 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB

STANDHYD (0102) | Area (ha)= 0.41

f221802b-7ca3-45e2-99f8-9af8e094b359\7ad2b545

Ptotal= 62.71 mm | Comments: 10 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	10.66	6.50	4.39	9.75	0.63
0.25	0.63	3.50	10.66	6.75	4.39	10.00	0.63
0.50	0.63	3.75	10.66	7.00	4.39	10.25	0.63
0.75	0.63	4.00	10.66	7.25	2.51	10.50	0.63
1.00	0.63	4.25	28.84	7.50	2.51	10.75	0.63
1.25	0.63	4.50	28.84	7.75	2.51	11.00	0.63
1.50	0.63	4.75	28.84	8.00	2.51	11.25	0.63
1.75	0.63	5.00	28.84	8.25	1.25	11.50	0.63
2.00	0.63	5.25	8.15	8.50	1.25	11.75	0.63
2.25	3.76	5.50	8.15	8.75	1.25	12.00	0.63
2.50	3.76	5.75	8.15	9.00	1.25		
2.75	3.76	6.00	8.15	9.25	0.63		
3.00	3.76	6.25	4.39	9.50	0.63		

CALIB

STANDHYD (0101) | Area (ha)= 2.78

ID= 1 DT= 5.0 min | Total Imp(%)= 49.00 Dir. Conn.(%)= 49.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.36	1.42
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.75	2.00
Length (m)=	136.01	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63

ID= 1 DT= 5.0 min | Total Imp(%)= 73.60 Dir. Conn.(%)= 73.60

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.30	0.11
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	2.50	2.00
Length (m)=	52.54	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

3.000 3.76 | 6.083 8.15 | 9.167 1.25 | 12.25 0.63
3.083 3.76 | 6.167 8.15 | 9.250 1.25 |
Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
PEAK FLOW (cms)= 0.02 0.01
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56
TOTALS
0.030 (iii)

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103)
ID= 1 DT= 5.0 min
Area (ha)= 0.87
Total Imp(%)= 67.60 Dir. Conn.(%)= 67.60

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.59 0.28
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 3.76 6.250 8.15 | 9.33 0.63
0.167 0.00 3.250 3.76 6.333 4.39 | 9.42 0.63
0.250 0.00 3.333 10.66 6.417 4.39 | 9.50 0.63
0.333 0.63 3.417 10.66 6.500 4.39 | 9.58 0.63
0.417 0.63 3.500 10.66 6.583 4.39 | 9.67 0.63
0.500 0.63 3.583 10.66 6.667 4.39 | 9.75 0.63
0.583 0.63 3.667 10.66 6.750 4.39 | 9.83 0.63
0.667 0.63 3.750 10.66 6.833 4.39 | 9.92 0.63
0.750 0.63 3.833 10.66 6.917 4.39 | 10.00 0.63

0.833 0.63 | 3.917 10.66 | 7.000 4.39 | 10.08 0.63
0.917 0.63 | 4.000 10.66 | 7.083 4.39 | 10.17 0.63
1.000 0.63 | 4.083 10.66 | 7.167 4.39 | 10.25 0.63
1.083 0.63 | 4.167 10.66 | 7.250 4.39 | 10.33 0.63
1.167 0.63 | 4.250 10.66 | 7.333 2.51 | 10.42 0.63
1.250 0.63 | 4.333 28.84 | 7.417 2.51 | 10.50 0.63
1.333 0.63 | 4.417 28.84 | 7.500 2.51 | 10.58 0.63
1.417 0.63 | 4.500 28.84 | 7.583 2.51 | 10.67 0.63
1.500 0.63 | 4.583 28.84 | 7.667 2.51 | 10.75 0.63
1.583 0.63 | 4.667 28.84 | 7.750 2.51 | 10.83 0.63
1.667 0.63 | 4.750 28.84 | 7.833 2.51 | 10.92 0.63
1.750 0.63 | 4.833 28.84 | 7.917 2.51 | 11.00 0.63
1.833 0.63 | 4.917 28.84 | 8.000 2.51 | 11.08 0.63
1.917 0.63 | 5.000 28.84 | 8.083 2.51 | 11.17 0.63
2.000 0.63 | 5.083 28.84 | 8.167 2.51 | 11.25 0.63
2.083 0.63 | 5.167 28.84 | 8.250 2.51 | 11.33 0.63
2.167 0.63 | 5.250 28.84 | 8.333 1.25 | 11.42 0.63
2.250 0.63 | 5.333 8.15 | 8.417 1.25 | 11.50 0.63
2.333 3.76 | 5.417 8.15 | 8.500 1.25 | 11.58 0.63
2.417 3.76 | 5.500 8.15 | 8.583 1.25 | 11.67 0.63
2.500 3.76 | 5.583 8.15 | 8.667 1.25 | 11.75 0.63
2.583 3.76 | 5.667 8.15 | 8.750 1.25 | 11.83 0.63
2.667 3.76 | 5.750 8.15 | 8.833 1.25 | 11.92 0.63
2.750 3.76 | 5.833 8.15 | 8.917 1.25 | 12.00 0.63
2.833 3.76 | 5.917 8.15 | 9.000 1.25 | 12.08 0.63
2.917 3.76 | 6.000 8.15 | 9.083 1.25 | 12.17 0.63
3.000 3.76 | 6.083 8.15 | 9.167 1.25 | 12.25 0.63
3.083 3.76 | 6.167 8.15 | 9.250 1.25 |

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS

PEAK FLOW (cms)= 0.05 0.01
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56
0.84

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3
ID1= 1 (0101): 2.78 0.143 5.25 38.64
+ ID2= 2 (0102): 0.41 0.030 5.25 53.99
ID = 3 (0010): 3.19 0.173 5.25 40.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1
ID1= 3 (0010): 3.19 0.173 5.25 40.63
+ ID2= 2 (0103): 0.87 0.061 5.25 52.48
ID = 1 (0010): 4.06 0.234 5.25 43.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0501)
ID= 1 DT= 5.0 min
Area (ha)= 1.35
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.87 0.47
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 3.76 6.250 8.15 | 9.33 0.63
0.167 0.00 3.250 3.76 6.333 4.39 | 9.42 0.63
0.250 0.00 3.333 10.66 6.417 4.39 | 9.50 0.63
0.333 0.63 3.417 10.66 6.500 4.39 | 9.58 0.63
0.417 0.63 3.500 10.66 6.583 4.39 | 9.67 0.63
0.500 0.63 3.583 10.66 6.667 4.39 | 9.75 0.63
0.583 0.63 3.667 10.66 6.750 4.39 | 9.83 0.63
0.667 0.63 3.750 10.66 6.833 4.39 | 9.92 0.63
0.750 0.63 3.833 10.66 6.917 4.39 | 10.00 0.63

0.833 0.63 | 3.917 10.66 | 7.000 4.39 | 10.08 0.63
0.917 0.63 | 4.000 10.66 | 7.083 4.39 | 10.17 0.63
1.000 0.63 | 4.083 10.66 | 7.167 4.39 | 10.25 0.63
1.083 0.63 | 4.167 10.66 | 7.250 4.39 | 10.33 0.63
1.167 0.63 | 4.250 10.66 | 7.333 2.51 | 10.42 0.63
1.250 0.63 | 4.333 28.84 | 7.417 2.51 | 10.50 0.63
1.333 0.63 | 4.417 28.84 | 7.500 2.51 | 10.58 0.63
1.417 0.63 | 4.500 28.84 | 7.583 2.51 | 10.67 0.63
1.500 0.63 | 4.583 28.84 | 7.667 2.51 | 10.75 0.63
1.583 0.63 | 4.667 28.84 | 7.750 2.51 | 10.83 0.63
1.667 0.63 | 4.750 28.84 | 7.833 2.51 | 10.92 0.63
1.750 0.63 | 4.833 28.84 | 7.917 2.51 | 11.00 0.63
1.833 0.63 | 4.917 28.84 | 8.000 2.51 | 11.08 0.63
1.917 0.63 | 5.000 28.84 | 8.083 2.51 | 11.17 0.63
2.000 0.63 | 5.083 28.84 | 8.167 2.51 | 11.25 0.63
2.083 0.63 | 5.167 28.84 | 8.250 2.51 | 11.33 0.63
2.167 0.63 | 5.250 28.84 | 8.333 1.25 | 11.42 0.63
2.250 0.63 | 5.333 8.15 | 8.417 1.25 | 11.50 0.63
2.333 3.76 | 5.417 8.15 | 8.500 1.25 | 11.58 0.63
2.417 3.76 | 5.500 8.15 | 8.583 1.25 | 11.67 0.63
2.500 3.76 | 5.583 8.15 | 8.667 1.25 | 11.75 0.63
2.583 3.76 | 5.667 8.15 | 8.750 1.25 | 11.83 0.63
2.667 3.76 | 5.750 8.15 | 8.833 1.25 | 11.92 0.63
2.750 3.76 | 5.833 8.15 | 8.917 1.25 | 12.00 0.63
2.833 3.76 | 5.917 8.15 | 9.000 1.25 | 12.08 0.63
2.917 3.76 | 6.000 8.15 | 9.083 1.25 | 12.17 0.63
3.000 3.76 | 6.083 8.15 | 9.167 1.25 | 12.25 0.63
3.083 3.76 | 6.167 8.15 | 9.250 1.25 |

Max.Eff.Inten.(mm/hr)= 28.84 20.34
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS

PEAK FLOW (cms)= 0.07 0.02
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 32.80
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.52
0.81

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min

Area (ha)= 0.51
Total Imp(%)= 65.90 Dir. Conn.(%)= 65.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.33 0.17
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63

2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.03 0.01 0.035 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 60.71 35.33 52.04
TOTAL RAINFALL (mm)= 62.71 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56 0.83

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0501):	1.35	0.093	5.25	50.88
+ ID2= 2 (0502):	0.51	0.035	5.25	52.04
ID = 3 (0015):	1.85	0.128	5.25	51.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min

Area (ha)= 1.41
Total Imp(%)= 48.70 Dir. Conn.(%)= 48.70

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.69 0.72
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63

Max.Eff.Inten.(mm/hr)= 28.84 20.34
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.06 0.03 0.089 (iii)

TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	60.71	32.80	46.38
TOTAL RAINFALL (mm)=	62.71	62.71	62.71
RUNOFF COEFFICIENT =	0.97	0.52	0.74

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min

Area (ha)= 2.06
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.33 0.72
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63

1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.11 0.04
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56

TOTALS

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 1.79
STANDHYD (0801)	Total Imp(%)= 63.90
ID= 1 DT= 5.0 min	Dir. Conn.(%)= 63.90

IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)= 1.14 0.65	
Dep. Storage (mm)= 2.00 1.50	
Average Slope (%)= 1.33 2.00	
Length (m)= 109.27 40.00	
Mannings n = 0.013 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.09 0.03
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 60.71 35.33
TOTAL RAINFALL (mm)= 62.71 62.71
RUNOFF COEFFICIENT = 0.97 0.56

TOTALS

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

COMMENTS:

** SIMULATION : 100 Year 12 Hour AES (Bloor, **

READ STORM	Filename: C:\Users\p004074G\AppData
	ata\Local\Temp\
	f221802b-7ca3-45e2-99f8-9af8e094b359\d5379e32
Ptotal= 88.54 mm	Comments: 100 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	15.05	6.50	6.20	9.75	0.89
0.25	0.89	3.50	15.05	6.75	6.20	10.00	0.89
0.50	0.89	3.75	15.05	7.00	6.20	10.25	0.89
0.75	0.89	4.00	15.05	7.25	3.54	10.50	0.89
1.00	0.89	4.25	40.71	7.50	3.54	10.75	0.89
1.25	0.89	4.50	40.71	7.75	3.54	11.00	0.89
1.50	0.89	4.75	40.71	8.00	3.54	11.25	0.89
1.75	0.89	5.00	40.71	8.25	1.77	11.50	0.89
2.00	0.89	5.25	11.51	8.50	1.77	11.75	0.89
2.25	5.31	5.50	11.51	8.75	1.77	12.00	0.89
2.50	5.31	5.75	11.51	9.00	1.77		
2.75	5.31	6.00	11.51	9.25	0.89		
3.00	5.31	6.25	6.20	9.50	0.89		

CALIB	Area (ha)= 2.78
STANDHYD (0101)	Total Imp(%)= 49.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)= 49.00

IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)= 1.36 1.42	
Dep. Storage (mm)= 2.00 5.00	
Average Slope (%)= 1.75 2.00	
Length (m)= 136.01 40.00	
Mannings n = 0.013 0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voain.dat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\69cd
dc47-7eb6-4bd0-adeb-6bfeab05ad3c\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\69cd
dc47-7eb6-4bd0-adeb-6bfeab05ad3c\sce

DATE: 06/24/2024 TIME: 11:21:34

USER:

RUNOFF VOLUME (mm)= 86.54 32.20 58.82
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.36 0.66

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min

Area (ha)= 0.41
Total Imp(%)= 73.60 Dir. Conn.(%)= 73.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.30 0.11
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 19.81
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
0.217 (iii)
5.25

PEAK FLOW (cms)= 0.15 0.06
TIME TO PEAK (hrs)= 5.25 5.33

1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
0.043 (iii)
5.25

PEAK FLOW (cms)= 0.03 0.01
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 78.84
TOTAL RAINFALL (mm)= 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.89

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103)
ID= 1 DT= 5.0 min

Area (ha)= 0.87
Total Imp(%)= 67.60 Dir. Conn.(%)= 67.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.59 0.28
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.07 0.02 0.089 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 77.10
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 1 (0101): 2.78 0.217 5.25 58.82
+ ID2= 2 (0102): 0.41 0.043 5.25 78.84
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 3 (0010): 3.19 0.260 5.25 61.42
+ ID2= 2 (0103): 0.87 0.089 5.25 77.10
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0501)
ID= 1 DT= 5.0 min
Area (ha)= 1.35
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80
IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.87 0.47
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 5.31 6.250 11.51 9.33 0.89
0.167 0.00 3.250 5.31 6.333 6.20 9.42 0.89
0.250 0.00 3.333 15.05 6.417 6.20 9.50 0.89
0.333 0.89 3.417 15.05 6.500 6.20 9.58 0.89
0.417 0.89 3.500 15.05 6.583 6.20 9.67 0.89
0.500 0.89 3.583 15.05 6.667 6.20 9.75 0.89
0.583 0.89 3.667 15.05 6.750 6.20 9.83 0.89
0.667 0.89 3.750 15.05 6.833 6.20 9.92 0.89
0.750 0.89 3.833 15.05 6.917 6.20 10.00 0.89
0.833 0.89 3.917 15.05 7.000 6.20 10.08 0.89
0.917 0.89 4.000 15.05 7.083 6.20 10.17 0.89
1.000 0.89 4.083 15.05 7.167 6.20 10.25 0.89
1.083 0.89 4.167 15.05 7.250 6.20 10.33 0.89
1.167 0.89 4.250 15.05 7.333 3.54 10.42 0.89
1.250 0.89 4.333 40.71 7.417 3.54 10.50 0.89
1.333 0.89 4.417 40.71 7.500 3.54 10.58 0.89
1.417 0.89 4.500 40.71 7.583 3.54 10.67 0.89
1.500 0.89 4.583 40.71 7.667 3.54 10.75 0.89
1.583 0.89 4.667 40.71 7.750 3.54 10.83 0.89
1.667 0.89 4.750 40.71 7.833 3.54 10.92 0.89
1.750 0.89 4.833 40.71 7.917 3.54 11.00 0.89
1.833 0.89 4.917 40.71 8.000 3.54 11.08 0.89
1.917 0.89 5.000 40.71 8.083 3.54 11.17 0.89
2.000 0.89 5.083 40.71 8.167 3.54 11.25 0.89
2.083 0.89 5.167 40.71 8.250 3.54 11.33 0.89
2.167 0.89 5.250 40.71 8.333 1.77 11.42 0.89
2.250 0.89 5.333 11.51 8.417 1.77 11.50 0.89
2.333 5.31 5.417 11.51 8.500 1.77 11.58 0.89
2.417 5.31 5.500 11.51 8.583 1.77 11.67 0.89
2.500 5.31 5.583 11.51 8.667 1.77 11.75 0.89
2.583 5.31 5.667 11.51 8.750 1.77 11.83 0.89
2.667 5.31 5.750 11.51 8.833 1.77 11.92 0.89
2.750 5.31 5.833 11.51 8.917 1.77 12.00 0.89
2.833 5.31 5.917 11.51 9.000 1.77 12.08 0.89
2.917 5.31 6.000 11.51 9.083 1.77 12.17 0.89
3.000 5.31 6.083 11.51 9.167 1.77 12.25 0.89
3.083 5.31 6.167 11.51 9.250 1.77

Max.Eff.Inten.(mm/hr)= 40.71 32.66
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS

PEAK FLOW (cms)= 0.10 0.04 0.136 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 54.99 75.43
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.62 0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min
Area (ha)= 0.51
Total Imp(%)= 65.90 Dir. Conn.(%)= 65.90
IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.33 0.17
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TRANSFORMED HYETOGRAPH
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 5.31 6.250 11.51 9.33 0.89
0.167 0.00 3.250 5.31 6.333 6.20 9.42 0.89
0.250 0.00 3.333 15.05 6.417 6.20 9.50 0.89
0.333 0.89 3.417 15.05 6.500 6.20 9.58 0.89
0.417 0.89 3.500 15.05 6.583 6.20 9.67 0.89
0.500 0.89 3.583 15.05 6.667 6.20 9.75 0.89
0.583 0.89 3.667 15.05 6.750 6.20 9.83 0.89
0.667 0.89 3.750 15.05 6.833 6.20 9.92 0.89
0.750 0.89 3.833 15.05 6.917 6.20 10.00 0.89
0.833 0.89 3.917 15.05 7.000 6.20 10.08 0.89
0.917 0.89 4.000 15.05 7.083 6.20 10.17 0.89
1.000 0.89 4.083 15.05 7.167 6.20 10.25 0.89
1.083 0.89 4.167 15.05 7.250 6.20 10.33 0.89
1.167 0.89 4.250 15.05 7.333 3.54 10.42 0.89
1.250 0.89 4.333 40.71 7.417 3.54 10.50 0.89
1.333 0.89 4.417 40.71 7.500 3.54 10.58 0.89
1.417 0.89 4.500 40.71 7.583 3.54 10.67 0.89
1.500 0.89 4.583 40.71 7.667 3.54 10.75 0.89

1.583 0.89 4.667 40.71 7.750 3.54 10.83 0.89
1.667 0.89 4.750 40.71 7.833 3.54 10.92 0.89
1.750 0.89 4.833 40.71 7.917 3.54 11.00 0.89
1.833 0.89 4.917 40.71 8.000 3.54 11.08 0.89
1.917 0.89 5.000 40.71 8.083 3.54 11.17 0.89
2.000 0.89 5.083 40.71 8.167 3.54 11.25 0.89
2.083 0.89 5.167 40.71 8.250 3.54 11.33 0.89
2.167 0.89 5.250 40.71 8.333 1.77 11.42 0.89
2.250 0.89 5.333 11.51 8.417 1.77 11.50 0.89
2.333 5.31 5.417 11.51 8.500 1.77 11.58 0.89
2.417 5.31 5.500 11.51 8.583 1.77 11.67 0.89
2.500 5.31 5.583 11.51 8.667 1.77 11.75 0.89
2.583 5.31 5.667 11.51 8.750 1.77 11.83 0.89
2.667 5.31 5.750 11.51 8.833 1.77 11.92 0.89
2.750 5.31 5.833 11.51 8.917 1.77 12.00 0.89
2.833 5.31 5.917 11.51 9.000 1.77 12.08 0.89
2.917 5.31 6.000 11.51 9.083 1.77 12.17 0.89
3.000 5.31 6.083 11.51 9.167 1.77 12.25 0.89
3.083 5.31 6.167 11.51 9.250 1.77

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
TOTALS
PEAK FLOW (cms)= 0.04 0.01 0.051 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 76.60
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)
1 + 2 = 3
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 1 (0501): 1.35 0.136 5.25 75.43
+ ID2= 2 (0502): 0.51 0.051 5.25 76.60
=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min

Area (ha)= 1.41
Total Imp(%)= 48.70 Dir. Conn.(%)= 48.70

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.69 0.72
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89

2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.66
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.08 0.06 0.135 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 54.99 70.35
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.62 0.79

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min

Area (ha)= 2.06
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.33 0.72
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89

0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.15 0.06 0.209 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 76.30
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.86

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min

Area (ha)= 1.79
Total Imp(%)= 63.90 Dir. Conn.(%)= 63.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.14 0.65
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89

2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.13 0.05 0.181 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 86.54 57.45 76.03
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.98 0.65 0.86

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A L
V V I SSSSS UUUUU A A LLLLL
000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y M M 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\b943
8c3f-d7fd-4398-ba8f-e7eb9e0b423d\sce

Summary filename:

C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\b943
8c3f-d7fd-4398-ba8f-e7eb9e0b423d\sce

DATE: 06/24/2024

TIME: 11:21:36

USER:

COMMENTS:

** SIMULATION : 2 Year 12 Hour AES (Bloor, TR **

READ STORM File: C:\Users\p004074G\AppData\Local\Temp\ f221802b-7ca3-45e2-99f8-9af8e094b359\13526e56
Ptotal= 42.00 mm Comments: 2 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	7.14	6.50	2.94	9.75	0.42
0.25	0.42	3.50	7.14	6.75	2.94	10.00	0.42
0.50	0.42	3.75	7.14	7.00	2.94	10.25	0.42
0.75	0.42	4.00	7.14	7.25	1.68	10.50	0.42
1.00	0.42	4.25	19.32	7.50	1.68	10.75	0.42
1.25	0.42	4.50	19.32	7.75	1.68	11.00	0.42
1.50	0.42	4.75	19.32	8.00	1.68	11.25	0.42
1.75	0.42	5.00	19.32	8.25	0.84	11.50	0.42
2.00	0.42	5.25	5.46	8.50	0.84	11.75	0.42
2.25	2.52	5.50	5.46	8.75	0.84	12.00	0.42
2.50	2.52	5.75	5.46	9.00	0.84		
2.75	2.52	6.00	5.46	9.25	0.42		
3.00	2.52	6.25	2.94	9.50	0.42		

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min
Area (ha)= 2.78
Total Imp(%)= 49.00 Dir. Conn.(%)= 49.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.36 1.42
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 2.52 6.250 5.46 9.33 0.42
0.167 0.00 3.250 2.52 6.333 2.94 9.42 0.42
0.250 0.00 3.333 7.14 6.417 2.94 9.50 0.42
0.333 0.42 3.417 7.14 6.500 2.94 9.58 0.42
0.417 0.42 3.500 7.14 6.583 2.94 9.67 0.42
0.500 0.42 3.583 7.14 6.667 2.94 9.75 0.42
0.583 0.42 3.667 7.14 6.750 2.94 9.83 0.42
0.667 0.42 3.750 7.14 6.833 2.94 9.92 0.42
0.750 0.42 3.833 7.14 6.917 2.94 10.00 0.42
0.833 0.42 3.917 7.14 7.000 2.94 10.08 0.42
0.917 0.42 4.000 7.14 7.083 2.94 10.17 0.42
1.000 0.42 4.083 7.14 7.167 2.94 10.25 0.42
1.083 0.42 4.167 7.14 7.250 2.94 10.33 0.42
1.167 0.42 4.250 7.14 7.333 1.68 10.42 0.42
1.250 0.42 4.333 19.32 7.417 1.68 10.50 0.42
1.333 0.42 4.417 19.32 7.500 1.68 10.58 0.42
1.417 0.42 4.500 19.32 7.583 1.68 10.67 0.42
1.500 0.42 4.583 19.32 7.667 1.68 10.75 0.42
1.583 0.42 4.667 19.32 7.750 1.68 10.83 0.42
1.667 0.42 4.750 19.32 7.833 1.68 10.92 0.42
1.750 0.42 4.833 19.32 7.917 1.68 11.00 0.42
1.833 0.42 4.917 19.32 8.000 1.68 11.08 0.42
1.917 0.42 5.000 19.32 8.083 1.68 11.17 0.42
2.000 0.42 5.083 19.32 8.167 1.68 11.25 0.42
2.083 0.42 5.167 19.32 8.250 1.68 11.33 0.42
2.167 0.42 5.250 19.32 8.333 0.84 11.42 0.42
2.250 0.42 5.333 5.46 8.417 0.84 11.50 0.42
2.333 2.52 5.417 5.46 8.500 0.84 11.58 0.42
2.417 2.52 5.500 5.46 8.583 0.84 11.67 0.42
2.500 2.52 5.583 5.46 8.667 0.84 11.75 0.42
2.583 2.52 5.667 5.46 8.750 0.84 11.83 0.42

2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 4.86
over (min) 5.00 30.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.07 0.02 0.088 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 8.04 23.70
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.19 0.56

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min
Area (ha)= 0.41
Total Imp(%)= 73.60 Dir. Conn.(%)= 73.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.30 0.11
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 2.52 6.250 5.46 9.33 0.42
0.167 0.00 3.250 2.52 6.333 2.94 9.42 0.42
0.250 0.00 3.333 7.14 6.417 2.94 9.50 0.42
0.333 0.42 3.417 7.14 6.500 2.94 9.58 0.42
0.417 0.42 3.500 7.14 6.583 2.94 9.67 0.42

0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.02 0.00 0.019 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 34.49
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.82

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0103)	Area (ha)=	0.87	
ID= 1 DT= 5.0 min	Total Imp(%)=	67.60	Dir. Conn.(%)= 67.60

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)= 0.59	0.28
Dep. Storage	(mm)= 2.00	1.50
Average Slope	(%)= 1.62	2.00
Length	(m)= 76.12	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42

2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.03 0.01 0.039 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 33.26
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.79

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0501)	Area (ha)=	1.35	
ID= 1 DT= 5.0 min	Total Imp(%)=	64.80	Dir. Conn.(%)= 64.80

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)= 0.87	0.47
Dep. Storage	(mm)= 2.00	6.00
Average Slope	(%)= 0.29	2.00
Length	(m)= 94.83	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42

ADD HYD (0010)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):	2.78	0.088	5.25	23.70
+ ID2= 2 (0102):	0.41	0.019	5.25	34.49
=====				
ID = 3 (0010):	3.19	0.108	5.25	25.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0010):	3.19	0.108	5.25	25.10
+ ID2= 2 (0103):	0.87	0.039	5.25	33.26
=====				
ID = 1 (0010):	4.06	0.147	5.25	26.85

2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 10.69
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.05 0.01 0.058 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 16.76 31.81
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.40 0.76

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0502)
ID= 1 DT= 5.0 min
Area (ha)= 0.51
Total Imp(%)= 65.90 Dir. Conn.(%)= 65.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.33 0.17
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42

0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.02 0.00 0.022 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.89
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.78

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)
1 + 2 = 3
ID1= 1 (0501): 1.35 0.058 5.25 31.81
+ ID2= 2 (0502): 0.51 0.022 5.25 32.89
=====

ID = 3 (0015): 1.85 0.081 5.25 32.10

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0601)
ID= 1 DT= 5.0 min
Area (ha)= 1.41
Total Imp(%)= 48.70 Dir. Conn.(%)= 48.70

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.69 0.72
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42

1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 10.69
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.04 0.02 0.054 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 16.76 28.07
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.40 0.67

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min
Area (ha)= 2.06
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.33 0.72

Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----			
TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52
0.167	0.00	3.250	2.52
0.250	0.00	3.333	7.14
0.333	0.42	3.417	7.14
0.417	0.42	3.500	7.14
0.500	0.42	3.583	7.14
0.583	0.42	3.667	7.14
0.667	0.42	3.750	7.14
0.750	0.42	3.833	7.14
0.833	0.42	3.917	7.14
0.917	0.42	4.000	7.14
1.000	0.42	4.083	7.14
1.083	0.42	4.167	7.14
1.167	0.42	4.250	7.14
1.250	0.42	4.333	19.32
1.333	0.42	4.417	19.32
1.417	0.42	4.500	19.32
1.500	0.42	4.583	19.32
1.583	0.42	4.667	19.32
1.667	0.42	4.750	19.32
1.750	0.42	4.833	19.32
1.833	0.42	4.917	19.32
1.917	0.42	5.000	19.32
2.000	0.42	5.083	19.32
2.083	0.42	5.167	19.32
2.167	0.42	5.250	19.32
2.250	0.42	5.333	5.46
2.333	2.52	5.417	5.46
2.417	2.52	5.500	5.46
2.500	2.52	5.583	5.46
2.583	2.52	5.667	5.46
2.667	2.52	5.750	5.46
2.750	2.52	5.833	5.46
2.833	2.52	5.917	5.46
2.917	2.52	6.000	5.46
3.000	2.52	6.083	5.46
3.083	2.52	6.167	5.46

Max.Eff.Inten.(mm/hr)= 19.32 11.36

over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.07 0.02 0.091 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.68
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.78

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 63.90
Dir. Conn.(%)= 63.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.14 0.65
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----			
TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52
0.167	0.00	3.250	2.52
0.250	0.00	3.333	7.14
0.333	0.42	3.417	7.14
0.417	0.42	3.500	7.14
0.500	0.42	3.583	7.14
0.583	0.42	3.667	7.14
0.667	0.42	3.750	7.14
0.750	0.42	3.833	7.14
0.833	0.42	3.917	7.14
0.917	0.42	4.000	7.14
1.000	0.42	4.083	7.14
1.083	0.42	4.167	7.14

1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.06 0.02 0.079 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 40.00 19.22 32.49
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.95 0.46 0.77

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y M M O O
O O T T H H Y M M O O
000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\5f3f
0dee-81b8-4d11-b6eb-09a5c19c1457\scs
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\5f3f
0dee-81b8-4d11-b6eb-09a5c19c1457\scs

DATE: 06/24/2024

TIME: 11:21:35

USER:

COMMENTS:

** SIMULATION : 25 Year 12 Hour AES (Bloor, T **

READ STORM
Filename: C:\Users\p004074G\AppData\Local\Temp\

f221802b-7ca3-45e2-99f8-9af8e094b359\ab0d04d0
Ptotal= 73.10 mm | Comments: 25 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	12.43	6.50	5.12	9.75	0.73
0.25	0.73	3.50	12.43	6.75	5.12	10.00	0.73
0.50	0.73	3.75	12.43	7.00	5.12	10.25	0.73
0.75	0.73	4.00	12.43	7.25	2.92	10.50	0.73
1.00	0.73	4.25	33.63	7.50	2.92	10.75	0.73
1.25	0.73	4.50	33.63	7.75	2.92	11.00	0.73
1.50	0.73	4.75	33.63	8.00	2.92	11.25	0.73
1.75	0.73	5.00	33.63	8.25	1.46	11.50	0.73
2.00	0.73	5.25	9.50	8.50	1.46	11.75	0.73
2.25	4.39	5.50	9.50	8.75	1.46	12.00	0.73
2.50	4.39	5.75	9.50	9.00	1.46		
2.75	4.39	6.00	9.50	9.25	0.73		
3.00	4.39	6.25	5.12	9.50	0.73		

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min | Area (ha)= 2.78
Total Imp(%)= 49.00 Dir. Conn.(%)= 49.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.36 1.42
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73

1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 14.02
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.13 0.05 0.172 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 71.10 23.04 46.58
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.32 0.64

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102) | Area (ha)= 0.41

ID= 1 DT= 5.0 min | Total Imp(%)= 73.60 Dir. Conn.(%)= 73.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.30 0.11
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73

3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.03 0.01 0.035 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 71.10 44.03 63.93
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103) | Area (ha)= 0.87
ID= 1 DT= 5.0 min | Total Imp(%)= 67.60 Dir. Conn.(%)= 67.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.59 0.28
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73

0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.05 0.02 0.072 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 71.10 44.03 62.32
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)				
1 + 2 = 3				
		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
				R.V.
				(mm)
ID1= 1 (0101):		2.78	0.172	5.25
+ ID2= 2 (0102):		0.41	0.035	5.25
				63.93
=====				
ID = 3 (0010):		3.19	0.207	5.25
				48.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)				
3 + 2 = 1				
		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
				R.V.
				(mm)
ID1= 3 (0010):		3.19	0.207	5.25
+ ID2= 2 (0103):		0.87	0.072	5.25
				62.32
=====				
ID = 1 (0010):		4.06	0.280	5.25
				51.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
STANDHYD (0501)				
ID= 1 DT= 5.0 min				
		Area	(ha)=	1.35
		Total Imp(%)=	64.80	Dir. Conn.(%)= 64.80

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.87 0.47
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----									
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73		
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73		
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73		
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73		
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73		
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73		
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73		
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73		
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73		

0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.27
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.08 0.03 0.110 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 71.10 41.52 60.68
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.57 0.83

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0502)				
ID= 1 DT= 5.0 min				
		Area	(ha)=	0.51
		Total Imp(%)=	65.90	Dir. Conn.(%)= 65.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.33 0.17
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----									
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73		
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73		
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73		
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73		
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73		
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73		
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73		
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73		
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73		
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73		
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73		
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73		
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73		
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73		
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73		
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73		
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73		
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73		
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73		
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73		
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73		
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73		
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73		
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73		
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73		
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73		
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73		
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73		
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73		
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73		
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73		
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73		
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73		

2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.03 0.01 *TOTALS*
TIME TO PEAK (hrs)= 5.25 5.25 0.042 (iii)
RUNOFF VOLUME (mm)= 71.10 44.03 61.85
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.85

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0501):	1.35	0.110	5.25	60.68
+ ID2= 2 (0502):	0.51	0.042	5.25	61.85
ID = 3 (0015):	1.85	0.152	5.25	61.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)=	1.41
STANDHYD (0601)	Total Imp(%)=	48.70
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	48.70

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.69	0.72
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.86	2.00
Length (m)=	96.99	40.00
Mannings n	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.27
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.06 0.04 *TOTALS*
0.108 (iii)

TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 71.10 41.52 55.91
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.57 0.76

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)=	2.06
STANDHYD (0701)	Total Imp(%)=	64.80
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	64.80

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.33	0.72
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	0.41	2.00
Length (m)=	117.10	40.00
Mannings n	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min)= 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.12 0.04 *TOTALS*
TIME TO PEAK (hrs)= 5.25 5.25 0.169 (iii)
RUNOFF VOLUME (mm)= 71.10 44.03 61.57
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.84

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)=	1.79
STANDHYD (0801)	Total Imp(%)=	63.90
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	63.90

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.14	0.65
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	1.33	2.00
Length (m)=	109.27	40.00
Mannings n	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.11 0.04 0.147 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 71.10 44.03 61.32
TOTAL RAINFALL (mm)= 73.10 73.10 73.10
RUNOFF COEFFICIENT = 0.97 0.60 0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y M M O O
O O T T H H Y M M O O
000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\b65f2acb-9172-4e46-a0c6-497250e4816c\scse
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\b65f2acb-9172-4e46-a0c6-497250e4816c\scse

DATE: 06/24/2024 TIME: 11:21:35

USER:

COMMENTS: _____

** SIMULATION : 5 Year 12 Hour AES (Bloor, TR **

File: C:\Users\p004074G\AppData\Local\Temp\ f221802b-7ca3-45e2-99f8-9af8e094b359\ e7069398
Comments: 5 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	9.25	6.50	3.81	9.75	0.54
0.25	0.54	3.50	9.25	6.75	3.81	10.00	0.54
0.50	0.54	3.75	9.25	7.00	3.81	10.25	0.54
0.75	0.54	4.00	9.25	7.25	2.18	10.50	0.54
1.00	0.54	4.25	25.02	7.50	2.18	10.75	0.54
1.25	0.54	4.50	25.02	7.75	2.18	11.00	0.54
1.50	0.54	4.75	25.02	8.00	2.18	11.25	0.54
1.75	0.54	5.00	25.02	8.25	1.09	11.50	0.54
2.00	0.54	5.25	7.07	8.50	1.09	11.75	0.54
2.25	3.26	5.50	7.07	8.75	1.09	12.00	0.54
2.50	3.26	5.75	7.07	9.00	1.09		
2.75	3.26	6.00	7.07	9.25	0.54		
3.00	3.26	6.25	3.81	9.50	0.54		

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min
Area (ha)= 2.78
Total Imp(%)= 49.00 Dir. Conn.(%)= 49.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.36 1.42
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 8.23
over (min) 5.00 30.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.09 0.03 0.120 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25

RUNOFF VOLUME (mm)= 52.38 13.36 32.47
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.25 0.60

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min

Area (ha)= 0.41
Total Imp(%)= 73.60 Dir. Conn.(%)= 73.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.30 0.11
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.02 0.00 0.026 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 28.62 46.08
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103)
ID= 1 DT= 5.0 min

Area (ha)= 0.87
Total Imp(%)= 67.60 Dir. Conn.(%)= 67.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.59 0.28
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

PEAK FLOW (cms)= 0.04 0.01 0.052 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 28.62 44.67
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.82

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	2.78	0.120	5.25	32.47
+ ID2= 2 (0102):	0.41	0.026	5.25	46.08
=====				
ID = 3 (0010):	3.19	0.146	5.25	34.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0010):	3.19	0.146	5.25	34.24
+ ID2= 2 (0103):	0.87	0.052	5.25	44.67
=====				
ID = 1 (0010):	4.06	0.198	5.25	36.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0501)
ID= 1 DT= 5.0 min

Area (ha)= 1.35
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.87 0.47
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.29 2.00
Length (m)= 94.83 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.48
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.06 0.02 0.079 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 26.09 43.12
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.48 0.79

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 0.51
STANDHYD (0502)	Total Imp(%)= 65.90 Dir. Conn.(%)= 65.90
ID= 1 DT= 5.0 min	

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.33 0.17
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.23 2.00
Length (m)= 58.04 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54

1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS

PEAK FLOW (cms)= 0.02 0.01 0.030 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 28.62 44.26
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.81

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0501):	1.35	0.079	5.25	43.12
+ ID2= 2 (0502):	0.51	0.030	5.25	44.26
ID = 3 (0015):	1.85	0.109	5.25	43.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)= 1.41
STANDHYD (0601)	Total Imp(%)= 48.70 Dir. Conn.(%)= 48.70
ID= 1 DT= 5.0 min	

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.69 0.72
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54

2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.48
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.05 0.03 0.075 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 26.09 38.88
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.48 0.72

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0701)	Area (ha)= 2.06
ID= 1 DT= 5.0 min	Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.33	0.72
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	0.41	2.00
Length (m)=	117.10	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54

- THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0801)	Area (ha)= 1.79
ID= 1 DT= 5.0 min	Total Imp(%)= 63.90 Dir. Conn.(%)= 63.90

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.14	0.65
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	1.33	2.00
Length (m)=	109.27	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54

0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.09 0.03 0.122 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 28.62 44.01
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.81

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
over (min) 5.00 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

TOTALS
PEAK FLOW (cms)= 0.08 0.03 0.105 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 52.38 28.62 43.80
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.96 0.53 0.81

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\1d759ba3-c5ff-41e3-a0bd-657c1cb7bb35\sce

Summary filename:
C:\Users\p004074G\AppData\Local\Civica\XH5\cd9a1a77-9ff1-45df-b597-776898829552\1d759ba3-c5ff-41e3-a0bd-657c1cb7bb35\sce

DATE: 06/24/2024 TIME: 11:21:35

USER:

COMMENTS: _____

** SIMULATION : 50 Year 12 Hour AES (Bloor, T **

READ STORM	Filename: C:\Users\p004074G\AppData\Local\Temp\
Ptotal= 80.82 mm	f221802b-7ca3-45e2-99f8-9af8e094b359\cc7e037c
	Comments: 50 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	13.74	6.50	5.66	9.75	0.81	
0.25	0.81	3.50	13.74	6.75	5.66	10.00	0.81	
0.50	0.81	3.75	13.74	7.00	5.66	10.25	0.81	
0.75	0.81	4.00	13.74	7.25	3.23	10.50	0.81	
1.00	0.81	4.25	37.17	7.50	3.23	10.75	0.81	
1.25	0.81	4.50	37.17	7.75	3.23	11.00	0.81	
1.50	0.81	4.75	37.17	8.00	3.23	11.25	0.81	
1.75	0.81	5.00	37.17	8.25	1.62	11.50	0.81	
2.00	0.81	5.25	10.50	8.50	1.62	11.75	0.81	
2.25	4.85	5.50	10.50	8.75	1.62	12.00	0.81	
2.50	4.85	5.75	10.50	9.00	1.62			
2.75	4.85	6.00	10.50	9.25	0.81			
3.00	4.85	6.25	5.66	9.50	0.81			

CALIB			
STANDHYD (0101)	Area (ha)=	2.78	
ID= 1 DT= 5.0 min	Total Imp(%)=	49.00	Dir. Conn.(%)= 49.00
Surface Area	(ha)=	1.36	PERVIOUS (i)
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	1.75	2.00
Length	(m)=	136.01	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81

2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 17.01
over (min) 25.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.14 0.05 0.194 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 78.82 27.50 52.64
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.34 0.65

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0102)	Area (ha)=	0.41	
ID= 1 DT= 5.0 min	Total Imp(%)=	73.60	Dir. Conn.(%)= 73.60

	IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.30
Dep. Storage	(mm)=	2.00
Average Slope	(%)=	2.50
Length	(m)=	52.54
Mannings n	=	0.013

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----								
TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr		hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81	
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81	
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81	
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81	
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81	

0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81	
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81	
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81	
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81	
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81	
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81	
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81	
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81	
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81	
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81	
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81	
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81	
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81	
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81	
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81	
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81	
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81	
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81	
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81	
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81	
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81	
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81	
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81	
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81	
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81	
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81	
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81	
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81	
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81	
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81	
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81	
3.083	4.85	6.167	10.50	9.250	1.62			

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.03 0.01 0.039 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68 71.37
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63 0.88

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0103)	Area (ha)= 0.87
ID= 1 DT= 5.0 min	Total Imp(%)= 67.60 Dir. Conn.(%)= 67.60

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.59	0.28
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	1.62	2.00
Length (m)=	76.12	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81

2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)=	37.17	29.06
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

			TOTALS
PEAK FLOW (cms)=	0.06	0.02	0.081 (iii)
TIME TO PEAK (hrs)=	5.25	5.25	5.25
RUNOFF VOLUME (mm)=	78.82	50.68	69.69
TOTAL RAINFALL (mm)=	80.82	80.82	80.82
RUNOFF COEFFICIENT =	0.98	0.63	0.86

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0101):	2.78	0.194	5.25	52.64
+ ID2= 2 (0102):	0.41	0.039	5.25	71.37
=====				
ID = 3 (0010):	3.19	0.234	5.25	55.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0010):	3.19	0.234	5.25	55.08
+ ID2= 2 (0103):	0.87	0.081	5.25	69.69
=====				
ID = 1 (0010):	4.06	0.314	5.25	58.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0501)	Area (ha)= 1.35
ID= 1 DT= 5.0 min	Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.87	0.47
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.29	2.00
Length (m)=	94.83	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81

2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)=	37.17	28.96
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

			TOTALS
PEAK FLOW (cms)=	0.09	0.03	0.123 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	78.82	48.19	68.03
TOTAL RAINFALL (mm)=	80.82	80.82	80.82
RUNOFF COEFFICIENT =	0.98	0.60	0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB				
STANDHYD (0502)	Area (ha)=	0.51		
ID= 1 DT= 5.0 min	Total Imp(%)=	65.90	Dir. Conn.(%)=	65.90

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.33	0.17
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	0.23	2.00
Length (m)=	58.04	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81

0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.03 0.01
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68
TOTAL RAINFALL (mm)= 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

TOTALS
0.047 (iii)
5.25
69.20
80.82
0.86

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)				
1 + 2 = 3				
		AREA	OPEAK	TPEAK
		(ha)	(cms)	(hrs)
ID1= 1 (0501):		1.35	0.123	5.25
+ ID2= 2 (0502):		0.51	0.047	5.25
ID = 3 (0015):				
		1.85	0.170	5.25
				68.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		Area (ha)= 1.41	
STANDHYD (0601)		Total Imp(%)= 48.70	Dir. Conn.(%)= 48.70
ID= 1 DT= 5.0 min			

IMPERVIOUS (i)
Surface Area (ha)= 0.69 0.72
Dep. Storage (mm)= 2.00 6.00
Average Slope (%)= 0.86 2.00
Length (m)= 96.99 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81

1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 28.96
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.07 0.05
TIME TO PEAK (hrs)= 5.25 5.33
RUNOFF VOLUME (mm)= 78.82 48.19
TOTAL RAINFALL (mm)= 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.60

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		Area (ha)= 2.06	
STANDHYD (0701)		Total Imp(%)= 64.80	Dir. Conn.(%)= 64.80
ID= 1 DT= 5.0 min			

IMPERVIOUS (i)
Surface Area (ha)= 1.33 0.72

Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 29.06

over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.14 0.05
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68
TOTAL RAINFALL (mm)= 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63

TOTALS
0.189 (iii)
5.25
68.91
80.82
0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 63.90 Dir. Conn.(%)= 63.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.14 0.65
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 0.00 3.167 4.85 6.250 10.50 9.33 0.81
0.167 0.00 3.250 4.85 6.333 5.66 9.42 0.81
0.250 0.00 3.333 13.74 6.417 5.66 9.50 0.81
0.333 0.81 3.417 13.74 6.500 5.66 9.58 0.81
0.417 0.81 3.500 13.74 6.583 5.66 9.67 0.81
0.500 0.81 3.583 13.74 6.667 5.66 9.75 0.81
0.583 0.81 3.667 13.74 6.750 5.66 9.83 0.81
0.667 0.81 3.750 13.74 6.833 5.66 9.92 0.81
0.750 0.81 3.833 13.74 6.917 5.66 10.00 0.81
0.833 0.81 3.917 13.74 7.000 5.66 10.08 0.81
0.917 0.81 4.000 13.74 7.083 5.66 10.17 0.81
1.000 0.81 4.083 13.74 7.167 5.66 10.25 0.81
1.083 0.81 4.167 13.74 7.250 5.66 10.33 0.81

1.167 0.81 4.250 13.74 7.333 3.23 10.42 0.81
1.250 0.81 4.333 37.17 7.417 3.23 10.50 0.81
1.333 0.81 4.417 37.17 7.500 3.23 10.58 0.81
1.417 0.81 4.500 37.17 7.583 3.23 10.67 0.81
1.500 0.81 4.583 37.17 7.667 3.23 10.75 0.81
1.583 0.81 4.667 37.17 7.750 3.23 10.83 0.81
1.667 0.81 4.750 37.17 7.833 3.23 10.92 0.81
1.750 0.81 4.833 37.17 7.917 3.23 11.00 0.81
1.833 0.81 4.917 37.17 8.000 3.23 11.08 0.81
1.917 0.81 5.000 37.17 8.083 3.23 11.17 0.81
2.000 0.81 5.083 37.17 8.167 3.23 11.25 0.81
2.083 0.81 5.167 37.17 8.250 3.23 11.33 0.81
2.167 0.81 5.250 37.17 8.333 1.62 11.42 0.81
2.250 0.81 5.333 10.50 8.417 1.62 11.50 0.81
2.333 4.85 5.417 10.50 8.500 1.62 11.58 0.81
2.417 4.85 5.500 10.50 8.583 1.62 11.67 0.81
2.500 4.85 5.583 10.50 8.667 1.62 11.75 0.81
2.583 4.85 5.667 10.50 8.750 1.62 11.83 0.81
2.667 4.85 5.750 10.50 8.833 1.62 11.92 0.81
2.750 4.85 5.833 10.50 8.917 1.62 12.00 0.81
2.833 4.85 5.917 10.50 9.000 1.62 12.08 0.81
2.917 4.85 6.000 10.50 9.083 1.62 12.17 0.81
3.000 4.85 6.083 10.50 9.167 1.62 12.25 0.81
3.083 4.85 6.167 10.50 9.250 1.62

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.12 0.05
TIME TO PEAK (hrs)= 5.25 5.25
RUNOFF VOLUME (mm)= 78.82 50.68
TOTAL RAINFALL (mm)= 80.82 80.82
RUNOFF COEFFICIENT = 0.98 0.63

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

V V I SSSS U U A L (v 6.2.2015)
V V I SS U U A A L

V V I SS U U A A A A A L
V V I SS U U A A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y M M O O
O O T T H H Y Y M M O O
000 T T H H Y M M 000

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\V02\voind.dat

Output filename:
C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\322d
ecc7-25de-4984-b9be-050e48d42654\sce
Summary filename:
C:\Users\p004074G\AppData\Local\Civica\VH5\cd9a1a77-9ff1-45df-b597-776898829552\322d
ecc7-25de-4984-b9be-050e48d42654\sce

DATE: 06/24/2024 TIME: 11:21:35

USER:

COMMENTS:

** SIMULATION : Hazel **

READ STORM
Filename: C:\Users\p004074G\AppData
ata\Local\Temp\
f221802b-7ca3-45e2-99f8-9af8e094b359\d07e3020
Ptotal=212.00 mm
Comments: Hazel

TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr

0.00 6.00 3.00 13.00 6.00 23.00 9.00 53.00
1.00 4.00 4.00 17.00 7.00 13.00 10.00 38.00
2.00 6.00 5.00 13.00 8.00 13.00 11.00 13.00

CALIB
STANDHYD (0101)
ID= 1 DT= 5.0 min
Area (ha)= 2.78
Total Imp(%)= 49.00 Dir. Conn.(%)= 49.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.36 1.42
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.75 2.00
Length (m)= 136.01 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr ' hrs mm/hr hrs mm/hr
0.083 6.00 3.083 13.00 6.083 23.00 9.08 53.00
0.167 6.00 3.167 13.00 6.167 23.00 9.17 53.00
0.250 6.00 3.250 13.00 6.250 23.00 9.25 53.00
0.333 6.00 3.333 13.00 6.333 23.00 9.33 53.00
0.417 6.00 3.417 13.00 6.417 23.00 9.42 53.00
0.500 6.00 3.500 13.00 6.500 23.00 9.50 53.00
0.583 6.00 3.583 13.00 6.583 23.00 9.58 53.00
0.667 6.00 3.667 13.00 6.667 23.00 9.67 53.00
0.750 6.00 3.750 13.00 6.750 23.00 9.75 53.00
0.833 6.00 3.833 13.00 6.833 23.00 9.83 53.00
0.917 6.00 3.917 13.00 6.917 23.00 9.92 53.00
1.000 6.00 4.000 13.00 7.000 23.00 10.00 53.00
1.083 4.00 4.083 17.00 7.083 13.00 10.08 38.00
1.167 4.00 4.167 17.00 7.167 13.00 10.17 38.00
1.250 4.00 4.250 17.00 7.250 13.00 10.25 38.00
1.333 4.00 4.333 17.00 7.333 13.00 10.33 38.00
1.417 4.00 4.417 17.00 7.417 13.00 10.42 38.00
1.500 4.00 4.500 17.00 7.500 13.00 10.50 38.00
1.583 4.00 4.583 17.00 7.583 13.00 10.58 38.00
1.667 4.00 4.667 17.00 7.667 13.00 10.67 38.00
1.750 4.00 4.750 17.00 7.750 13.00 10.75 38.00
1.833 4.00 4.833 17.00 7.833 13.00 10.83 38.00
1.917 4.00 4.917 17.00 7.917 13.00 10.92 38.00
2.000 4.00 5.000 17.00 8.000 13.00 11.00 38.00
2.083 6.00 5.083 13.00 8.083 13.00 11.08 13.00
2.167 6.00 5.167 13.00 8.167 13.00 11.17 13.00

2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 41.22
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.20 0.15 0.350 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 125.95 167.13
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.59 0.79

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 65.6 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0102)
ID= 1 DT= 5.0 min
Area (ha)= 0.41
Total Imp(%)= 73.60 Dir. Conn.(%)= 73.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.30 0.11
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 2.50 2.00
Length (m)= 52.54 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00

0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.04 0.01 0.059 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 200.35
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.95

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

- CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0103)
ID= 1 DT= 5.0 min
Area (ha)= 0.87
Total Imp(%)= 67.60 Dir. Conn.(%)= 67.60

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.59 0.28
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.62 2.00
Length (m)= 76.12 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00

2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.09 0.04 0.124 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 198.18
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.93

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0010)
1 + 2 = 3
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 1 (0101): 2.78 0.350 10.00 167.13
+ ID2= 2 (0102): 0.41 0.059 10.00 200.35
=====

ID = 3 (0010): 3.19 0.409 10.00 171.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0010)
3 + 2 = 1
AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
ID1= 3 (0010): 3.19 0.409 10.00 171.45
+ ID2= 2 (0103): 0.87 0.124 10.00 198.18

=====

ID = 1 (0010): 4.06 0.533 10.00 177.17

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0501)	Area (ha)= 1.35
ID= 1 DT= 5.0 min	Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.87	0.47
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.29	2.00
Length (m)=	94.83	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00

2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.54
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06
PEAK FLOW (cms)=	0.13	0.06
TIME TO PEAK (hrs)=	10.00	10.08
RUNOFF VOLUME (mm)=	210.00	171.56
TOTAL RAINFALL (mm)=	212.00	212.00
RUNOFF COEFFICIENT	= 0.99	0.81
		0.93

TOTALS

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0502)	Area (ha)= 0.51
ID= 1 DT= 5.0 min	Total Imp(%)= 65.90 Dir. Conn.(%)= 65.90

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.33	0.17
Dep. Storage (mm)=	2.00	1.50
Average Slope (%)=	0.23	2.00
Length (m)=	58.04	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00

0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33
over (min)	5.00	20.00
Storage Coeff. (min)=	6.00 (ii)	18.00 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.06

TOTALS

PEAK FLOW (cms)=	0.05	0.02
TIME TO PEAK (hrs)=	10.00	10.08
RUNOFF VOLUME (mm)=	210.00	173.55
TOTAL RAINFALL (mm)=	212.00	212.00
RUNOFF COEFFICIENT	= 0.99	0.82
		0.93

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0015)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0501):	1.35	0.192	10.00	196.46
+ ID2= 2 (0502):	0.51	0.072	10.00	197.55
=====				
ID = 3 (0015):	1.85	0.263	10.00	196.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
STANDHYD (0601)	Area (ha)= 1.41
ID= 1 DT= 5.0 min	Total Imp(%)= 48.70 Dir. Conn.(%)= 48.70

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.69	0.72
Dep. Storage (mm)=	2.00	6.00
Average Slope (%)=	0.86	2.00
Length (m)=	96.99	40.00
Mannings n	= 0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00

1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.54
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.10 0.10 0.197 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 171.56 190.28
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.81 0.90

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 86.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0701)
ID= 1 DT= 5.0 min
Area (ha)= 2.06
Total Imp(%)= 64.80 Dir. Conn.(%)= 64.80

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.33 0.72
Dep. Storage (mm)= 2.00 1.50

Average Slope (%)= 0.41 2.00
Length (m)= 117.10 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)

Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06
PEAK FLOW (cms)= 0.20 0.10 0.292 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 197.16
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.93

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0801)
ID= 1 DT= 5.0 min
Area (ha)= 1.79
Total Imp(%)= 63.90 Dir. Conn.(%)= 63.90

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.14 0.65
Dep. Storage (mm)= 2.00 1.50
Average Slope (%)= 1.33 2.00
Length (m)= 109.27 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00

1.333 4.00 4.333 17.00 7.333 13.00 10.33 38.00
1.417 4.00 4.417 17.00 7.417 13.00 10.42 38.00
1.500 4.00 4.500 17.00 7.500 13.00 10.50 38.00
1.583 4.00 4.583 17.00 7.583 13.00 10.58 38.00
1.667 4.00 4.667 17.00 7.667 13.00 10.67 38.00
1.750 4.00 4.750 17.00 7.750 13.00 10.75 38.00
1.833 4.00 4.833 17.00 7.833 13.00 10.83 38.00
1.917 4.00 4.917 17.00 7.917 13.00 10.92 38.00
2.000 4.00 5.000 17.00 8.000 13.00 11.00 38.00
2.083 6.00 5.083 13.00 8.083 13.00 11.08 13.00
2.167 6.00 5.167 13.00 8.167 13.00 11.17 13.00
2.250 6.00 5.250 13.00 8.250 13.00 11.25 13.00
2.333 6.00 5.333 13.00 8.333 13.00 11.33 13.00
2.417 6.00 5.417 13.00 8.417 13.00 11.42 13.00
2.500 6.00 5.500 13.00 8.500 13.00 11.50 13.00
2.583 6.00 5.583 13.00 8.583 13.00 11.58 13.00
2.667 6.00 5.667 13.00 8.667 13.00 11.67 13.00
2.750 6.00 5.750 13.00 8.750 13.00 11.75 13.00
2.833 6.00 5.833 13.00 8.833 13.00 11.83 13.00
2.917 6.00 5.917 13.00 8.917 13.00 11.92 13.00
3.000 6.00 6.000 13.00 9.000 13.00 12.00 13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 6.00 (ii) 18.00 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.17 0.09 0.254 (iii)
TIME TO PEAK (hrs)= 10.00 10.08 10.00
RUNOFF VOLUME (mm)= 210.00 173.55 196.83
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 0.99 0.82 0.93

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

APPENDIX C

Quality Control

APPENDIX C: Quality Control

Stormceptor

Detailed Stormceptor Sizing Report - HRP-1

Detailed Stormceptor Sizing Report - HRP-2

Detailed Stormceptor Sizing Report - HRP-3

Detailed Stormceptor Sizing Report - HRP-4A

Detailed Stormceptor Sizing Report - HRP-4B

Detailed Stormceptor Sizing Report - HRP-5A

Detailed Stormceptor Sizing Report - HRP-5B

Drawing and Specification

STORMCEPTOR

Stormceptor® EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-1	EOR Name:	
		EOR Company:	
Drainage Area (ha):	1.79	EOR Email:	
% Imperviousness:	63.90	EOR Phone:	

Runoff Coefficient 'c': 0.68

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	38.04
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	151.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	885
Estimated Average Annual Sediment Volume (L/yr):	719

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	45
EFO6	54
EFO8	59
EFO10	63
EFO12	65

Recommended Stormceptor EFO Model: **EFO10**
Estimated Net Annual Sediment (TSS) Load Reduction (%): **63**
Water Quality Runoff Volume Capture (%): **> 90**

Stormceptor®EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-2	EOR Name:	
		EOR Company:	
Drainage Area (ha):	2.06	EOR Email:	
% Imperviousness:	64.80	EOR Phone:	

Runoff Coefficient 'c': 0.68

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	44.12
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	205.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	1016
Estimated Average Annual Sediment Volume (L/yr):	826

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	43
EFO6	52
EFO8	58
EFO10	62
EFO12	64

Recommended Stormceptor EFO Model: **EFO10**

Estimated Net Annual Sediment (TSS) Load Reduction (%): **62**

Water Quality Runoff Volume Capture (%): **> 90**

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

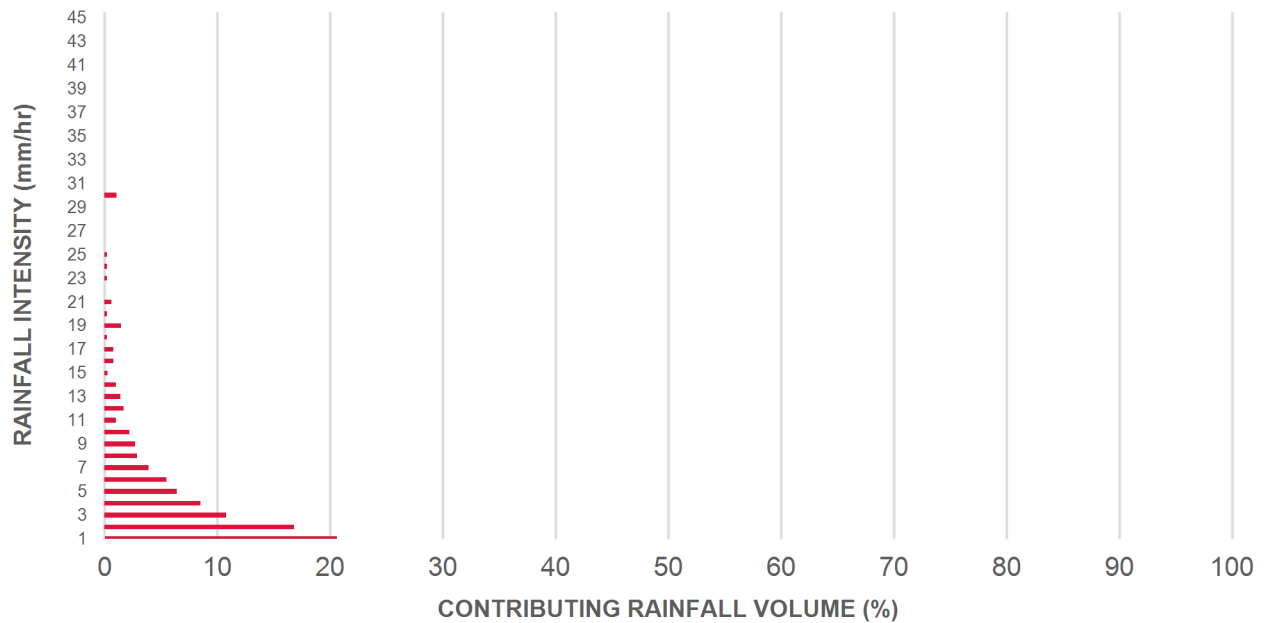
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.97	118.0	16.0	70	6.0	6.0
1.00	20.6	29.1	3.94	237.0	32.0	70	14.5	20.5
2.00	16.8	45.9	7.89	473.0	65.0	67	11.3	31.8
3.00	10.8	56.7	11.83	710.0	97.0	63	6.8	38.6
4.00	8.5	65.2	15.78	947.0	130.0	60	5.1	43.7
5.00	6.4	71.6	19.72	1183.0	162.0	57	3.7	47.3
6.00	5.5	77.0	23.67	1420.0	195.0	55	3.0	50.3
7.00	3.9	81.0	27.61	1657.0	227.0	53	2.1	52.4
8.00	2.9	83.9	31.56	1893.0	259.0	52	1.5	53.9
9.00	2.7	86.5	35.50	2130.0	292.0	51	1.4	55.3
10.00	2.2	88.7	39.45	2367.0	324.0	50	1.1	56.4
11.00	1.0	89.7	43.39	2603.0	357.0	50	0.5	56.9
12.00	1.7	91.3	47.34	2840.0	389.0	48	0.8	57.7
13.00	1.4	92.8	51.28	3077.0	421.0	47	0.7	58.4
14.00	1.0	93.7	55.22	3313.0	454.0	47	0.5	58.8
15.00	0.3	94.0	59.17	3550.0	486.0	46	0.1	59.0
16.00	0.8	94.8	63.11	3787.0	519.0	45	0.4	59.3
17.00	0.8	95.7	67.06	4024.0	551.0	44	0.4	59.7
18.00	0.2	95.8	71.00	4260.0	584.0	43	0.1	59.8
19.00	1.5	97.3	74.95	4497.0	616.0	42	0.6	60.4
20.00	0.2	97.5	78.89	4734.0	648.0	42	0.1	60.5
21.00	0.6	98.2	82.84	4970.0	681.0	42	0.3	60.7
22.00	0.0	98.2	86.78	5207.0	713.0	41	0.0	60.7
23.00	0.2	98.4	90.73	5444.0	746.0	41	0.1	60.8
24.00	0.2	98.6	94.67	5680.0	778.0	41	0.1	60.9
25.00	0.2	98.9	98.62	5917.0	811.0	41	0.1	61.0
30.00	1.1	100.0	118.34	7100.0	973.0	40	0.5	61.5
35.00	0.0	100.0	138.06	8284.0	1135.0	38	0.0	61.5
40.00	0.0	100.0	157.78	9467.0	1297.0	36	0.0	61.5
45.00	0.0	100.0	177.51	10650.0	1459.0	33	0.0	61.5
Estimated Net Annual Sediment (TSS) Load Reduction =								61 %

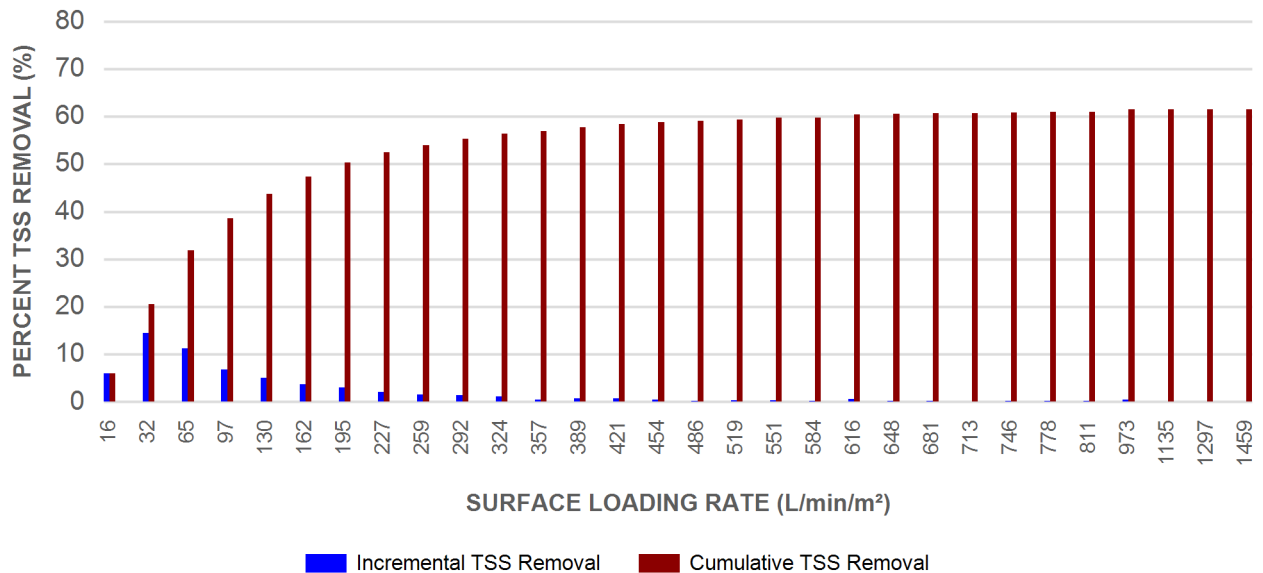
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

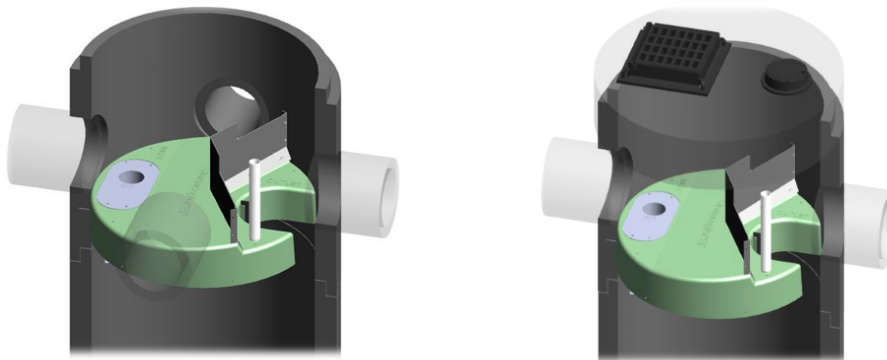
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

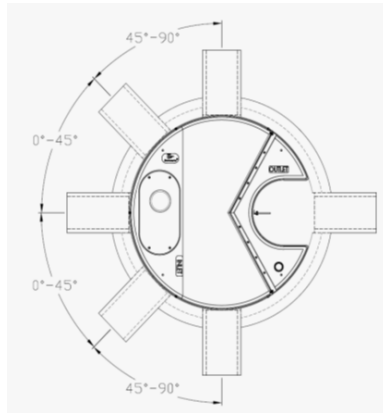
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor® EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor® EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-3	EOR Name:	
		EOR Company:	
Drainage Area (ha):	1.41	EOR Email:	
% Imperviousness:	48.70	EOR Phone:	

Runoff Coefficient 'c': 0.59

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	25.97
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	130.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	523
Estimated Average Annual Sediment Volume (L/yr):	425

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	49
EFO6	58
EFO8	62
EFO10	65
EFO12	67

Recommended Stormceptor EFO Model: EFO8
Estimated Net Annual Sediment (TSS) Load Reduction (%): 62
Water Quality Runoff Volume Capture (%): > 90

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

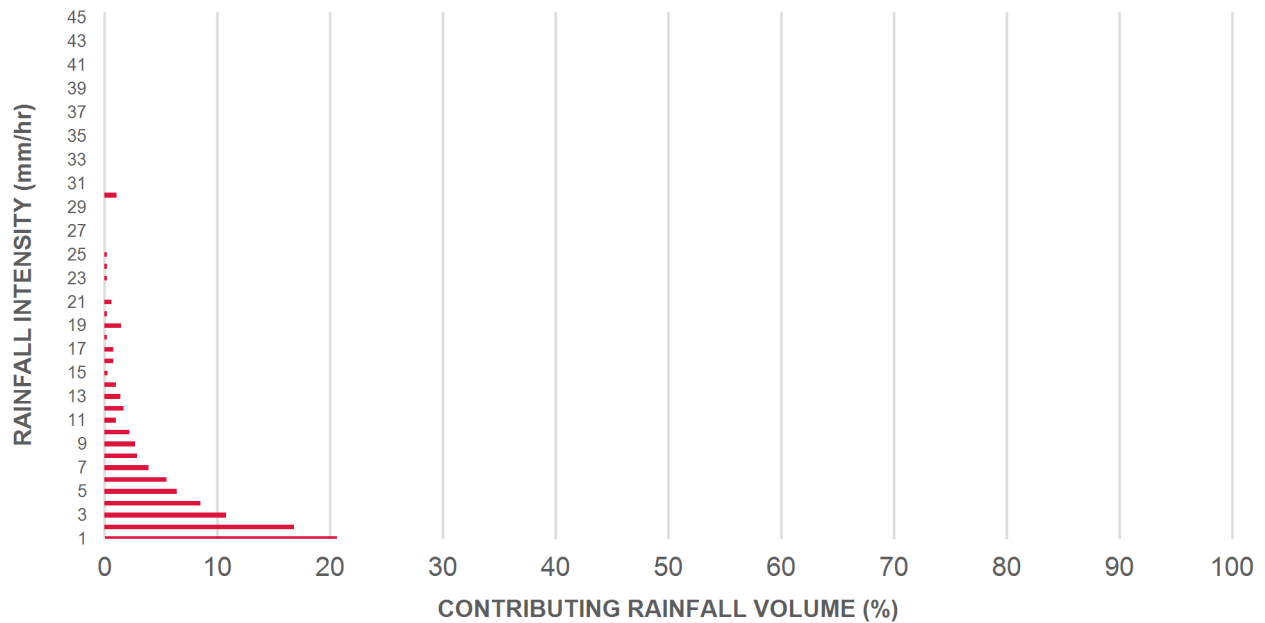
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.16	70.0	15.0	70	6.0	6.0
1.00	20.6	29.1	2.32	139.0	30.0	70	14.5	20.5
2.00	16.8	45.9	4.64	279.0	59.0	67	11.3	31.8
3.00	10.8	56.7	6.96	418.0	89.0	64	6.9	38.7
4.00	8.5	65.2	9.29	557.0	119.0	62	5.2	43.9
5.00	6.4	71.6	11.61	696.0	148.0	59	3.8	47.7
6.00	5.5	77.0	13.93	836.0	178.0	57	3.1	50.8
7.00	3.9	81.0	16.25	975.0	207.0	54	2.1	52.9
8.00	2.9	83.9	18.57	1114.0	237.0	53	1.5	54.4
9.00	2.7	86.5	20.89	1254.0	267.0	52	1.4	55.8
10.00	2.2	88.7	23.21	1393.0	296.0	51	1.1	56.9
11.00	1.0	89.7	25.53	1532.0	326.0	50	0.5	57.4
12.00	1.7	91.3	27.86	1671.0	356.0	50	0.8	58.2
13.00	1.4	92.8	30.18	1811.0	385.0	49	0.7	58.9
14.00	1.0	93.7	32.50	1950.0	415.0	48	0.5	59.4
15.00	0.3	94.0	34.82	2089.0	445.0	47	0.1	59.5
16.00	0.8	94.8	37.14	2228.0	474.0	46	0.4	59.9
17.00	0.8	95.7	39.46	2368.0	504.0	45	0.4	60.3
18.00	0.2	95.8	41.78	2507.0	533.0	44	0.1	60.4
19.00	1.5	97.3	44.10	2646.0	563.0	43	0.6	61.0
20.00	0.2	97.5	46.43	2786.0	593.0	42	0.1	61.1
21.00	0.6	98.2	48.75	2925.0	622.0	42	0.3	61.3
22.00	0.0	98.2	51.07	3064.0	652.0	42	0.0	61.3
23.00	0.2	98.4	53.39	3203.0	682.0	42	0.1	61.4
24.00	0.2	98.6	55.71	3343.0	711.0	41	0.1	61.5
25.00	0.2	98.9	58.03	3482.0	741.0	41	0.1	61.6
30.00	1.1	100.0	69.64	4178.0	889.0	41	0.5	62.1
35.00	0.0	100.0	81.25	4875.0	1037.0	40	0.0	62.1
40.00	0.0	100.0	92.85	5571.0	1185.0	37	0.0	62.1
45.00	0.0	100.0	104.46	6268.0	1334.0	35	0.0	62.1
Estimated Net Annual Sediment (TSS) Load Reduction =								62 %

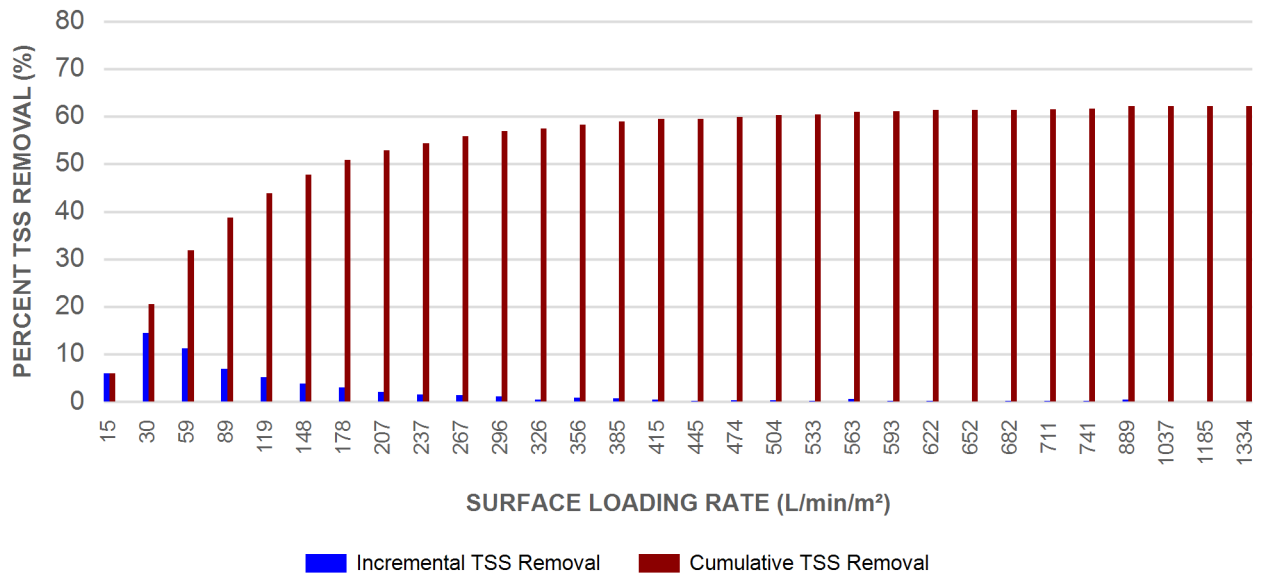
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

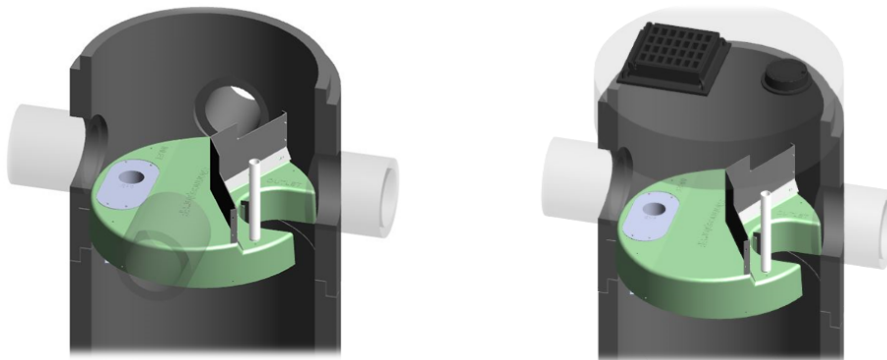
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

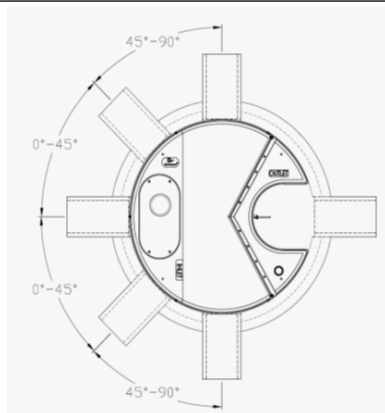
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor® EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor® EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-4A	EOR Name:	
		EOR Company:	
Drainage Area (ha):	1.35	EOR Email:	
% Imperviousness:	64.80	EOR Phone:	

Runoff Coefficient 'c': 0.68

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	28.92
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	173.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	655
Estimated Average Annual Sediment Volume (L/yr):	533

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	48
EFO6	57
EFO8	61
EFO10	64
EFO12	66

Recommended Stormceptor EFO Model: EFO8
Estimated Net Annual Sediment (TSS) Load Reduction (%): 61
Water Quality Runoff Volume Capture (%): > 90

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

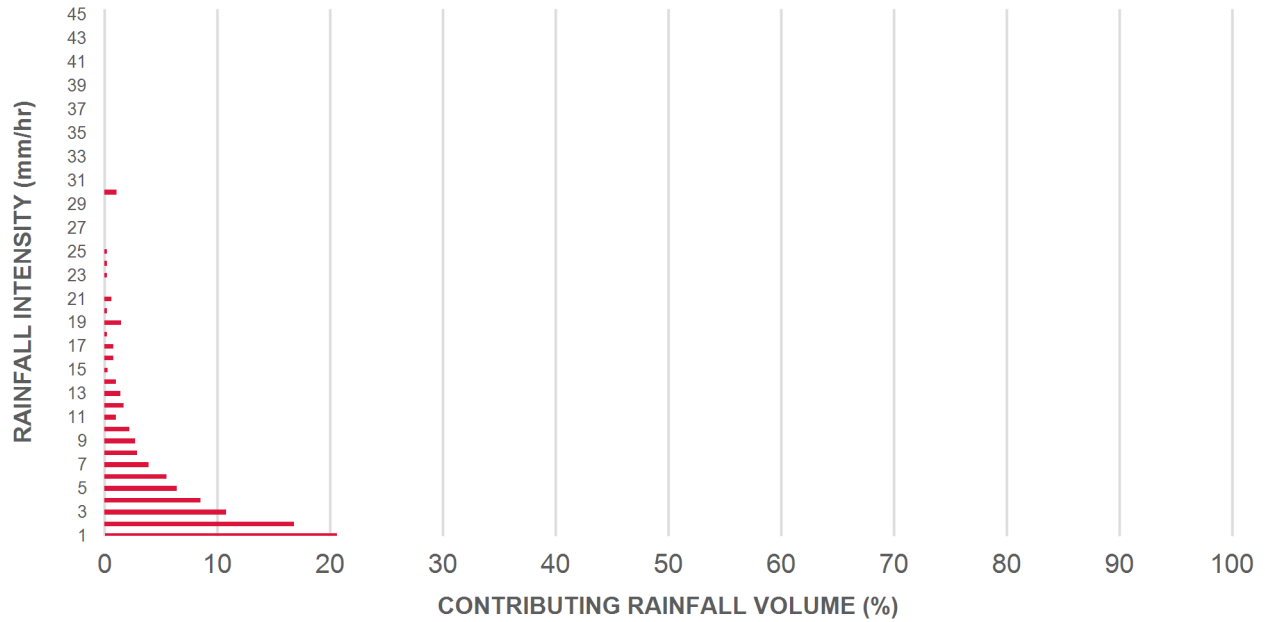
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.29	78.0	17.0	70	6.0	6.0
1.00	20.6	29.1	2.59	155.0	33.0	70	14.5	20.5
2.00	16.8	45.9	5.17	310.0	66.0	67	11.3	31.8
3.00	10.8	56.7	7.76	465.0	99.0	62	6.7	38.5
4.00	8.5	65.2	10.34	620.0	132.0	60	5.1	43.6
5.00	6.4	71.6	12.93	776.0	165.0	57	3.7	47.2
6.00	5.5	77.0	15.51	931.0	198.0	55	3.0	50.2
7.00	3.9	81.0	18.10	1086.0	231.0	53	2.1	52.3
8.00	2.9	83.9	20.68	1241.0	264.0	52	1.5	53.8
9.00	2.7	86.5	23.27	1396.0	297.0	51	1.4	55.2
10.00	2.2	88.7	25.85	1551.0	330.0	50	1.1	56.3
11.00	1.0	89.7	28.44	1706.0	363.0	49	0.5	56.8
12.00	1.7	91.3	31.02	1861.0	396.0	48	0.8	57.6
13.00	1.4	92.8	33.61	2016.0	429.0	47	0.7	58.3
14.00	1.0	93.7	36.19	2171.0	462.0	46	0.4	58.7
15.00	0.3	94.0	38.78	2327.0	495.0	45	0.1	58.8
16.00	0.8	94.8	41.36	2482.0	528.0	44	0.4	59.2
17.00	0.8	95.7	43.95	2637.0	561.0	43	0.4	59.6
18.00	0.2	95.8	46.53	2792.0	594.0	42	0.1	59.6
19.00	1.5	97.3	49.12	2947.0	627.0	42	0.6	60.3
20.00	0.2	97.5	51.70	3102.0	660.0	42	0.1	60.3
21.00	0.6	98.2	54.29	3257.0	693.0	42	0.3	60.6
22.00	0.0	98.2	56.87	3412.0	726.0	41	0.0	60.6
23.00	0.2	98.4	59.46	3567.0	759.0	41	0.1	60.7
24.00	0.2	98.6	62.04	3722.0	792.0	41	0.1	60.8
25.00	0.2	98.9	64.63	3878.0	825.0	41	0.1	60.9
30.00	1.1	100.0	77.55	4653.0	990.0	40	0.5	61.3
35.00	0.0	100.0	90.48	5429.0	1155.0	38	0.0	61.3
40.00	0.0	100.0	103.40	6204.0	1320.0	35	0.0	61.3
45.00	0.0	100.0	116.33	6980.0	1485.0	32	0.0	61.3
Estimated Net Annual Sediment (TSS) Load Reduction =								61 %

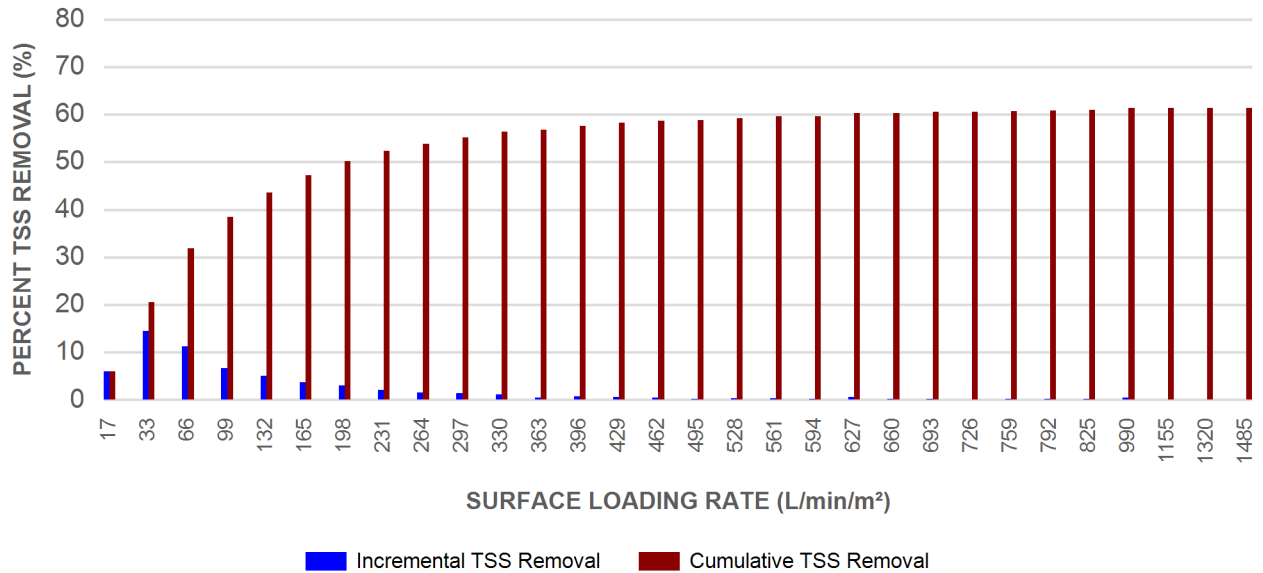
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

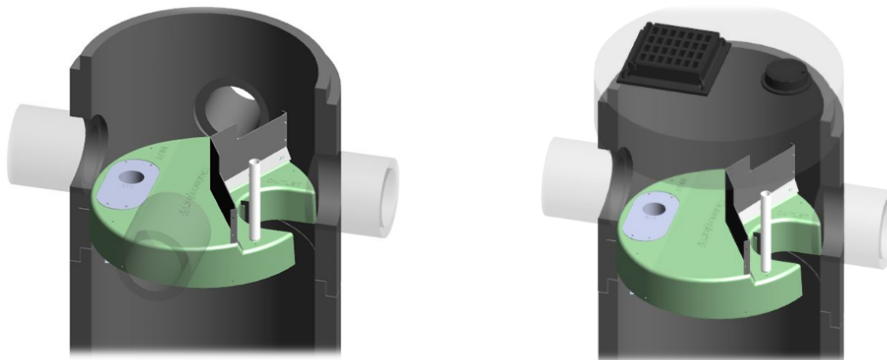
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

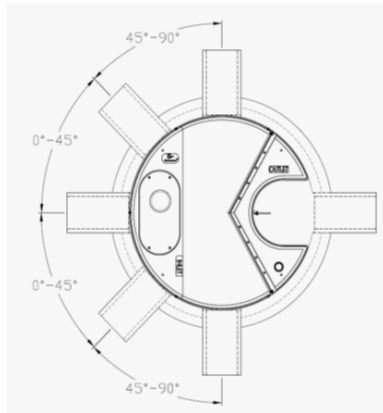
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor®EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program’s **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor® EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-4B	EOR Name:	
		EOR Company:	
Drainage Area (ha):	0.51	EOR Email:	
% Imperviousness:	65.90	EOR Phone:	

Runoff Coefficient 'c': 0.69

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	11.03
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	72.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	264
Estimated Average Annual Sediment Volume (L/yr):	215

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	58
EFO6	64
EFO8	67
EFO10	69
EFO12	70

Recommended Stormceptor EFO Model: **EFO6**
Estimated Net Annual Sediment (TSS) Load Reduction (%): **64**
Water Quality Runoff Volume Capture (%): **> 90**

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

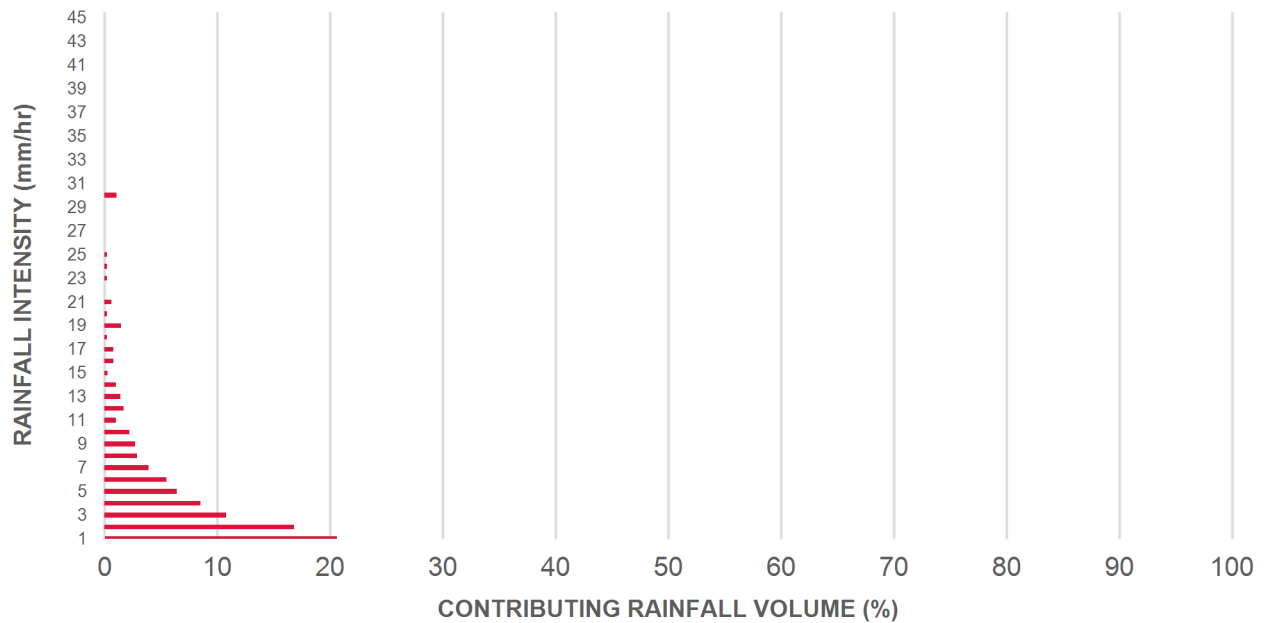
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	0.49	30.0	11.0	70	6.0	6.0
1.00	20.6	29.1	0.99	59.0	22.0	70	14.5	20.5
2.00	16.8	45.9	1.97	118.0	45.0	70	11.8	32.3
3.00	10.8	56.7	2.96	177.0	67.0	67	7.2	39.6
4.00	8.5	65.2	3.94	237.0	90.0	63	5.3	44.9
5.00	6.4	71.6	4.93	296.0	112.0	62	3.9	48.9
6.00	5.5	77.0	5.92	355.0	135.0	60	3.3	52.1
7.00	3.9	81.0	6.90	414.0	157.0	58	2.3	54.4
8.00	2.9	83.9	7.89	473.0	180.0	56	1.6	56.0
9.00	2.7	86.5	8.87	532.0	202.0	54	1.4	57.5
10.00	2.2	88.7	9.86	592.0	225.0	53	1.2	58.6
11.00	1.0	89.7	10.85	651.0	247.0	53	0.5	59.2
12.00	1.7	91.3	11.83	710.0	270.0	52	0.9	60.0
13.00	1.4	92.8	12.82	769.0	292.0	51	0.7	60.7
14.00	1.0	93.7	13.80	828.0	315.0	51	0.5	61.2
15.00	0.3	94.0	14.79	887.0	337.0	50	0.2	61.4
16.00	0.8	94.8	15.78	947.0	360.0	49	0.4	61.8
17.00	0.8	95.7	16.76	1006.0	382.0	49	0.4	62.2
18.00	0.2	95.8	17.75	1065.0	405.0	48	0.1	62.3
19.00	1.5	97.3	18.73	1124.0	427.0	47	0.7	63.0
20.00	0.2	97.5	19.72	1183.0	450.0	47	0.1	63.1
21.00	0.6	98.2	20.70	1242.0	472.0	46	0.3	63.3
22.00	0.0	98.2	21.69	1301.0	495.0	45	0.0	63.3
23.00	0.2	98.4	22.68	1361.0	517.0	45	0.1	63.4
24.00	0.2	98.6	23.66	1420.0	540.0	44	0.1	63.5
25.00	0.2	98.9	24.65	1479.0	562.0	43	0.1	63.7
30.00	1.1	100.0	29.58	1775.0	675.0	42	0.5	64.1
35.00	0.0	100.0	34.51	2070.0	787.0	41	0.0	64.1
40.00	0.0	100.0	39.44	2366.0	900.0	41	0.0	64.1
45.00	0.0	100.0	44.37	2662.0	1012.0	40	0.0	64.1
Estimated Net Annual Sediment (TSS) Load Reduction =								64 %

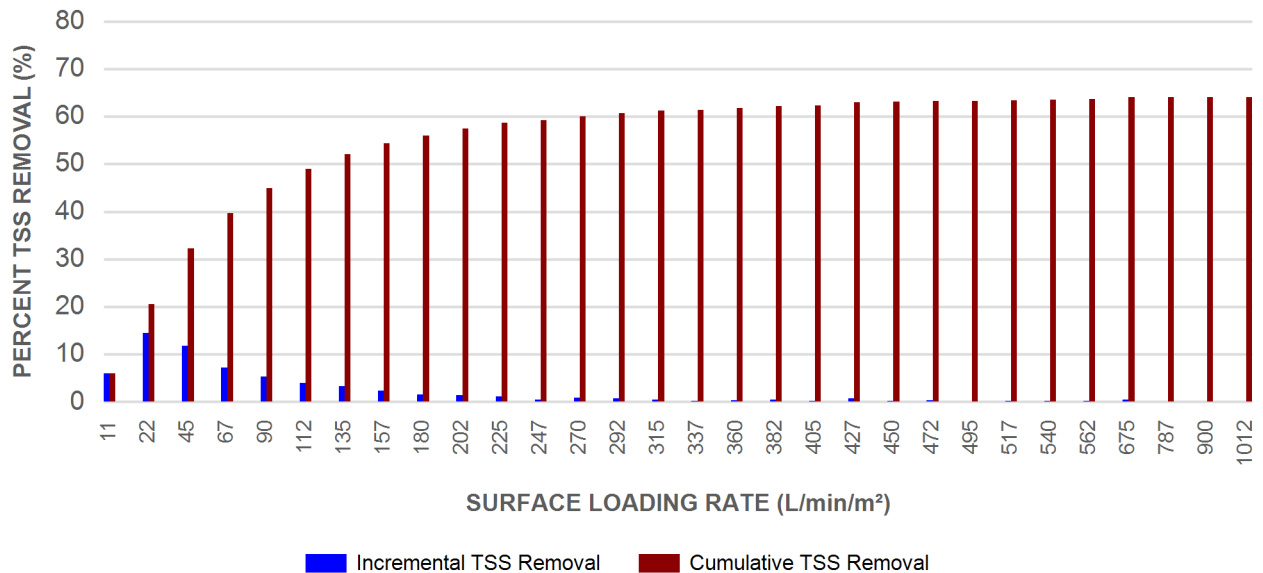
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

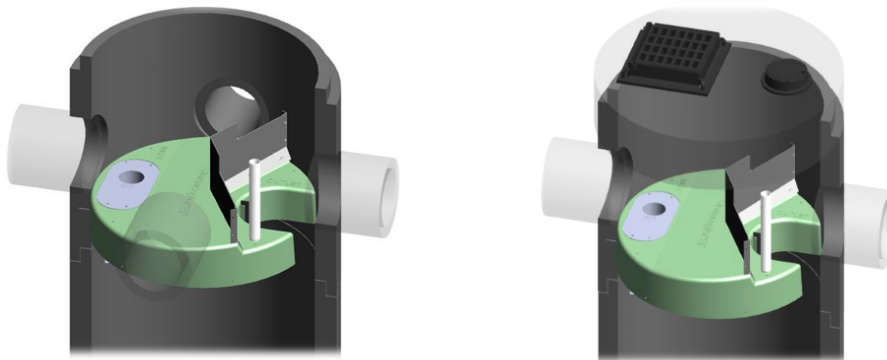
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

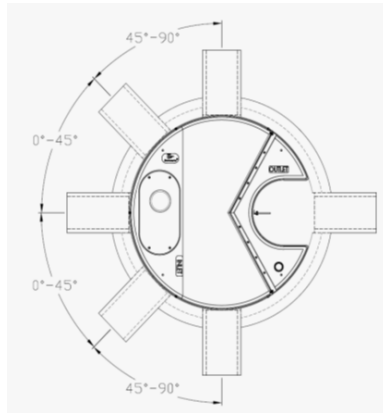
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor® EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor®EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-5A	EOR Name:	
		EOR Company:	
Drainage Area (ha):	2.77	EOR Email:	
% Imperviousness:	49.30	EOR Phone:	

Runoff Coefficient 'c': 0.59

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	51.32
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	151.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	1006
Estimated Average Annual Sediment Volume (L/yr):	818

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	41
EFO6	50
EFO8	57
EFO10	60
EFO12	63

Recommended Stormceptor EFO Model: EFO10
Estimated Net Annual Sediment (TSS) Load Reduction (%): 60
Water Quality Runoff Volume Capture (%): > 90

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

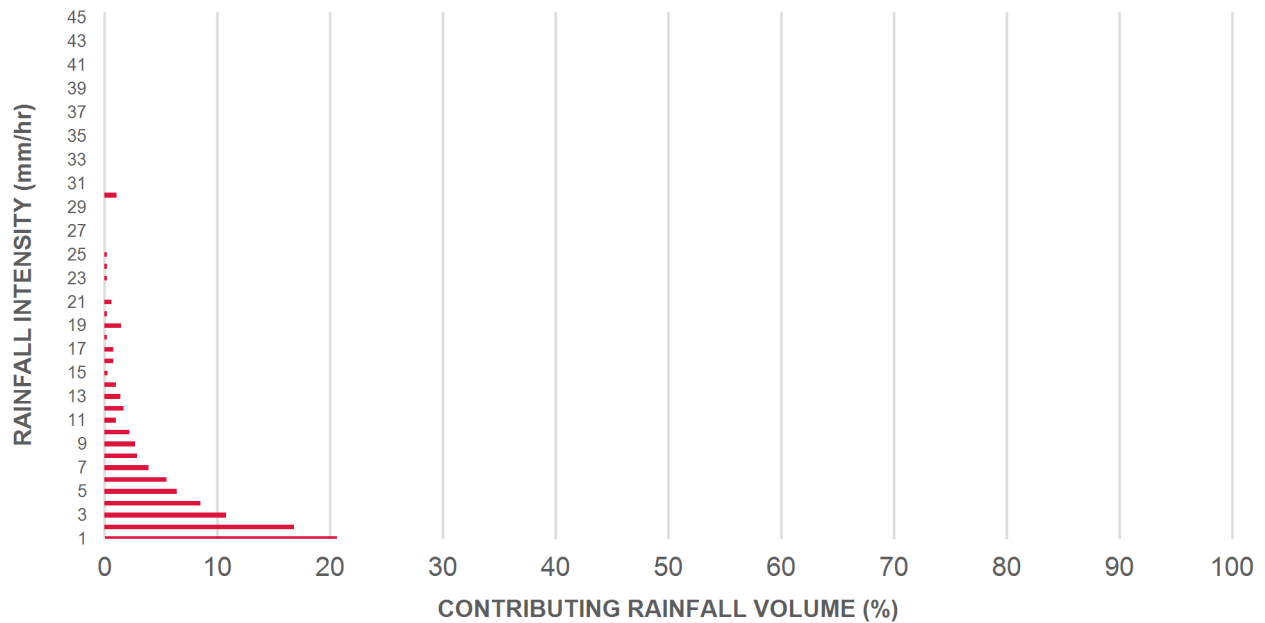
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	2.29	138.0	19.0	70	6.0	6.0
1.00	20.6	29.1	4.59	275.0	38.0	70	14.5	20.5
2.00	16.8	45.9	9.18	551.0	75.0	66	11.0	31.5
3.00	10.8	56.7	13.76	826.0	113.0	62	6.6	38.2
4.00	8.5	65.2	18.35	1101.0	151.0	58	4.9	43.1
5.00	6.4	71.6	22.94	1376.0	189.0	56	3.6	46.6
6.00	5.5	77.0	27.53	1652.0	226.0	53	2.9	49.6
7.00	3.9	81.0	32.12	1927.0	264.0	52	2.1	51.6
8.00	2.9	83.9	36.70	2202.0	302.0	51	1.5	53.1
9.00	2.7	86.5	41.29	2478.0	339.0	50	1.3	54.4
10.00	2.2	88.7	45.88	2753.0	377.0	49	1.1	55.5
11.00	1.0	89.7	50.47	3028.0	415.0	48	0.5	56.0
12.00	1.7	91.3	55.06	3303.0	453.0	47	0.8	56.7
13.00	1.4	92.8	59.64	3579.0	490.0	45	0.6	57.4
14.00	1.0	93.7	64.23	3854.0	528.0	44	0.4	57.8
15.00	0.3	94.0	68.82	4129.0	566.0	43	0.1	57.9
16.00	0.8	94.8	73.41	4404.0	603.0	42	0.3	58.3
17.00	0.8	95.7	78.00	4680.0	641.0	42	0.4	58.6
18.00	0.2	95.8	82.58	4955.0	679.0	42	0.1	58.7
19.00	1.5	97.3	87.17	5230.0	716.0	41	0.6	59.3
20.00	0.2	97.5	91.76	5506.0	754.0	41	0.1	59.4
21.00	0.6	98.2	96.35	5781.0	792.0	41	0.3	59.6
22.00	0.0	98.2	100.94	6056.0	830.0	41	0.0	59.6
23.00	0.2	98.4	105.52	6331.0	867.0	41	0.1	59.7
24.00	0.2	98.6	110.11	6607.0	905.0	41	0.1	59.8
25.00	0.2	98.9	114.70	6882.0	943.0	40	0.1	59.9
30.00	1.1	100.0	137.64	8258.0	1131.0	38	0.4	60.4
35.00	0.0	100.0	160.58	9635.0	1320.0	35	0.0	60.4
40.00	0.0	100.0	183.52	11011.0	1508.0	32	0.0	60.4
45.00	0.0	100.0	206.46	12388.0	1697.0	28	0.0	60.4
Estimated Net Annual Sediment (TSS) Load Reduction =								60 %

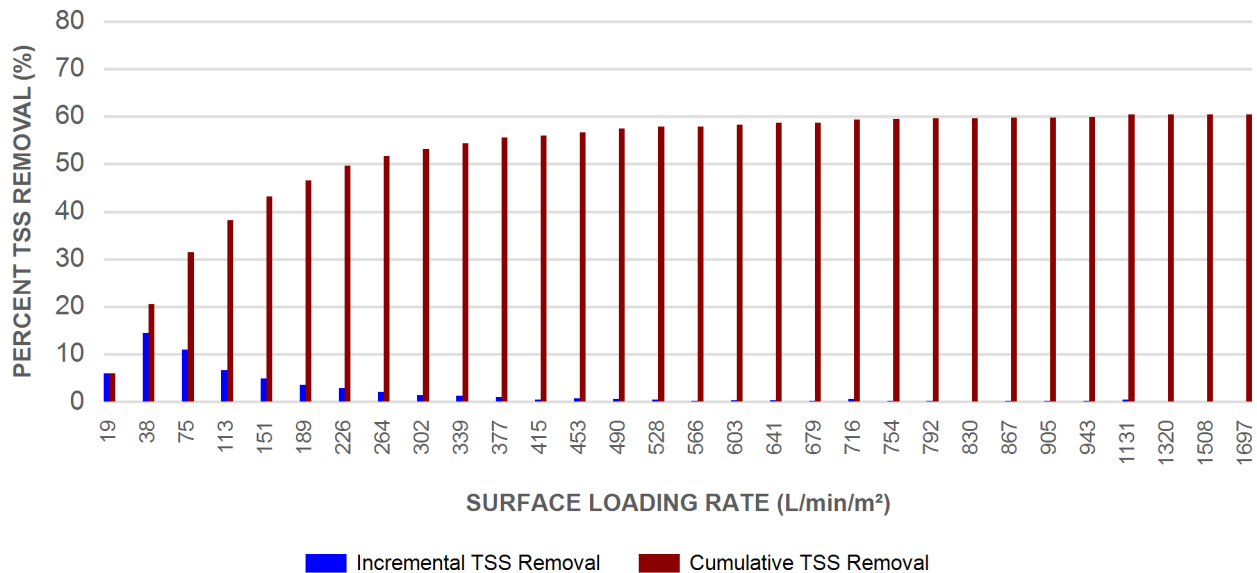
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

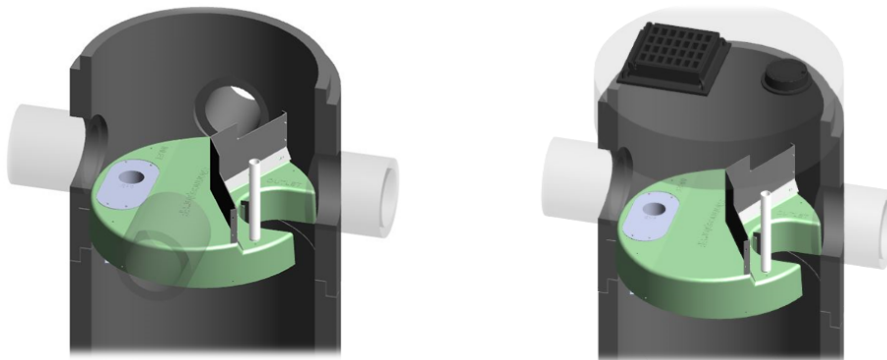
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

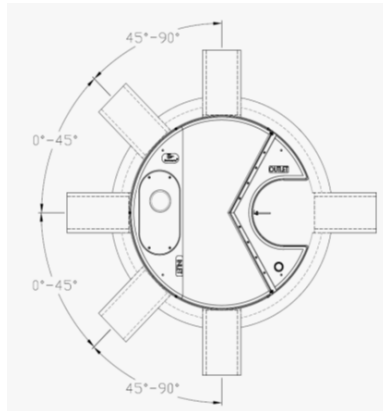
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor® EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor® EF Sizing Report

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/08/2024

Province:	Ontario	Project Name:	Williams Parkway Widening
City:	Brampton	Project Number:	478286
Nearest Rainfall Station:	TORONTO INTL AP	Designer Name:	Devi Thapa
Climate Station Id:	6158731	Designer Company:	Parsons
Years of Rainfall Data:	20	Designer Email:	devi.thapa@parsons.com
		Designer Phone:	190-594-3050
Site Name:	HRP-5B	EOR Name:	
		EOR Company:	
Drainage Area (ha):	1.28	EOR Email:	
% Imperviousness:	70.61	EOR Phone:	

Runoff Coefficient 'c': 0.72

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	28.80
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	400.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	677
Estimated Average Annual Sediment Volume (L/yr):	550

**Net Annual Sediment
(TSS) Load Reduction
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	48
EFO6	57
EFO8	61
EFO10	65
EFO12	67

Recommended Stormceptor EFO Model: EFO8
Estimated Net Annual Sediment (TSS) Load Reduction (%): 61
Water Quality Runoff Volume Capture (%): > 90

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

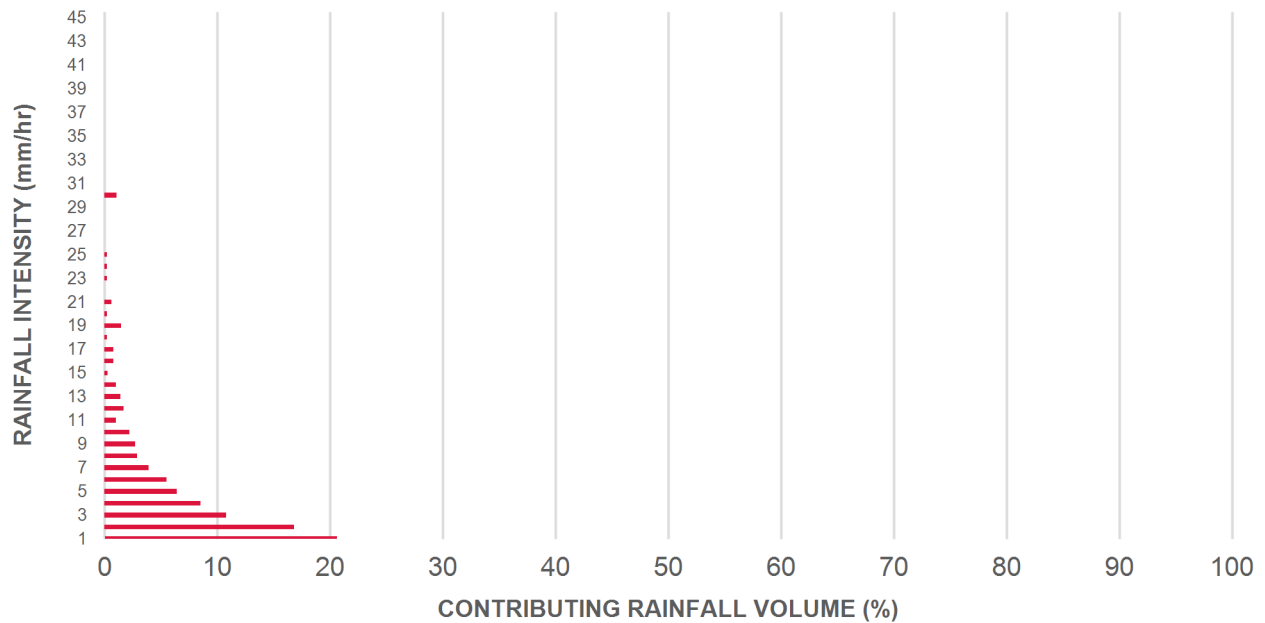
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.29	77.0	16.0	70	6.0	6.0
1.00	20.6	29.1	2.58	155.0	33.0	70	14.5	20.5
2.00	16.8	45.9	5.15	309.0	66.0	67	11.3	31.8
3.00	10.8	56.7	7.73	464.0	99.0	63	6.8	38.6
4.00	8.5	65.2	10.30	618.0	131.0	60	5.1	43.7
5.00	6.4	71.6	12.88	773.0	164.0	57	3.7	47.3
6.00	5.5	77.0	15.45	927.0	197.0	55	3.0	50.3
7.00	3.9	81.0	18.03	1082.0	230.0	53	2.1	52.4
8.00	2.9	83.9	20.60	1236.0	263.0	52	1.5	53.9
9.00	2.7	86.5	23.18	1391.0	296.0	51	1.4	55.3
10.00	2.2	88.7	25.75	1545.0	329.0	50	1.1	56.4
11.00	1.0	89.7	28.33	1700.0	362.0	49	0.5	56.9
12.00	1.7	91.3	30.90	1854.0	394.0	48	0.8	57.7
13.00	1.4	92.8	33.48	2009.0	427.0	47	0.7	58.4
14.00	1.0	93.7	36.05	2163.0	460.0	46	0.4	58.8
15.00	0.3	94.0	38.63	2318.0	493.0	45	0.1	58.9
16.00	0.8	94.8	41.20	2472.0	526.0	44	0.4	59.3
17.00	0.8	95.7	43.78	2627.0	559.0	44	0.4	59.7
18.00	0.2	95.8	46.35	2781.0	592.0	42	0.1	59.7
19.00	1.5	97.3	48.93	2936.0	625.0	42	0.6	60.4
20.00	0.2	97.5	51.50	3090.0	657.0	42	0.1	60.4
21.00	0.6	98.2	54.08	3245.0	690.0	42	0.3	60.7
22.00	0.0	98.2	56.65	3399.0	723.0	41	0.0	60.7
23.00	0.2	98.4	59.23	3554.0	756.0	41	0.1	60.8
24.00	0.2	98.6	61.80	3708.0	789.0	41	0.1	60.9
25.00	0.2	98.9	64.38	3863.0	822.0	41	0.1	61.0
30.00	1.1	100.0	77.25	4635.0	986.0	40	0.5	61.4
35.00	0.0	100.0	90.13	5408.0	1151.0	38	0.0	61.4
40.00	0.0	100.0	103.00	6180.0	1315.0	35	0.0	61.4
45.00	0.0	100.0	115.88	6953.0	1479.0	32	0.0	61.4
Estimated Net Annual Sediment (TSS) Load Reduction =								61 %

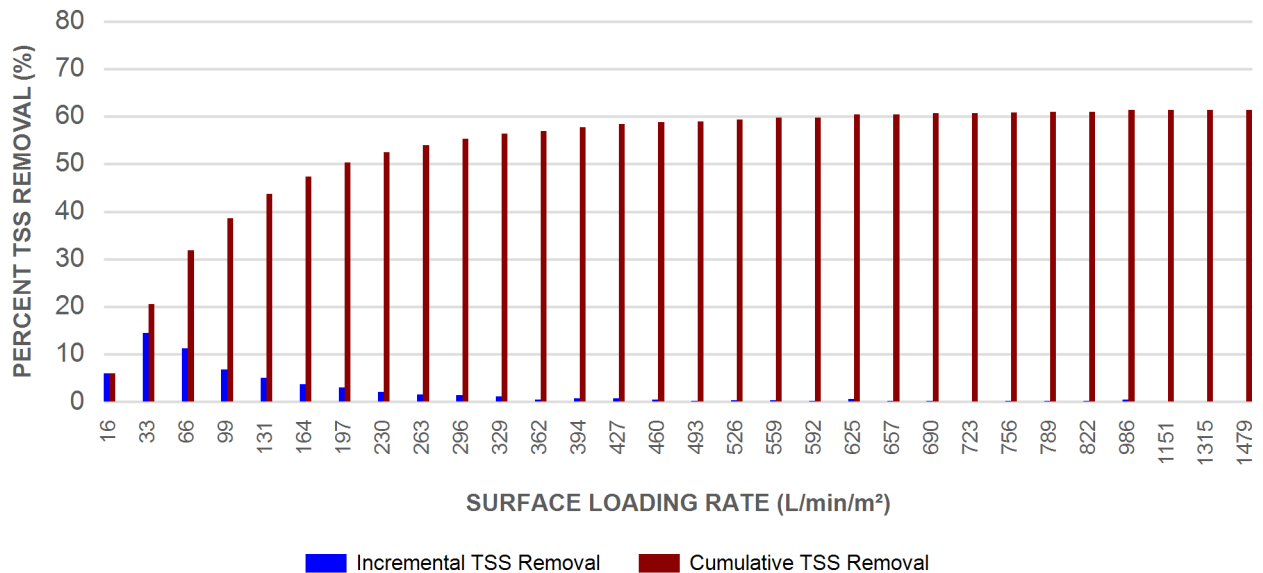
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

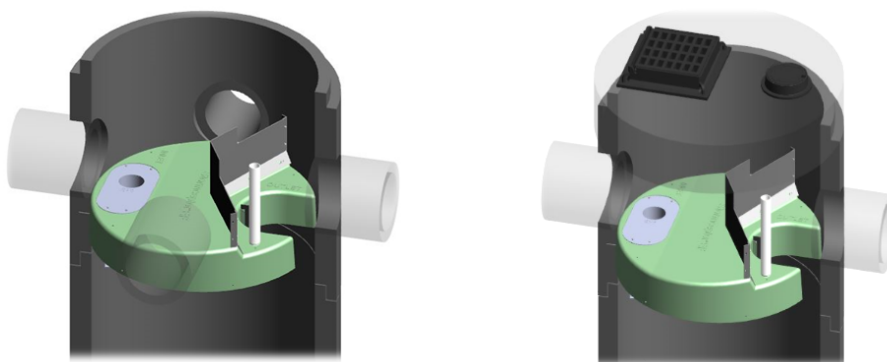
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

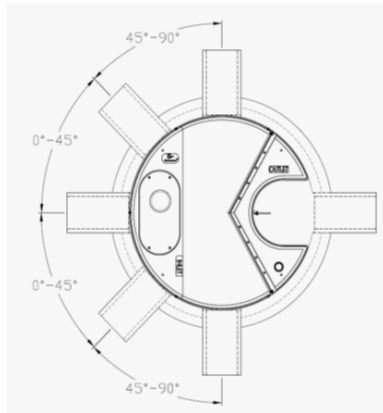
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor® EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

Stormceptor® EF Sizing Report

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor®EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

STANDARD SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE WITH THIRD-PARTY VERIFIED LIGHT LIQUID RE-ENTRAINMENT SIMULATION PERFORMANCE TESTING RESULTS

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, designing, maintaining, and constructing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, **specifically an OGS device that has been third-party tested for oil and fuel retention capability using a protocol for light liquid re-entrainment simulation testing, with testing results and a Statement of Verification in accordance with all the provisions of ISO 14034 Environmental Management – Environmental Technology Verification (ETV).** Work includes supply and installation of concrete bases, precast sections, and the appropriate precast section with OGS internal components correctly installed within the system, watertight sealed to the precast concrete prior to arrival to the project site.

1.2 REFERENCE STANDARDS

1.2.1 For Canadian projects only, the following reference standards apply:

CAN/CSA-A257.4-14: Joints for Circular Concrete Sewer and Culvert Pipe, Manhole Sections, and Fittings Using Rubber Gaskets

CAN/CSA-A257.4-14: Precast Reinforced Circular Concrete Manhole Sections, Catch Basins, and Fittings

CAN/CSA-S6-00: Canadian Highway Bridge Design Code

1.2.2 For ALL projects, the following reference standards apply:

ASTM D-4097: Contact Molded Glass Fiber Reinforced Chemical Resistant Tanks

ASTM C 478: Specification for Precast Reinforced Concrete Manhole Sections

ASTM C 443: Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

ASTM C 891: Standard Practice for Installation of Underground Precast Concrete Utility Structures

ASTM D2563: Standard Practice for Classification of Visual Defects in Reinforced Plastics

1.3 SHOP DRAWINGS

1.3.1 Shop drawings shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail the precast concrete components and OGS internal components prior to shipment, including the sequence for installation.

1.3.2 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record. Any and all changes to project cost estimates, bonding amounts, plan check fees for revision of approved documents, or design impacts due to regulatory requirements as a result of a product substitution shall be coordinated by the Contractor with the Engineer of Record.

1.4 HANDLING AND STORAGE

Prevent damage to materials during storage and handling.

1.4.1 OGS internal components supplied by the Manufacturer for attachment to the precast concrete vessel shall be pre-fabricated, bolted to the precast and watertight sealed to the precast vessel surface prior to site delivery to ensure Manufacturer's internal assembly process and quality control processes are fully adhered to, and to prevent materials damage on site.

1.4.2 Follow all instructions including the sequence for installation in the shop drawings during installation.

PART 2 – PRODUCTS

2.1 GENERAL

2.1.1 The OGS vessel shall be cylindrical and constructed from precast concrete riser and slab components.

2.1.2 The precast concrete OGS internal components shall include a fiberglass insert bolted and watertight sealed inside the precast concrete vessel, prior to site delivery. Primary internal components that are to be anchored and watertight sealed to the precast concrete vessel shall be done so only by the Manufacturer prior to arrival at the job site to ensure product quality.

2.1.3 The OGS shall be allowed to be specified and have the ability to function as a 240-degree bend structure in the stormwater drainage system, or as a junction structure.

2.1.4 The OGS to be specified shall have the capability to accept influent flow from an inlet grate and an inlet pipe.

2.2 PRECAST CONCRETE SECTIONS

All precast concrete components shall be designed and manufactured to meet highway loading conditions per State/Provincial or local requirements.

2.3 GASKETS

Only profile neoprene or nitrile rubber gaskets that are oil resistant shall be accepted. For Canadian projects only, gaskets shall be in accordance to CSA A257.4-14. Mastic sealants, butyl tape/rope or Conseal CS-101 alone are not acceptable gasket materials.

2.4 JOINTS

The concrete joints shall be watertight and meet the design criteria according to ASTM C-990. For projects where joints require gaskets, the concrete joints shall be watertight and oil resistant and meet the design criteria according to ASTM C-443. Mastic sealants or butyl tape/rope alone are not an acceptable alternative.

2.5 FRAMES AND COVERS

Frames and covers shall be manufactured in accordance with State/Provincial or local requirements for inspection and maintenance access purposes. A minimum of one cover, at least 22-inch (560 mm) in diameter, shall be clearly embossed with the OGS manufacturer's product name to properly identify this asset's purpose is for stormwater quality treatment.

2.6 PRECAST CONCRETE

All precast concrete components shall conform to the appropriate CSA or ASTM specifications.

2.7 FIBERGLASS

The fiberglass portion of the OGS device shall be constructed in accordance with ASTM D2563, and in accordance with the PS15-69 manufacturing standard, and shall only be installed, bolted and watertight sealed to the precast concrete by the Manufacturer prior to arrival at the project site to ensure product quality.

2.8 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a fiberglass insert for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The total sediment storage capacity shall be a minimum 40 ft³ (1.1 m³). The total petroleum hydrocarbon storage capacity shall be a minimum 50 gallons (189 liters). The access opening to the sump of the OGS device for periodic inspection and maintenance purposes shall be a minimum 16 inches (406 mm) in diameter.

2.9 LADDERS

Ladder rungs shall be provided upon request or to comply with State/Provincial or local requirements.

2.10 INSPECTION

All precast concrete sections shall be level and inspected to ensure dimensions, appearance, integrity of internal components, and quality of the product meets State/Provincial or local specifications and associated standards.

2.11 WEIR

Weir shall be constructed of 5052 aluminum alloy and shall be installed, bolted and watertight sealed by the Manufacturer prior to shipment to the project site to ensure product quality.

2.12 DROP PIPE

Drop pipe shall be constructed of 5052 aluminum alloy and shall be watertight sealed to the insert with silicone adhesive. Based on assessment of the dimensions of the precast riser section containing the fiberglass insert and the dimensions of the drop pipe, the drop pipe may be installed by the Manufacturer prior to shipment to the project site, or may be installed at the project site by the Contractor, at the Manufacturer's discretion.

2.13 OUTLET RISER VANE

Outlet riser vane shall be constructed of ¼-inch 60 durometer EPDM rubber and shall be installed by the Manufacturer prior to shipment to the site.

2.14 SAFETY GRATE

Safety grate shall be constructed of 6061-T6 aluminum alloy and shall be installed by the Manufacturer prior to shipment to the site.

2.15 FASTENERS

All fasteners for component attachment shall be constructed of stainless steel. These include bolts, washers, and nuts used for attachment of the fiberglass insert, weir, drop pipe, outlet riser vane, and safety grate.

2.16 OIL INSPECTION PIPE

Oil inspection pipe shall be constructed of 3-inch diameter Schedule 40 PVC and shall be watertight sealed to the oil inspection port with Sikaflex 1a adhesive. Oil inspection pipe shall be installed by the Manufacturer prior to shipment to the site.

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 HYDROLOGY AND RUNOFF VOLUME

The OGS device shall be engineered, designed and sized to treat a minimum of 90 percent of the average annual runoff volume, unless otherwise stated by the Engineer of Record, using historical rainfall data. Rainfall data sets should be comprised of a minimum 15-years of rainfall data or a longer continuous period if available for a given location, but in all cases a minimum 5-year period of rainfall data.

3.3 ANNUAL (TSS) SEDIMENT LOAD AND STORAGE CAPACITY

The OGS device shall be capable of removing and have sufficient storage capacity for the calculated annual total suspended solids (TSS) mass load and volume without scouring previously captured pollutants prior to maintenance being required. The annual (TSS) sediment load and volume transported from the drainage area should be calculated and compared to the OGS device's available storage capacity by the specifying Engineer to ensure adequate capacity between maintenance cycles. Sediment loadings shall be determined by land use and defined as a minimum of 450 kg (992 lb) of sediment (TSS) per impervious hectare of drainage area per year, or greater based on land use, as noted in Table 1 below.

Annual sediment volume calculations shall be performed using the projected average annual treated runoff volume, a typical sediment bulk density of 1602 kg/m³ (100 lbs/ft³) and an assumed Event Mean Concentration (EMC) of 125 mg/L TSS in the runoff, or as otherwise determined by the Engineer of Record.

Example calculation for a 1.3-hectares parking lot site:

- 1.28 meters of rainfall depth, per year
- 1.3 hectares of 100% impervious drainage area
- EMC of 125 mg/L TSS in runoff
- Treatment of 90% of the average annual runoff volume
- Target average annual TSS removal rate of 60% by OGS

Annual Runoff Volume:

- 1.28 m rain depth x 1.3 ha x 10,000 m²/ha = 16,640 m³ of runoff volume
- 16,640 m³ x 1000 L/m³ = 16,640,000 L of runoff volume
- 16,640,000 L x 0.90 = 14,976,000 L to be treated by OGS unit

Annual Sediment Mass and Sediment Volume Load Calculation:

- 14,976,000 L x 125 mg/L x kg/1,000,000 mg = 1,872 kg annual sediment mass
- 1,872 kg x m³/1602 kg = 1.17 m³ annual sediment volume
- 1.17 m³ x 60% TSS removal rate by OGS = 0.70 m³ minimum expected annual storage requirement in OGS

As a guideline, the U.S. EPA has determined typical annual sediment loads per drainage area for various sites by land use (see Table 1). Certain States, Provinces and local jurisdictions have also established such guidelines.

Table 1 – Annual Mass Sediment Loading by Land Use								
	Commercial	Parking Lot	Residential			Highways	Industrial	Shopping Center
			High	Med.	Low			
(lbs/acre/yr)	1,000	400	420	250	10	880	500	440
(kg/hectare/yr)	1,124	450	472	281	11	989	562	494

Source: U.S. EPA Stormwater Best Management Practice Design Guide Volume 1, Appendix D, Table D-1, Burton and Pitt 2002

3.4 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in Table 2, Section 3.5, and based on third-party performance testing conducted in accordance with the Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol *Procedure for Laboratory Testing of Oil-Grit Separators*, as follows:

3.4.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.4.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.4.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.4.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 3.3.

3.4.5 The Peclet Number is not an approved method or model for calculating TSS removal, sizing, or scaling OGS devices.

3.4.6 If an alternate OGS device is proposed, supporting documentation shall be submitted that demonstrates:

- Canadian ETV or ISO 14034 ETV Verification Statement which verifies third-party performance testing conducted in accordance with the **Procedure for Laboratory Testing of Oil-Grit Separators**, including the Light Liquid Re-entrainment Simulation Testing.
- Equal or better sediment (TSS) removal of the PSD specified in Table 2 at equivalent surface loading rates, as compared to the OGS device specified herein.

- Equal or better Light Liquid Re-entrainment Simulation Test results (using low-density polyethylene beads as a surrogate for light liquids such as oil and fuel) at equivalent surface loading rates, as compared to the OGS device specified herein. However, an alternative OGS device shall not be allowed as a substitute if the Light Liquid Re-entrainment Simulation Test was performed with screening components within the OGS device that are effective at retaining the low-density polyethylene beads, but would not be expected to retain light liquids such as oil and fuel.
- Equal or greater sediment storage capacity, as compared to the OGS device specified herein.
- Supporting documentation shall be signed and sealed by a local registered Professional Engineer. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.5 PARTICLE SIZE DISTRIBUTION (PSD) FOR SIZING

The OGS device shall be sized to achieve the Engineer-specified average annual percent sediment (TSS) removal based solely on the test sediment used in the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. This test sediment is comprised of inorganic ground silica with a specific gravity of 2.65, uniformly mixed, and containing a broad range of particle sizes as specified in Table 2. No alternative PSDs or deviations from Table 2 shall be accepted.

Table 2 Canadian ETV Program Procedure for Laboratory Testing of Oil-Grit Separators Particle Size Distribution (PSD) of Test Sediment		
Particle Diameter (Microns)	% by Mass of All Particles	Specific Gravity
1000	5%	2.65
500	5%	2.65
250	15%	2.65
150	15%	2.65
100	10%	2.65
75	5%	2.65
50	10%	2.65
20	15%	2.65
8	10%	2.65
5	5%	2.65
2	5%	2.65

3.6 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party scour testing conducted and have in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. This scour testing is conducted with the device pre-loaded with test sediment comprised of the particle size distribution (PSD) illustrated in Table 2.

3.6.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

Data generated from laboratory scour testing performed with an OGS device pre-loaded with a coarser PSD than in Table 2 (i.e. the coarser PSD has no particles in the 1-micron to 50-micron size range, or the D₅₀ of the test sediment exceeds 75 microns) shall not be acceptable for the determination of the device's suitability for on-line installation.

3.7 DESIGN ACCOUNTING FOR BYPASS

3.7.1 The OGS device shall be specified to achieve the TSS removal performance and water quality objectives without washout of previously captured pollutants. The OGS device shall also have sufficient hydraulic conveyance capacity to convey the peak storm event, in accordance with hydraulic conditions per the Engineer of Record. To ensure this is achieved, there are two design options with associated requirements:

3.7.1.1 The OGS device shall be placed **off-line** with an upstream diversion structure (typically in an upstream manhole) that only allows the water quality volume to be diverted to the OGS device, and excessive flows diverted downstream around the OGS device to prevent high flow washout of pollutants previously captured. This design typically incorporates a triangular layout including an upstream bypass manhole with an appropriately engineered weir wall, the OGS device, and a downstream junction manhole, which is connected to both the OGS device and bypass structure. In this case with an external bypass required, the OGS device manufacturer must provide calculations and designs for all structures, piping and any other required material applicable to the proper functioning of the system, stamped by a Professional Engineer.

3.7.1.2 Alternatively, OGS devices in compliance with Section 3.6 shall be acceptable for an **on-line** design configuration, thereby eliminating the requirement for an upstream bypass manhole and downstream junction manhole.

3.7.2 The OGS device shall also have sufficient hydraulic conveyance capacity to convey the peak storm event, in accordance with hydraulic conditions per the Engineer of Record. If an alternate OGS device is proposed, supporting documentation shall be submitted that demonstrates equal or better hydraulic conveyance capacity as compared to the OGS device specified herein. This documentation shall be signed and sealed by a local registered Professional Engineer. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.8 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.8.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

3.9 PETROLEUM HYDROCARBONS AND FLOATABLES STORAGE CAPACITY

Petroleum hydrocarbons and floatables storage capacity in the OGS device shall be a minimum 50 gallons (189 Liters), or more as specified.

3.9.1 The OGS device shall have gasketed precast concrete joints that are watertight, and oil resistant and meet the design criteria according to ASTM C-443 to provide safe oil and other hydrocarbon materials storage and ground water protection. Mastic sealants or butyl tape/rope alone are not an acceptable alternative.

3.10 SURFACE LOADING RATE SCALING OF DIFFERENT MODEL SIZES

The reference device for scaling shall be an OGS device that has been third-party tested in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. Other model sizes of the tested device shall only be scaled such that the claimed TSS removal efficiency of the scaled device shall be no greater than the TSS removal efficiency of the tested device at identical **surface loading rates** (flow rate divided by settling surface area). The depth of other model sizes of the tested device shall be scaled in accordance with the depth scaling provisions within Section 6.0 of the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.10.1 The Peclet Number and volumetric scaling are not approved methods for scaling OGS devices.

PART 4 – INSPECTION & MAINTENANCE

The OGS manufacturer shall provide an Owner's Manual upon request. Maintenance shall be performed by a professional service provider who has experience in cleaning OGS devices and has been trained and certified in applicable health and safety practices, including confined space entry procedures.

- 4.1 A Quality Assurance Plan that provides inspection for a minimum of 5 years shall be included with the OGS stormwater quality device, and written into the Environmental Compliance Approval (ECA) or the appropriate State/Provincial or local approval document.
- 4.2 OGS device inspection shall include determination of sediment depth and presence of petroleum hydrocarbons below the insert. Inspection shall be easily conducted from finished grade through a frame and cover of at least 22 inch (560 mm) in diameter.
- 4.3 Inspection and pollutant removal shall be conducted periodically. For routine maintenance cleaning activities, pollutant removal shall typically utilize a truck equipped with vacuum apparatus, and shall be easily conducted from finished grade through a frame and cover of at least 22-inches (560 mm) in diameter.
- 4.4 Diameter of the maintenance access opening to the lower chamber and sump shall be scaled consistently across all model sizes, and shall be 1/3 the inside diameter of the OGS structure, or larger.
- 4.5 No confined space entry shall be required for routine inspection and maintenance cleaning activities.
- 4.6 For OGS model sizes of diameter 72 inches (1828 mm) and greater, the access opening to the OGS device's lower chamber and sump shall be large enough to allow a maintenance worker to enter the lower chamber to facilitate non-routine maintenance cleaning activities and repairs, as needed.
- 4.7 The orifice-containing component (i.e. drop pipe, duct, chute, etc.) of the OGS device used to control flow rate into the lower chamber shall be removable from the insert to facilitate cleaning, repair, or replacement of the orifice-containing component, as needed.

PART 5 – EXECUTION

5.1 PRECAST CONCRETE INSTALLATION

The installation of the precast concrete OGS stormwater quality treatment device shall conform to ASTM C 891, ASTM C 478, ASTM C 443, CAN/CSA-A257.4-14, CAN/CSA-A257.4-14, CAN/CSA-S6-00 and all highway, State/Provincial, or local specifications for the construction of manholes. Selected sections of a general specification that are applicable are summarized below. The Contractor shall furnish all labor, equipment and materials necessary to offload, assemble as needed the OGS internal components as specified in the Shop Drawings.

5.2 EXCAVATION

5.2.1 Excavation for the installation of the OGS stormwater quality treatment device shall conform to highway, State/Provincial or local specifications. Topsoil that is removed during the excavation for the OGS stormwater quality treatment device shall be stockpiled in designated areas and not be mixed with subsoil or other materials. Topsoil stockpiles and the general site preparation for the installation of the OGS stormwater quality device shall conform to highway, State/Provincial or local specifications.

5.2.2 The OGS device shall not be installed on frozen ground. Excavation shall extend a minimum of 12 inch (300 mm) from the precast concrete surfaces plus an allowance for shoring and bracing where required. If the bottom of the excavation provides an unsuitable foundation additional excavation may be required.

5.2.3 In areas with a high water table, continuous dewatering shall be provided to ensure that the excavation is stable and free of water.

5.3 BACKFILLING

Backfill material shall conform to highway, State/Provincial or local specifications. Backfill material shall be placed in uniform layers not exceeding 12 inches (300 mm) in depth and compacted to highway, State/Provincial or local specifications.

5.4 OGS WATER QUALITY DEVICE CONSTRUCTION SEQUENCE

5.4.1 The precast concrete OGS stormwater quality treatment device is installed and leveled in sections in the following sequence:

- aggregate base
- base slab, or base
- riser section(s) (if required)
- riser section w/ pre-installed fiberglass insert
- upper riser section(s)
- internal OGS device components
- connect inlet and outlet pipes
- riser section, top slab and/or transition (if required)
- frame and access cover

5.4.2 The precast concrete base shall be placed level at the specified grade. The entire base shall be in contact with the underlying compacted granular material. Subsequent sections, complete with oil resistant, watertight joint seals, shall be installed in accordance with the precast concrete manufacturer's recommendations.

5.4.3 Adjustment of the OGS stormwater quality treatment device can be performed by lifting the upper sections free of the excavated area, re-leveling the base, and re-installing the sections. Damaged sections and gaskets shall be repaired or replaced as necessary. Once the OGS stormwater quality treatment device has been constructed, any lift holes must be plugged with mortar.

5.5 DROP PIPE AND OIL INSPECTION PIPE

Once the upper precast concrete riser has been attached to the lower precast concrete riser section, the OGS device Drop Pipe and Oil Inspection Pipe must be attached, and watertight sealed to the fiberglass insert using Sikaflex 1a. Installation instructions and required materials shall be provided by the OGS manufacturer.

5.6 INLET AND OUTLET PIPES

Inlet and outlet pipes shall be securely set using grout or approved pipe seals (flexible boot connections, where applicable) so that the structure is watertight. Non-secure inlets and outlets will result in improper performance.

5.7 FRAME AND COVER OR FRAME AND GRATE INSTALLATION

Precast concrete adjustment units shall be installed to set the frame and cover/grate at the required elevation. The adjustment units shall be laid in a full bed of mortar with successive units being joined using sealant recommended by the manufacturer. Frames for the cover/grate should be set in a full bed of mortar at the elevation specified.

5.7.1 A minimum of one cover, at least 22-inch (560 mm) in diameter, shall be clearly embossed with the OGS device brand or product name to properly identify this asset's purpose is for stormwater quality treatment.

Stormceptor® EF Sizing Report

THIRD-PARTY TESTING AND VERIFICATION

► **Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

► **Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

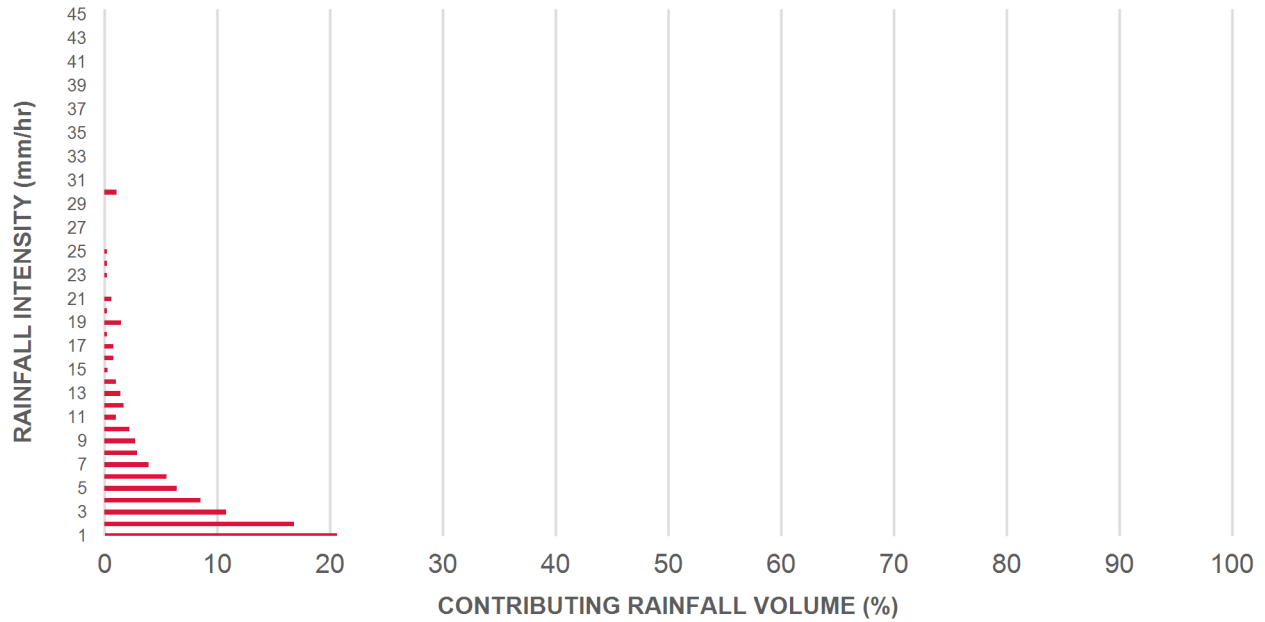
Stormceptor®EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.70	102.0	14.0	70	6.0	6.0
1.00	20.6	29.1	3.40	204.0	28.0	70	14.5	20.5
2.00	16.8	45.9	6.80	408.0	56.0	69	11.6	32.1
3.00	10.8	56.7	10.20	612.0	84.0	64	6.9	39.0
4.00	8.5	65.2	13.60	816.0	112.0	62	5.2	44.2
5.00	6.4	71.6	17.00	1020.0	140.0	59	3.8	47.9
6.00	5.5	77.0	20.40	1224.0	168.0	57	3.1	51.1
7.00	3.9	81.0	23.81	1428.0	196.0	55	2.2	53.2
8.00	2.9	83.9	27.21	1632.0	224.0	53	1.5	54.8
9.00	2.7	86.5	30.61	1836.0	252.0	53	1.4	56.2
10.00	2.2	88.7	34.01	2040.0	280.0	52	1.1	57.3
11.00	1.0	89.7	37.41	2244.0	307.0	51	0.5	57.8
12.00	1.7	91.3	40.81	2449.0	335.0	50	0.8	58.6
13.00	1.4	92.8	44.21	2653.0	363.0	49	0.7	59.3
14.00	1.0	93.7	47.61	2857.0	391.0	48	0.5	59.8
15.00	0.3	94.0	51.01	3061.0	419.0	47	0.1	59.9
16.00	0.8	94.8	54.41	3265.0	447.0	47	0.4	60.3
17.00	0.8	95.7	57.81	3469.0	475.0	46	0.4	60.7
18.00	0.2	95.8	61.21	3673.0	503.0	45	0.1	60.8
19.00	1.5	97.3	64.61	3877.0	531.0	44	0.7	61.4
20.00	0.2	97.5	68.01	4081.0	559.0	43	0.1	61.5
21.00	0.6	98.2	71.42	4285.0	587.0	43	0.3	61.8
22.00	0.0	98.2	74.82	4489.0	615.0	42	0.0	61.8
23.00	0.2	98.4	78.22	4693.0	643.0	42	0.1	61.9
24.00	0.2	98.6	81.62	4897.0	671.0	42	0.1	62.0
25.00	0.2	98.9	85.02	5101.0	699.0	42	0.1	62.1
30.00	1.1	100.0	102.02	6121.0	839.0	41	0.5	62.5
35.00	0.0	100.0	119.03	7142.0	978.0	40	0.0	62.5
40.00	0.0	100.0	136.03	8162.0	1118.0	38	0.0	62.5
45.00	0.0	100.0	153.03	9182.0	1258.0	36	0.0	62.5
Estimated Net Annual Sediment (TSS) Load Reduction =								63 %

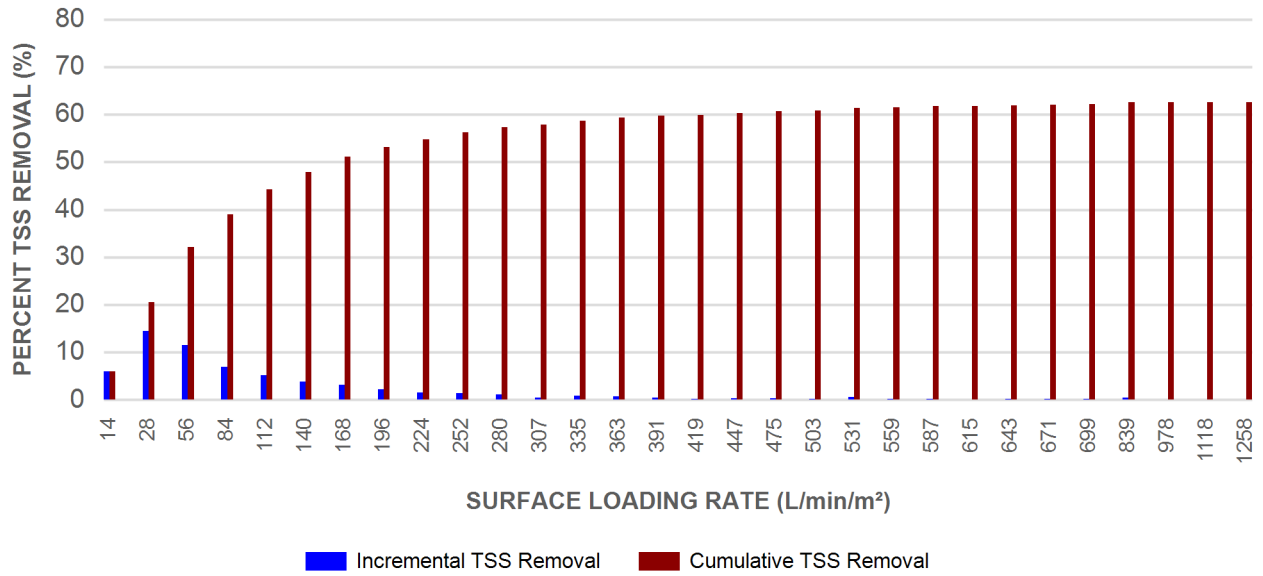
Climate Station ID: 6158731 Years of Rainfall Data: 20

Stormceptor®EF Sizing Report

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

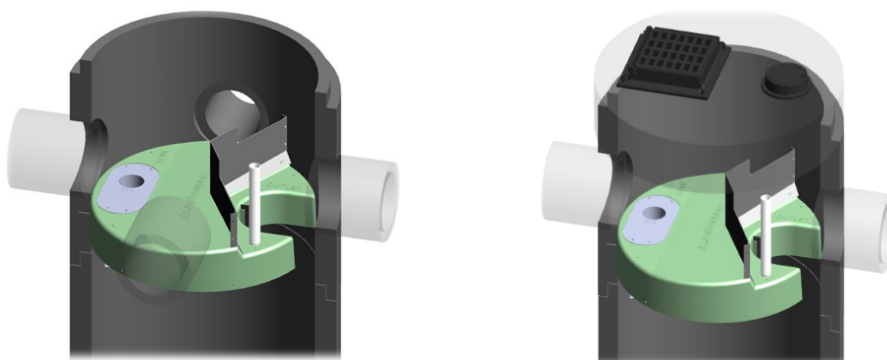
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

DESIGN FLEXIBILITY

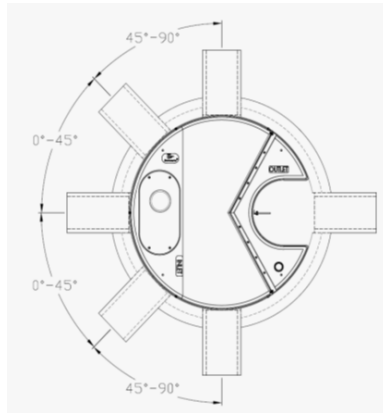
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



Stormceptor® EF Sizing Report



INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1.

For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Stormceptor® EF Sizing Report

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL	SLR (L/min/m ²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

Stormceptor® EF Sizing Report

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

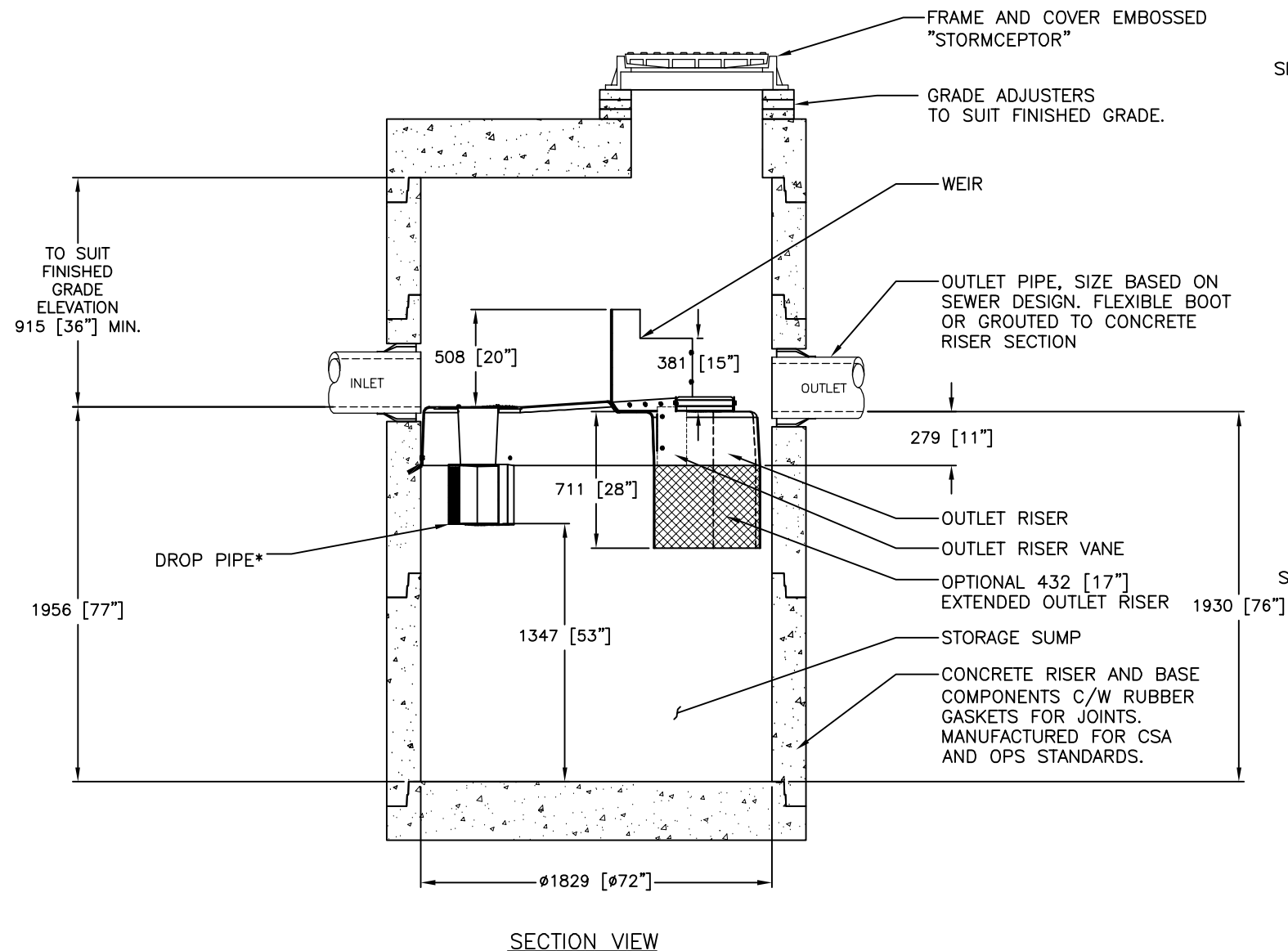
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

Stormceptor®EF Sizing Report

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

11:05 AM DWG 4/12/2019 11:05 AM



GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m² (27.9 gpm/ft²) FOR STORMCEPTOR EF6 AND 535 L/min/m² (13.1 gpm/ft²) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).

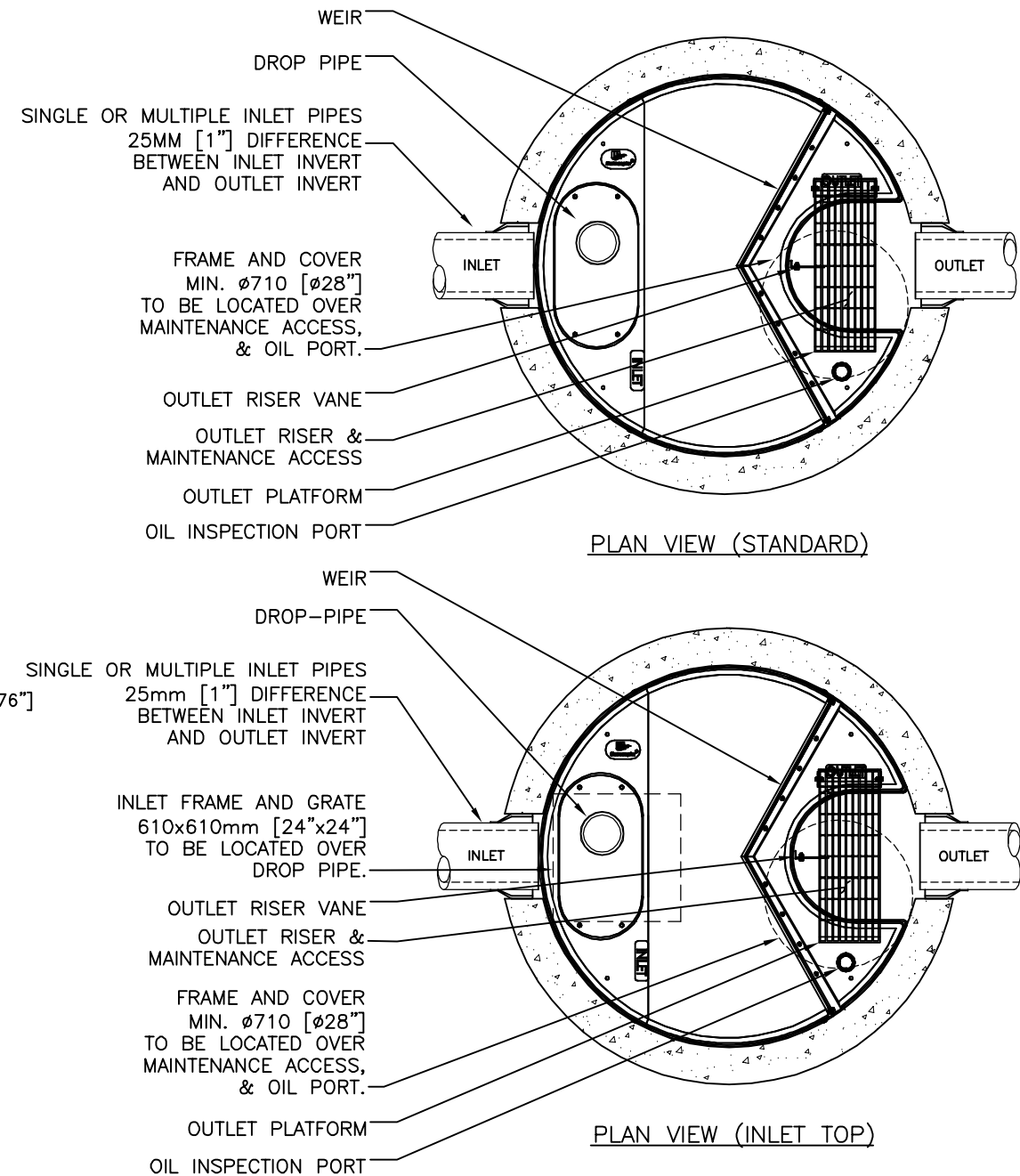
1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

INSTALLATION NOTES

- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
- C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
- D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
- E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION



<u>SITE SPECIFIC DATA REQUIREMENTS</u>					
STORMCEPTOR MODEL			EFO6		
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*
* PER ENGINEER OF RECORD					

The design and information shown on this drawing is the property of Inbrum Systems ("Inbrum"). It is provided as a service to the project owner, engineer and contractor by Inbrum Systems ("Inbrum"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the written consent of Inbrum Systems. Inbrum Systems disclaims any liability or responsibility for such use.

####	####	####	####	####
####	####	####	####	####
####	####	####	####	####
1	6/8/18	OUTLET PLATFORM	JSK	JSK
0	05/26/17	INITIAL RELEASE	JSK	JSK
MARK	DATE	REVISION DESCRIPTION	BY	

0
2
4
6
8

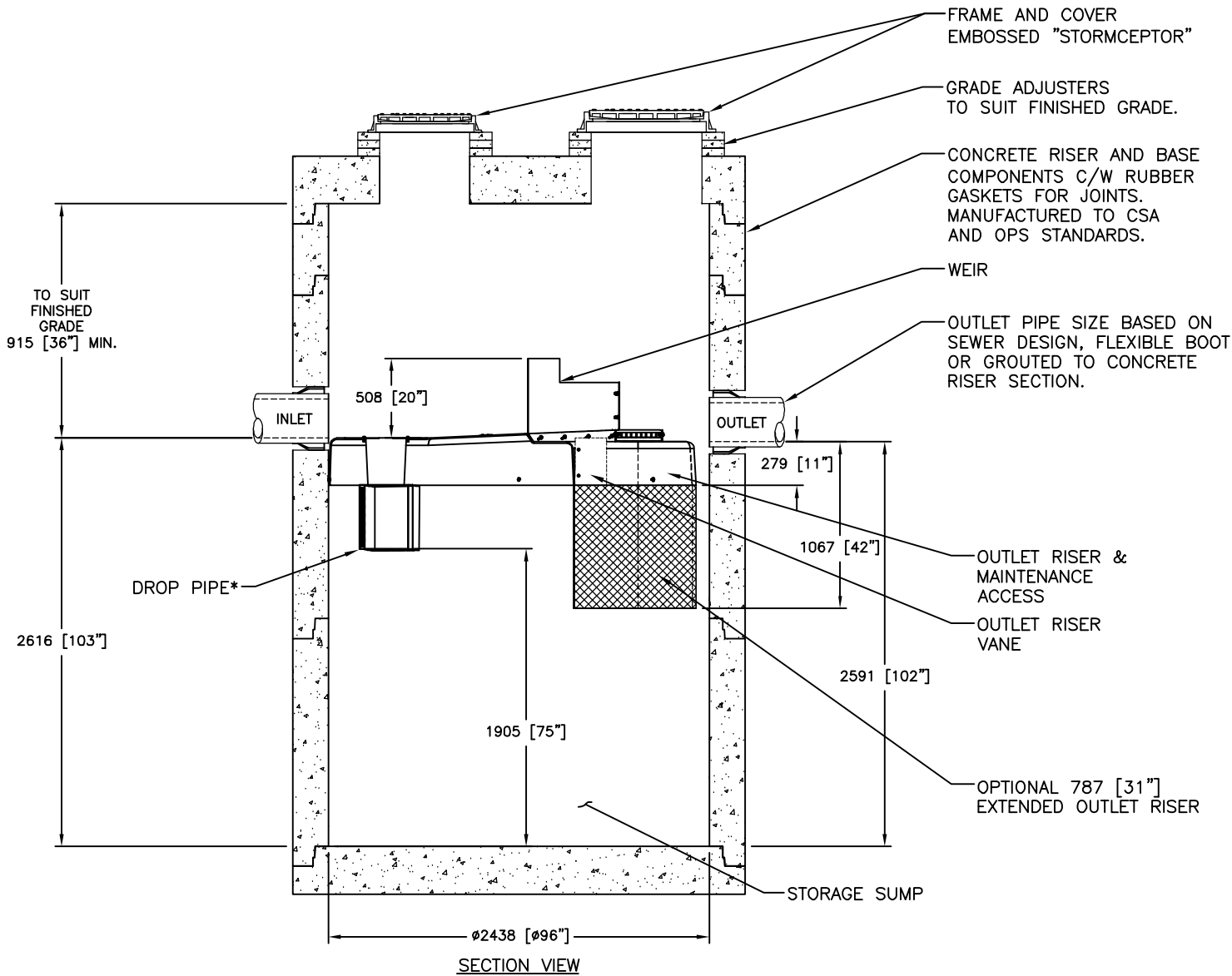
Stormceptor® EF



THE INFORMATION SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING PATENTS:
Australia Patent No. 685,161; 1,117,115; 1,728,680; 7,799,911 / Australian Patent No. 388,647
U.S. Patent Nos. 4,209,380; 4,257,841; 4,378,977; 4,386,282; 4,583,885; 4,583,886; 4,583,887; 4,583,888; 4,583,889; 4,583,890; 4,583,891; 4,583,892; 4,583,893; 4,583,894; 4,583,895; 4,583,896; 4,583,897; 4,583,898; 4,583,899; 4,583,900; 4,583,901; 4,583,902; 4,583,903; 4,583,904; 4,583,905; 4,583,906; 4,583,907; 4,583,908; 4,583,909; 4,583,910; 4,583,911; 4,583,912; 4,583,913; 4,583,914; 4,583,915; 4,583,916; 4,583,917; 4,583,918; 4,583,919; 4,583,920; 4,583,921; 4,583,922; 4,583,923; 4,583,924; 4,583,925; 4,583,926; 4,583,927; 4,583,928; 4,583,929; 4,583,930; 4,583,931; 4,583,932; 4,583,933; 4,583,934; 4,583,935; 4,583,936; 4,583,937; 4,583,938; 4,583,939; 4,583,940; 4,583,941; 4,583,942; 4,583,943; 4,583,944; 4,583,945; 4,583,946; 4,583,947; 4,583,948; 4,583,949; 4,583,950; 4,583,951; 4,583,952; 4,583,953; 4,583,954; 4,583,955; 4,583,956; 4,583,957; 4,583,958; 4,583,959; 4,583,960; 4,583,961; 4,583,962; 4,583,963; 4,583,964; 4,583,965; 4,583,966; 4,583,967; 4,583,968; 4,583,969; 4,583,970; 4,583,971; 4,583,972; 4,583,973; 4,583,974; 4,583,975; 4,583,976; 4,583,977; 4,583,978; 4,583,979; 4,583,980; 4,583,981; 4,583,982; 4,583,983; 4,583,984; 4,583,985; 4,583,986; 4,583,987; 4,583,988; 4,583,989; 4,583,990; 4,583,991; 4,583,992; 4,583,993; 4,583,994; 4,583,995; 4,583,996; 4,583,997; 4,583,998; 4,583,999; 4,584,000; 4,584,001; 4,584,002; 4,584,003; 4,584,004; 4,584,005; 4,584,006; 4,584,007; 4,584,008; 4,584,009; 4,584,010; 4,584,011; 4,584,012; 4,584,013; 4,584,014; 4,584,015; 4,584,016; 4,584,017; 4,584,018; 4,584,019; 4,584,020; 4,584,021; 4,584,022; 4,584,023; 4,584,024; 4,584,025; 4,584,026; 4,584,027; 4,584,028; 4,584,029; 4,584,030; 4,584,031; 4,584,032; 4,584,033; 4,584,034; 4,584,035; 4,584,036; 4,584,037; 4,584,038; 4,584,039; 4,584,040; 4,584,041; 4,584,042; 4,584,043; 4,584,044; 4,584,045; 4,584,046; 4,584,047; 4,584,048; 4,584,049; 4,584,050; 4,584,051; 4,584,052; 4,584,053; 4,584,054; 4,584,055; 4,584,056; 4,584,057; 4,584,058; 4,584,059; 4,584,060; 4,584,061; 4,584,062; 4,584,063; 4,584,064; 4,584,065; 4,584,066; 4,584,067; 4,584,068; 4,584,069; 4,584,070; 4,584,071; 4,584,072; 4,584,073; 4,584,074; 4,584,075; 4,584,076; 4,584,077; 4,584,078; 4,584,079; 4,584,080; 4,584,081; 4,584,082; 4,584,083; 4,584,084; 4,584,085; 4,584,086; 4,584,087; 4,584,088; 4,584,089; 4,584,090; 4,584,091; 4,584,092; 4,584,093; 4,584,094; 4,584,095; 4,584,096; 4,584,097; 4,584,098; 4,584,099; 4,584,100; 4,584,101; 4,584,102; 4,584,103; 4,584,104; 4,584,105; 4,584,106; 4,584,107; 4,584,108; 4,584,109; 4,584,110; 4,584,111; 4,584,112; 4,584,113; 4,584,114; 4,584,115; 4,584,116; 4,584,117; 4,584,118; 4,584,119; 4,584,120; 4,584,121; 4,584,122; 4,584,123; 4,584,124; 4,584,125; 4,584,126; 4,584,127; 4,584,128; 4,584,129; 4,584,130; 4,584,131; 4,584,132; 4,584,133; 4,584,134; 4,584,135; 4,584,136; 4,584,137; 4,584,138; 4,584,139; 4,584,140; 4,584,141; 4,584,142; 4,584,143; 4,584,144; 4,584,145; 4,584,146; 4,584,147; 4,584,148; 4,584,149; 4,584,150; 4,584,151; 4,584,152; 4,584,153; 4,584,154; 4,584,155; 4,584,156; 4,584,157; 4,584,158; 4,584,159; 4,584,160; 4,584,161; 4,584,162; 4,584,163; 4,584,164; 4,584,165; 4,584,166; 4,584,167; 4,584,168; 4,584,169; 4,584,170; 4,584,171; 4,584,172; 4,584,173; 4,584,174; 4,584,175; 4,584,176; 4,584,177; 4,584,178; 4,584,179; 4,584,180; 4,584,181; 4,584,182; 4,584,183; 4,584,184; 4,584,185; 4,584,186; 4,584,187; 4,584,188; 4,584,189; 4,584,190; 4,584,191; 4,584,192; 4,584,193; 4,584,194; 4,584,195; 4,584,196; 4,584,197; 4,584,198; 4,584,199; 4,584,200; 4,584,201; 4,584,202; 4,584,203; 4,584,204; 4,584,205; 4,584,206; 4,584,207; 4,584,208; 4,584,209; 4,584,210; 4,584,211; 4,584,212; 4,584,213; 4,584,214; 4,584,215; 4,584,216; 4,584,217; 4,584,218; 4,584,219; 4,584,220; 4,584,221; 4,584,222; 4,584,223; 4,584,224; 4,584,225; 4,584,226; 4,584,227; 4,584,228; 4,584,229; 4,584,230; 4,584,231; 4,584,232; 4,584,233; 4,584,234; 4,584,235; 4,584,236; 4,584,237; 4,584,238; 4,584,239; 4,584,240; 4,584,241; 4,584,242; 4,584,243; 4,584,244; 4,58

DATE: 10/13/2017		
DESIGNED: JSK	DRAWN: JSK	
CHECKED: BSF	APPROVED: SP	
PROJECT No.: EFO6	SEQUENCE No.: *	
SHEET: 1 OF 1		

DRAWING NOT TO BE USED FOR CONSTRUCTION

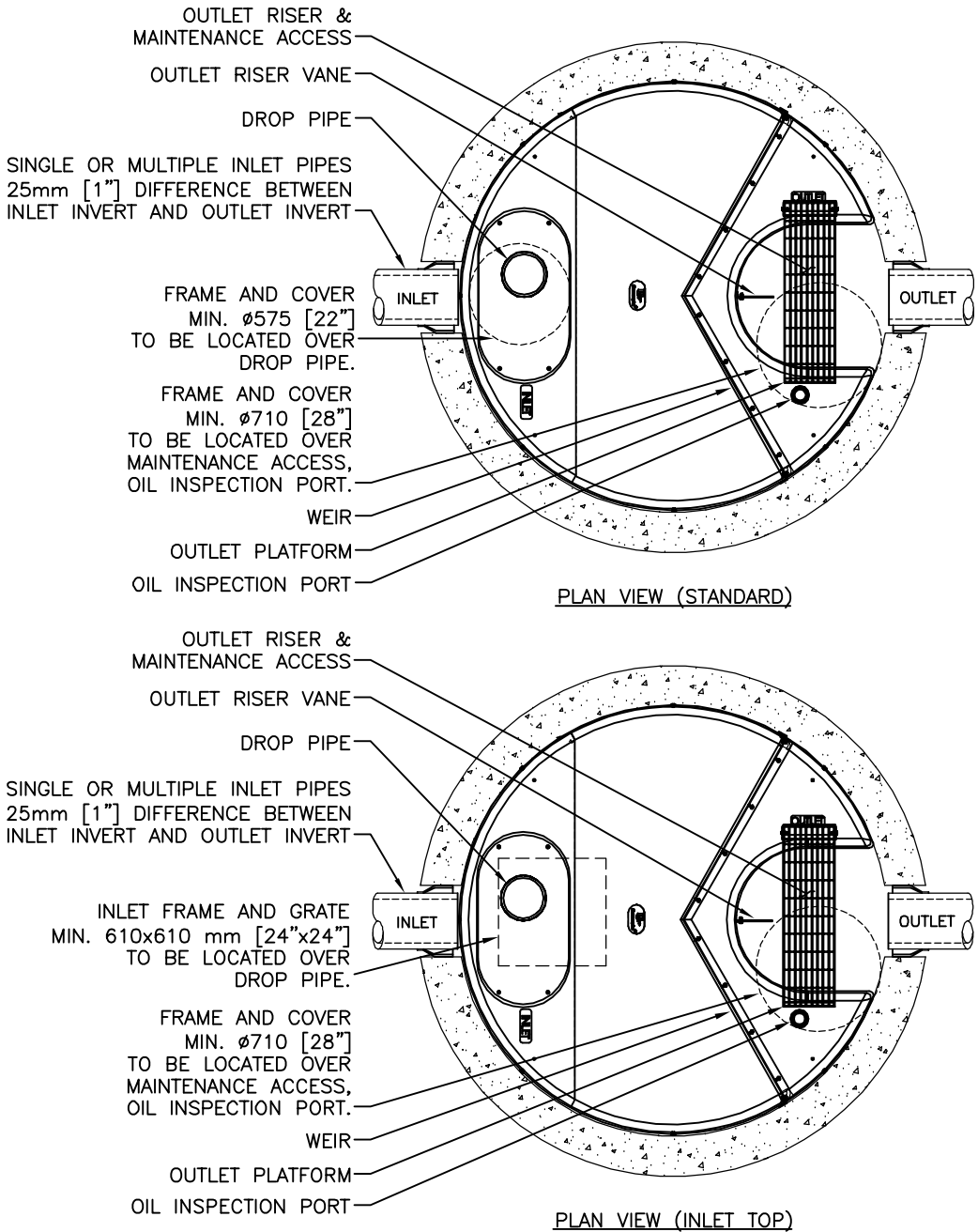


- GENERAL NOTES:**
- * MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m² (27.9 gpm/ft²) FOR STORMCEPTOR EF8 AND 535 L/min/m² (13.1 gpm/ft²) FOR STORMCEPTOR EFO8 (OIL CAPTURE CONFIGURATION).
 - ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
 - STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
 - UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
 - DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
 - NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

- INSTALLATION NOTES**
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
 - C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
 - D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
 - E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

STANDARD DETAIL
NOT FOR CONSTRUCTION



SITE SPECIFIC DATA REQUIREMENTS					
STORMCEPTOR MODEL		EFO8			
STRUCTURE ID		*			
HYDROCARBON STORAGE REQ'D (L)		*			
WATER QUALITY FLOW RATE (L/s)		*			
PEAK FLOW RATE (L/s)		*			
RETURN PERIOD OF PEAK FLOW (yrs)		*			
DRAINAGE AREA (HA)		*			
DRAINAGE AREA IMPERVIOUSNESS (%)		*			
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*
* PER ENGINEER OF RECORD					

The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Imbrium Systems ("Imbrium"). Neither this drawing, nor any part thereof, may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of Imbrium. Imbrium expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, these are to be resolved by the engineer of record. Imbrium accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

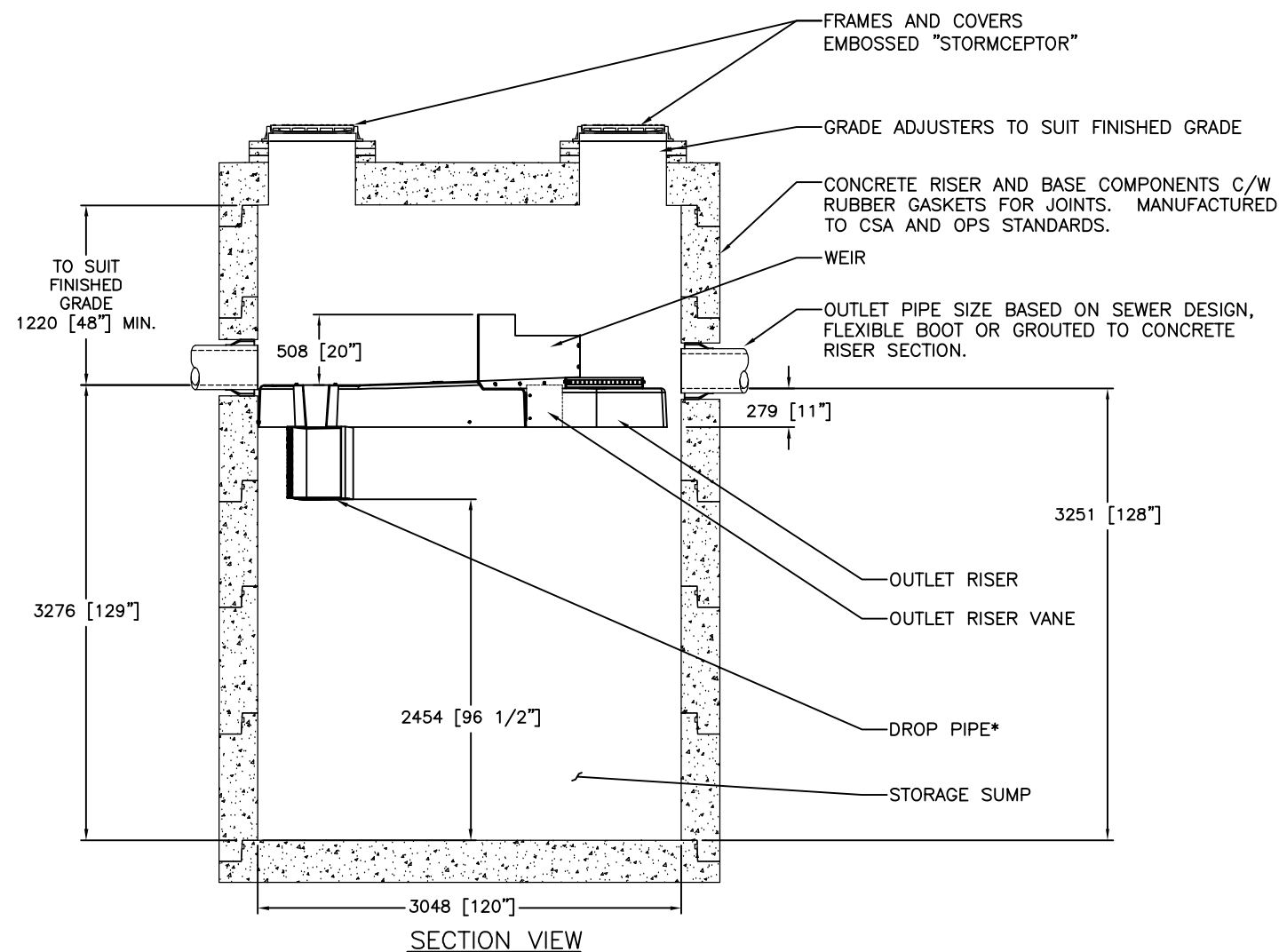
####	####	####	####	JSK	JSK	BY
####	####	####	####	OUTLET PLATFORM	INITIAL RELEASE	REVISION DESCRIPTION
####	####	####	####	6/8/18	5/26/17	DATE
####	####	####	1	0		MARK

407 FAIRVIEW DRIVE, WHITBY, ON L1N 3A9
TEL: 800-385-4801 CA: 416-860-9600 INTL: +1-416-860-9600
The Stormceptor is a registered trademark of Imbrium Systems Inc. ("Imbrium").
Imbrium Systems Inc. is a registered provider of the Stormceptor system.
Imbrium Systems Inc. is a registered provider of the Stormceptor system.
Imbrium Systems Inc. is a registered provider of the Stormceptor system.

DATE: 10/13/2017

DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: *
PROJECT No.: EFO8	SEQUENCE No.: *
SHEET: 1	OF 1

DRAWING NOT TO BE USED FOR CONSTRUCTION



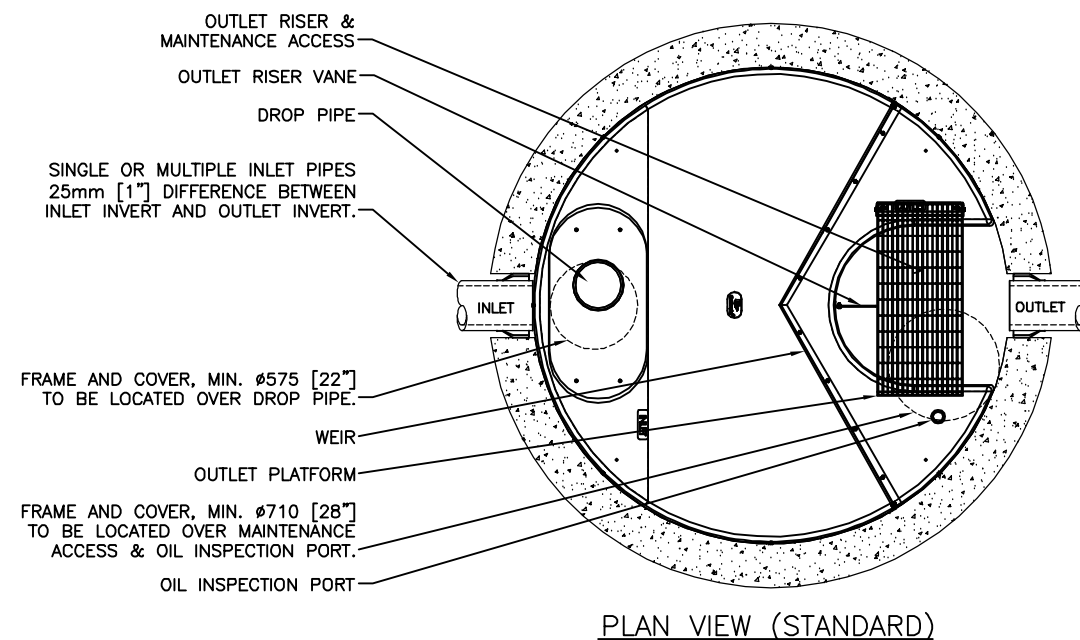
GENERAL NOTES:

- * MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m² (27.9 gpm/ft²) FOR STORMCEPTOR EF10 AND 535 L/min/m² (13.1 gpm/ft²) FOR STORMCEPTOR EFO10 (OIL CAPTURE CONFIGURATION).
1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
 2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
 3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
 4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
 5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

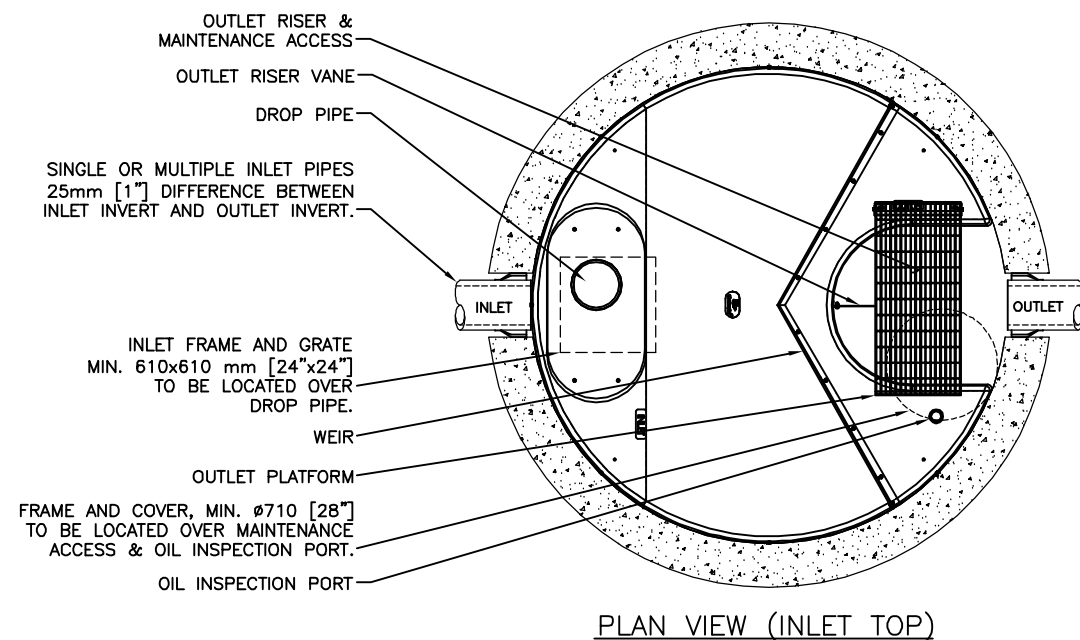
FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

INSTALLATION NOTES

- INSTALLER HOW-TO:**
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
 - C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
 - D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
 - E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

<u>SITE SPECIFIC DATA REQUIREMENTS</u>					
STORMCEPTOR MODEL		EFO10			
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
WATER QUALITY FLOW RATE (L/s)					
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*
* PER ENGINEER OF RECORD					

The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Indian Systems (Inc.). This information is not to be used, copied, reproduced, or modified in any manner without the prior written consent of Indian. Failure to comply with this disclaimer may result in Indian expressly disclaiming any liability or responsibility for such use.

Discrepancies between the actual field information upon which the drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Indian immediately for re-evaluation of the design. Indian accepts no responsibility for any errors, omissions, or incomplete or inaccurate information supplied by others.

####	####				####
####	####				####
####	####				####
1	6/8/18	OUTLET PLATFORM			JSK
0	5/26/17	INITIAL RELEASE			JSK
MARK	DATE	REVISION DESCRIPTION			BY

Stormceptor® EF

SCALE = NTS

[illegible]

DATE: 10/24/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EFO10	SEQUENCE No.: *
SHEET: 1 OF 1	

STANDARD DETAIL
NOT FOR CONSTRUCTION

APPENDIX D

Low Impact Development Feasibility Study - Scope of Work

Low Impact Development Feasibility Study

Scope of Work

Background

Low Impact Development (LID) is required to achieve the draft conditions of MECP's Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA). The primary objective of LID will be to intercept and control the 90th percentile runoff volume from the road ROW and external areas draining into the road ROW, where feasible, to provide 80% TSS control to achieve the water quality criteria. Per the draft CLI ECA conditions, control is in the following hierarchical order, with each step exhausted before proceeding to the next: 1) retention (infiltration, reuse or evapotranspiration), 2) LID filtration, and 3) conventional stormwater management. Step 3, conventional stormwater management, should proceed only once Maximum Extent Possible has been attained for Steps 1 and 2 for retention and filtration. Maximum Extent Possible means maximum achievable runoff volume control through retention and LID filtration practices, given the site restrictions. The LID feasibility study will assess such site restrictions and recommend opportunities to proceed to detailed design.

Scope of Work

The scope of the LID feasibility study includes the following tasks:

1. Collect and review background information
 - a. The Vendor shall collect and review all background information/data relating to this project including, but not limited to the following:
 - i. Williams Parkway Improvements Municipal Class Environmental Assessment (MCEA) Project Report and all technical studies completed as part of the MCEA
 - ii. 30% Preliminary Design Drawings
 - iii. City's storm sewer network GIS layers and as-built drawings, where available
 - iv. 0.5 m contours
 - v. Depth to water table mapping from the Oak Ridges Moraine Groundwater Program
 - b. The Vendor shall collect new information regarding City assets where needed to evaluate feasibility of LID, such as the following:
 - i. survey the elevation of existing stormwater infrastructure to ensure feasibility of underdrain outlet to existing infrastructure. If this work requires any maintenance/cleaning to be performed prior to the survey, work with City Operations in an expeditious manner to complete the survey.

- ii. The Vendor shall collect and review long-term groundwater monitoring data from surrounding subdivisions within the last 5 years.

2. Feasibility screening of opportunities

- a. The Vendor shall assess feasibility of the following types of LID opportunities:
 - i. Divert road runoff into LID facilities in the boulevard and/or median prior to draining to the existing storm sewer system. Consider the best suited type of LID practice for specific locations, such as bioswales, rain gardens, stormwater tree trenches, and permeable pavement.
 - ii. Convert turf to native drought resilient landscaping.
 - iii. Intercept road and/or external runoff with Oil Grit Separators or other manufactured treatment devices
 - iv. Other opportunities, if identified during review.
- b. The vendor shall complete an assessment of all aspects that impact LID design and long-term performance and maintenance, including but not limited to the following:
 - i. Vertical constraints of existing topography and elevation of storm sewer system relative to the new design components (e.g. underdrains, distribution pipes).
 - ii. Space available in boulevards and medians based on the current alignment and the subsurface utility investigation.
 - iii. Integration of LID opportunities with planned landscaping improvements, where feasible, such as new street trees.
 - iv. Pre-treatment of surface runoff at curb cut inlets is mandatory and must not be provided using rock rip rap or grass filter strips. Preferred pre-treatment methods include a sump catchbasin with no connecting pipes, concrete forebay, or prefabricated units.
 - v. Pre-treatment of subsurface inlets is mandatory, such as distribution pipes throughout stormwater tree trenches. Pre-treatment may consist of a sump catchbasin with a goss trap upstream of the distribution pipe.
 - vi. Safe access for maintenance staff/contractors to park in boulevard/median while maintaining vegetative components of biofiltration facilities. For example, accounting for the space needed as a constraint or recommending ways to integrate other components to accommodate this (e.g. pavers next to planting beds).
 - vii. Capital works concerns regarding retained/filtered stormwater in the median and boulevard entering the road subgrade.
 - viii. Any source water protection areas that may impact SWM facility implementation
- c. Geotechnical and hydrogeological investigation
Subsurface investigations will be undertaken to characterize soil through borehole investigation and groundwater conditions through monitoring wells. Boreholes and

Monitoring wells shall be situated at the initial best suited LID proposed locations. Boreholes should be situated on both sides of the road, in the boulevard and the median, with no more than 250 m spacing between boreholes on either side of the road. Soil sampling shall be completed to ensure underlying soils are not contaminated. For groundwater monitoring, provide continuous measurements of groundwater levels through water level monitoring for a period of 1 year at the initial best suited LID proposed locations. In-situ infiltration testing at the LID invert shall be used to estimate hydraulic conductivity of the soils in the area. Any impacts to construction such as dewatering needs, as well as impact assessment and potential mitigation methods will be identified. Also, geotechnical recommendations regarding design of excavations, groundwater control, base stability, backfill, pipe bedding, and embankment slope stability, shall be provided. The vendor will gather sufficient information to get permits from different regulating agencies.

d. Subsurface Utility Investigations

Gather all information regarding existing utilities from the appropriate Agencies. Assess potential utility impacts/conflicts and prepare a preliminary strategy to overcome them. The Vendor shall attend meetings with the affected Utility companies. The Vendor shall be responsible for the collection of all utility data in accordance with American Society of Civil Engineers (ASCE) Standard 38-02 "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data".

e. Feasibility Study Report

Assess different stormwater LID design alternatives for suitability to achieve stormwater management objectives as per the CLI ECA stormwater management criteria for retrofit, given site conditions and constraints discovered through the investigations required above. The assessment of alternatives must use a triple bottom line approach, i.e., social, environmental, and economic evaluation. The economic evaluation must consider lifecycle costs of the LID. An evaluation/scoring matrix must be developed to rationalize the selected design. All items above, namely 2a to 2d shall be included in the feasibility study report.

3. Recommended solution

- a. Identify the location and concept design of retrofit opportunities recommended to proceed to detailed design. A typical plan and section may be provided as the concept design of common types of opportunities that repeat along the corridor. Otherwise, a concept design of unique opportunities (e.g. at a specified adjacent park) will be provided. Planting plans are outside of the scope of this study.
- b. Estimate the design and construction cost of recommended solution.

- c. Calculate the level of control provided as per applicable stormwater management criteria, such as water quality, water balance, and erosion control, by the proposed solution. Recommend additional benefits to be assessed during detailed design, such as lowering runoff intensity to the existing storm sewers.
- d. Briefly describe the additional benefits of the recommended retrofits in terms of Complete Streets, such as the landscape enhancements requested by Council.
- e. Identify additional investigations and approvals needed during detailed design, including applicable Class and Schedule with the Class EA process.
- f. Prepare Inspection and Maintenance plan for the proposed solution.
- g. Prepare an LID SWM Design brief addressing items 3a to 3f, and including but the following items:
 1. Confirm delineation and characterization of the contributing external areas to:
 - i. Confirm the level of water quality control provided by existing SWM infrastructure; and
 - ii. confirm extent of remaining water quality control required to ultimately provide full control of the 90th percentile storm (or 80% TSS control) for the external drainage areas.
 2. Confirm if additional property is required to provide sufficient space for stormwater management control per the applicable criteria. All property requirements including acquisitions and easements for the proposed work shall be identified and submitted to the City for review and approval with special attention given to the integration of storm water quantity and quality control (e.g. ponds and grass swales) as space constraints shall not be used as a rationale for not implementing adequate stormwater management. Space requirements must be re-evaluated based on updated stormwater management criteria in the CLI ECA during preliminary design stage.

Deliverables

The consultant must provide one (1) digital copy of:

- Feasibility Study Report, summarizing findings of all site investigations including assessment of LID alternatives and recommended option;
- LID SWM Design brief, showing preliminary design, calculations and SWM criteria results for the selected design;
- a map of the recommended locations of stormwater retrofits in a format that can be imported to MicroStation;
- concept design drawings in a format that can be imported to MicroStation; and
- Detailed calculations referenced in the report.

Data to be provided by the City

1. Williams Parkway Improvements Municipal Class Environmental Assessment (MCEA) Project Report and all technical studies completed as part of the MCEA

2. 30% Preliminary Design Drawings (including existing conditions/removals plans)
3. City's storm sewer network GIS layers and as-built drawings, where available
4. 0.5 m contours
5. City's impervious cover mapping
6. City parcel layer
7. Region of Peel's water and wastewater GIS layers

APPENDIX E

Hydraulic Analysis/HEC-RAS Modeling and Drawings

Spring Creek-Williams Parkway EA

N Park Dr Crossing

Maitland St Crossing

Williams Pkwy Crossing

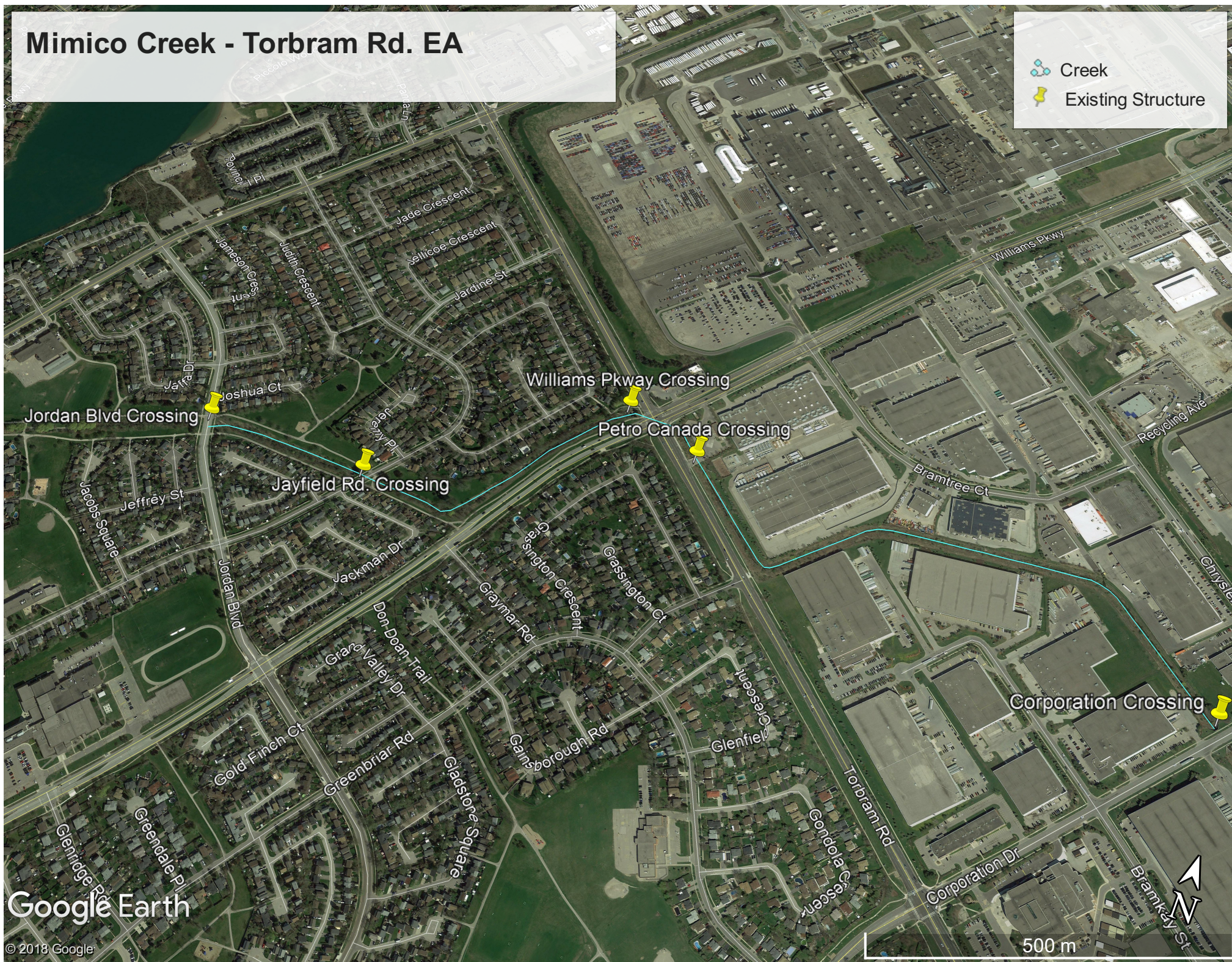
Hilldate Crescent Crossing

Central Park Crossing



Mimico Creek - Torbram Rd. EA

-  Creek
-  Existing Structure

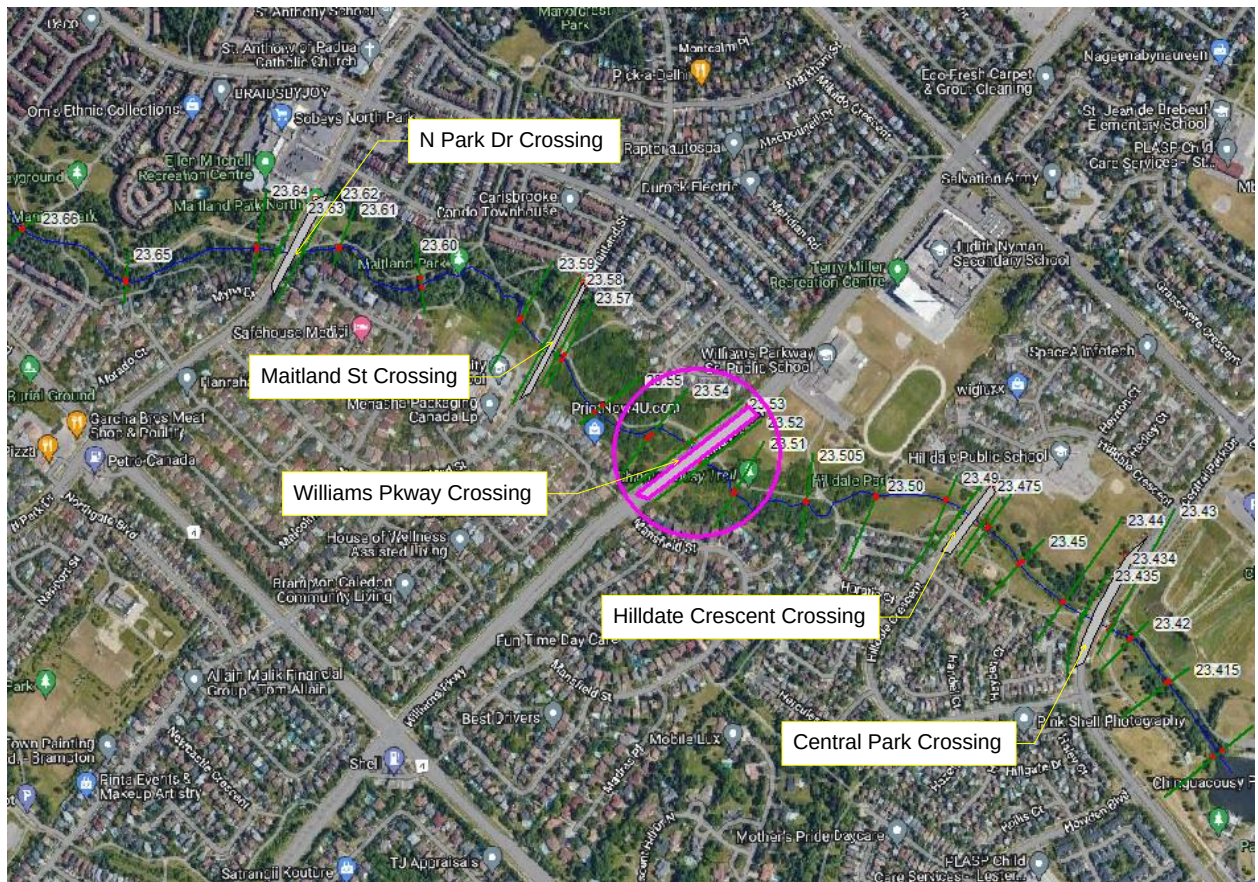


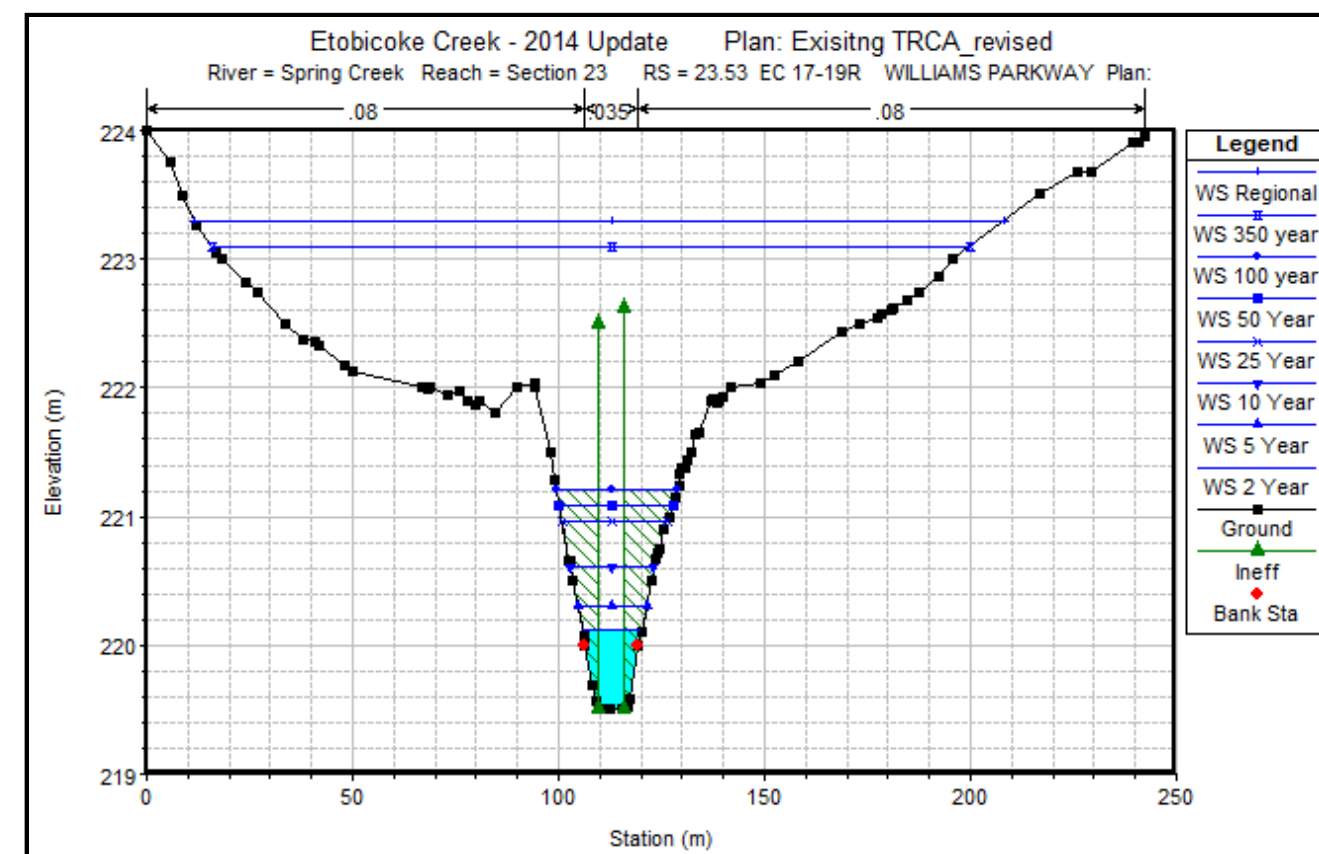
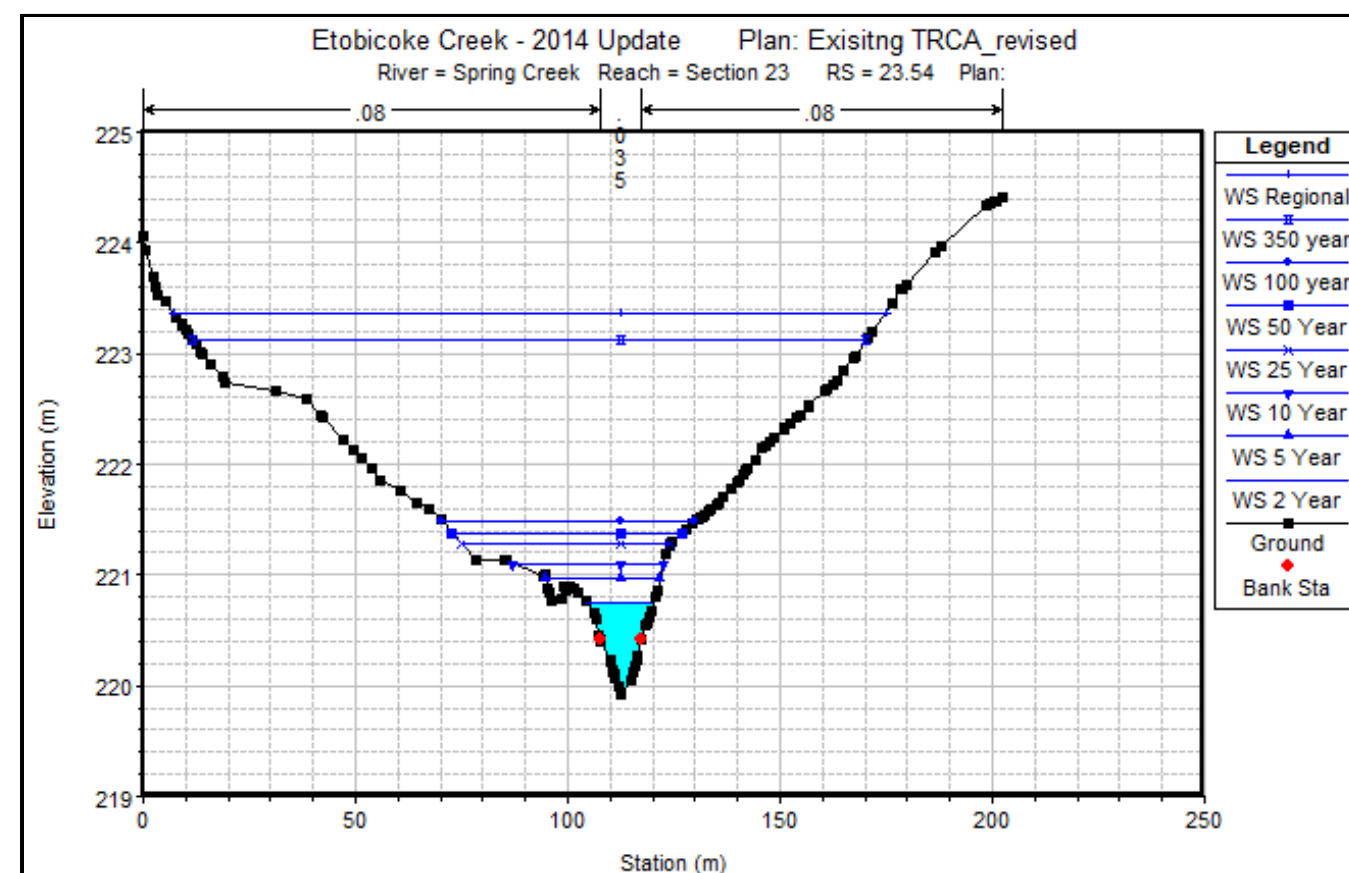
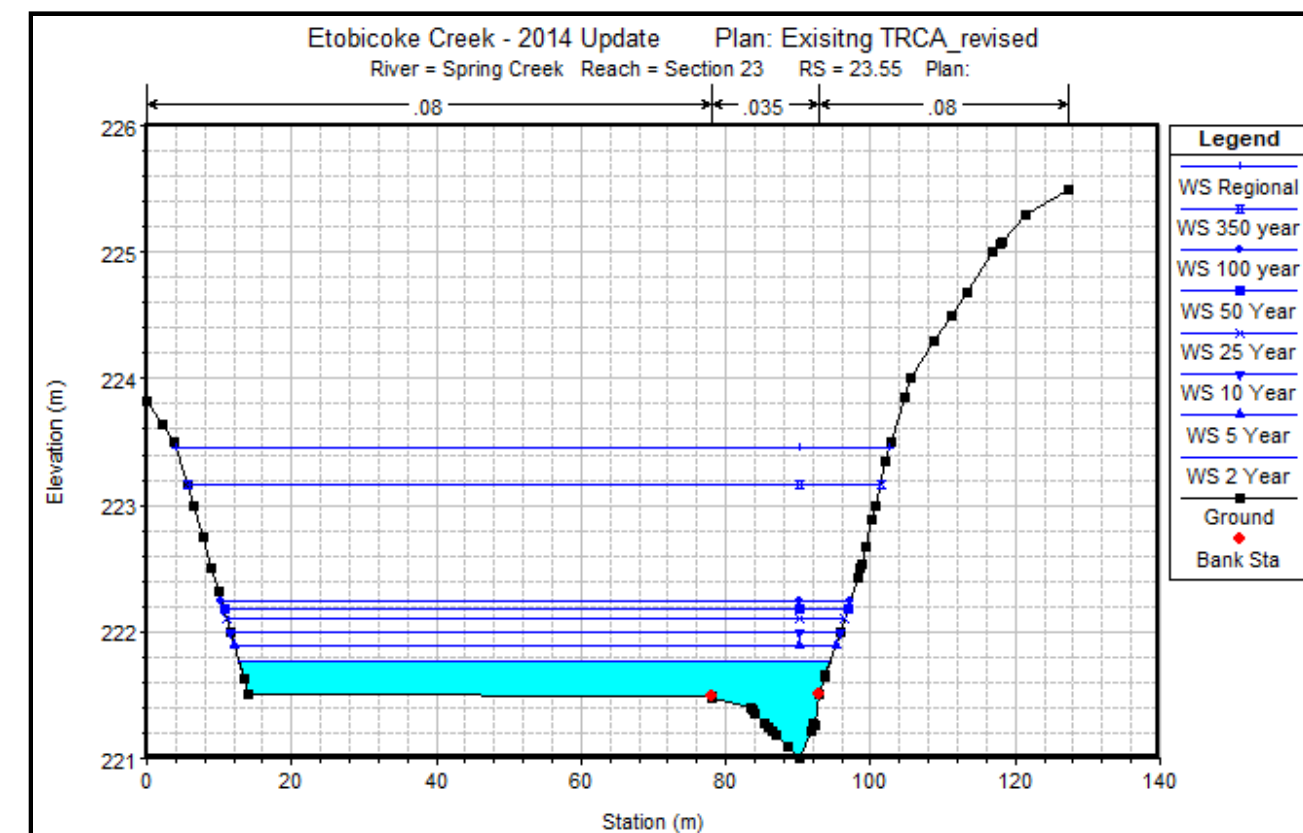
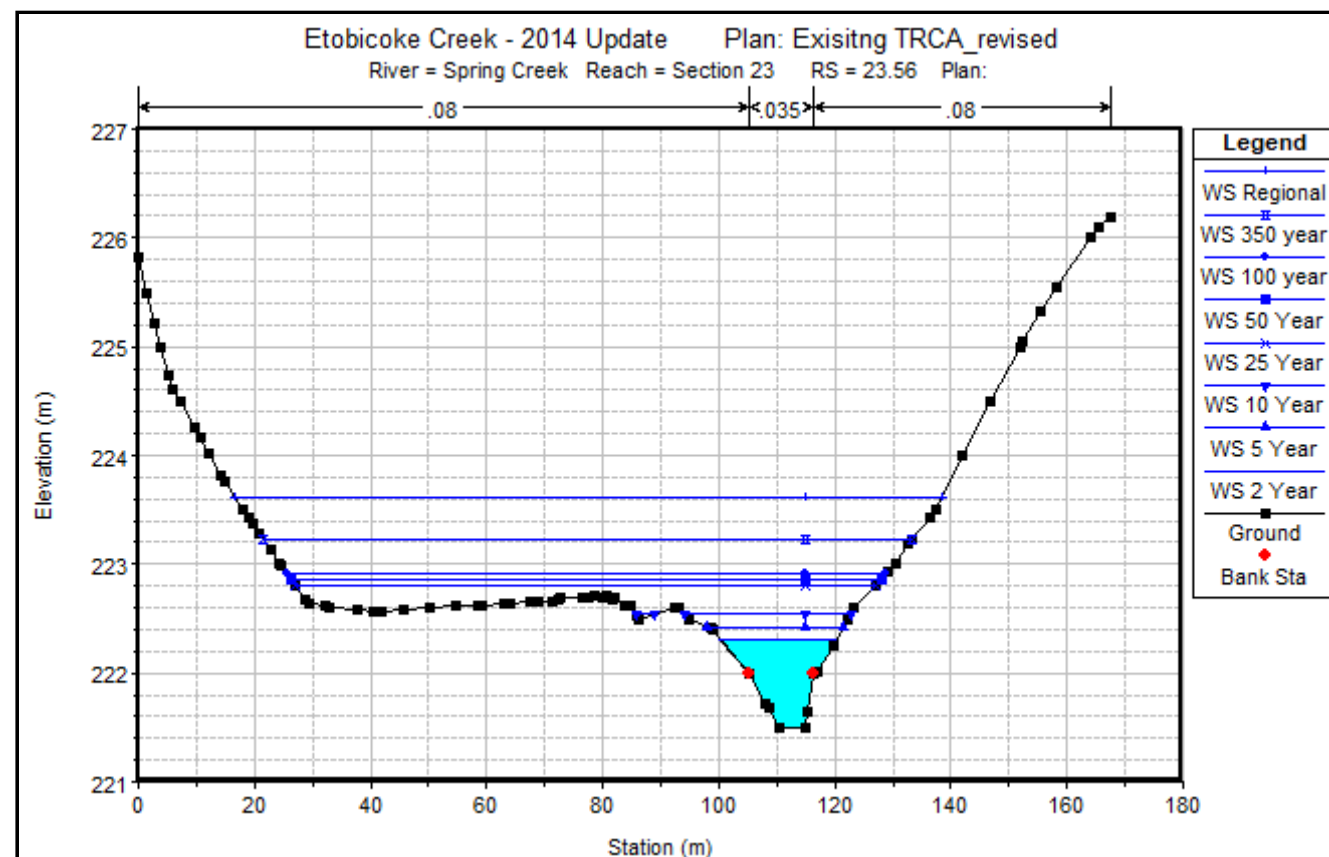
TRCA

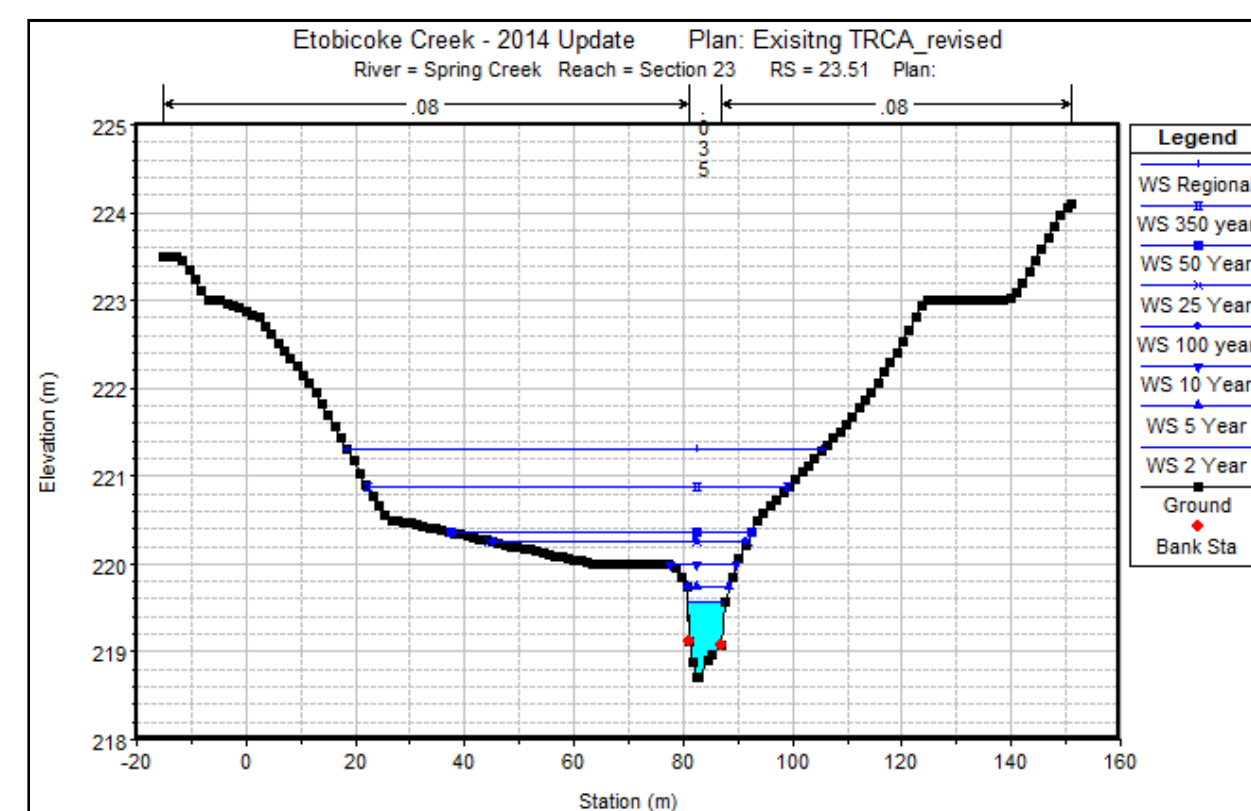
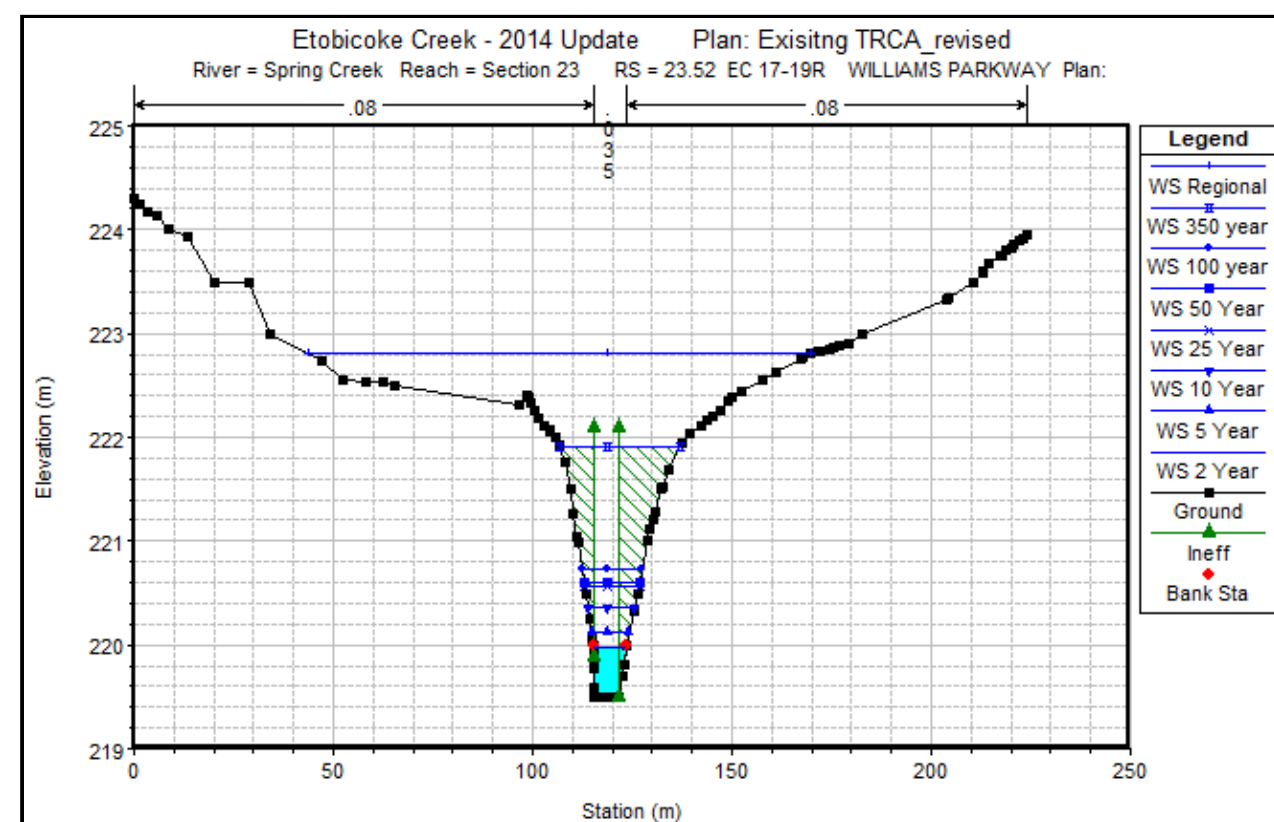
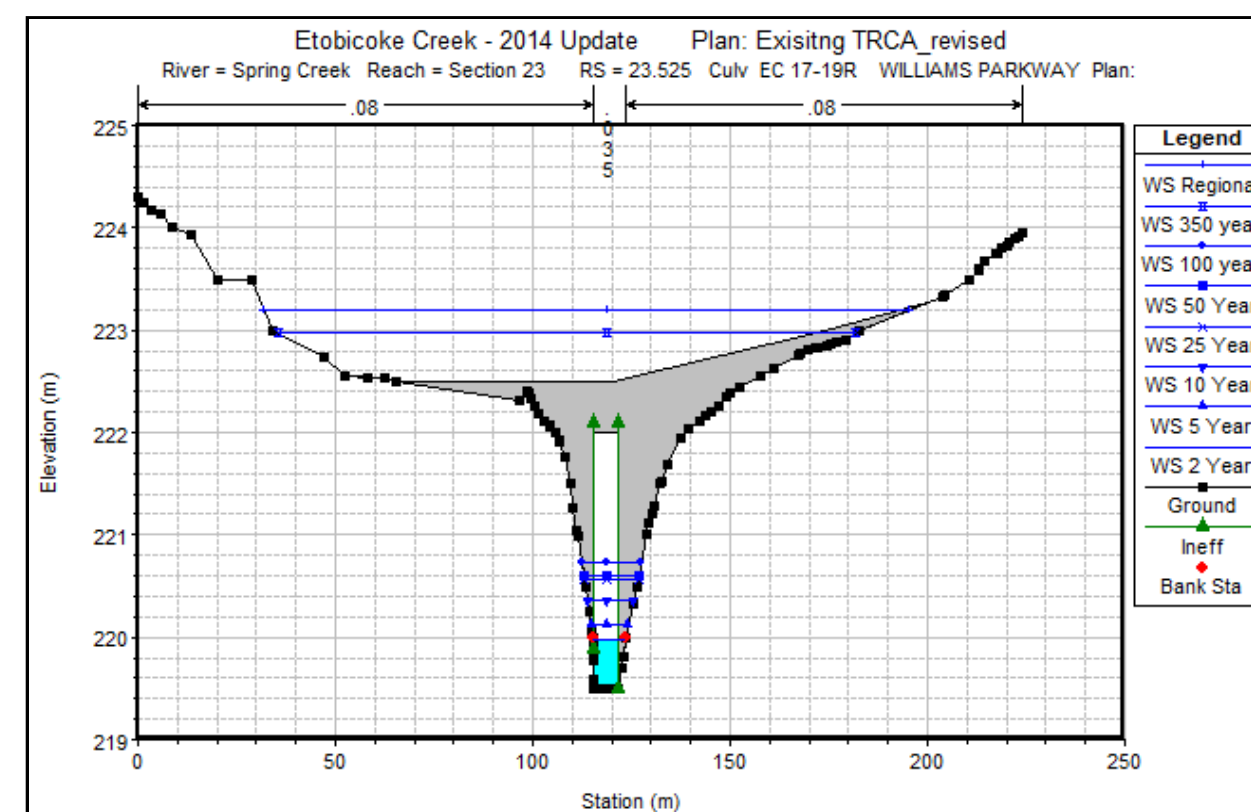
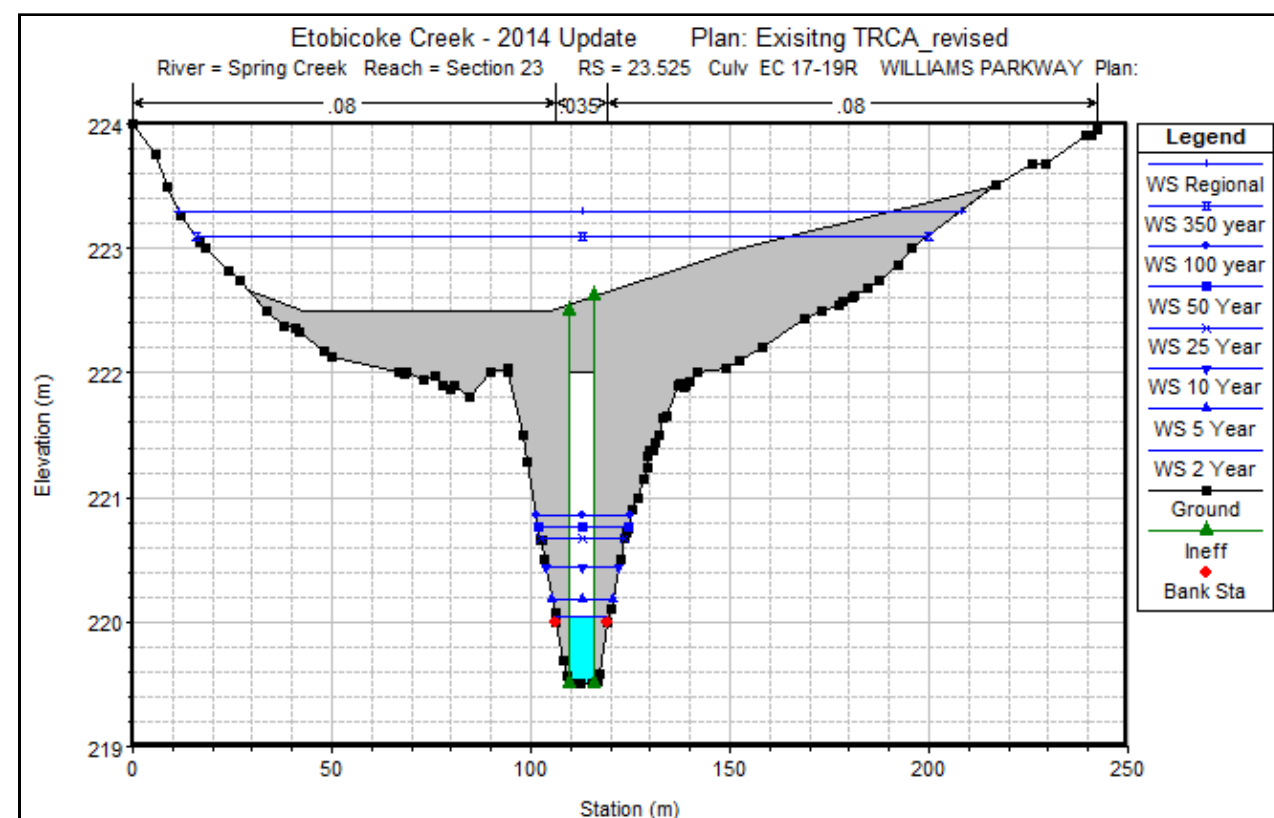
(6.3 x 2.5) m BOX CULVERT

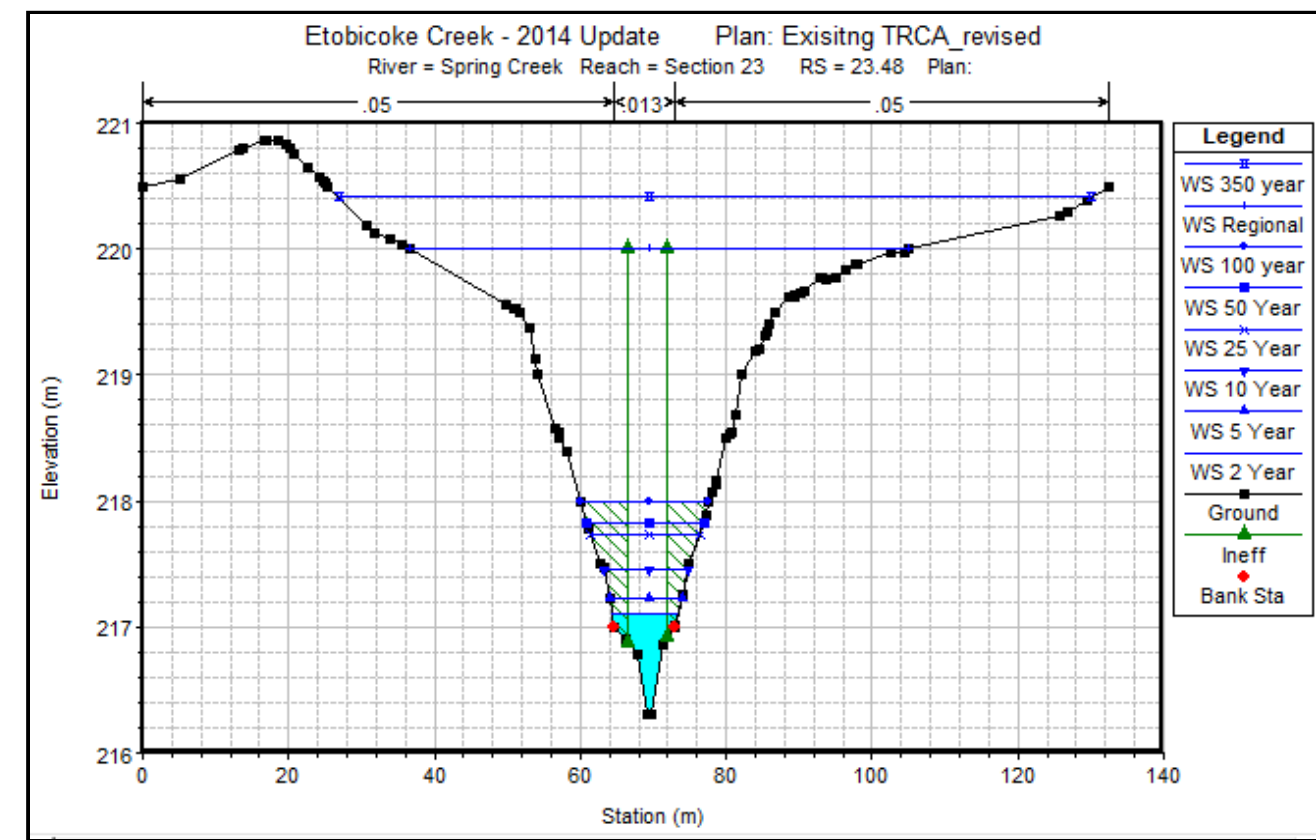
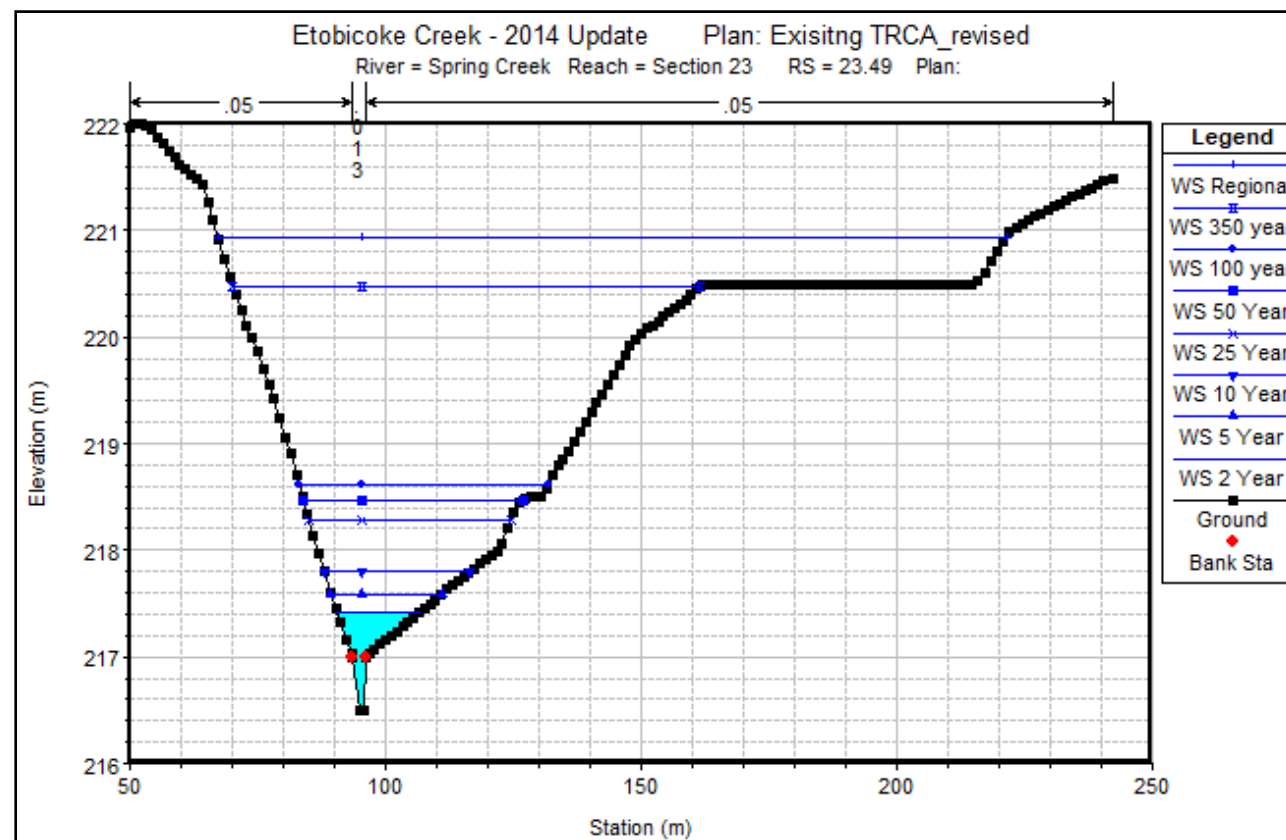
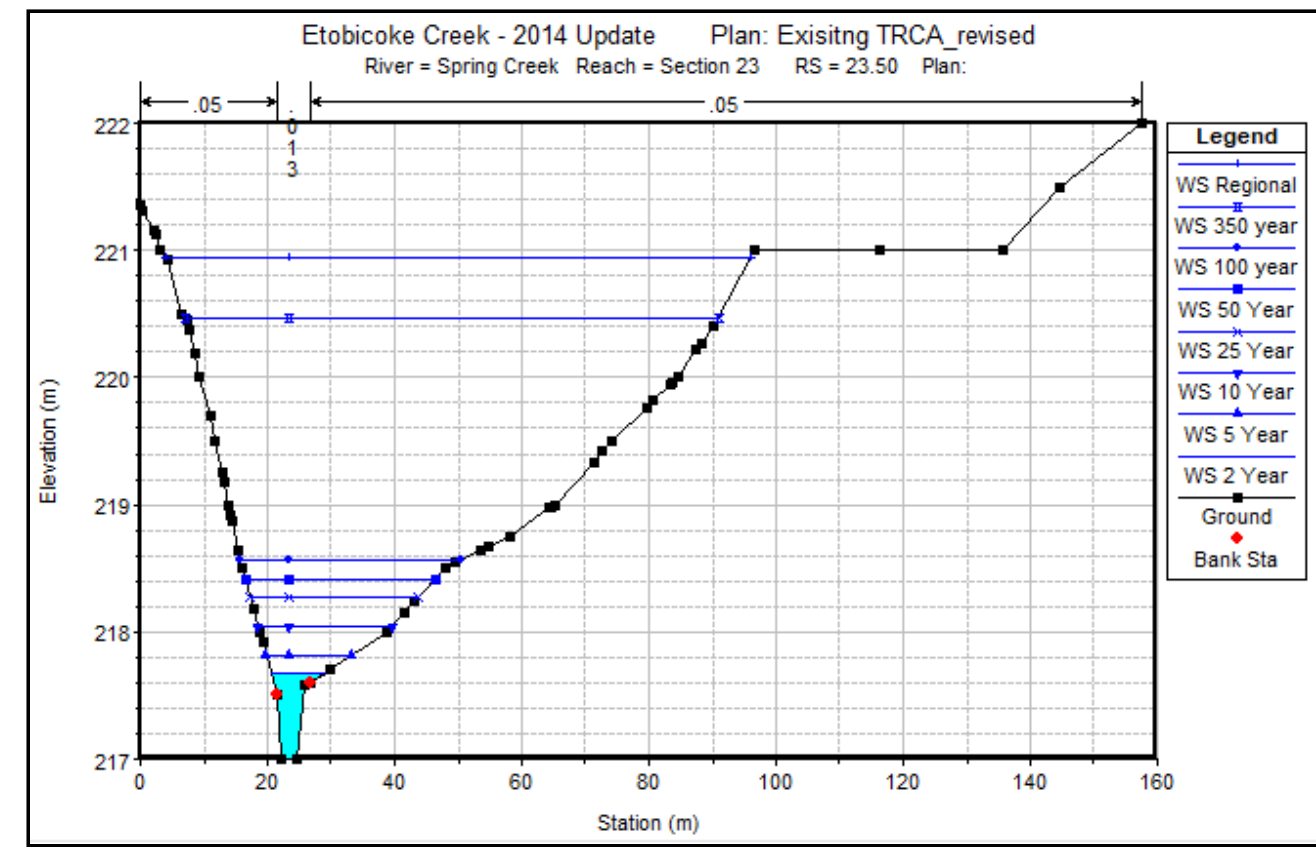
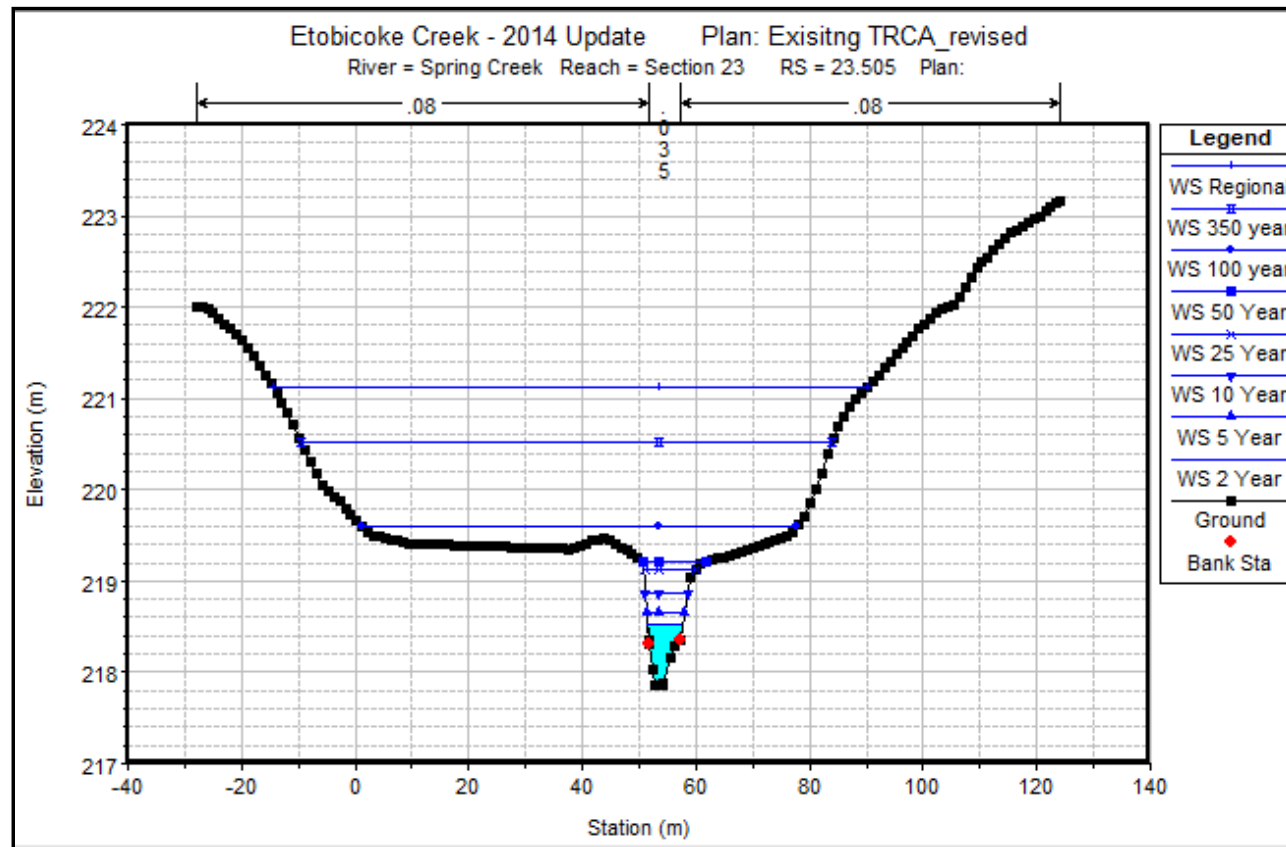
WILLIAMS PARKWAY AND CHINGUACOUSY TRAIL

EXISTING CONDITION







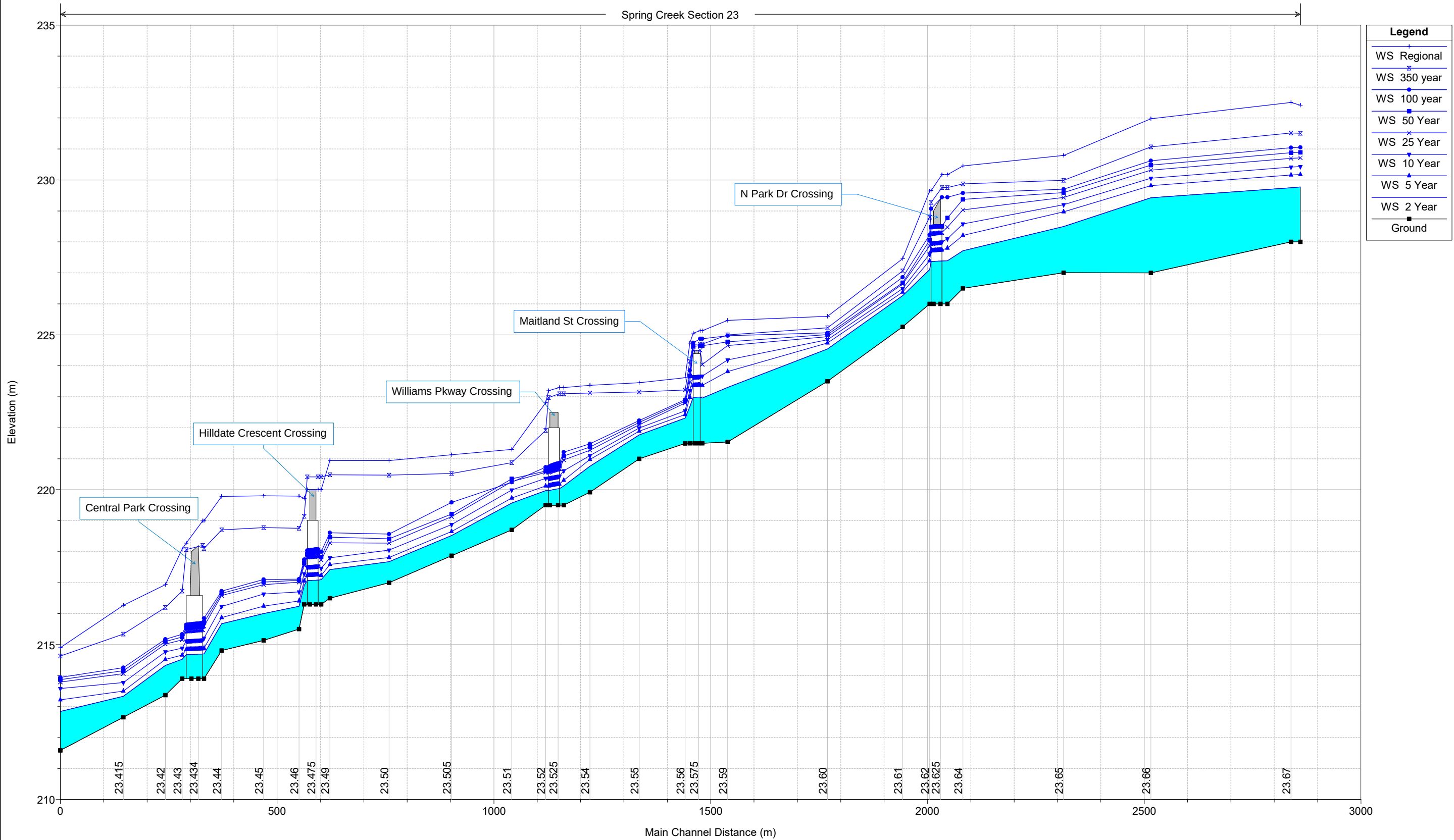


Etobicoke Creek - 2014 Update

Plan: Existing TRCA_revised

Plan:

Spring Creek Section 23



Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 2 Year			
Q Culv Group (m3/s)	5.05	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.5
Q Barrel (m3/s)	5.05	Culv Vel DS (m/s)	1.71
E.G. US. (m)	220.21	Culv Inv El Up (m)	219.5
W.S. US. (m)	220.12	Culv Inv El Dn (m)	219.5
E.G. DS (m)	220.12	Culv Frctn Ls (m)	0.03
W.S. DS (m)	219.97	Culv Exit Loss (m)	0
Delta EG (m)	0.09	Culv Entr Loss (m)	0.06
Delta WS (m)	0.15	Q Weir (m3/s)	
E.G. IC (m)	220.13	Weir Sta Lft (m)	
E.G. OC (m)	220.21	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	220.04	Weir Max Depth (m)	
Culv WS Outlet (m)	219.97	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	0.4	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 5 Year			
Q Culv Group (m3/s)	7.52	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.74
Q Barrel (m3/s)	7.52	Culv Vel DS (m/s)	1.92
E.G. US. (m)	220.42	Culv Inv El Up (m)	219.5
W.S. US. (m)	220.31	Culv Inv El Dn (m)	219.5
E.G. DS (m)	220.31	Culv Frctn Ls (m)	0.03
W.S. DS (m)	220.12	Culv Exit Loss (m)	0
Delta EG (m)	0.11	Culv Entr Loss (m)	0.08
Delta WS (m)	0.19	Q Weir (m3/s)	
E.G. IC (m)	220.32	Weir Sta Lft (m)	
E.G. OC (m)	220.42	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	220.19	Weir Max Depth (m)	
Culv WS Outlet (m)	220.12	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	0.53	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 10 Year			
Q Culv Group (m3/s)	12.39	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.1
Q Barrel (m3/s)	12.39	Culv Vel DS (m/s)	2.27
E.G. US. (m)	220.77	Culv Inv El Up (m)	219.5
W.S. US. (m)	220.61	Culv Inv El Dn (m)	219.5
E.G. DS (m)	220.63	Culv Frctn Ls (m)	0.03
W.S. DS (m)	220.37	Culv Exit Loss (m)	0
Delta EG (m)	0.14	Culv Entr Loss (m)	0.11
Delta WS (m)	0.25	Q Weir (m3/s)	
E.G. IC (m)	220.66	Weir Sta Lft (m)	
E.G. OC (m)	220.77	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	220.44	Weir Max Depth (m)	
Culv WS Outlet (m)	220.37	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	0.73	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 25 Year			
Q Culv Group (m3/s)	19.01	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.56
Q Barrel (m3/s)	19.01	Culv Vel DS (m/s)	2.84
E.G. US. (m)	221.18	Culv Inv El Up (m)	219.5
W.S. US. (m)	220.96	Culv Inv El Dn (m)	219.5
E.G. DS (m)	220.97	Culv Frctn Ls (m)	0.04
W.S. DS (m)	220.56	Culv Exit Loss (m)	0
Delta EG (m)	0.21	Culv Entr Loss (m)	0.17
Delta WS (m)	0.4	Q Weir (m3/s)	
E.G. IC (m)	221.05	Weir Sta Lft (m)	
E.G. OC (m)	221.18	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	220.68	Weir Max Depth (m)	
Culv WS Outlet (m)	220.56	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	0.98	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 50 Year			
Q Culv Group (m3/s)	21.54	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.72
Q Barrel (m3/s)	21.54	Culv Vel DS (m/s)	3.1
E.G. US. (m)	221.32	Culv Inv El Up (m)	219.5
W.S. US. (m)	221.09	Culv Inv El Dn (m)	219.5
E.G. DS (m)	221.09	Culv Frctn Ls (m)	0.04
W.S. DS (m)	220.6	Culv Exit Loss (m)	0
Delta EG (m)	0.23	Culv Entr Loss (m)	0.19
Delta WS (m)	0.48	Q Weir (m3/s)	
E.G. IC (m)	221.19	Weir Sta Lft (m)	
E.G. OC (m)	221.32	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	220.76	Weir Max Depth (m)	
Culv WS Outlet (m)	220.6	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.06	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 100 Year			
Q Culv Group (m3/s)	24.13	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.82
Q Barrel (m3/s)	24.13	Culv Vel DS (m/s)	3.12
E.G. US. (m)	221.47	Culv Inv El Up (m)	219.5
W.S. US. (m)	221.21	Culv Inv El Dn (m)	219.5
E.G. DS (m)	221.22	Culv Frctn Ls (m)	0.04
W.S. DS (m)	220.73	Culv Exit Loss (m)	0
Delta EG (m)	0.24	Culv Entr Loss (m)	0.2
Delta WS (m)	0.48	Q Weir (m3/s)	
E.G. IC (m)	221.33	Weir Sta Lft (m)	
E.G. OC (m)	221.47	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	220.86	Weir Max Depth (m)	
Culv WS Outlet (m)	220.73	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.14	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: 350 Year			
Q Culv Group (m3/s)	8.17	Culv Full Len (m)	25
# Barrels	1	Culv Vel US (m/s)	0.52
Q Barrel (m3/s)	8.17	Culv Vel DS (m/s)	0.52
E.G. US. (m)	223.12	Culv Inv El Up (m)	219.5
W.S. US. (m)	223.1	Culv Inv El Dn (m)	219.5
E.G. DS (m)	223.12	Culv Frctn Ls (m)	0
W.S. DS (m)	221.91	Culv Exit Loss (m)	0
Delta EG (m)	0.01	Culv Entr Loss (m)	0.01
Delta WS (m)	1.18	Q Weir (m3/s)	65.66
E.G. IC (m)	223.11	Weir Sta Lft (m)	15.2
E.G. OC (m)	223.12	Weir Sta Rgt (m)	168.27
Culvert Control	Outlet	Weir Submerg	0.77
Culv WS Inlet (m)	222	Weir Max Depth (m)	0.62
Culv WS Outlet (m)	223.1	Weir Avg Depth (m)	0.45
Culv Nml Depth (m)		Weir Flow Area (m2)	68.13
Culv Crt Depth (m)	0.56	Min El Weir Flow (m)	222.5

Plan: Dec18_Revised Xsection TRCA Spring Creek Section 23 RS: 23.525 Culv Group: Culvert #1 Profile: Regional			
Q Culv Group (m3/s)	15.26	Culv Full Len (m)	25
# Barrels	1	Culv Vel US (m/s)	0.97
Q Barrel (m3/s)	15.26	Culv Vel DS (m/s)	0.97
E.G. US. (m)	223.38	Culv Inv El Up (m)	219.5
W.S. US. (m)	223.3	Culv Inv El Dn (m)	219.5
E.G. DS (m)	223.35	Culv Frctn Ls (m)	0
W.S. DS (m)	222.81	Culv Exit Loss (m)	0
Delta EG (m)	0.03	Culv Entr Loss (m)	0.02
Delta WS (m)	0.49	Q Weir (m3/s)	131.99
E.G. IC (m)	223.36	Weir Sta Lft (m)	10.52
E.G. OC (m)	223.38	Weir Sta Rgt (m)	200.72
Culvert Control	Outlet	Weir Submerg	0.41
Culv WS Inlet (m)	222	Weir Max Depth (m)	0.88
Culv WS Outlet (m)	222	Weir Avg Depth (m)	0.59
Culv Nml Depth (m)		Weir Flow Area (m2)	112.4
Culv Crt Depth (m)	0.84	Min El Weir Flow (m)	222.5

PROFILE OUTPUT TABLE - TRCA RIVER ETOBICOKE CREEK, SPRING CREEK SECTION 23

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.68	2 Year	14.24	228	229.8		229.83	0.0008	1.07	16.18	14.08	0.28
Section 23	23.68	5 Year	22.02	228	230.2		230.25	0.0008	1.28	22.21	15.96	0.29
Section 23	23.68	10 Year	28.41	228	230.4		230.53	0.0009	1.43	26.45	17.21	0.31
Section 23	23.68	25 Year	36.91	228	230.7		230.83	0.001	1.62	31.47	18.71	0.33
Section 23	23.68	50 Year	43.46	228	230.9		231.03	0.0011	1.76	34.96	19.73	0.34
Section 23	23.68	100 Year	49.69	228	231.1		231.21	0.0011	1.88	38.15	20.52	0.36
Section 23	23.68	350 Year	71.84	228	231.5		231.73	0.0013	2.27	48.09	23.31	0.4
Section 23	23.68	Regional	139.6	228	232.4		232.86	0.002	3.29	73.36	33.77	0.51
Section 23	23.67	2 Year	14.24	228	229.8		229.81	0.0011	1.23	19.6	20.13	0.32
Section 23	23.67	5 Year	22.02	228	230.2		230.23	0.001	1.4	28.53	23.8	0.32
Section 23	23.67	10 Year	28.41	228	230.4		230.5	0.001	1.53	35.02	26.44	0.33
Section 23	23.67	25 Year	36.91	228	230.7		230.8	0.0011	1.7	42.96	29.95	0.35
Section 23	23.67	50 Year	43.46	228	230.9		230.99	0.0012	1.83	48.71	33.28	0.36
Section 23	23.67	100 Year	49.69	228	231		231.17	0.0012	1.97	54.28	38.53	0.38
Section 23	23.67	350 Year	71.84	228	231.5		231.66	0.0012	2.19	73.57	42.2	0.39
Section 23	23.67	Regional	139.6	228	232.5		232.7	0.0014	2.78	118.82	50.05	0.43
Section 23	23.66	2 Year	14.24	227	229.4		229.49	0.0009	1.37	21.79	21.28	0.3
Section 23	23.66	5 Year	22.02	227	229.8		229.9	0.001	1.63	31.23	27.09	0.32
Section 23	23.66	10 Year	28.41	227	230.1		230.15	0.0011	1.8	38.16	30.77	0.34
Section 23	23.66	25 Year	36.91	227	230.3		230.43	0.0012	2	46.64	34.64	0.36
Section 23	23.66	50 Year	43.46	227	230.5		230.6	0.0013	2.14	52.45	37.06	0.38
Section 23	23.66	100 Year	49.69	227	230.6		230.75	0.0013	2.25	57.88	38.88	0.39
Section 23	23.66	350 Year	71.84	227	231.1		231.23	0.0015	2.58	76.47	45.18	0.42
Section 23	23.66	Regional	139.6	227	232		232.19	0.0018	3.3	125.53	60.03	0.48
Section 23	23.65	2 Year	14.24	227	228.5	228.5	229.01	0.0118	3.45	6.35	8.84	0.99
Section 23	23.65	5 Year	22.02	227	229	229	229.44	0.0077	3.46	12.59	17.59	0.84
Section 23	23.65	10 Year	28.41	227	229.2	229.2	229.67	0.0072	3.63	17.1	21.76	0.83
Section 23	23.65	25 Year	36.91	227	229.4	229.4	229.92	0.0069	3.85	22.68	26.01	0.83
Section 23	23.65	50 Year	43.46	227	229.6	229.6	230.08	0.0067	3.97	26.91	28.34	0.83
Section 23	23.65	100 Year	49.69	227	229.7	229.7	230.21	0.0069	4.14	30.11	29.74	0.84
Section 23	23.65	350 Year	71.84	227	230	230	230.61	0.0079	4.78	39.28	33.45	0.92
Section 23	23.65	Regional	139.6	227	230.8	230.8	231.49	0.0078	5.64	72.67	49.16	0.96
Section 23	23.64	2 Year	14.24	227	227.7		227.8	0.0024	1.52	17.88	32.83	0.45
Section 23	23.64	5 Year	22.02	227	228.2		228.26	0.0011	1.29	39.67	52.11	0.32

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.64	10 Year	28.41	227	228.6		228.62	0.0006	1.16	60.69	61.1	0.26
Section 23	23.64	25 Year	36.91	227	229		229.06	0.0004	1.05	90.24	69.55	0.21
Section 23	23.64	50 Year	43.46	227	229.4		229.4	0.0003	0.99	115.01	75.99	0.19
Section 23	23.64	100 Year	49.69	227	229.6		229.6	0.0003	1	130.91	79.92	0.18
Section 23	23.64	350 Year	71.84	227	229.9		229.91	0.0004	1.24	155.48	86.06	0.22
Section 23	23.64	Regional	139.6	227	230.5		230.52	0.0007	1.86	208.98	100.21	0.3
Section 23	23.63	2 Year	14.24	226	227.4	227.1	227.63	0.0052	2.18	6.52	16.8	0.65
Section 23	23.63	5 Year	22.02	226	227.8	227.4	228.11	0.0045	2.49	8.86	19.97	0.64
Section 23	23.63	10 Year	28.41	226	228.1	227.6	228.47	0.0041	2.68	10.59	22.48	0.63
Section 23	23.63	25 Year	36.91	226	228.5	227.9	228.91	0.0038	2.9	12.71	26.12	0.62
Section 23	23.63	50 Year	43.46	226	228.8	228.1	229.24	0.0035	3.02	14.4	34.27	0.61
Section 23	23.63	100 Year	49.69	226	229.4	228.2	229.55	0.0009	1.82	63.26	64.91	0.32
Section 23	23.63	350 Year	71.84	226	229.8	228.8	229.86	0.0009	1.94	100.6	76.85	0.33
Section 23	23.63	Regional	139.6	226	230.2	229.5	230.42	0.002	3.09	138.6	108.25	0.5
Section 23	23.63		Culvert									
Section 23	23.62	2 Year	14.24	226	227.1	227.1	227.54	0.0134	2.9	4.91	12.02	1
Section 23	23.62	5 Year	22.02	226	227.4	227.4	227.97	0.0124	3.37	6.54	13.6	1
Section 23	23.62	10 Year	28.41	226	227.6	227.6	228.29	0.0115	3.65	7.78	14.55	1
Section 23	23.62	25 Year	36.91	226	227.9	227.9	228.68	0.0108	3.98	9.26	15.72	1
Section 23	23.62	50 Year	43.46	226	228.1	228.1	228.96	0.0105	4.21	10.32	16.63	1
Section 23	23.62	100 Year	49.69	226	228.2	228.2	229.21	0.0102	4.4	11.29	17.61	1
Section 23	23.62	350 Year	71.84	226	228.8	228.8	229.25	0.0046	3.49	35.92	24.41	0.7
Section 23	23.62	Regional	139.6	226	229.7	229.7	230.19	0.0045	4.21	99.64	108.39	0.73
Section 23	23.61	2 Year	14.24	225	226.3	226.2	226.44	0.0065	2.07	12.05	29.99	0.71
Section 23	23.61	5 Year	22.02	225	226.4	226.4	226.65	0.0089	2.65	15.75	34.52	0.86
Section 23	23.61	10 Year	28.41	225	226.5	226.5	226.8	0.0091	2.87	19.91	38.96	0.88
Section 23	23.61	25 Year	36.91	225	226.6	226.6	226.97	0.0088	3.07	26.33	48.11	0.88
Section 23	23.61	50 Year	43.46	225	226.7	226.7	227.08	0.0104	3.42	28.42	50.67	0.97
Section 23	23.61	100 Year	49.69	225	226.9	226.9	227.17	0.0074	3.15	38.47	63.27	0.83
Section 23	23.61	350 Year	71.84	225	227.1	227.1	227.4	0.0077	3.5	52.18	69.59	0.87
Section 23	23.61	Regional	139.6	225	227.5	227.5	227.93	0.0094	4.47	80.99	75.97	1
Section 23	23.6	2 Year	14.24	224	224.5	224.5	224.76	0.0163	2.06	6.98	19.52	0.99
Section 23	23.6	5 Year	22.02	224	224.7	224.7	224.95	0.0107	2.12	13.41	45.43	0.85
Section 23	23.6	10 Year	28.41	224	224.8	224.8	225.07	0.0093	2.2	19.14	56.34	0.82
Section 23	23.6	25 Year	36.91	224	224.9	224.9	225.19	0.0092	2.38	24.89	60.85	0.83

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.6	50 Year	43.46	224	225	225	225.27	0.0092	2.5	28.96	63.87	0.84
Section 23	23.6	100 Year	49.69	224	225.1	225.1	225.34	0.0091	2.6	32.73	65.45	0.84
Section 23	23.6	350 Year	71.84	224	225.2	225.2	225.56	0.0096	2.96	43.53	68.37	0.89
Section 23	23.6	Regional	139.6	224	225.6	225.6	226.07	0.0106	3.75	69.83	72.74	0.98
Section 23	23.59	2 Year	14.24	222	223.3		223.31	0.0002	0.53	77.35	101.47	0.14
Section 23	23.59	5 Year	22.02	222	223.8		223.82	0.0001	0.47	133.93	125.21	0.11
Section 23	23.59	10 Year	28.41	222	224.2		224.19	8E-05	0.43	184.86	139.72	0.09
Section 23	23.59	25 Year	36.91	222	224.7		224.66	5E-05	0.41	251.02	145.16	0.08
Section 23	23.59	50 Year	43.46	222	224.8		224.78	6E-05	0.45	268.44	146.56	0.08
Section 23	23.59	100 Year	49.69	222	225		224.97	6E-05	0.46	297.36	148.83	0.08
Section 23	23.59	350 Year	71.84	222	225		225	0.0001	0.65	301.67	149.12	0.12
Section 23	23.59	Regional	139.6	222	225.5		225.48	0.0002	1.01	372.69	153.89	0.17
Section 23	23.58	2 Year	14.24	222	223	222.6	223.21	0.0045	2.25	6.99	15.7	0.63
Section 23	23.58	5 Year	22.02	222	223.4	222.9	223.7	0.0042	2.62	9.32	19.37	0.64
Section 23	23.58	10 Year	28.41	222	223.7	223.2	224.06	0.004	2.86	11.04	23.45	0.65
Section 23	23.58	25 Year	36.91	222	224	223.4	224.51	0.0038	3.12	13.16	66.31	0.65
Section 23	23.58	50 Year	43.46	222	224.7	223.6	224.74	0.0009	1.73	71.89	99.18	0.32
Section 23	23.58	100 Year	49.69	222	224.9	223.8	224.94	0.0007	1.62	90.5	105.95	0.29
Section 23	23.58	350 Year	71.84	222	224.7	224.4	224.92	0.0021	2.73	75.93	100.73	0.5
Section 23	23.58	Regional	139.6	222	225.1	224.9	225.38	0.0026	3.33	142.68	126.41	0.57
Section 23	23.58		Culvert									
Section 23	23.57	2 Year	14.24	222	222.7	222.7	223.13	0.0124	3.03	5.1	16.83	0.99
Section 23	23.57	5 Year	22.02	222	223	223	223.58	0.0114	3.51	6.86	19.8	1
Section 23	23.57	10 Year	28.41	222	223.2	223.2	223.92	0.011	3.83	8.12	22.6	1.01
Section 23	23.57	25 Year	36.91	222	223.5	223.5	224.33	0.0105	4.19	9.67	27.6	1.01
Section 23	23.57	50 Year	43.46	222	223.7	223.7	224.62	0.0102	4.43	10.78	31.27	1.01
Section 23	23.57	100 Year	49.69	222	223.9	223.9	224.88	0.0099	4.63	11.8	34.35	1.01
Section 23	23.57	350 Year	71.84	222	224.2	224.2	224.47	0.0039	3.12	50.42	68.5	0.65
Section 23	23.57	Regional	139.6	222	224.7	224.7	225.18	0.0049	4.06	104.77	113.15	0.75
Section 23	23.56	2 Year	14.24	221	222.3	222.2	222.48	0.0074	1.86	8.92	20.31	0.73
Section 23	23.56	5 Year	22.02	221	222.4	222.4	222.7	0.0099	2.39	11.42	23.7	0.87
Section 23	23.56	10 Year	28.41	221	222.6	222.6	222.86	0.0097	2.6	14.69	31.93	0.88
Section 23	23.56	25 Year	36.91	221	222.8	222.8	223.01	0.0054	2.28	33.98	99.78	0.68
Section 23	23.56	50 Year	43.46	221	222.9	222.9	223.08	0.0055	2.39	40.36	101.68	0.69
Section 23	23.56	100 Year	49.69	221	222.9	222.9	223.14	0.0057	2.51	45.18	103.09	0.71

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.56	350 Year	71.84	221	223.2		223.37	0.0034	2.25	79.01	111.65	0.57
Section 23	23.56	Regional	139.6	221	223.6		223.81	0.004	2.81	125.22	121.66	0.64
Section 23	23.55	2 Year	14.24	221	221.8		221.81	0.0041	1.13	25.28	81.7	0.52
Section 23	23.55	5 Year	22.02	221	221.9		221.94	0.0037	1.25	35.39	83.1	0.51
Section 23	23.55	10 Year	28.41	221	222		222.04	0.0033	1.29	43.93	84.27	0.49
Section 23	23.55	25 Year	36.91	221	222.1		222.15	0.0032	1.39	52.81	85.37	0.49
Section 23	23.55	50 Year	43.46	221	222.2		222.23	0.0031	1.46	59.35	86.16	0.49
Section 23	23.55	100 Year	49.69	221	222.2		222.3	0.0031	1.53	64.74	86.81	0.5
Section 23	23.55	350 Year	71.84	221	223.2		223.18	0.0005	0.97	148.97	95.69	0.23
Section 23	23.55	Regional	139.6	221	223.5		223.51	0.0011	1.59	177.63	98.57	0.34
Section 23	23.54	2 Year	14.24	220	220.8	220.8	221.03	0.013	2.33	6.85	15.83	0.95
Section 23	23.54	5 Year	22.02	220	221	221	221.27	0.0099	2.51	11.89	27.01	0.88
Section 23	23.54	10 Year	28.41	220	221.1	221.1	221.43	0.0095	2.7	15.84	35.44	0.88
Section 23	23.54	25 Year	36.91	220	221.3	221.3	221.6	0.008	2.75	23.6	49.17	0.83
Section 23	23.54	50 Year	43.46	220	221.4	221.4	221.7	0.0075	2.84	28.75	54.03	0.82
Section 23	23.54	100 Year	49.69	220	221.5	221.5	221.79	0.0068	2.84	34.65	59.43	0.78
Section 23	23.54	350 Year	71.84	220	223.1		223.14	0.0003	0.97	213.32	158.53	0.18
Section 23	23.54	Regional	139.6	220	223.4		223.42	0.0007	1.59	253.78	167.7	0.28
Section 23	23.53	2 Year	5.05	220	220.1	219.9	220.21	0.0038	1.29	3.92	14.47	0.52
Section 23	23.53	5 Year	7.52	220	220.3	220	220.42	0.0036	1.48	5.08	16.81	0.53
Section 23	23.53	10 Year	12.39	220	220.6	220.2	220.77	0.0033	1.76	7.02	20.28	0.53
Section 23	23.53	25 Year	19.01	220	221	220.5	221.18	0.0031	2.06	9.21	25.41	0.54
Section 23	23.53	50 Year	21.54	220	221.1	220.6	221.32	0.0031	2.16	9.99	27.45	0.55
Section 23	23.53	100 Year	24.13	220	221.2	220.6	221.47	0.003	2.24	10.78	29.44	0.55
Section 23	23.53	350 Year	73.83	220	223.1	221.9	223.13	0.0002	0.96	215.29	184.19	0.16
Section 23	23.53	Regional	147.3	220	223.3	222.6	223.38	0.0006	1.67	253.28	196.43	0.28
Section 23	23.53		Culvert									
Section 23	23.52	2 Year	5.05	220	220	219.9	220.12	0.0107	1.71	2.95	8.01	0.8
Section 23	23.52	5 Year	7.52	220	220.1	220	220.31	0.0093	1.92	3.91	9.34	0.78
Section 23	23.52	10 Year	12.39	220	220.4	220.2	220.63	0.0083	2.27	5.45	11.85	0.78
Section 23	23.52	25 Year	19.01	220	220.6	220.5	220.97	0.0099	2.84	6.69	13.72	0.88
Section 23	23.52	50 Year	21.54	220	220.6	220.6	221.09	0.0112	3.1	6.95	14.06	0.94
Section 23	23.52	100 Year	24.13	220	220.7	220.7	221.22	0.0099	3.12	7.72	15.08	0.9
Section 23	23.52	350 Year	73.83	220	221.9	221.9	223.12	0.0097	4.85	15.21	30.27	1
Section 23	23.52	Regional	147.3	220	222.8	222.8	223.35	0.0041	3.87	100.62	126.05	0.69

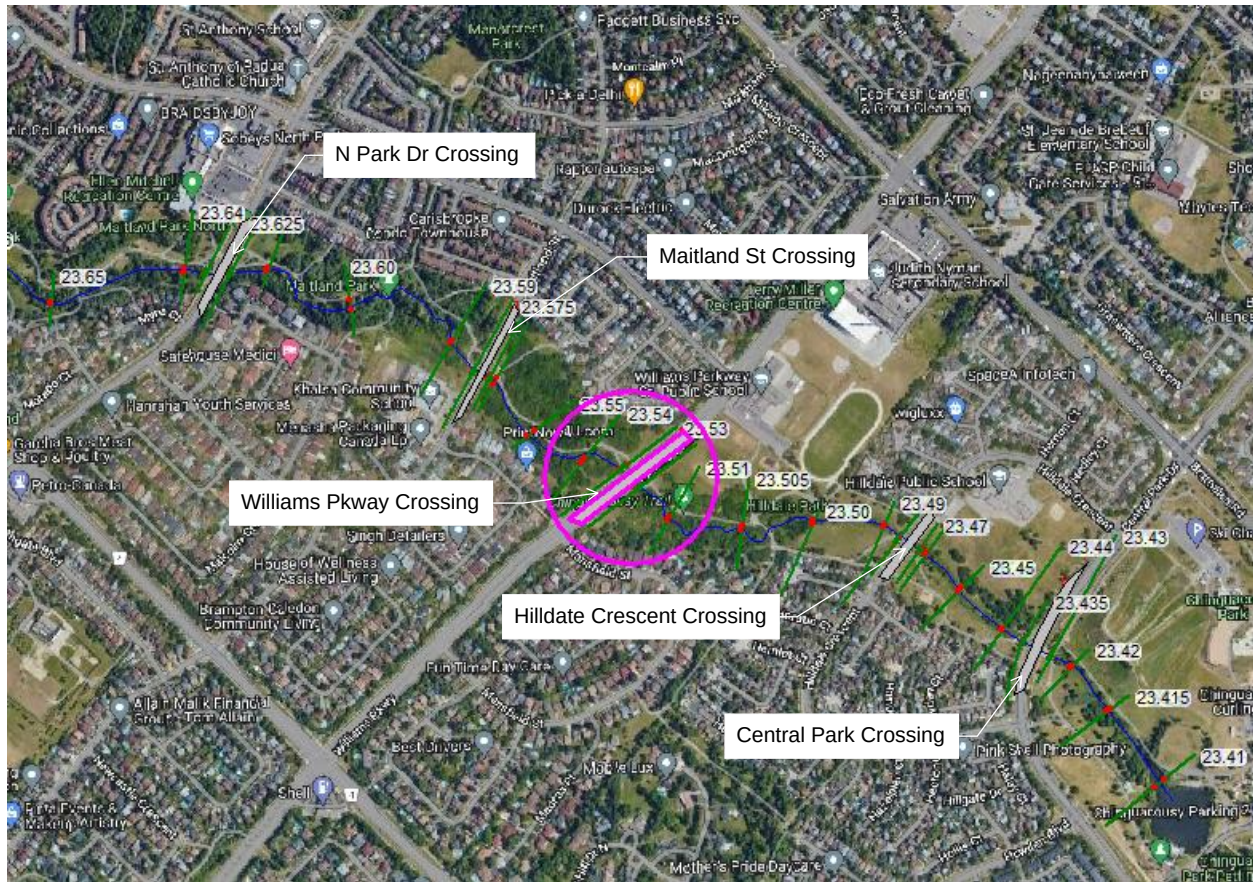
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.51	2 Year	5.05	219	219.6		219.65	0.0034	1.27	4.19	6.92	0.49
Section 23	23.51	5 Year	7.52	219	219.7		219.84	0.0036	1.5	5.39	7.64	0.53
Section 23	23.51	10 Year	12.39	219	220	219.7	220.16	0.0038	1.85	7.89	12.14	0.57
Section 23	23.51	25 Year	19.01	219	220.3	219.9	220.44	0.0034	2.03	17.61	47.25	0.55
Section 23	23.51	50 Year	21.54	219	220.4	220.2	220.52	0.0031	2.03	22.25	54.98	0.54
Section 23	23.51	100 Year	24.13	219	220.2	220.2	220.55	0.0058	2.64	16.78	46.09	0.73
Section 23	23.51	350 Year	73.83	219	220.9	220.9	221.22	0.006	3.46	57.94	76.97	0.79
Section 23	23.51	Regional	147.3	219	221.3	221.3	221.76	0.0076	4.43	92.97	86.94	0.91
Section 23	23.51	2 Year	5.05	218	218.5	218.5	218.74	0.0164	2.07	2.49	6.19	1
Section 23	23.51	5 Year	7.52	218	218.7	218.7	218.93	0.0148	2.35	3.35	6.63	0.99
Section 23	23.51	10 Year	12.39	218	218.9	218.9	219.25	0.013	2.75	4.92	7.37	0.98
Section 23	23.51	25 Year	19.01	218	219.1	219.1	219.62	0.0119	3.16	6.94	9.19	0.99
Section 23	23.51	50 Year	21.54	218	219.2	219.2	219.75	0.0117	3.31	7.77	10.97	0.99
Section 23	23.51	100 Year	24.13	218	219.6	219.6	219.8	0.0039	2.3	24.95	76.4	0.6
Section 23	23.51	350 Year	73.83	218	220.5		220.61	0.0016	2.01	105.7	93.41	0.41
Section 23	23.51	Regional	147.3	218	221.1		221.24	0.0019	2.55	164.9	104.66	0.47
Section 23	23.5	2 Year	5.05	217	217.7	217.7	217.88	0.0019	2.01	2.68	8.62	0.92
Section 23	23.5	5 Year	7.52	217	217.8	217.8	218.07	0.0018	2.29	4.19	13.42	0.92
Section 23	23.5	10 Year	12.39	217	218.1	218.1	218.35	0.0015	2.55	8.3	21.12	0.88
Section 23	23.5	25 Year	19.01	217	218.3	218.3	218.62	0.0013	2.86	13.66	26.4	0.88
Section 23	23.5	50 Year	21.54	217	218.4	218.3	218.72	0.001	2.74	17.6	29.81	0.79
Section 23	23.5	100 Year	24.13	217	218.6	218.4	218.84	0.0008	2.62	22.46	34.83	0.71
Section 23	23.5	350 Year	73.83	217	220.5		220.56	0.0001	1.97	141.63	83.97	0.35
Section 23	23.5	Regional	147.3	217	220.9		221.15	0.0003	3.12	182.95	91.99	0.51
Section 23	23.49	2 Year	5.05	217	217.4	217.4	217.64	0.0016	2.27	4.75	16.34	0.83
Section 23	23.49	5 Year	7.52	217	217.6	217.6	217.82	0.0014	2.46	7.97	21.87	0.82
Section 23	23.49	10 Year	12.39	217	217.8	217.8	218.08	0.0015	2.87	13.23	28.47	0.86
Section 23	23.49	25 Year	19.01	217	218.3	218	218.41	0.0006	2.25	30.37	39.49	0.57
Section 23	23.49	50 Year	21.54	217	218.5	218.1	218.57	0.0004	2.11	37.91	43	0.5
Section 23	23.49	100 Year	24.13	217	218.6		218.71	0.0004	2.1	44.53	48.69	0.48
Section 23	23.49	350 Year	73.83	217	220.5		220.53	0.0001	1.96	170.13	91.48	0.32
Section 23	23.49	Regional	147.3	217	220.9		221.09	0.0003	3.37	237.99	154.15	0.52
Section 23	23.48	2 Year	5.05	216	217.1	217.1	217.32	0.0023	2.09	2.42	9.02	1
Section 23	23.48	5 Year	7.52	216	217.2	217.2	217.52	0.0021	2.38	3.15	9.97	1
Section 23	23.48	10 Year	12.39	216	217.5	217.5	217.87	0.0019	2.82	4.39	11.52	1

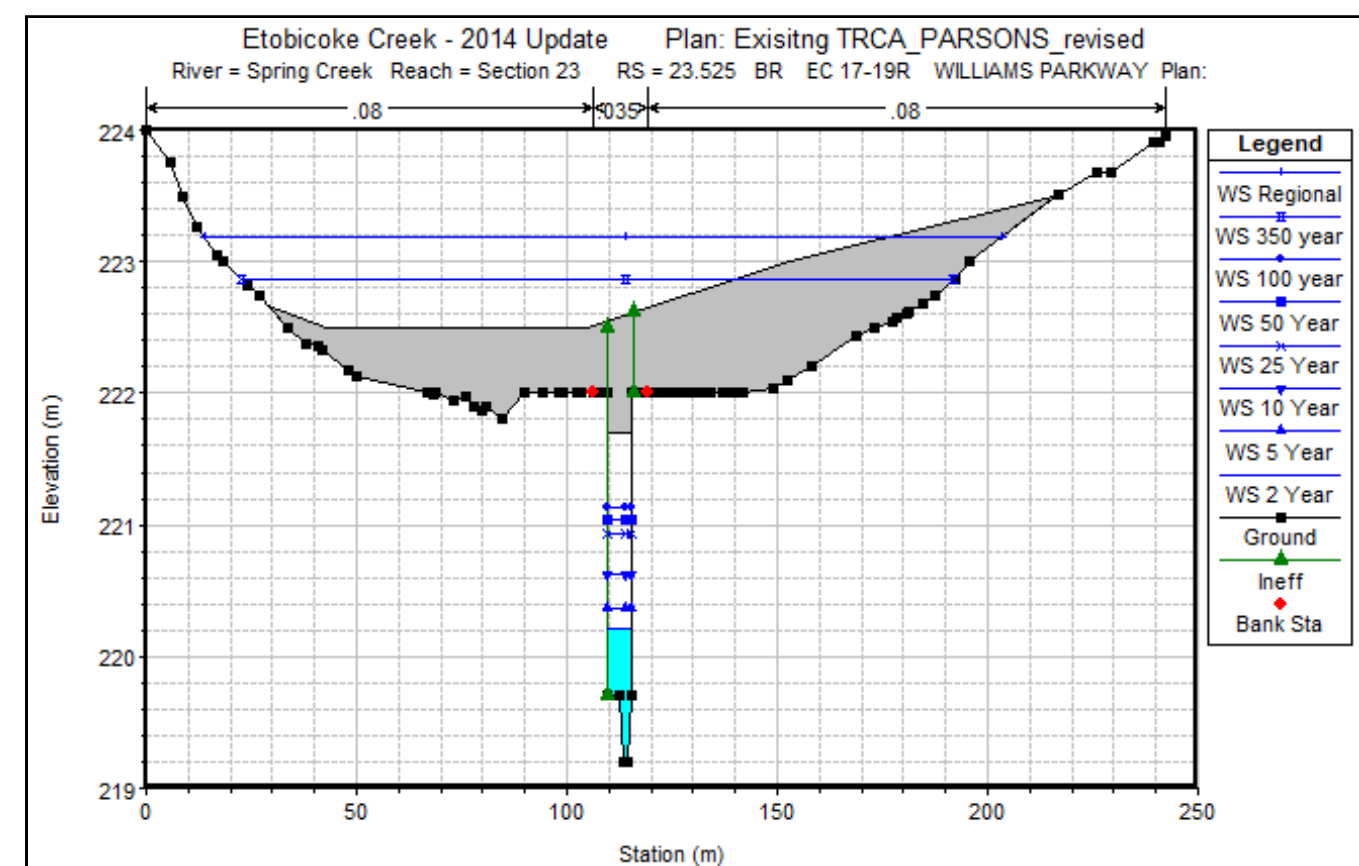
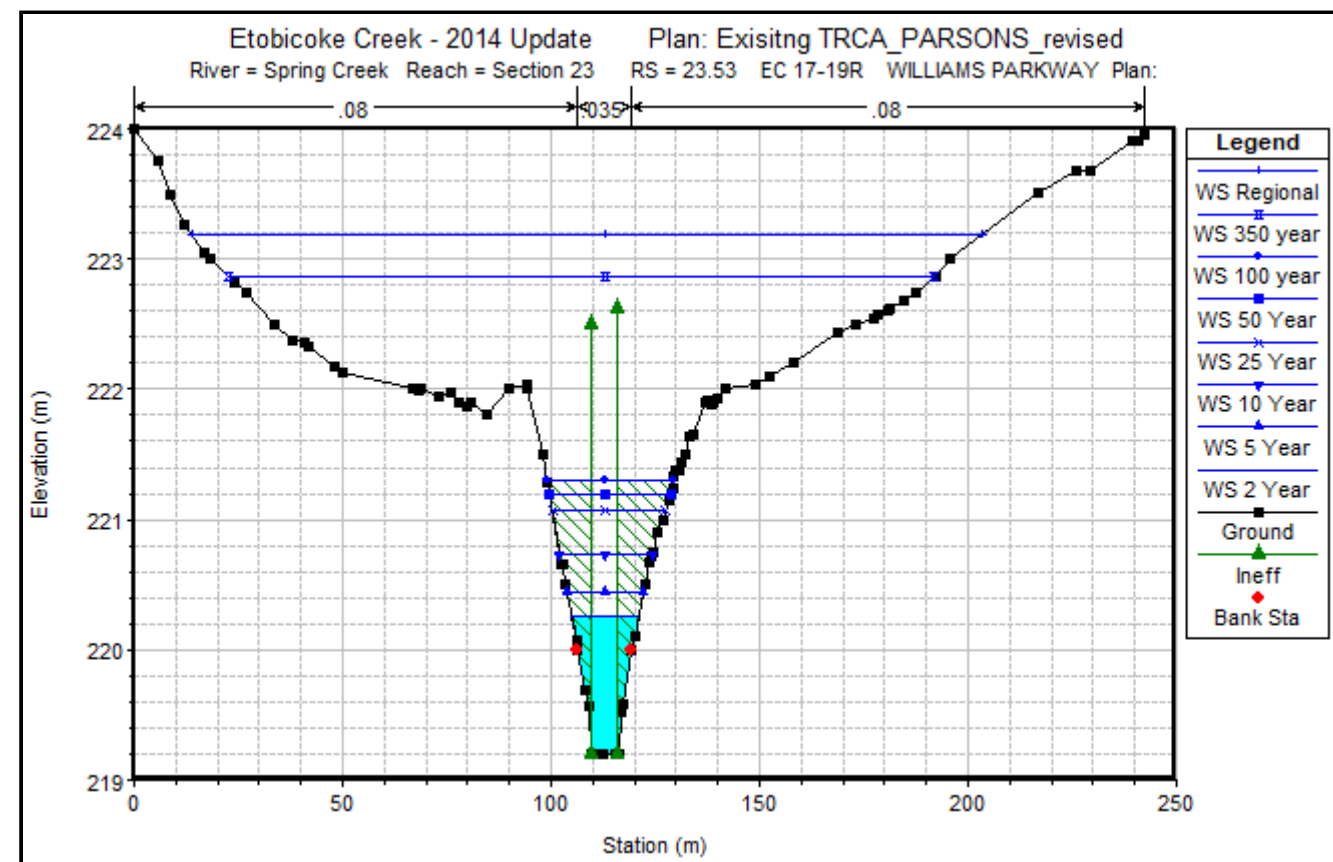
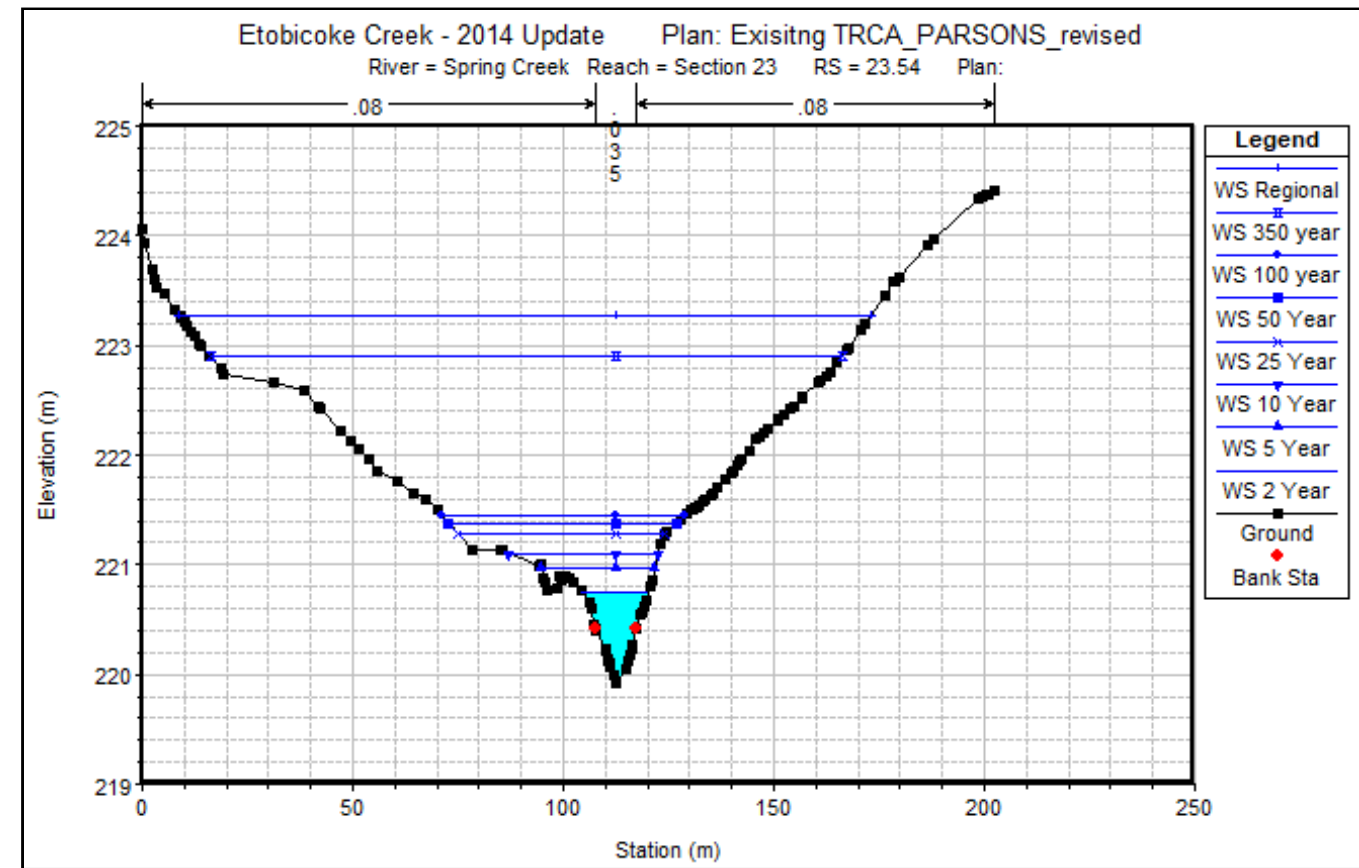
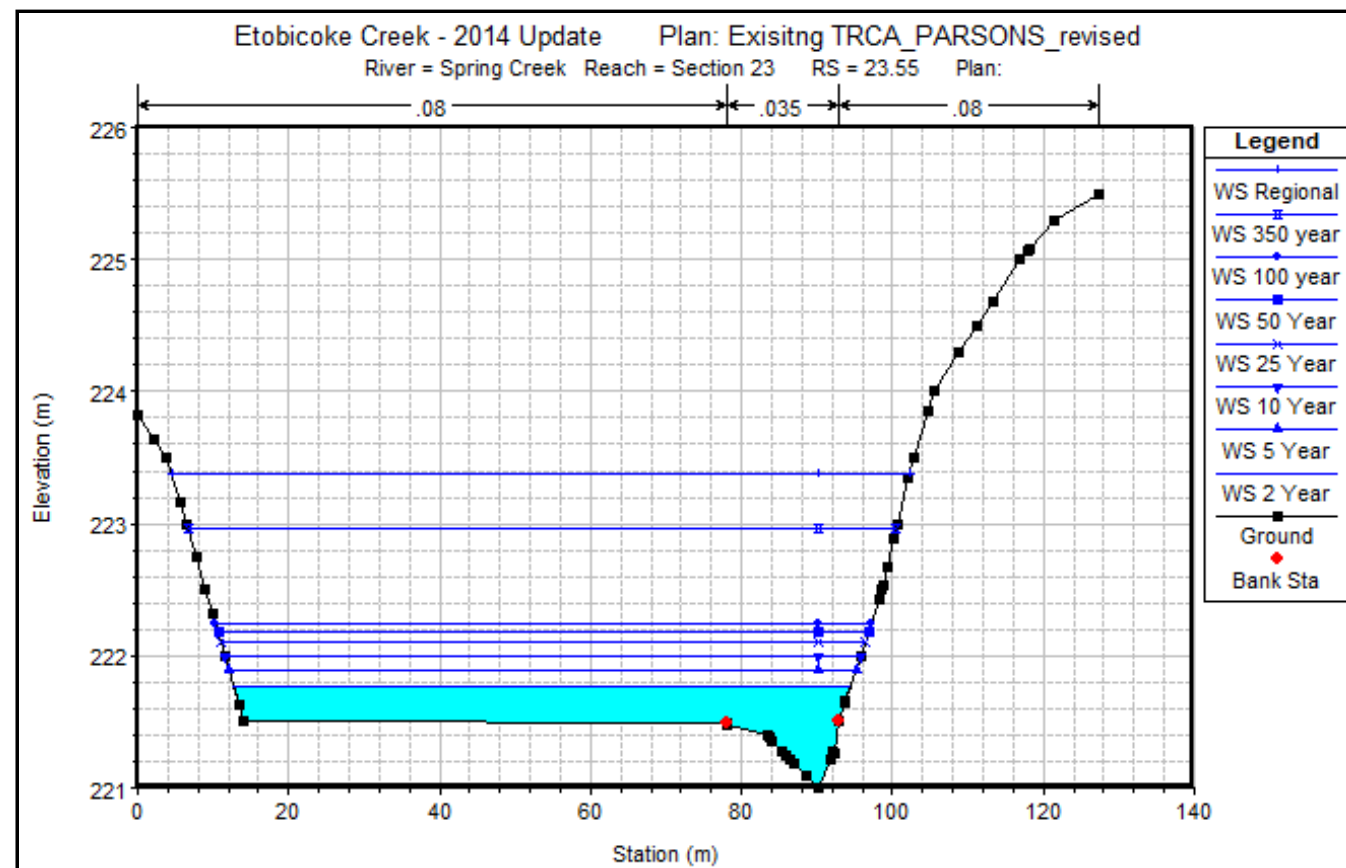
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.48	25 Year	19.01	216	217.7	217.7	218.27	0.0017	3.25	5.85	14.88	1
Section 23	23.48	50 Year	21.54	216	217.8	217.8	218.41	0.0016	3.39	6.35	15.98	1
Section 23	23.48	100 Year	24.13	216	218	217.9	218.56	0.0013	3.31	7.29	17.59	0.91
Section 23	23.48	350 Year	73.83	216	220.4	219.3	220.55	0.0001	1.88	115.08	103.19	0.31
Section 23	23.48	Regional	147.3	216	220	220	220.87	0.0007	4.52	78.2	68.29	0.8
Section 23	23.48		Culvert									
Section 23	23.47	2 Year	5.05	216	216.9	216.9	217.14	0.0023	2.1	2.4	7.72	1.01
Section 23	23.47	5 Year	7.52	216	217.1	217.1	217.35	0.002	2.39	3.14	12.91	1
Section 23	23.47	10 Year	12.39	216	217.3	217.3	217.69	0.0018	2.83	4.38	19.27	1
Section 23	23.47	25 Year	19.01	216	217.6	217.6	218.09	0.0016	3.25	5.85	25.71	1
Section 23	23.47	50 Year	21.54	216	217.7	217.7	218.24	0.0016	3.4	6.34	27.13	1
Section 23	23.47	100 Year	24.13	216	217.7	217.7	218.37	0.0016	3.52	6.86	32.25	1
Section 23	23.47	350 Year	73.83	216	219.1	219.1	220.48	0.0012	5.13	14.4	88.31	1
Section 23	23.47	Regional	147.3	216	219.7	219.5	219.99	0.0004	3.08	167.08	108.75	0.56
Section 23	23.46	2 Year	5.05	216	216.2	216.2	216.49	0.002	2.27	2.66	7.72	0.95
Section 23	23.46	5 Year	7.52	216	216.4	216.4	216.71	0.0017	2.5	4.26	10.57	0.92
Section 23	23.46	10 Year	12.39	216	216.7	216.7	217.05	0.0014	2.78	8.48	19.88	0.87
Section 23	23.46	25 Year	19.01	216	217	217	217.35	0.0011	2.89	16.67	32.15	0.79
Section 23	23.46	50 Year	21.54	216	217.1	217.1	217.44	0.0011	3.06	18.71	37.06	0.82
Section 23	23.46	100 Year	24.13	216	217.1	217.1	217.52	0.0013	3.28	20.15	40.33	0.87
Section 23	23.46	350 Year	73.83	216	218.8		218.86	0.0002	2.31	136.47	92.94	0.42
Section 23	23.46	Regional	147.3	216	219.8		219.91	0.0002	2.72	249.61	128.55	0.43
Section 23	23.45	2 Year	5.05	215	216		216.05	0.0003	1.02	6.08	16.02	0.41
Section 23	23.45	5 Year	7.52	215	216.2		216.29	0.0002	1.04	11.08	25.61	0.36
Section 23	23.45	10 Year	12.39	215	216.6		216.68	0.0001	1.06	24.33	41.29	0.3
Section 23	23.45	25 Year	19.01	215	216.9		216.99	0.0001	1.21	38.2	50.77	0.31
Section 23	23.45	50 Year	21.54	215	217		217.08	0.0001	1.27	42.69	54.02	0.32
Section 23	23.45	100 Year	24.13	215	217.1		217.17	0.0001	1.32	47.18	56.95	0.32
Section 23	23.45	350 Year	73.83	215	218.8		218.82	7E-05	1.39	189.84	105.95	0.24
Section 23	23.45	Regional	147.3	215	219.8		219.88	8E-05	1.86	311.37	135.01	0.28
Section 23	23.44	2 Year	5.05	215	215.7	215.7	215.97	0.0017	2.49	3.2	7.87	0.92
Section 23	23.44	5 Year	7.52	215	215.9	215.9	216.22	0.0015	2.79	4.9	9.61	0.91
Section 23	23.44	10 Year	12.39	215	216.2	216.2	216.62	0.0012	3.08	9.84	20.26	0.86
Section 23	23.44	25 Year	19.01	215	216.6	216.6	216.94	0.0009	3.16	19.55	33.43	0.78
Section 23	23.44	50 Year	21.54	215	216.7	216.7	217.02	0.001	3.31	21.93	34.84	0.8

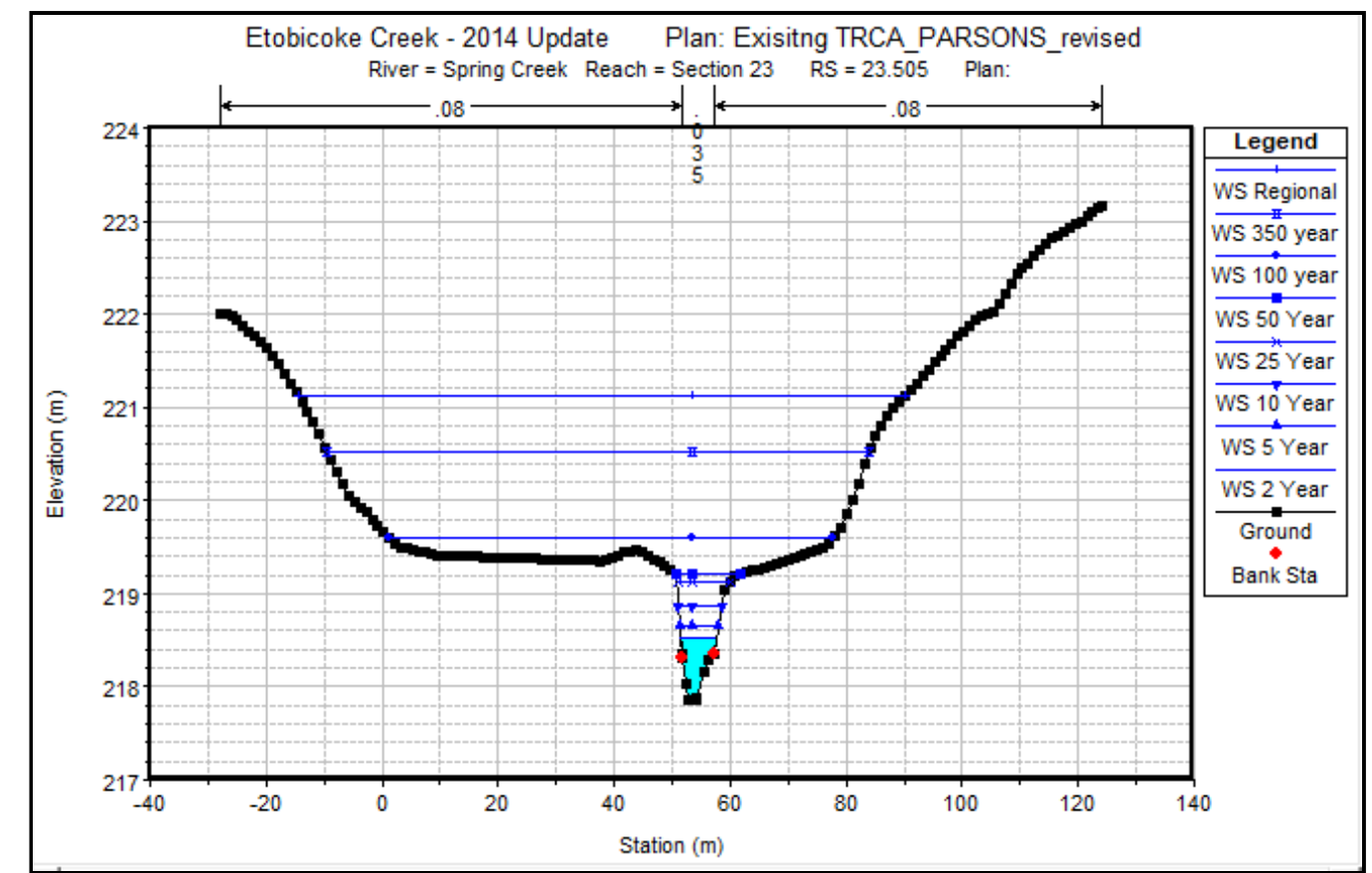
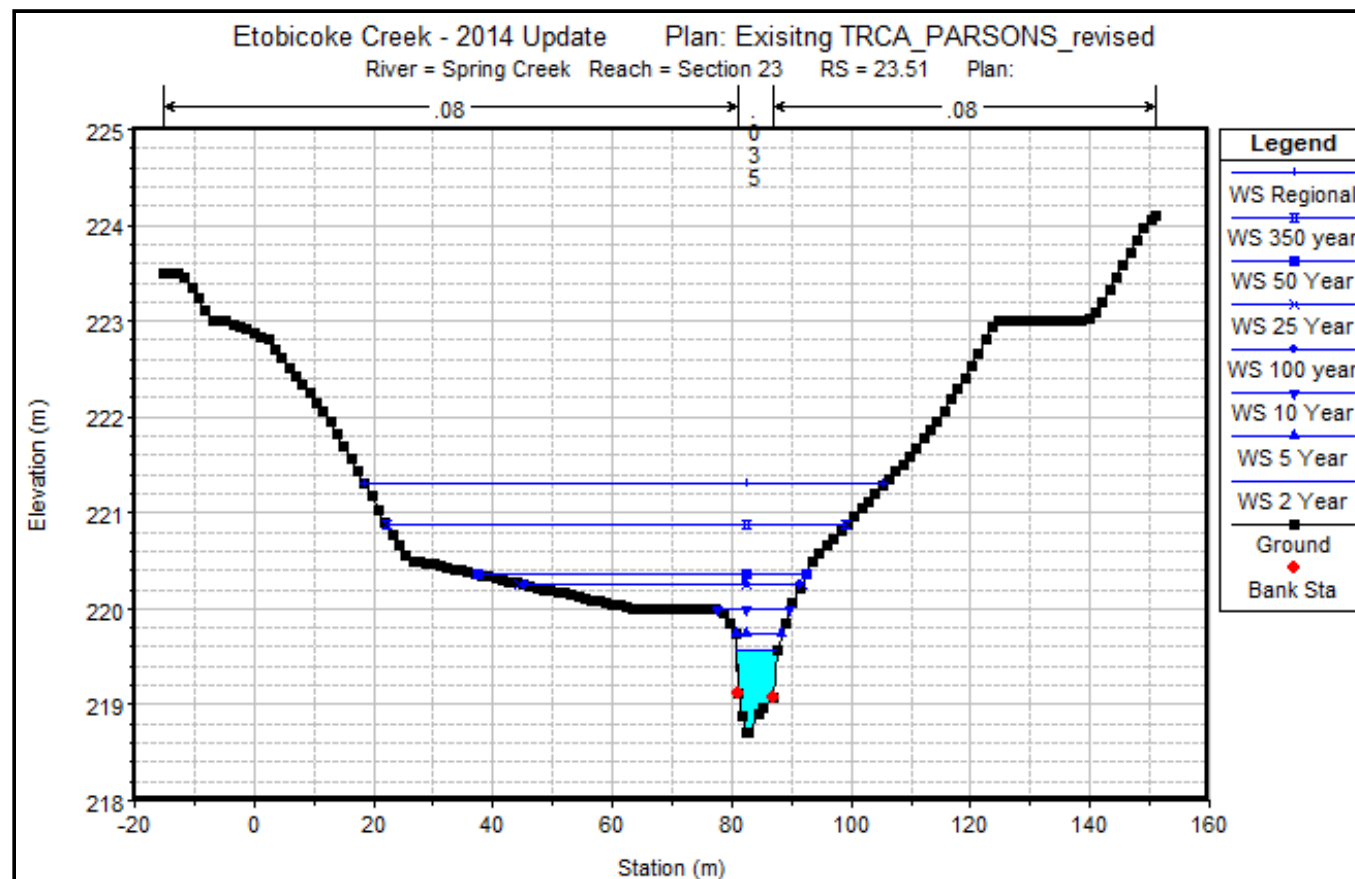
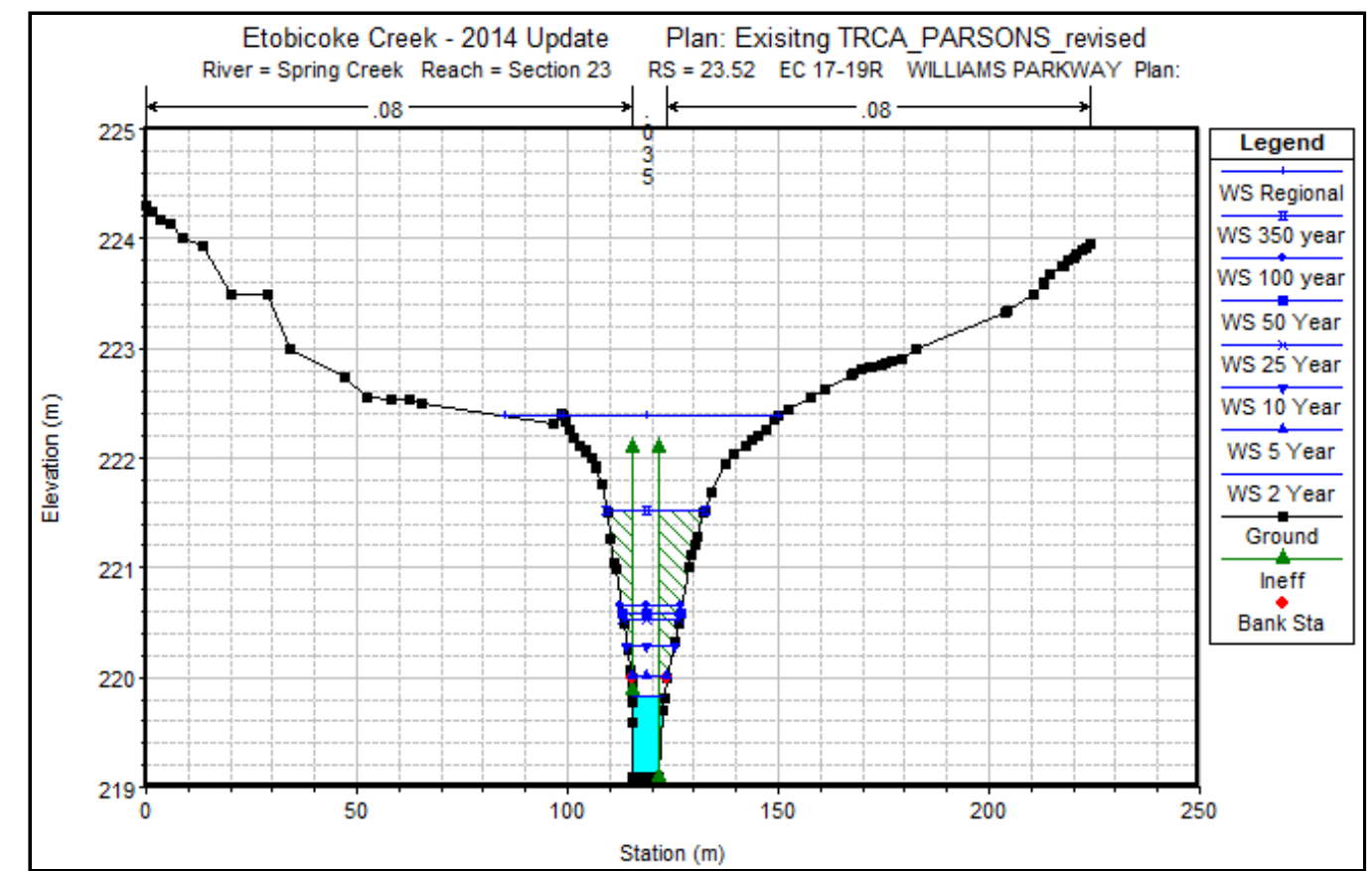
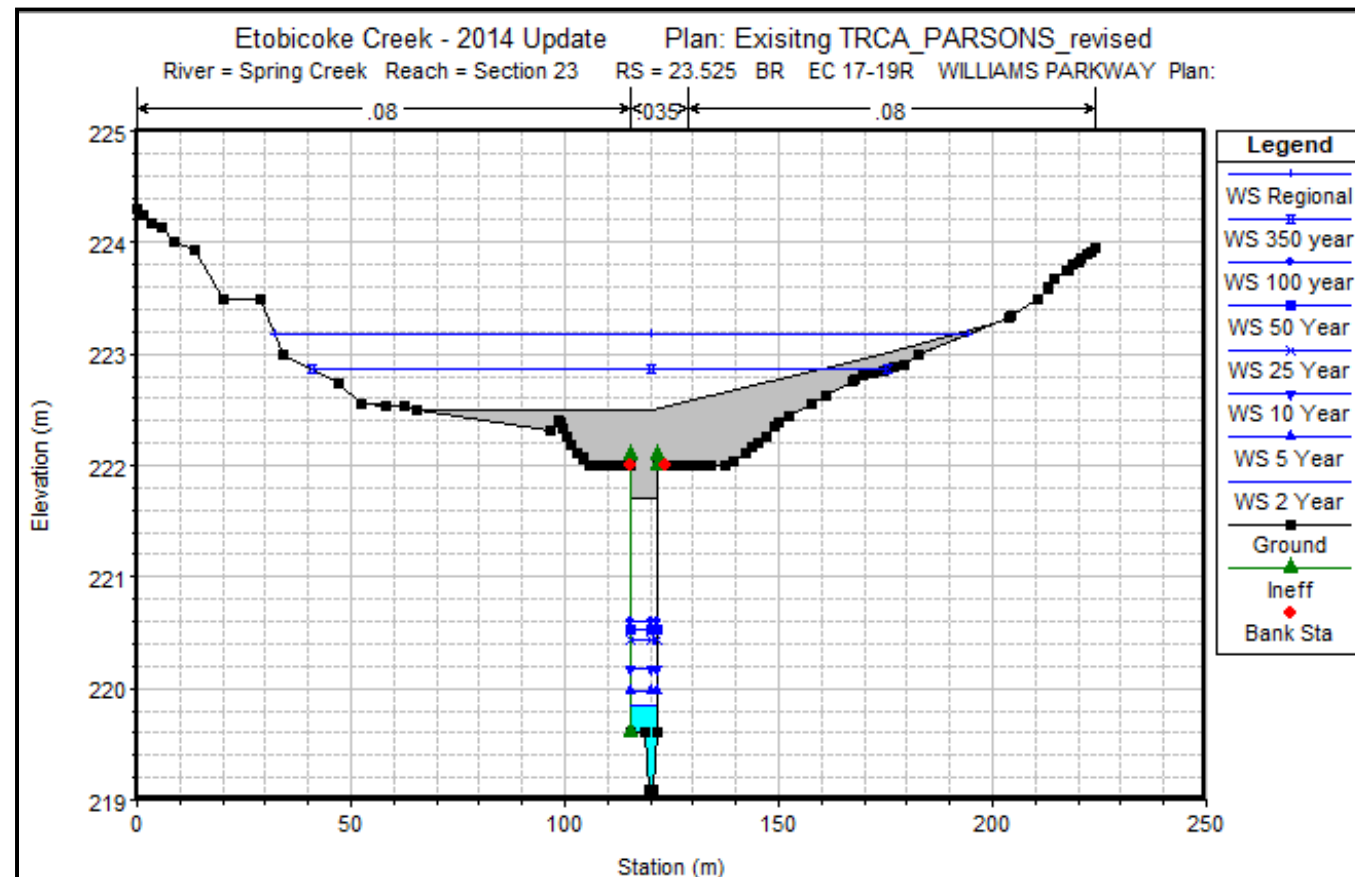
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.44	100 Year	24.13	215	216.7	216.7	217.11	0.001	3.42	24.53	36.45	0.81
Section 23	23.44	350 Year	73.83	215	218.7		218.81	0.0002	2.52	148.79	100.79	0.41
Section 23	23.44	Regional	147.3	215	219.8		219.87	0.0002	2.68	369.81	250.61	0.39
Section 23	23.44	2 Year	5.05	214	214.7	214.5	214.8	0.0008	1.39	3.64	5.5	0.54
Section 23	23.44	5 Year	7.52	214	214.9	214.6	215.02	0.0008	1.61	4.67	5.5	0.56
Section 23	23.44	10 Year	12.39	214	215.2	214.8	215.4	0.0009	1.92	6.45	5.5	0.57
Section 23	23.44	25 Year	19.01	214	215.6	215.1	215.84	0.0009	2.23	8.53	5.5	0.57
Section 23	23.44	50 Year	21.54	214	215.7	215.2	216	0.0009	2.33	9.26	5.5	0.57
Section 23	23.44	100 Year	24.13	214	215.9	215.3	216.15	0.0009	2.42	9.98	5.52	0.57
Section 23	23.44	350 Year	73.83	214	218.1	216.7	218.66	0.0006	3.3	22.37	33.36	0.52
Section 23	23.44	Regional	147.3	214	219	219	219.68	0.0009	4.12	91.29	94.43	0.6
Section 23	23.43		Culvert									
Section 23	23.43	2 Year	5.05	214	214.5	214.5	214.75	0.0025	2.08	2.42	6.37	1
Section 23	23.43	5 Year	7.52	214	214.7	214.7	214.95	0.0022	2.37	3.17	6.52	1
Section 23	23.43	10 Year	12.39	214	214.9	214.9	215.29	0.002	2.81	4.4	7.4	1
Section 23	23.43	25 Year	19.01	214	215.2	215.2	215.69	0.0018	3.23	5.88	12.69	1
Section 23	23.43	50 Year	21.54	214	215.3	215.3	215.83	0.0018	3.37	6.39	14.13	1
Section 23	23.43	100 Year	24.13	214	215.3	215.3	215.96	0.0017	3.51	6.88	15.43	1
Section 23	23.43	350 Year	73.83	214	216.7	216.7	218.04	0.0013	5.08	14.54	41.45	1
Section 23	23.43	Regional	147.3	214	218.1	218.1	218.48	0.0004	3.46	191.6	249.3	0.56
Section 23	23.42	2 Year	5.05	213	214.3	214.1	214.45	0.0052	1.51	3.34	4.64	0.57
Section 23	23.42	5 Year	7.52	213	214.5	214.2	214.68	0.0055	1.76	4.37	6.44	0.6
Section 23	23.42	10 Year	12.39	213	214.8	214.5	215	0.006	2.18	6.48	10.55	0.66
Section 23	23.42	25 Year	19.01	213	215	214.9	215.31	0.0062	2.53	9.7	15.13	0.69
Section 23	23.42	50 Year	21.54	213	215.1	215	215.41	0.0061	2.62	11.01	16.61	0.69
Section 23	23.42	100 Year	24.13	213	215.2	215.1	215.49	0.0061	2.71	12.3	18.04	0.7
Section 23	23.42	350 Year	73.83	213	216.2		216.51	0.0043	3.17	41.96	40.71	0.63
Section 23	23.42	Regional	147.3	213	216.9		217.28	0.0042	3.7	78.41	59.02	0.65
Section 23	23.42	2 Year	5.05	213	213.3	213.3	213.59	0.017	2.25	2.25	4.42	1.01
Section 23	23.42	5 Year	7.52	213	213.5	213.5	213.81	0.0162	2.48	3.03	4.91	1.01
Section 23	23.42	10 Year	12.39	213	213.8	213.8	214.16	0.0127	2.78	4.67	7.2	0.95
Section 23	23.42	25 Year	19.01	213	214.1	214.1	214.52	0.0107	3.08	7.06	9.41	0.91
Section 23	23.42	50 Year	21.54	213	214.2	214.2	214.63	0.0101	3.16	8.02	10.38	0.9
Section 23	23.42	100 Year	24.13	213	214.3	214.3	214.74	0.0095	3.22	9.1	11.5	0.88
Section 23	23.42	350 Year	73.83	213	215.3	215.3	215.95	0.007	4.09	29.03	27.09	0.83

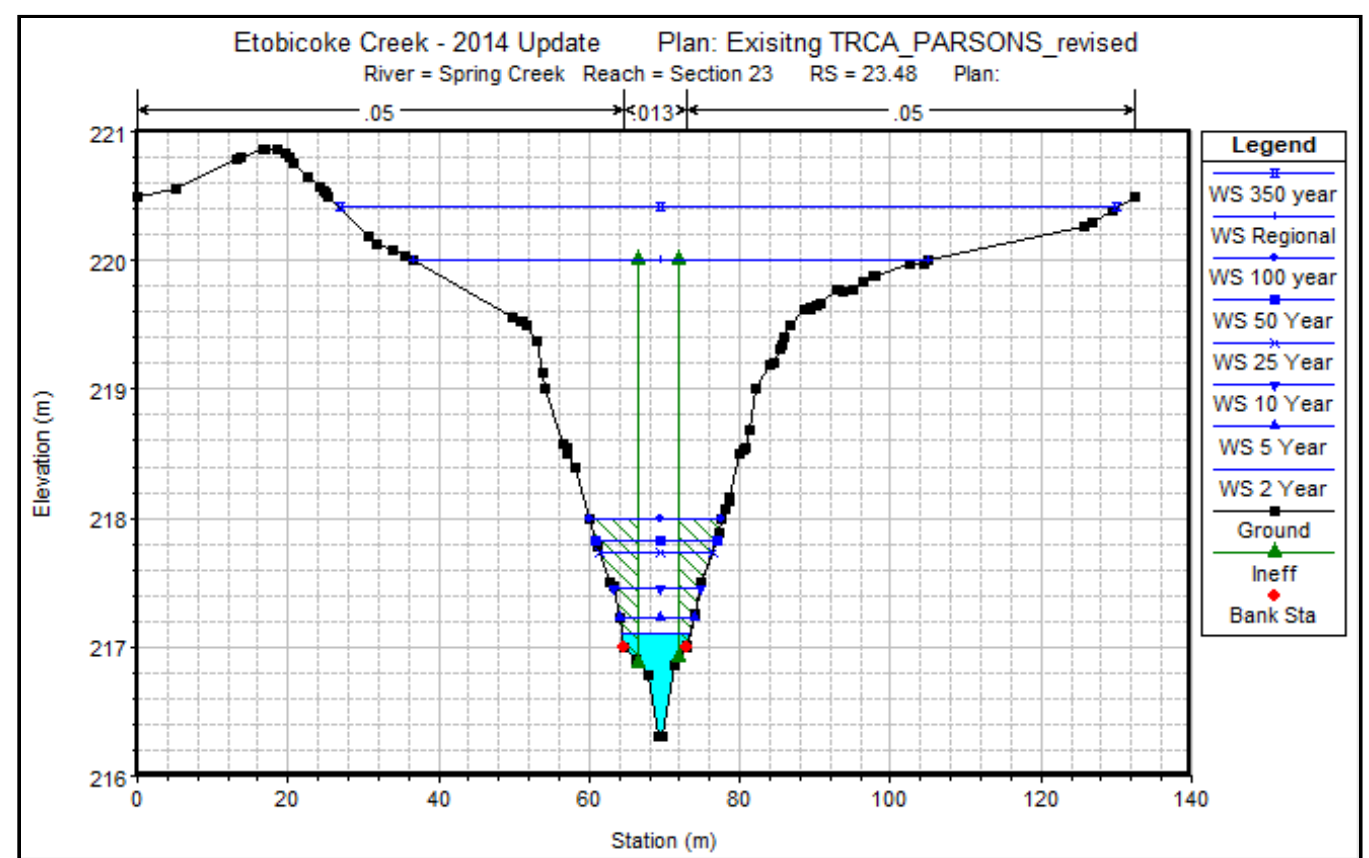
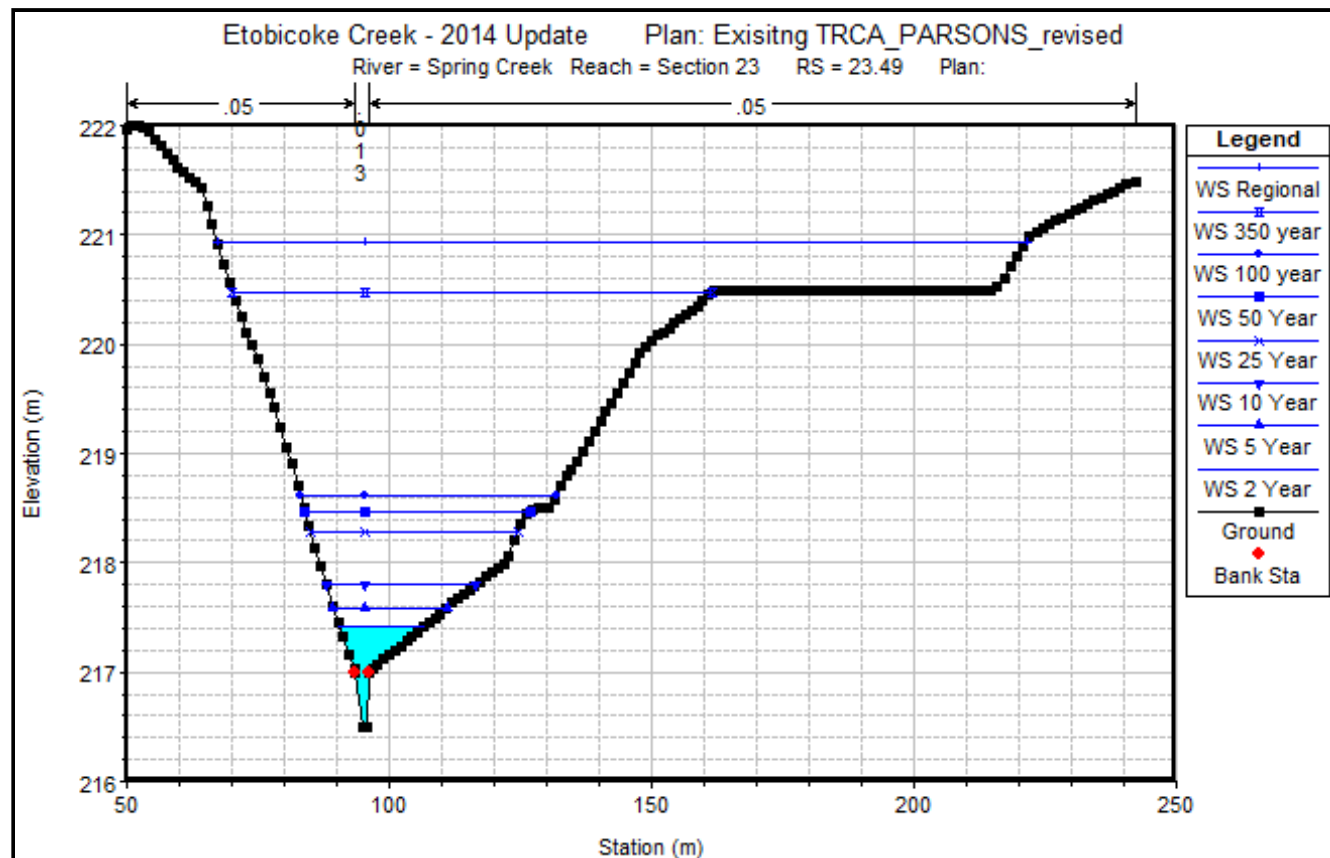
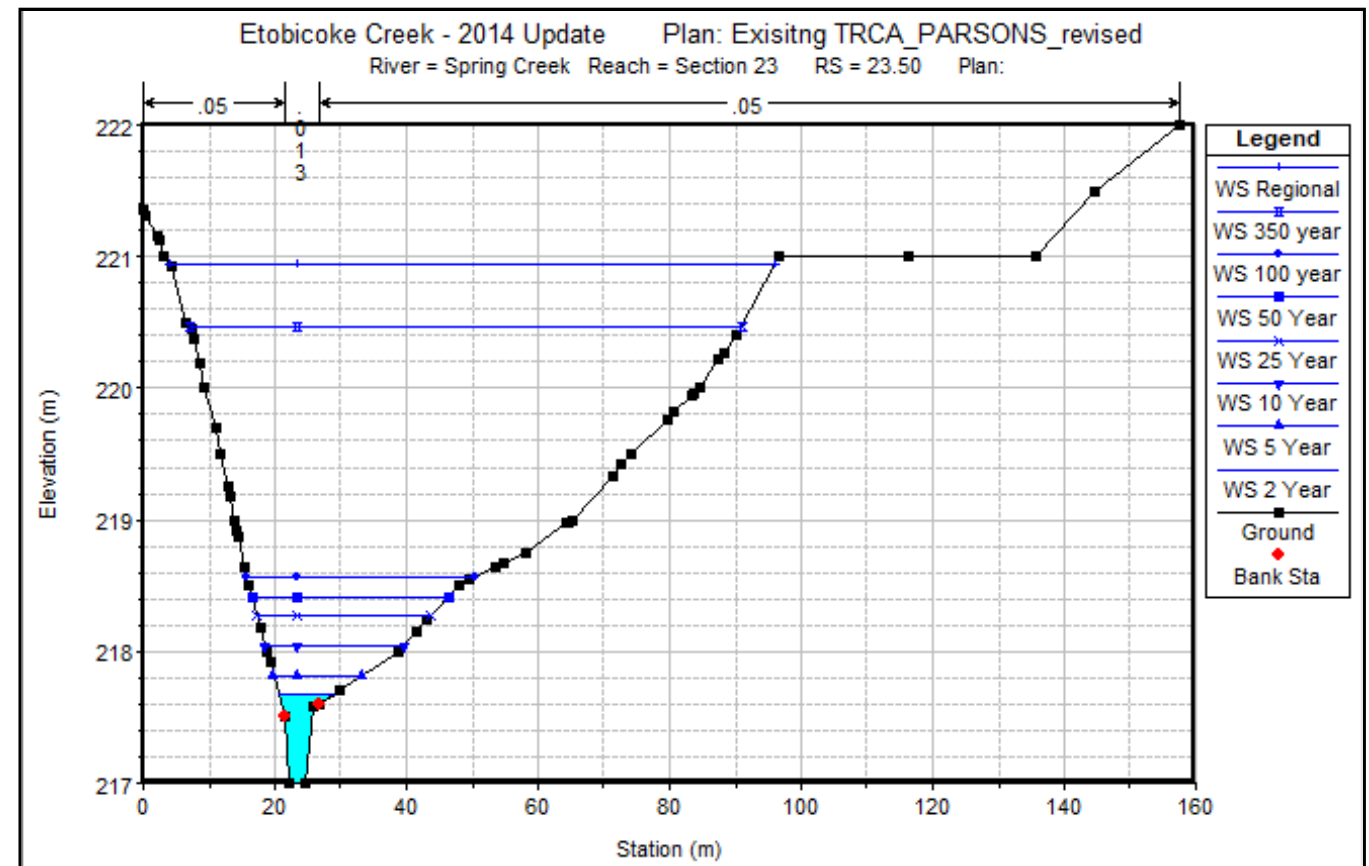
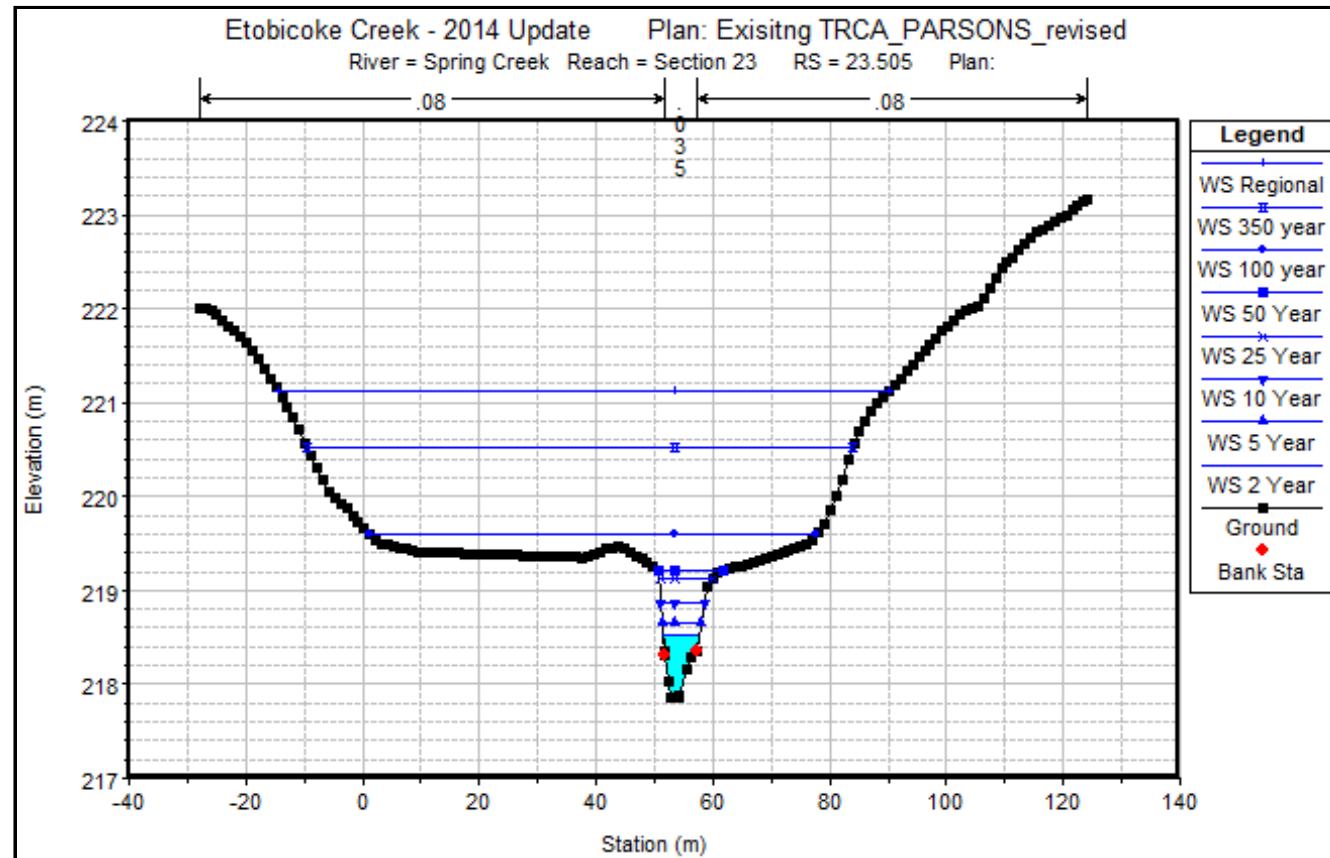
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.42	Regional	147.3	213	216.3	216.3	216.8	0.0052	4.36	69.93	60.93	0.76
Section 23	23.41	2 Year	5.59	212	212.8	211.9	212.84	6E-05	0.23	26.47	28.07	0.07
Section 23	23.41	5 Year	7.88	212	213.2	212	213.22	4E-05	0.24	37.72	31.15	0.06
Section 23	23.41	10 Year	13	212	213.6	212.1	213.58	5E-05	0.31	49.51	35.05	0.07
Section 23	23.41	25 Year	19.79	212	213.8	212.2	213.8	8E-05	0.41	57.34	39.55	0.09
Section 23	23.41	50 Year	22.62	212	213.9	212.2	213.88	9E-05	0.45	60.57	41.34	0.1
Section 23	23.41	100 Year	25.38	212	213.9	212.3	213.95	0.0001	0.49	63.52	42.87	0.1
Section 23	23.41	350 Year	77.61	212	214.6	212.8	214.68	0.0003	1.07	98.51	59.27	0.2
Section 23	23.41	Regional	152.7	212	214.9	213.4	215.05	0.0009	1.88	115.55	69.79	0.34

REVISED EXISTING CULVERT



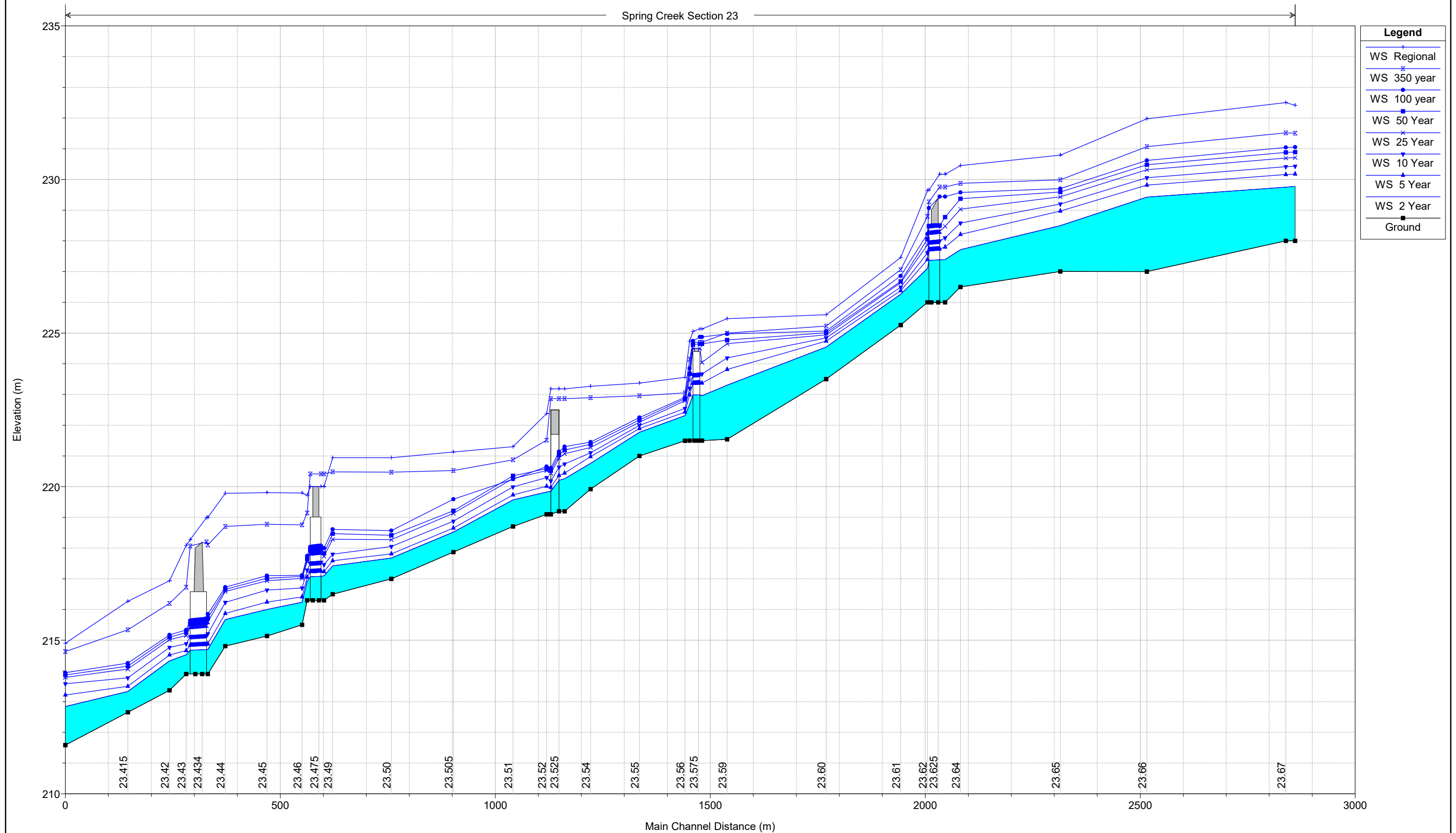






Etobicoke Creek - 2014 Update Plan: Exisitng TRCA_PARSONS_revised
Plan:

Spring Creek Section 23



Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 2 Year				
E.G. US. (m)	220.29	Element	Inside BR US	Inside BR DS
W.S. US. (m)	220.26	E.G. Elev (m)	220.29	220.05
Q Total (m3/s)	5.05	W.S. Elev (m)	220.21	219.85
Q Bridge (m3/s)	5.05	Crit W.S. (m)	219.95	219.85
Q Weir (m3/s)		Max Chl Dpth (m)	1.01	0.75
Weir Sta Lft (m)		Vel Total (m/s)	1.26	2.02
Weir Sta Rgt (m)		Flow Area (m2)	4.01	2.5
Weir Submerg		Froude # Chl	0.49	1.01
Weir Max Depth (m)		Specif Force (m3)	2.12	1.68
Min El Weir Flow (m)	222.5	Hydr Depth (m)	0.67	0.41
Min El Prs (m)	221.7	W.P. Total (m)	6.68	6.58
Delta EG (m)	0.4	Conv. Total (m3/s)	81.5	37.5
Delta WS (m)	0.43	Top Width (m)	6.11	6.11
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	2.02	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	22.58	67.6
BR Sel Method	Momentum	Power Total (N/m s)	28.44	136.47

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 5 Year				
E.G. US. (m)	220.49	Element	Inside BR US	Inside BR DS
W.S. US. (m)	220.44	E.G. Elev (m)	220.48	220.24
Q Total (m3/s)	7.52	W.S. Elev (m)	220.37	219.98
Q Bridge (m3/s)	7.52	Crit W.S. (m)	220.08	219.98
Q Weir (m3/s)		Max Chl Dpth (m)	1.17	0.88
Weir Sta Lft (m)		Vel Total (m/s)	1.51	2.29
Weir Sta Rgt (m)		Flow Area (m2)	4.97	3.29
Weir Submerg		Froude # Chl	0.53	0.99
Weir Max Depth (m)		Specif Force (m3)	3.36	2.77
Min El Weir Flow (m)	222.5	Hydr Depth (m)	0.83	0.54
Min El Prs (m)	221.7	W.P. Total (m)	6.84	6.71
Delta EG (m)	0.39	Conv. Total (m3/s)	114.7	58.5
Delta WS (m)	0.43	Top Width (m)	6.11	6.12
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	2.29	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	30.62	79.55
BR Sel Method	Momentum	Power Total (N/m s)	46.35	181.79

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 10 Year				
E.G. US. (m)	220.82	Element	Inside BR US	Inside BR DS
W.S. US. (m)	220.74	E.G. Elev (m)	220.81	220.56
Q Total (m3/s)	12.39	W.S. Elev (m)	220.63	220.18
Q Bridge (m3/s)	12.39	Crit W.S. (m)	220.29	220.18
Q Weir (m3/s)		Max Chl Dpth (m)	1.43	1.08
Weir Sta Lft (m)		Vel Total (m/s)	1.89	2.71
Weir Sta Rgt (m)		Flow Area (m2)	6.55	4.57
Weir Submerg		Froude # Chl	0.58	1
Weir Max Depth (m)		Specif Force (m3)	6.11	5.26
Min El Weir Flow (m)	222.5	Hydr Depth (m)	1.1	0.75
Min El Prs (m)	221.7	W.P. Total (m)	7.11	6.92
Delta EG (m)	0.39	Conv. Total (m3/s)	177.3	98.9
Delta WS (m)	0.44	Top Width (m)	6.13	6.13
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	2.71	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	44.12	101.49
BR Sel Method	Momentum	Power Total (N/m s)	83.42	275.28

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 25 Year				
E.G. US. (m)	221.21	Element	Inside BR US	Inside BR DS
W.S. US. (m)	221.07	E.G. Elev (m)	221.2	220.93
Q Total (m3/s)	19.01	W.S. Elev (m)	220.93	220.43
Q Bridge (m3/s)	19.01	Crit W.S. (m)	220.55	220.43
Q Weir (m3/s)		Max Chl Dpth (m)	1.73	1.33
Weir Sta Lft (m)		Vel Total (m/s)	2.28	3.13
Weir Sta Rgt (m)		Flow Area (m2)	8.34	6.08
Weir Submerg		Froude # Chl	0.62	1
Weir Max Depth (m)		Specif Force (m3)	10.37	9.21
Min El Weir Flow (m)	222.5	Hydr Depth (m)	1.39	1
Min El Prs (m)	221.7	W.P. Total (m)	7.41	7.17
Delta EG (m)	0.45	Conv. Total (m3/s)	258.1	155.8
Delta WS (m)	0.55	Top Width (m)	6.14	6.14
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	3.13	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	59.93	123.93
BR Sel Method	Momentum	Power Total (N/m s)	136.52	387.28

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 50 Year				
E.G. US. (m)	221.34	Element	Inside BR US	Inside BR DS
W.S. US. (m)	221.19	E.G. Elev (m)	221.33	221.06
Q Total (m3/s)	21.54	W.S. Elev (m)	221.03	220.52
Q Bridge (m3/s)	21.54	Crit W.S. (m)	220.64	220.52
Q Weir (m3/s)		Max Chl Dpth (m)	1.83	1.42
Weir Sta Lft (m)		Vel Total (m/s)	2.4	3.26
Weir Sta Rgt (m)		Flow Area (m2)	8.96	6.61
Weir Submerg		Froude # Chl	0.63	1
Weir Max Depth (m)		Specif Force (m3)	12.13	10.86
Min El Weir Flow (m)	222.5	Hydr Depth (m)	1.49	1.08
Min El Prs (m)	221.7	W.P. Total (m)	7.51	7.25
Delta EG (m)	0.48	Conv. Total (m3/s)	288.2	177.4
Delta WS (m)	0.6	Top Width (m)	6.15	6.14
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	3.26	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	65.38	131.65
BR Sel Method	Momentum	Power Total (N/m s)	157.09	429.1

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 100 year				
E.G. US. (m)	221.47	Element	Inside BR US	Inside BR DS
W.S. US. (m)	221.3	E.G. Elev (m)	221.46	221.19
Q Total (m3/s)	24.13	W.S. Elev (m)	221.14	220.6
Q Bridge (m3/s)	24.13	Crit W.S. (m)	220.72	220.6
Q Weir (m3/s)		Max Chl Dpth (m)	1.94	1.5
Weir Sta Lft (m)		Vel Total (m/s)	2.52	3.39
Weir Sta Rgt (m)		Flow Area (m2)	9.58	7.13
Weir Submerg		Froude # Chl	0.64	1
Weir Max Depth (m)		Specif Force (m3)	13.99	12.62
Min El Weir Flow (m)	222.5	Hydr Depth (m)	1.6	1.17
Min El Prs (m)	221.7	W.P. Total (m)	7.61	7.34
Delta EG (m)	0.51	Conv. Total (m3/s)	318.8	199.7
Delta WS (m)	0.65	Top Width (m)	6.15	6.15
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	3.39	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)	70.66	139.06
BR Sel Method	Momentum	Power Total (N/m s)	178.06	470.82

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: 350 year				
E.G. US. (m)	222.9	Element	Inside BR US	Inside BR DS
W.S. US. (m)	222.86	E.G. Elev (m)	222.9	222.9
Q Total (m3/s)	73.83	W.S. Elev (m)	222.86	222.86
Q Bridge (m3/s)	42.92	Crit W.S. (m)	222.93	222.95
Q Weir (m3/s)	30.91	Max Chl Dpth (m)	3.66	3.76
Weir Sta Lft (m)	38.9	Vel Total (m/s)	1.58	1.58
Weir Sta Rgt (m)	163.7	Flow Area (m2)	46.71	46.61
Weir Submerg	0	Froude # Chl	0.4	0.41
Weir Max Depth (m)	0.4	Specif Force (m3)	51.93	54.46
Min El Weir Flow (m)	222.5	Hydr Depth (m)	0.4	0.39
Min El Prs (m)	221.7	W.P. Total (m)	133.82	135.03
Delta EG (m)	0.19	Conv. Total (m3/s)		
Delta WS (m)	1.35	Top Width (m)	117.31	118.29
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	3.31	C & E Loss (m)		
BR Sluice Coef	0.5	Shear Total (N/m2)		
BR Sel Method	Press/Weir	Power Total (N/m s)		

Plan: JAN_Revised Xsection at Williams Parkway Bridge Spring Creek Section 23 RS: 23.525 Profile: Regional				
E.G. US. (m)	223.28	Element	Inside BR US	Inside BR DS
W.S. US. (m)	223.18	E.G. Elev (m)	223.28	223.28
Q Total (m3/s)	147.25	W.S. Elev (m)	223.18	223.18
Q Bridge (m3/s)	43.54	Crit W.S. (m)	223.2	223.21
Q Weir (m3/s)	103.71	Max Chl Dpth (m)	3.98	4.08
Weir Sta Lft (m)	31.09	Vel Total (m/s)	1.62	1.61
Weir Sta Rgt (m)	199.99	Flow Area (m2)	91.02	91.49
Weir Submerg	0.4	Froude # Chl	0.37	0.37
Weir Max Depth (m)	0.78	Specif Force (m3)	88.61	90.23
Min El Weir Flow (m)	222.5	Hydr Depth (m)	0.56	0.58
Min El Prs (m)	221.7	W.P. Total (m)	178.56	175.77
Delta EG (m)	0.02	Conv. Total (m3/s)		
Delta WS (m)	0.8	Top Width (m)	162.04	159.02
BR Open Area (m2)	12.97	Frctn Loss (m)		
BR Open Vel (m/s)	3.36	C & E Loss (m)		
BR Sluice Coef		Shear Total (N/m2)		
BR Sel Method	Press/Weir	Power Total (N/m s)		

PROFILE OUTPUT TABLE - TRCA RIVER ETOBICOKE CREEK, SPRING CREEK SECTION 23

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m³/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m²)	(m)	
Section 23	23.68	2 Year	14.24	228	229.77		229.83	0.00082	1.07	16.18	14.08	0.28
Section 23	23.68	5 Year	22.02	228	230.18		230.25	0.00085	1.28	22.21	15.96	0.29
Section 23	23.68	10 Year	28.41	228	230.43		230.53	0.00090	1.43	26.45	17.21	0.31
Section 23	23.68	25 Year	36.91	228	230.71		230.83	0.00099	1.62	31.47	18.71	0.33
Section 23	23.68	50 Year	43.46	228	230.89		231.03	0.00105	1.76	34.96	19.73	0.34
Section 23	23.68	100 Year	49.69	228	231.05		231.21	0.00111	1.88	38.15	20.52	0.36
Section 23	23.68	350 Year	71.84	228	231.51		231.73	0.00133	2.27	48.09	23.31	0.40
Section 23	23.68	Regional	139.59	228	232.42		232.86	0.00202	3.29	73.36	33.77	0.51
Section 23	23.67	2 Year	14.24	228	229.75		229.81	0.00109	1.23	19.6	20.13	0.32
Section 23	23.67	5 Year	22.02	228	230.16		230.23	0.00103	1.4	28.53	23.8	0.32
Section 23	23.67	10 Year	28.41	228	230.42		230.5	0.00104	1.53	35.02	26.44	0.33
Section 23	23.67	25 Year	36.91	228	230.7		230.8	0.00109	1.7	42.96	29.95	0.35
Section 23	23.67	50 Year	43.46	228	230.88		230.99	0.00116	1.83	48.71	33.28	0.36
Section 23	23.67	100 Year	49.69	228	231.04		231.17	0.00124	1.97	54.28	38.53	0.38
Section 23	23.67	350 Year	71.84	228	231.52		231.66	0.00124	2.19	73.57	42.2	0.39
Section 23	23.67	Regional	139.59	228	232.5		232.7	0.00141	2.78	118.82	50.05	0.43
Section 23	23.66	2 Year	14.24	227	229.43		229.49	0.00087	1.37	21.79	21.28	0.30
Section 23	23.66	5 Year	22.02	227	229.82		229.9	0.00098	1.63	31.23	27.09	0.32
Section 23	23.66	10 Year	28.41	227	230.06		230.15	0.00107	1.8	38.16	30.77	0.34
Section 23	23.66	25 Year	36.91	227	230.32		230.43	0.00117	2	46.64	34.64	0.36
Section 23	23.66	50 Year	43.46	227	230.48		230.6	0.00125	2.14	52.45	37.06	0.38
Section 23	23.66	100 Year	49.69	227	230.62		230.75	0.00131	2.25	57.88	38.88	0.39
Section 23	23.66	350 Year	71.84	227	231.07		231.23	0.00146	2.58	76.47	45.18	0.42
Section 23	23.66	Regional	139.59	227	231.97		232.19	0.00179	3.3	125.53	60.03	0.48
Section 23	23.65	2 Year	14.24	227.01	228.5	228.5	229.01	0.01176	3.45	6.35	8.84	0.99
Section 23	23.65	5 Year	22.02	227.01	228.97	228.97	229.44	0.00772	3.46	12.59	17.59	0.84

Section 23	23.65	10 Year	28.41	227.01	229.2	229.2	229.67	0.00717	3.63	17.1	21.76	0.83
Section 23	23.65	25 Year	36.91	227.01	229.43	229.43	229.92	0.00694	3.85	22.68	26.01	0.83
Section 23	23.65	50 Year	43.46	227.01	229.59	229.59	230.08	0.00673	3.97	26.91	28.34	0.83
Section 23	23.65	100 Year	49.69	227.01	229.7	229.7	230.21	0.00688	4.14	30.11	29.74	0.84
Section 23	23.65	350 Year	71.84	227.01	229.99	229.99	230.61	0.00794	4.78	39.28	33.45	0.92
Section 23	23.65	Regional	139.59	227.01	230.79	230.79	231.49	0.00784	5.64	72.67	49.16	0.96
Section 23	23.64	2 Year	14.24	226.5	227.71		227.8	0.00236	1.52	17.88	32.83	0.45
Section 23	23.64	5 Year	22.02	226.5	228.21		228.26	0.00106	1.29	39.67	52.11	0.32
Section 23	23.64	10 Year	28.41	226.5	228.58		228.62	0.00065	1.16	60.69	61.1	0.26
Section 23	23.64	25 Year	36.91	226.5	229.03		229.06	0.00041	1.05	90.24	69.55	0.21
Section 23	23.64	50 Year	43.46	226.5	229.37		229.4	0.00030	0.99	115.01	75.99	0.19
Section 23	23.64	100 Year	49.69	226.5	229.58		229.6	0.00028	1	130.91	79.92	0.18
Section 23	23.64	350 Year	71.84	226.5	229.87		229.91	0.00038	1.24	155.48	86.06	0.22
Section 23	23.64	Regional	139.59	226.5	230.45		230.52	0.00070	1.86	208.98	100.21	0.30
Section 23	23.63	2 Year	14.24	226	227.39	227.11	227.63	0.00521	2.18	6.52	16.8	0.65
Section 23	23.63	5 Year	22.02	226	227.8	227.4	228.11	0.00448	2.49	8.86	19.97	0.64
Section 23	23.63	10 Year	28.41	226	228.1	227.61	228.47	0.00412	2.68	10.59	22.48	0.63
Section 23	23.63	25 Year	36.91	226	228.48	227.87	228.91	0.00378	2.9	12.71	26.12	0.62
Section 23	23.63	50 Year	43.46	226	228.77	228.06	229.24	0.00346	3.02	14.4	34.27	0.61
Section 23	23.63	100 Year	49.69	226	229.44	228.23	229.55	0.00092	1.82	63.26	64.91	0.32
Section 23	23.63	350 Year	71.84	226	229.75	228.78	229.86	0.00092	1.94	100.6	76.85	0.33
Section 23	23.63	Regional	139.59	226	230.17	229.49	230.42	0.00202	3.09	138.6	108.25	0.50
Section 23	23.625		Culvert									
Section 23	23.62	2 Year	14.24	226	227.11	227.11	227.54	0.01342	2.9	4.91	12.02	1.00
Section 23	23.62	5 Year	22.02	226	227.39	227.39	227.97	0.01235	3.37	6.54	13.6	1.00
Section 23	23.62	10 Year	28.41	226	227.61	227.61	228.29	0.01150	3.65	7.78	14.55	1.00
Section 23	23.62	25 Year	36.91	226	227.87	227.87	228.68	0.01085	3.98	9.26	15.72	1.00
Section 23	23.62	50 Year	43.46	226	228.06	228.06	228.96	0.01049	4.21	10.32	16.63	1.00
Section 23	23.62	100 Year	49.69	226	228.23	228.23	229.21	0.01017	4.4	11.29	17.61	1.00
Section 23	23.62	350 Year	71.84	226	228.8	228.8	229.25	0.00455	3.49	35.92	24.41	0.70

Section 23	23.62	Regional	139.59	226	229.65	229.65	230.19	0.00453	4.21	99.64	108.39	0.73
Section 23	23.61	2 Year	14.24	225.26	226.27	226.2	226.44	0.00645	2.07	12.05	29.99	0.71
Section 23	23.61	5 Year	22.02	225.26	226.38	226.38	226.65	0.00893	2.65	15.75	34.52	0.86
Section 23	23.61	10 Year	28.41	225.26	226.49	226.49	226.8	0.00910	2.87	19.91	38.96	0.88
Section 23	23.61	25 Year	36.91	225.26	226.64	226.64	226.97	0.00876	3.07	26.33	48.11	0.88
Section 23	23.61	50 Year	43.46	225.26	226.68	226.68	227.08	0.01040	3.42	28.42	50.67	0.97
Section 23	23.61	100 Year	49.69	225.26	226.86	226.86	227.17	0.00744	3.15	38.47	63.27	0.83
Section 23	23.61	350 Year	71.84	225.26	227.06	227.06	227.4	0.00772	3.5	52.18	69.59	0.87
Section 23	23.61	Regional	139.59	225.26	227.46	227.46	227.93	0.00943	4.47	80.99	75.97	1.00
Section 23	23.6	2 Year	14.24	223.5	224.54	224.54	224.76	0.01626	2.06	6.98	19.52	0.99
Section 23	23.6	5 Year	22.02	223.5	224.73	224.73	224.95	0.01066	2.12	13.41	45.43	0.85
Section 23	23.6	10 Year	28.41	223.5	224.84	224.84	225.07	0.00930	2.2	19.14	56.34	0.82
Section 23	23.6	25 Year	36.91	223.5	224.94	224.94	225.19	0.00919	2.38	24.89	60.85	0.83
Section 23	23.6	50 Year	43.46	223.5	225.01	225.01	225.27	0.00920	2.5	28.96	63.87	0.84
Section 23	23.6	100 Year	49.69	223.5	225.07	225.07	225.34	0.00913	2.6	32.73	65.45	0.84
Section 23	23.6	350 Year	71.84	223.5	225.23	225.23	225.56	0.00965	2.96	43.53	68.37	0.89
Section 23	23.6	Regional	139.59	223.5	225.6	225.6	226.07	0.01059	3.75	69.83	72.74	0.98
Section 23	23.59	2 Year	14.24	221.54	223.31		223.31	0.00021	0.53	77.35	101.47	0.14
Section 23	23.59	5 Year	22.02	221.54	223.81		223.82	0.00011	0.47	133.93	125.21	0.11
Section 23	23.59	10 Year	28.41	221.54	224.19		224.19	0.00008	0.43	184.86	139.72	0.09
Section 23	23.59	25 Year	36.91	221.54	224.66		224.66	0.00005	0.41	251.02	145.16	0.08
Section 23	23.59	50 Year	43.46	221.54	224.77		224.78	0.00006	0.45	268.44	146.56	0.08
Section 23	23.59	100 Year	49.69	221.54	224.97		224.97	0.00006	0.46	297.36	148.83	0.08
Section 23	23.59	350 Year	71.84	221.54	225		225	0.00012	0.65	301.67	149.12	0.12
Section 23	23.59	Regional	139.59	221.54	225.47		225.48	0.00023	1.01	372.69	153.89	0.17
Section 23	23.58	2 Year	14.24	221.5	222.96	222.63	223.21	0.00448	2.25	6.99	15.7	0.63
Section 23	23.58	5 Year	22.02	221.5	223.37	222.94	223.7	0.00422	2.62	9.32	19.37	0.64
Section 23	23.58	10 Year	28.41	221.5	223.67	223.16	224.06	0.00404	2.86	11.04	23.45	0.65
Section 23	23.58	25 Year	36.91	221.5	224.04	223.44	224.51	0.00384	3.12	13.16	66.31	0.65
Section 23	23.58	50 Year	43.46	221.5	224.65	223.64	224.74	0.00087	1.73	71.89	99.18	0.32

Section 23	23.58	100 Year	49.69	221.5	224.87	223.81	224.94	0.00069	1.62	90.5	105.95	0.29
Section 23	23.58	350 Year	71.84	221.5	224.7	224.4	224.92	0.00212	2.73	75.93	100.73	0.50
Section 23	23.58	Regional	139.59	221.5	225.14	224.92	225.38	0.00264	3.33	142.68	126.41	0.57
Section 23	23.575		Culvert									
Section 23	23.57	2 Year	14.24	221.5	222.68	222.68	223.13	0.01239	3.03	5.1	16.83	0.99
Section 23	23.57	5 Year	22.02	221.5	222.98	222.98	223.58	0.01139	3.51	6.86	19.8	1.00
Section 23	23.57	10 Year	28.41	221.5	223.21	223.21	223.92	0.01096	3.83	8.12	22.6	1.01
Section 23	23.57	25 Year	36.91	221.5	223.48	223.48	224.33	0.01047	4.19	9.67	27.6	1.01
Section 23	23.57	50 Year	43.46	221.5	223.67	223.67	224.62	0.01016	4.43	10.78	31.27	1.01
Section 23	23.57	100 Year	49.69	221.5	223.85	223.85	224.88	0.00987	4.63	11.8	34.35	1.01
Section 23	23.57	350 Year	71.84	221.5	224.15	224.15	224.47	0.00385	3.12	50.42	68.5	0.65
Section 23	23.57	Regional	139.59	221.5	224.73	224.73	225.18	0.00486	4.06	104.77	113.15	0.75
Section 23	23.56	2 Year	14.24	221.49	222.31	222.21	222.48	0.00741	1.86	8.92	20.31	0.73
Section 23	23.56	5 Year	22.02	221.49	222.43	222.39	222.7	0.00993	2.39	11.42	23.7	0.87
Section 23	23.56	10 Year	28.41	221.49	222.55	222.55	222.86	0.00969	2.6	14.69	31.93	0.88
Section 23	23.56	25 Year	36.91	221.49	222.8	222.8	223.01	0.00537	2.28	33.98	99.78	0.68
Section 23	23.56	50 Year	43.46	221.49	222.86	222.86	223.08	0.00547	2.39	40.36	101.68	0.69
Section 23	23.56	100 Year	49.69	221.49	222.91	222.91	223.14	0.00575	2.51	45.18	103.09	0.71
Section 23	23.56	350 Year	71.84	221.49	223.05	223.05	223.32	0.00640	2.85	60.66	107.33	0.77
Section 23	23.56	Regional	139.59	221.49	223.56		223.78	0.00463	2.97	118.21	120.43	0.69
Section 23	23.55	2 Year	14.24	221	221.77		221.81	0.00412	1.13	25.28	81.7	0.52
Section 23	23.55	5 Year	22.02	221	221.89		221.94	0.00373	1.25	35.39	83.1	0.51
Section 23	23.55	10 Year	28.41	221	221.99		222.04	0.00326	1.29	43.93	84.27	0.49
Section 23	23.55	25 Year	36.91	221	222.1		222.15	0.00316	1.39	52.81	85.37	0.49
Section 23	23.55	50 Year	43.46	221	222.17		222.23	0.00307	1.46	59.35	86.16	0.49
Section 23	23.55	100 Year	49.69	221	222.25		222.31	0.00294	1.51	65.72	86.92	0.49
Section 23	23.55	350 Year	71.84	221	222.96		222.99	0.00076	1.11	129.99	93.82	0.27
Section 23	23.55	Regional	139.59	221	223.37		223.44	0.00128	1.66	169.49	97.76	0.37
Section 23	23.54	2 Year	14.24	219.92	220.76	220.76	221.03	0.01301	2.33	6.85	15.83	0.95
Section 23	23.54	5 Year	22.02	219.92	220.98	220.98	221.27	0.00993	2.51	11.89	27.01	0.88

Section 23	23.54	10 Year	28.41	219.92	221.1	221.1	221.43	0.00955	2.7	15.84	35.44	0.88
Section 23	23.54	25 Year	36.91	219.92	221.28	221.28	221.6	0.00795	2.75	23.6	49.17	0.83
Section 23	23.54	50 Year	43.46	219.92	221.38	221.38	221.7	0.00754	2.84	28.75	54.03	0.82
Section 23	23.54	100 Year	49.69	219.92	221.45	221.45	221.79	0.00753	2.95	32.9	57.77	0.82
Section 23	23.54	350 Year	71.84	219.92	222.9		222.93	0.00042	1.15	178.8	149.97	0.22
Section 23	23.54	Regional	139.59	219.92	223.27		223.33	0.00078	1.7	237.05	164.11	0.31
Section 23	23.53	2 Year	5.05	219.2	220.26	219.6	220.29	0.00065	0.76	6.68	16.23	0.23
Section 23	23.53	5 Year	7.52	219.2	220.44	219.72	220.49	0.00085	0.96	7.81	18.53	0.28
Section 23	23.53	10 Year	12.39	219.2	220.74	219.93	220.82	0.00113	1.28	9.69	22.2	0.33
Section 23	23.53	25 Year	19.01	219.2	221.07	220.17	221.21	0.00138	1.61	11.8	27.26	0.38
Section 23	23.53	50 Year	21.54	219.2	221.19	220.26	221.34	0.00145	1.72	12.53	29.09	0.39
Section 23	23.53	100 Year	24.13	219.2	221.3	220.35	221.47	0.00151	1.82	13.24	30.43	0.40
Section 23	23.53	350 Year	73.83	219.2	222.86	221.61	222.9	0.00030	1.1	176.12	169.27	0.19
Section 23	23.53	Regional	147.25	219.2	223.18	222.59	223.28	0.00068	1.77	233.31	189.45	0.29
Section 23	23.525		Bridge									
Section 23	23.52	2 Year	5.05	219.1	219.83	219.5	219.89	0.00266	1.11	4.57	7.41	0.41
Section 23	23.52	5 Year	7.52	219.1	220.01	219.63	220.1	0.00278	1.31	5.74	8.28	0.44
Section 23	23.52	10 Year	12.39	219.1	220.3	219.83	220.43	0.00305	1.64	7.54	11.15	0.48
Section 23	23.52	25 Year	19.01	219.1	220.52	220.08	220.75	0.00404	2.12	8.96	13.39	0.57
Section 23	23.52	50 Year	21.54	219.1	220.59	220.16	220.86	0.00446	2.3	9.37	13.93	0.60
Section 23	23.52	100 Year	24.13	219.1	220.65	220.25	220.96	0.00484	2.47	9.79	14.48	0.63
Section 23	23.52	350 Year	73.83	219.1	221.51	221.51	222.72	0.01043	4.85	15.21	23.13	1.00
Section 23	23.52	Regional	147.25	219.1	222.38	222.38	223.26	0.00667	4.61	59.56	64.07	0.83
Section 23	23.51	2 Year	5.05	218.7	219.57		219.65	0.00343	1.27	4.19	6.92	0.49
Section 23	23.51	5 Year	7.52	218.7	219.73		219.84	0.00360	1.5	5.39	7.64	0.53
Section 23	23.51	10 Year	12.39	218.7	219.99	219.66	220.16	0.00380	1.85	7.89	12.14	0.57
Section 23	23.51	25 Year	19.01	218.7	220.26	219.92	220.44	0.00339	2.03	17.61	47.25	0.55
Section 23	23.51	50 Year	21.54	218.7	220.35	220.15	220.52	0.00312	2.03	22.25	54.98	0.54
Section 23	23.51	100 Year	24.13	218.7	220.24	220.24	220.55	0.00584	2.64	16.78	46.09	0.73
Section 23	23.51	350 Year	73.83	218.7	220.87	220.87	221.22	0.00604	3.46	57.94	76.97	0.79

Section 23	23.51	Regional	147.25	218.7	221.3	221.3	221.76	0.00761	4.43	92.97	86.94	0.91
Section 23	23.505	2 Year	5.05	217.87	218.52	218.52	218.74	0.01637	2.07	2.49	6.19	1.00
Section 23	23.505	5 Year	7.52	217.87	218.65	218.65	218.93	0.01476	2.35	3.35	6.63	0.99
Section 23	23.505	10 Year	12.39	217.87	218.88	218.88	219.25	0.01300	2.75	4.92	7.37	0.98
Section 23	23.505	25 Year	19.01	217.87	219.13	219.13	219.62	0.01188	3.16	6.94	9.19	0.99
Section 23	23.505	50 Year	21.54	217.87	219.21	219.21	219.75	0.01172	3.31	7.77	10.97	0.99
Section 23	23.505	100 Year	24.13	217.87	219.59	219.59	219.8	0.00388	2.3	24.95	76.4	0.60
Section 23	23.505	350 Year	73.83	217.87	220.52		220.61	0.00156	2.01	105.7	93.41	0.41
Section 23	23.505	Regional	147.25	217.87	221.13		221.24	0.00187	2.55	164.9	104.66	0.47
Section 23	23.5	2 Year	5.05	217	217.68	217.66	217.88	0.00192	2.01	2.68	8.62	0.92
Section 23	23.5	5 Year	7.52	217	217.81	217.81	218.07	0.00179	2.29	4.19	13.42	0.92
Section 23	23.5	10 Year	12.39	217	218.05	218.05	218.35	0.00145	2.55	8.3	21.12	0.88
Section 23	23.5	25 Year	19.01	217	218.27	218.27	218.62	0.00134	2.86	13.66	26.4	0.88
Section 23	23.5	50 Year	21.54	217	218.41	218.34	218.72	0.00105	2.74	17.6	29.81	0.79
Section 23	23.5	100 Year	24.13	217	218.57	218.42	218.84	0.00082	2.62	22.46	34.83	0.71
Section 23	23.5	350 Year	73.83	217	220.47		220.56	0.00015	1.97	141.63	83.97	0.35
Section 23	23.5	Regional	147.25	217	220.94		221.15	0.00031	3.12	182.95	91.99	0.51
Section 23	23.49	2 Year	5.05	216.5	217.42	217.42	217.64	0.00158	2.27	4.75	16.34	0.83
Section 23	23.49	5 Year	7.52	216.5	217.59	217.59	217.82	0.00143	2.46	7.97	21.87	0.82
Section 23	23.49	10 Year	12.39	216.5	217.8	217.8	218.08	0.00147	2.87	13.23	28.47	0.86
Section 23	23.49	25 Year	19.01	216.5	218.29	218.03	218.41	0.00056	2.25	30.37	39.49	0.57
Section 23	23.49	50 Year	21.54	216.5	218.47	218.1	218.57	0.00043	2.11	37.91	43	0.50
Section 23	23.49	100 Year	24.13	216.5	218.61		218.71	0.00038	2.1	44.53	48.69	0.48
Section 23	23.49	350 Year	73.83	216.5	220.48		220.53	0.00014	1.96	170.13	91.48	0.32
Section 23	23.49	Regional	147.25	216.5	220.94		221.09	0.00035	3.37	237.99	154.15	0.52
Section 23	23.48	2 Year	5.05	216.3	217.1	217.1	217.32	0.00226	2.09	2.42	9.02	1.00
Section 23	23.48	5 Year	7.52	216.3	217.23	217.23	217.52	0.00207	2.38	3.15	9.97	1.00
Section 23	23.48	10 Year	12.39	216.3	217.46	217.46	217.87	0.00187	2.82	4.39	11.52	1.00
Section 23	23.48	25 Year	19.01	216.3	217.73	217.73	218.27	0.00169	3.25	5.85	14.88	1.00
Section 23	23.48	50 Year	21.54	216.3	217.83	217.83	218.41	0.00165	3.39	6.35	15.98	1.00

Section 23	23.48	100 Year	24.13	216.3	218	217.92	218.56	0.00130	3.31	7.29	17.59	0.91
Section 23	23.48	350 Year	73.83	216.3	220.41	219.33	220.55	0.00011	1.88	115.08	103.19	0.31
Section 23	23.48	Regional	147.25	216.3	220	220	220.87	0.00074	4.52	78.2	68.29	0.80
Section 23	23.475		Culvert									
Section 23	23.47	2 Year	5.05	216.3	216.92	216.92	217.14	0.00226	2.1	2.4	7.72	1.01
Section 23	23.47	5 Year	7.52	216.3	217.05	217.05	217.35	0.00205	2.39	3.14	12.91	1.00
Section 23	23.47	10 Year	12.39	216.3	217.28	217.28	217.69	0.00184	2.83	4.38	19.27	1.00
Section 23	23.47	25 Year	19.01	216.3	217.56	217.56	218.09	0.00164	3.25	5.85	25.71	1.00
Section 23	23.47	50 Year	21.54	216.3	217.65	217.65	218.24	0.00162	3.4	6.34	27.13	1.00
Section 23	23.47	100 Year	24.13	216.3	217.74	217.74	218.37	0.00156	3.52	6.86	32.25	1.00
Section 23	23.47	350 Year	73.83	216.3	219.14	219.14	220.48	0.00123	5.13	14.4	88.31	1.00
Section 23	23.47	Regional	147.25	216.3	219.72	219.5	219.99	0.00037	3.08	167.08	108.75	0.56
Section 23	23.46	2 Year	5.05	215.5	216.24	216.24	216.49	0.00204	2.27	2.66	7.72	0.95
Section 23	23.46	5 Year	7.52	215.5	216.41	216.41	216.71	0.00175	2.5	4.26	10.57	0.92
Section 23	23.46	10 Year	12.39	215.5	216.7	216.7	217.05	0.00140	2.78	8.48	19.88	0.87
Section 23	23.46	25 Year	19.01	215.5	217.02	217.02	217.35	0.00107	2.89	16.67	32.15	0.79
Section 23	23.46	50 Year	21.54	215.5	217.07	217.07	217.44	0.00113	3.06	18.71	37.06	0.82
Section 23	23.46	100 Year	24.13	215.5	217.11	217.11	217.52	0.00125	3.28	20.15	40.33	0.87
Section 23	23.46	350 Year	73.83	215.5	218.76		218.86	0.00023	2.31	136.47	92.94	0.42
Section 23	23.46	Regional	147.25	215.5	219.79		219.91	0.00021	2.72	249.61	128.55	0.43
Section 23	23.45	2 Year	5.05	215.14	216		216.05	0.00033	1.02	6.08	16.02	0.41
Section 23	23.45	5 Year	7.52	215.14	216.24		216.29	0.00023	1.04	11.08	25.61	0.36
Section 23	23.45	10 Year	12.39	215.14	216.63		216.68	0.00014	1.06	24.33	41.29	0.30
Section 23	23.45	25 Year	19.01	215.14	216.94		216.99	0.00014	1.21	38.2	50.77	0.31
Section 23	23.45	50 Year	21.54	215.14	217.02		217.08	0.00014	1.27	42.69	54.02	0.32
Section 23	23.45	100 Year	24.13	215.14	217.1		217.17	0.00015	1.32	47.18	56.95	0.32
Section 23	23.45	350 Year	73.83	215.14	218.77		218.82	0.00007	1.39	189.84	105.95	0.24
Section 23	23.45	Regional	147.25	215.14	219.8		219.88	0.00008	1.86	311.37	135.01	0.28
Section 23	23.44	2 Year	5.05	214.81	215.68	215.68	215.97	0.00166	2.49	3.2	7.87	0.92
Section 23	23.44	5 Year	7.52	214.81	215.87	215.87	216.22	0.00154	2.79	4.9	9.61	0.91

Section 23	23.44	10 Year	12.39	214.81	216.23	216.23	216.62	0.00122	3.08	9.84	20.26	0.86
Section 23	23.44	25 Year	19.01	214.81	216.59	216.59	216.94	0.00093	3.16	19.55	33.43	0.78
Section 23	23.44	50 Year	21.54	214.81	216.66	216.66	217.02	0.00097	3.31	21.93	34.84	0.80
Section 23	23.44	100 Year	24.13	214.81	216.73	216.73	217.11	0.00098	3.42	24.53	36.45	0.81
Section 23	23.44	350 Year	73.83	214.81	218.7		218.81	0.00020	2.52	148.79	100.79	0.41
Section 23	23.44	Regional	147.25	214.81	219.79		219.87	0.00016	2.68	369.81	250.61	0.39
Section 23	23.435	2 Year	5.05	213.9	214.7	214.48	214.8	0.00079	1.39	3.64	5.5	0.54
Section 23	23.435	5 Year	7.52	213.9	214.89	214.61	215.02	0.00082	1.61	4.67	5.5	0.56
Section 23	23.435	10 Year	12.39	213.9	215.21	214.84	215.4	0.00085	1.92	6.45	5.5	0.57
Section 23	23.435	25 Year	19.01	213.9	215.59	215.11	215.84	0.00089	2.23	8.53	5.5	0.57
Section 23	23.435	50 Year	21.54	213.9	215.72	215.2	216	0.00090	2.33	9.26	5.5	0.57
Section 23	23.435	100 Year	24.13	213.9	215.85	215.29	216.15	0.00090	2.42	9.98	5.52	0.57
Section 23	23.435	350 Year	73.83	213.9	218.11	216.68	218.66	0.00060	3.3	22.37	33.36	0.52
Section 23	23.435	Regional	147.25	213.9	219	219	219.68	0.00094	4.12	91.29	94.43	0.60
Section 23	23.434		Culvert									
Section 23	23.43	2 Year	5.05	213.9	214.53	214.53	214.75	0.00245	2.08	2.42	6.37	1.00
Section 23	23.43	5 Year	7.52	213.9	214.66	214.66	214.95	0.00223	2.37	3.17	6.52	1.00
Section 23	23.43	10 Year	12.39	213.9	214.89	214.89	215.29	0.00202	2.81	4.4	7.4	1.00
Section 23	23.43	25 Year	19.01	213.9	215.15	215.15	215.69	0.00182	3.23	5.88	12.69	1.00
Section 23	23.43	50 Year	21.54	213.9	215.25	215.25	215.83	0.00177	3.37	6.39	14.13	1.00
Section 23	23.43	100 Year	24.13	213.9	215.33	215.33	215.96	0.00174	3.51	6.88	15.43	1.00
Section 23	23.43	350 Year	73.83	213.9	216.73	216.73	218.04	0.00134	5.08	14.54	41.45	1.00
Section 23	23.43	Regional	147.25	213.9	218.09	218.09	218.48	0.00042	3.46	191.6	249.3	0.56
Section 23	23.42	2 Year	5.05	213.37	214.33	214.06	214.45	0.00525	1.51	3.34	4.64	0.57
Section 23	23.42	5 Year	7.52	213.37	214.52	214.24	214.68	0.00547	1.76	4.37	6.44	0.60
Section 23	23.42	10 Year	12.39	213.37	214.77	214.54	215	0.00602	2.18	6.48	10.55	0.66
Section 23	23.42	25 Year	19.01	213.37	215.02	214.89	215.31	0.00620	2.53	9.7	15.13	0.69
Section 23	23.42	50 Year	21.54	213.37	215.1	215	215.41	0.00614	2.62	11.01	16.61	0.69
Section 23	23.42	100 Year	24.13	213.37	215.18	215.09	215.49	0.00614	2.71	12.3	18.04	0.70
Section 23	23.42	350 Year	73.83	213.37	216.2		216.51	0.00427	3.17	41.96	40.71	0.63

Section 23	23.42	Regional	147.25	213.37	216.93		217.28	0.00416	3.7	78.41	59.02	0.65
Section 23	23.415	2 Year	5.05	212.65	213.33	213.33	213.59	0.01701	2.25	2.25	4.42	1.01
Section 23	23.415	5 Year	7.52	212.65	213.5	213.5	213.81	0.01618	2.48	3.03	4.91	1.01
Section 23	23.415	10 Year	12.39	212.65	213.77	213.77	214.16	0.01272	2.78	4.67	7.2	0.95
Section 23	23.415	25 Year	19.01	212.65	214.06	214.06	214.52	0.01069	3.08	7.06	9.41	0.91
Section 23	23.415	50 Year	21.54	212.65	214.16	214.16	214.63	0.01015	3.16	8.02	10.38	0.90
Section 23	23.415	100 Year	24.13	212.65	214.26	214.26	214.74	0.00953	3.22	9.1	11.5	0.88
Section 23	23.415	350 Year	73.83	212.65	215.34	215.34	215.95	0.00704	4.09	29.03	27.09	0.83
Section 23	23.415	Regional	147.25	212.65	216.27	216.27	216.8	0.00522	4.36	69.93	60.93	0.76
Section 23	23.41	2 Year	5.59	211.58	212.84	211.89	212.84	0.00006	0.23	26.47	28.07	0.07
Section 23	23.41	5 Year	7.88	211.58	213.22	211.95	213.22	0.00004	0.24	37.72	31.15	0.06
Section 23	23.41	10 Year	13	211.58	213.58	212.06	213.58	0.00005	0.31	49.51	35.05	0.07
Section 23	23.41	25 Year	19.79	211.58	213.79	212.17	213.8	0.00008	0.41	57.34	39.55	0.09
Section 23	23.41	50 Year	22.62	211.58	213.87	212.21	213.88	0.00009	0.45	60.57	41.34	0.10
Section 23	23.41	100 Year	25.38	211.58	213.94	212.25	213.95	0.00010	0.49	63.52	42.87	0.10
Section 23	23.41	350 Year	77.61	211.58	214.63	212.83	214.68	0.00033	1.07	98.51	59.27	0.20
Section 23	23.41	Regional	152.73	211.58	214.9	213.43	215.05	0.00092	1.88	115.55	69.79	0.34

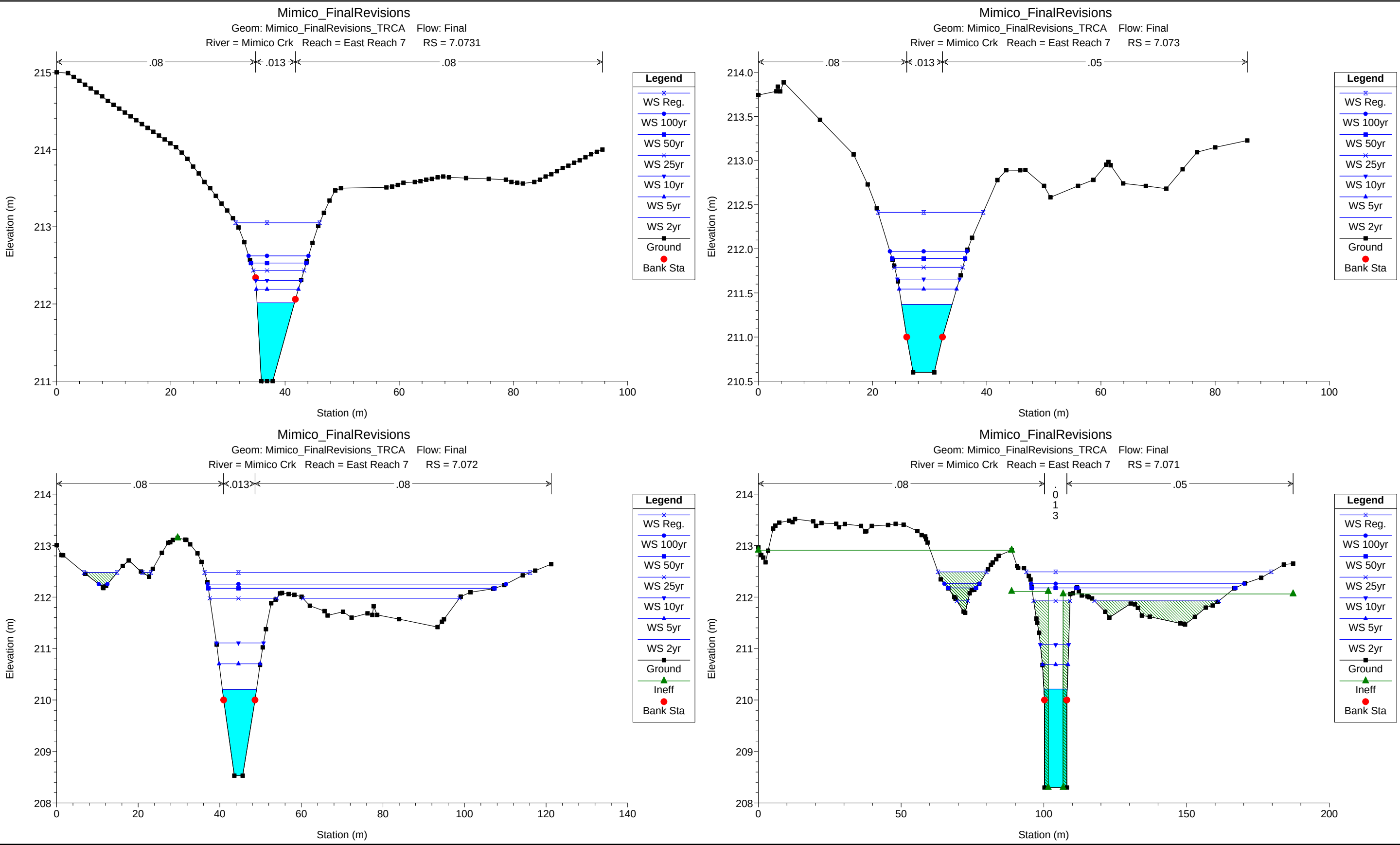
TRCA

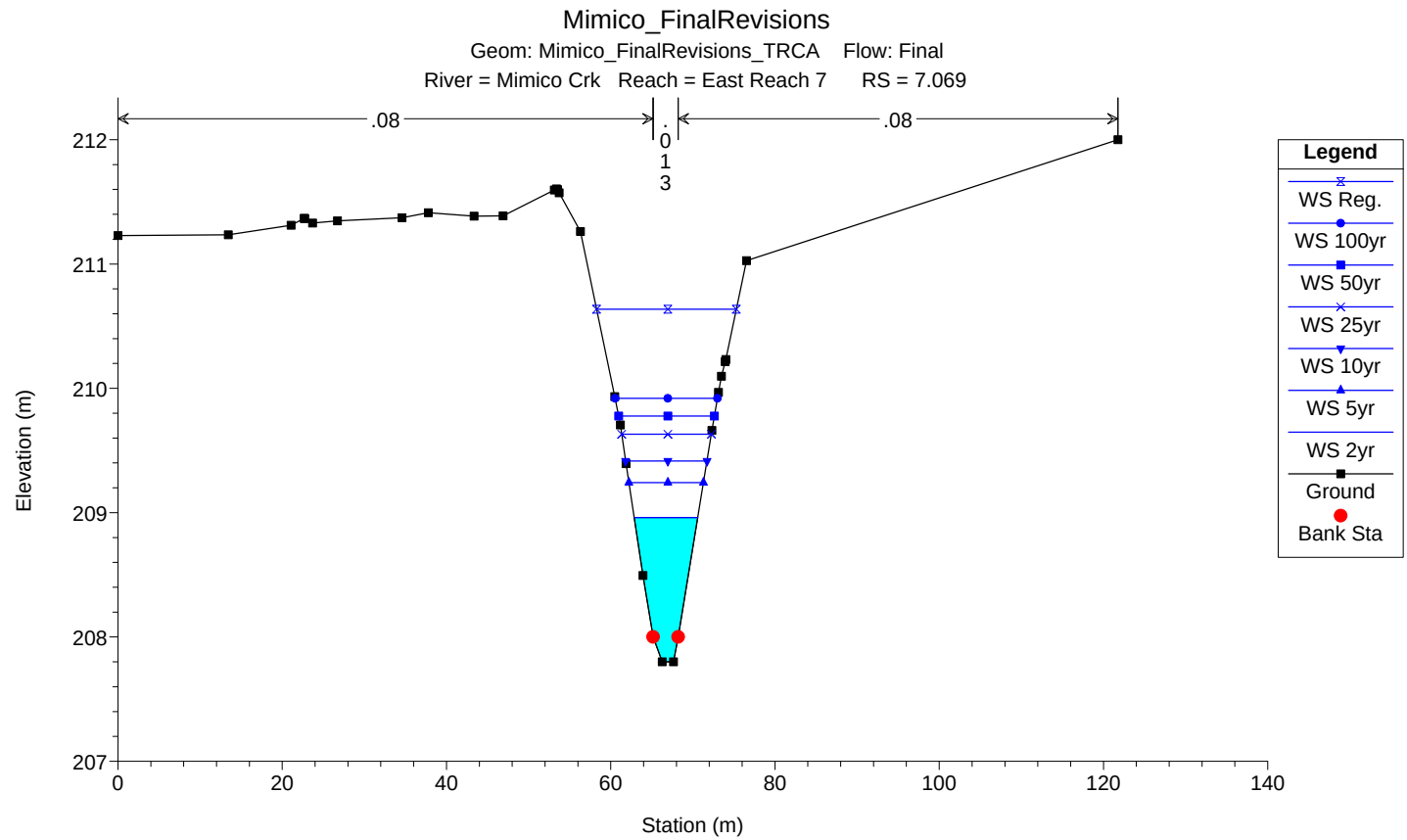
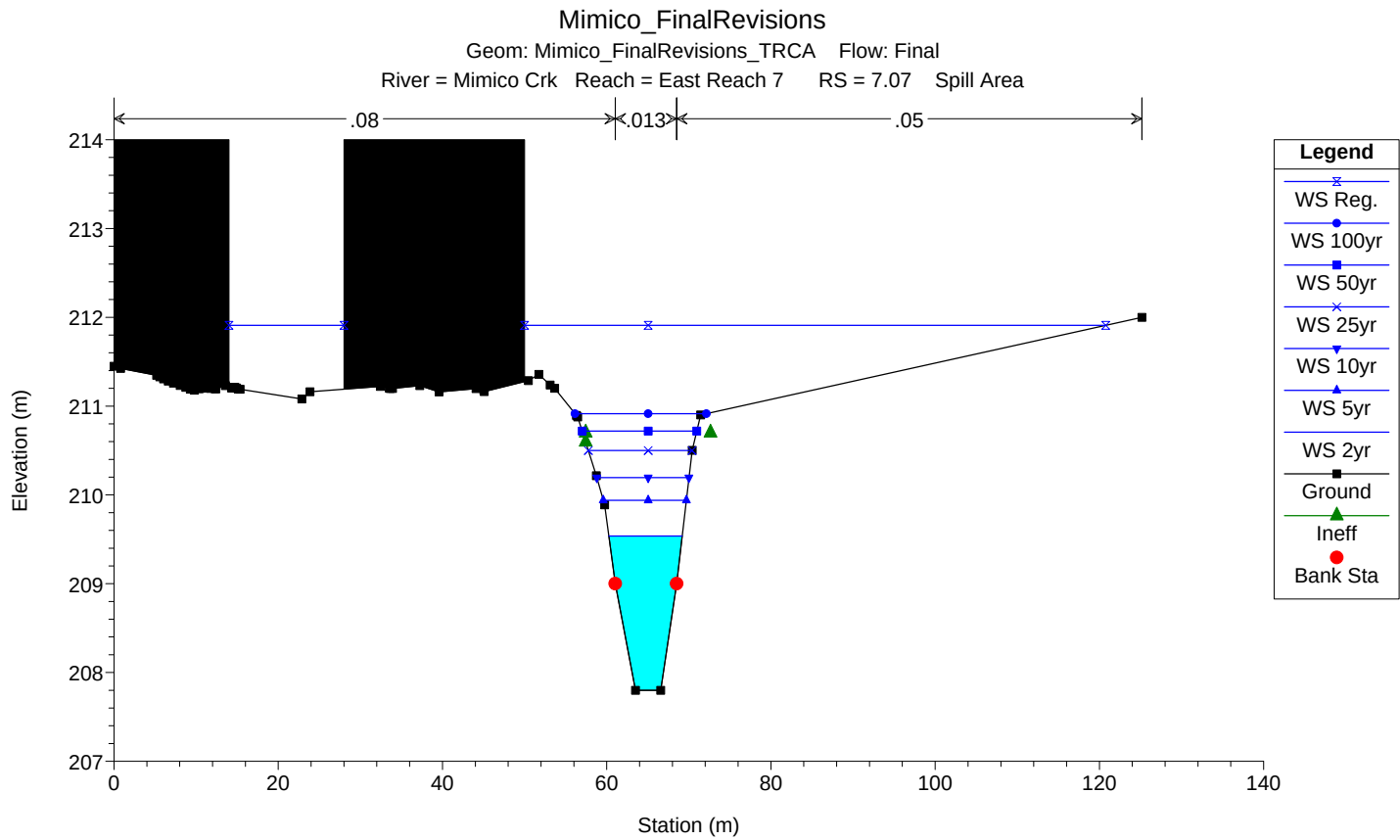
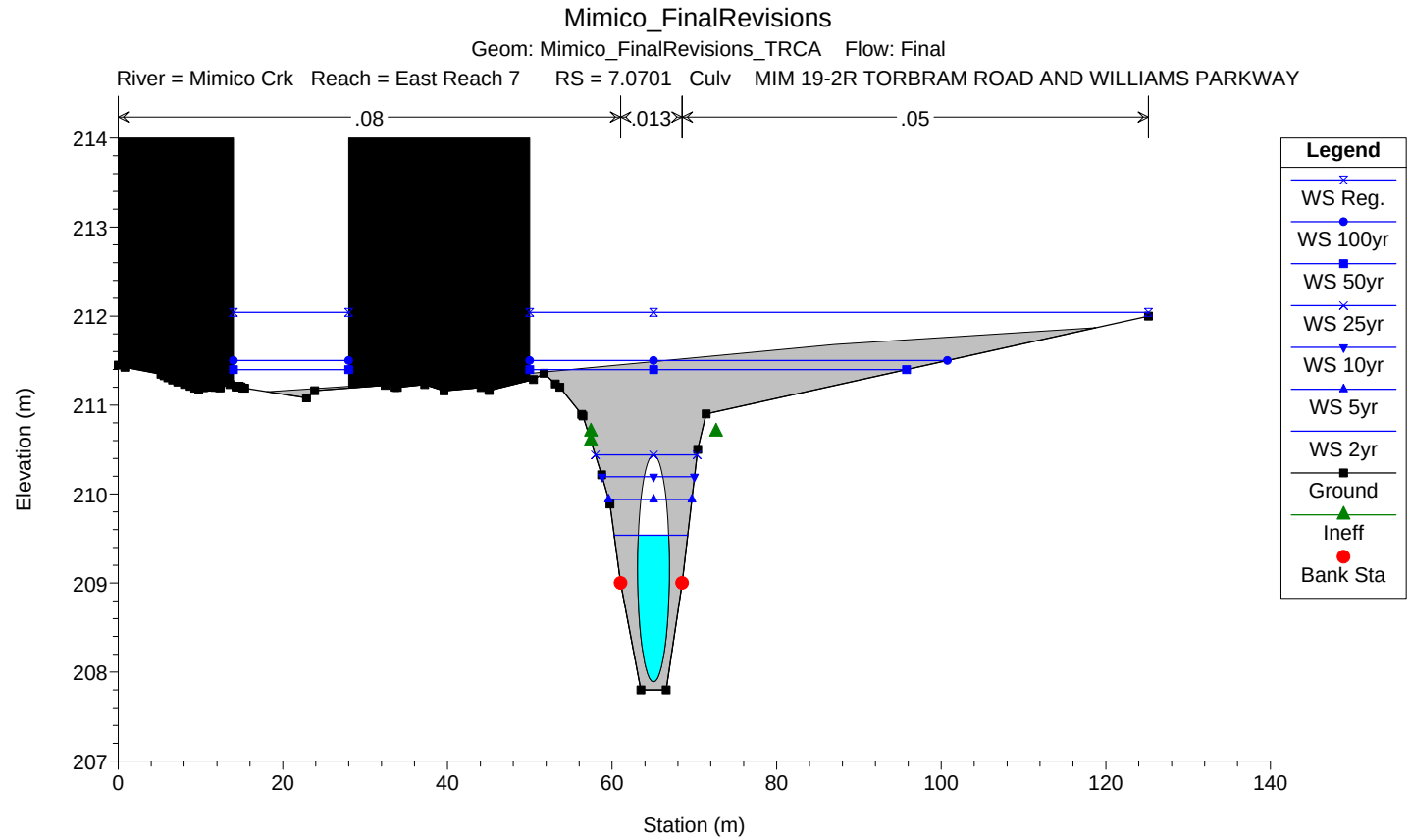
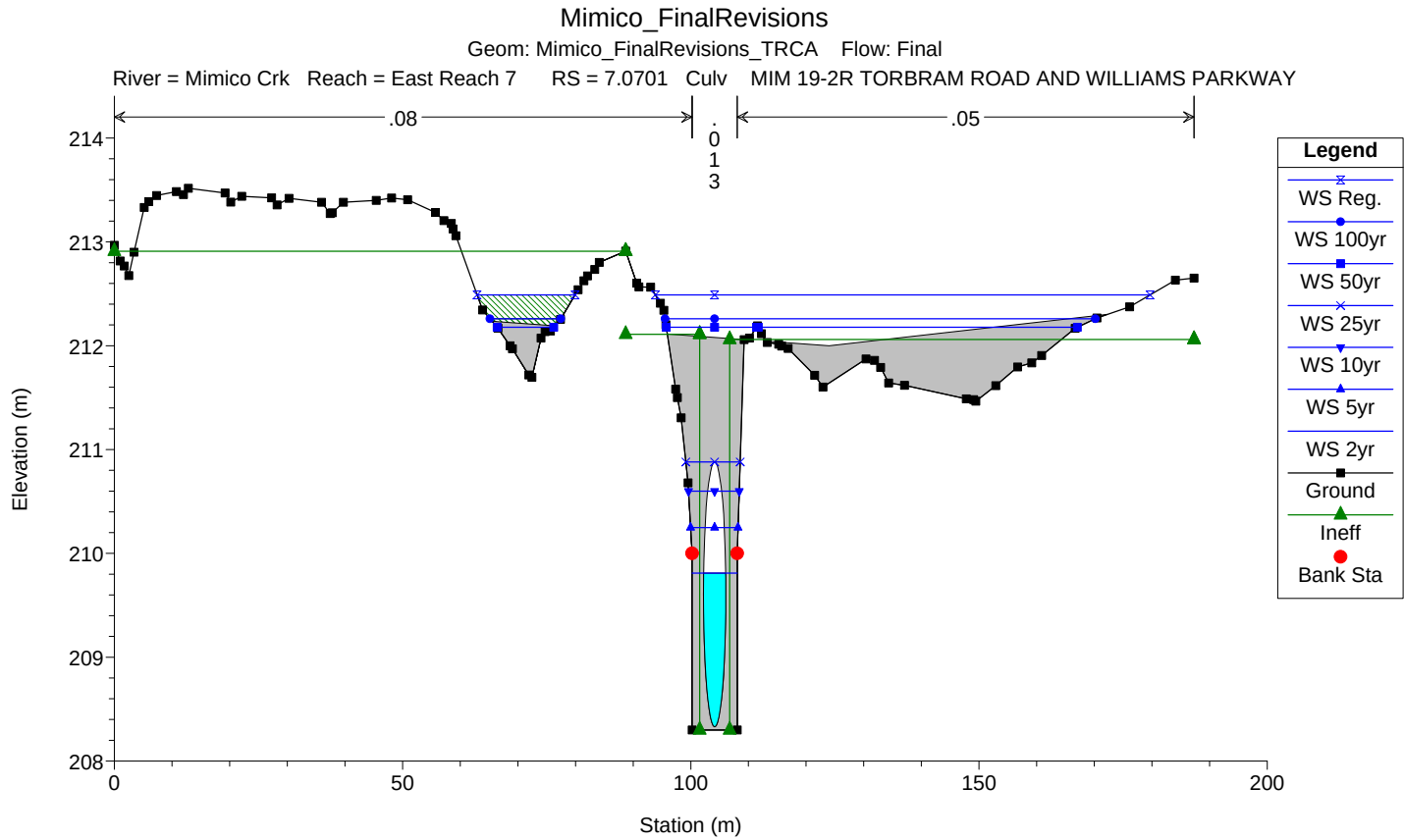
(3.9 x 2.7) m ARCH CSP CULVERT

WILLIAMS PARKWAY AND TORBRAM ROAD

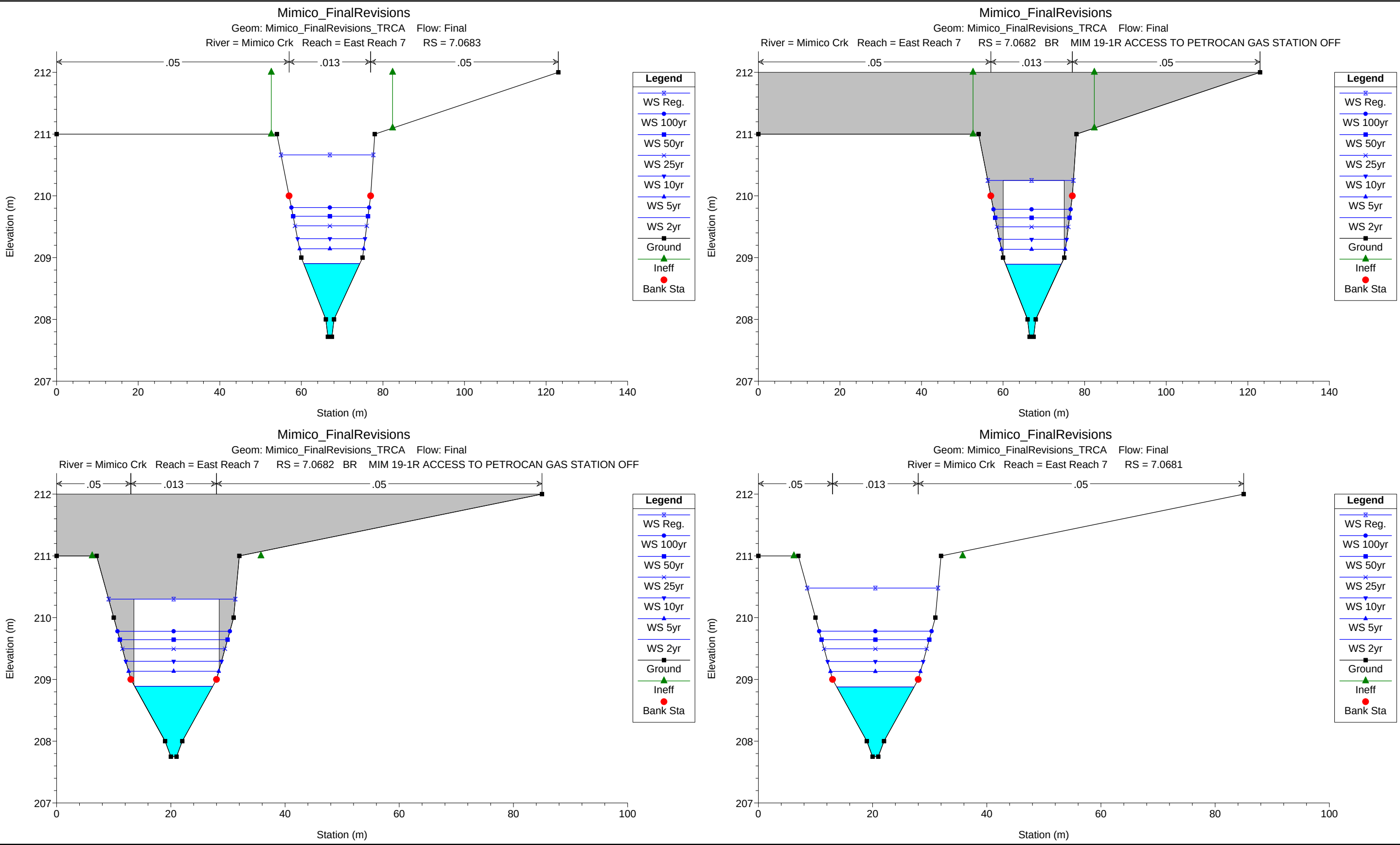
EXISTING CONDITION

EXISTING CONDITION TRCA GEOMETRY- UPSTREAM AND DOWNSTREAM OF CULVERT ST 7.0701





EXISTING CONDITION TRCA GEOMETRY- UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILES - TRCA

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	11.60	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.49
Q Barrel (m3/s)	11.60	Culv Vel DS (m/s)	2.19
E.G. US. (m)	210.28	Culv Inv El Up (m)	208.33
W.S. US. (m)	210.21	Culv Inv El Dn (m)	207.89
E.G. DS (m)	209.60	Culv Frctn Ls (m)	0.34
W.S. DS (m)	209.54	Culv Exit Loss (m)	0.18
Delta EG (m)	0.68	Culv Entr Loss (m)	0.16
Delta WS (m)	0.67	Q Weir (m3/s)	
E.G. IC (m)	210.13	Weir Sta Lft (m)	
E.G. OC (m)	210.28	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.81	Weir Max Depth (m)	
Culv WS Outlet (m)	209.54	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.43	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.24	Min El Weir Flow (m)	212.06

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	16.50	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.64
Q Barrel (m3/s)	16.50	Culv Vel DS (m/s)	2.47
E.G. US. (m)	210.78	Culv Inv El Up (m)	208.33
W.S. US. (m)	210.69	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.02	Culv Frctn Ls (m)	0.35
W.S. DS (m)	209.94	Culv Exit Loss (m)	0.24
Delta EG (m)	0.76	Culv Entr Loss (m)	0.18
Delta WS (m)	0.75	Q Weir (m3/s)	
E.G. IC (m)	210.59	Weir Sta Lft (m)	
E.G. OC (m)	210.78	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.25	Weir Max Depth (m)	
Culv WS Outlet (m)	209.94	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.81	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.50	Min El Weir Flow (m)	212.06

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	20.00	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.75
Q Barrel (m3/s)	20.00	Culv Vel DS (m/s)	2.71
E.G. US. (m)	211.17	Culv Inv El Up (m)	208.33
W.S. US. (m)	211.07	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.28	Culv Frctn Ls (m)	0.41
W.S. DS (m)	210.20	Culv Exit Loss (m)	0.29
Delta EG (m)	0.89	Culv Entr Loss (m)	0.19
Delta WS (m)	0.88	Q Weir (m3/s)	
E.G. IC (m)	210.92	Weir Sta Lft (m)	
E.G. OC (m)	211.17	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.60	Weir Max Depth (m)	
Culv WS Outlet (m)	210.20	Weir Avg Depth (m)	
Culv Nml Depth (m)	2.16	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.66	Min El Weir Flow (m)	212.06

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	24.60	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	3.17
Q Barrel (m3/s)	24.60	Culv Vel DS (m/s)	3.17
E.G. US. (m)	212.01	Culv Inv El Up (m)	208.33
W.S. US. (m)	211.93	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.60	Culv Frctn Ls (m)	0.74
W.S. DS (m)	210.50	Culv Exit Loss (m)	0.42
Delta EG (m)	1.42	Culv Entr Loss (m)	0.26
Delta WS (m)	1.43	Q Weir (m3/s)	
E.G. IC (m)	211.35	Weir Sta Lft (m)	
E.G. OC (m)	212.01	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.84	Min El Weir Flow (m)	212.06

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	24.44	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	3.15
Q Barrel (m3/s)	24.44	Culv Vel DS (m/s)	3.15
E.G. US. (m)	212.21	Culv Inv El Up (m)	208.33
W.S. US. (m)	212.18	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.82	Culv Frctn Ls (m)	0.73
W.S. DS (m)	210.72	Culv Exit Loss (m)	0.40
Delta EG (m)	1.39	Culv Entr Loss (m)	0.25
Delta WS (m)	1.46	Q Weir (m3/s)	3.93
E.G. IC (m)	211.75	Weir Sta Lft (m)	95.65
E.G. OC (m)	212.21	Weir Sta Rgt (m)	157.93
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.21
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.12
Culv Nml Depth (m)		Weir Flow Area (m2)	7.75
Culv Crt Depth (m)	1.83	Min El Weir Flow (m)	212.06

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	23.53	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	3.04
Q Barrel (m3/s)	23.53	Culv Vel DS (m/s)	3.04
E.G. US. (m)	212.30	Culv Inv El Up (m)	208.33
W.S. US. (m)	212.26	Culv Inv El Dn (m)	207.89
E.G. DS (m)	211.03	Culv Frctn Ls (m)	0.68
W.S. DS (m)	210.91	Culv Exit Loss (m)	0.36
Delta EG (m)	1.27	Culv Entr Loss (m)	0.23
Delta WS (m)	1.35	Q Weir (m3/s)	7.97
E.G. IC (m)	212.10	Weir Sta Lft (m)	95.46
E.G. OC (m)	212.30	Weir Sta Rgt (m)	170.67
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.29
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.18
Culv Nml Depth (m)		Weir Flow Area (m2)	13.23
Culv Crt Depth (m)	1.80	Min El Weir Flow (m)	212.06

Plan: TRCA Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	16.25	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	2.10
Q Barrel (m3/s)	16.25	Culv Vel DS (m/s)	2.10
E.G. US. (m)	212.57	Culv Inv El Up (m)	208.33
W.S. US. (m)	212.49	Culv Inv El Dn (m)	207.89
E.G. DS (m)	212.02	Culv Frctn Ls (m)	0.32
W.S. DS (m)	211.91	Culv Exit Loss (m)	0.11
Delta EG (m)	0.55	Culv Entr Loss (m)	0.11
Delta WS (m)	0.58	Q Weir (m3/s)	34.65
E.G. IC (m)	212.42	Weir Sta Lft (m)	90.86
E.G. OC (m)	212.57	Weir Sta Rgt (m)	182.38
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.58
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.41
Culv Nml Depth (m)		Weir Flow Area (m2)	37.11
Culv Crt Depth (m)	1.49	Min El Weir Flow (m)	212.06

PROFILE OUTPUT TABLE - TRCA RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002081	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001717	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001627	3.01	7.62	10.88	0.97
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001560	3.21	9.14	11.95	0.97
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.43	0.001501	3.34	10.36	12.78	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.97	211.97	212.56	0.001490	3.47	11.44	13.51	0.98
East Reach 7	7.073	Reg.	46.10	210.60	212.41	212.41	213.15	0.001294	3.94	18.46	18.42	0.96
East Reach 7	7.072	2yr	11.10	208.53	210.21	209.58	210.29	0.000259	1.27	8.80	8.38	0.38
East Reach 7	7.072	5yr	15.70	208.53	210.70	209.78	210.78	0.000154	1.25	13.39	10.07	0.31
East Reach 7	7.072	10yr	18.90	208.53	211.11	209.91	211.18	0.000105	1.20	17.76	11.53	0.27
East Reach 7	7.072	25yr	23.10	208.53	211.98	210.04	212.03	0.000045	0.99	42.31	54.78	0.19
East Reach 7	7.072	50yr	26.30	208.53	212.17	210.14	212.22	0.000045	1.04	54.31	70.15	0.19
East Reach 7	7.072	100yr	29.40	208.53	212.25	210.21	212.31	0.000051	1.12	60.15	75.24	0.20
East Reach 7	7.072	Reg.	46.10	208.53	212.48	210.62	212.59	0.000092	1.58	77.24	90.01	0.27
East Reach 7	7.071	2yr	11.60	208.30	210.21	209.10	210.28	0.000097	1.17	9.94	8.17	0.27
East Reach 7	7.071	5yr	16.50	208.30	210.69	209.31	210.78	0.000093	1.33	12.42	8.95	0.27
East Reach 7	7.071	10yr	20.00	208.30	211.07	209.45	211.17	0.000083	1.39	14.43	9.91	0.27
East Reach 7	7.071	25yr	24.60	208.30	211.93	209.62	212.01	0.000052	1.30	18.86	60.17	0.22
East Reach 7	7.071	50yr	28.10	208.30	212.18	209.74	212.21	0.000034	0.87	59.13	80.81	0.14
East Reach 7	7.071	100yr	31.50	208.30	212.26	209.85	212.30	0.000038	0.94	65.14	86.97	0.15
East Reach 7	7.071	Reg.	50.90	208.30	212.49	210.44	212.57	0.000075	1.36	83.68	102.82	0.21
East Reach 7	7.0701		Culvert									
East Reach 7	7.07	2yr	11.60	207.80	209.54	208.74	209.60	0.000152	1.12	10.75	8.94	0.30
East Reach 7	7.07	5yr	16.50	207.80	209.94	208.93	210.02	0.000130	1.23	14.56	10.12	0.29
East Reach 7	7.07	10yr	20.00	207.80	210.20	209.05	210.28	0.000122	1.30	17.30	11.22	0.29
East Reach 7	7.07	25yr	24.60	207.80	210.50	209.19	210.60	0.000115	1.38	20.93	12.64	0.29
East Reach 7	7.07	50yr	28.10	207.80	210.72	209.28	210.82	0.000110	1.44	23.83	13.95	0.29
East Reach 7	7.07	100yr	31.50	207.80	210.91	209.38	211.03	0.000108	1.49	26.69	16.00	0.29
East Reach 7	7.07	Reg.	50.90	207.80	211.91	209.84	212.02	0.000081	1.59	81.81	84.78	0.26
East Reach 7	7.069	2yr	11.60	207.80	208.96	208.96	209.46	0.001575	3.23	5.66	7.74	0.98
East Reach 7	7.069	5yr	16.50	207.80	209.24	209.24	209.85	0.001440	3.59	8.02	9.08	0.97
East Reach 7	7.069	10yr	20.00	207.80	209.42	209.42	210.10	0.001393	3.82	9.67	9.91	0.98
East Reach 7	7.069	25yr	24.60	207.80	209.63	209.63	210.39	0.001328	4.07	11.92	10.91	0.97

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.78	209.78	210.60	0.001308	4.25	13.56	11.66	0.98
East Reach 7	7.069	100yr	31.50	207.80	209.92	209.92	210.79	0.001271	4.40	15.28	12.46	0.98
East Reach 7	7.069	Reg.	50.90	207.80	210.64	210.64	211.73	0.001119	5.03	25.84	17.02	0.96
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000917	1.54	7.54	13.75	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.12	15.72	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000471	1.45	13.76	16.54	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000362	1.42	17.31	17.58	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000305	1.40	20.08	18.35	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000268	1.39	22.74	19.06	0.40
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000116	1.28	40.57	22.65	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	38.02	22.92	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.011358	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511	Culvert										
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451	Culvert										
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

HEC-RAS Plan: TRCA River: Mimico Crk Reach: East Reach 7 (Continued)

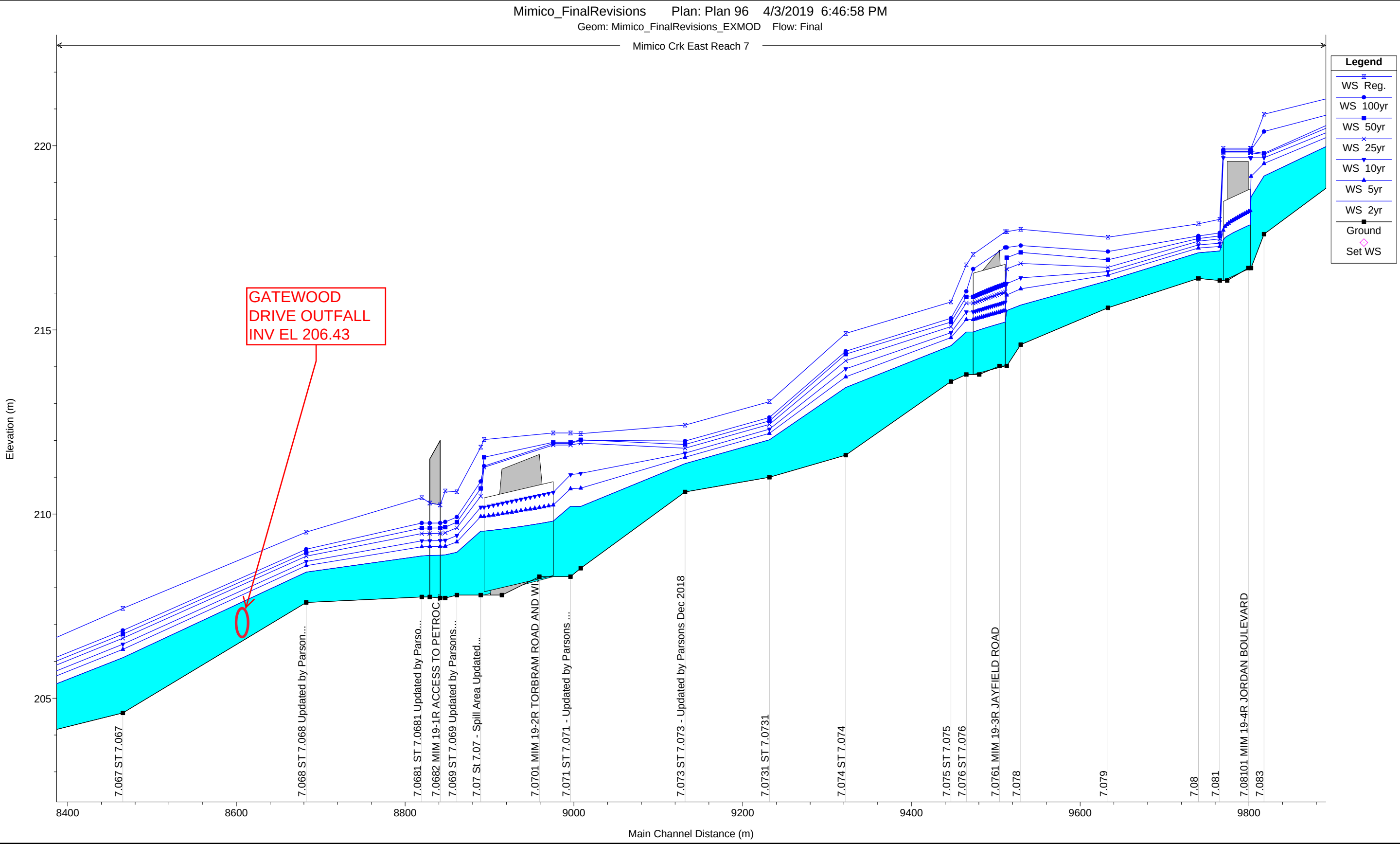
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

MODIFIED EXISTING

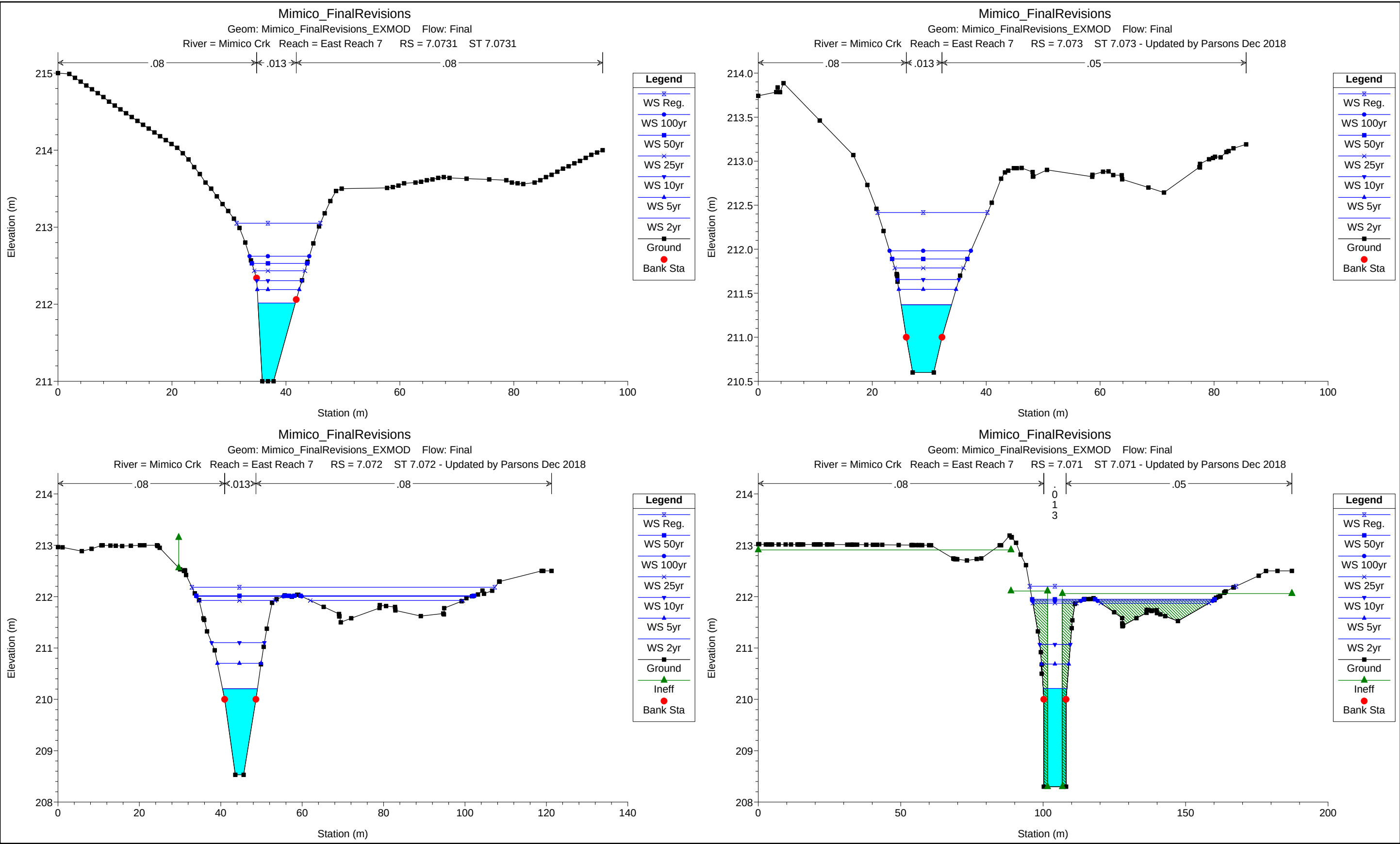
(3.9 x 2.7) m ARCH CSP CULVERT

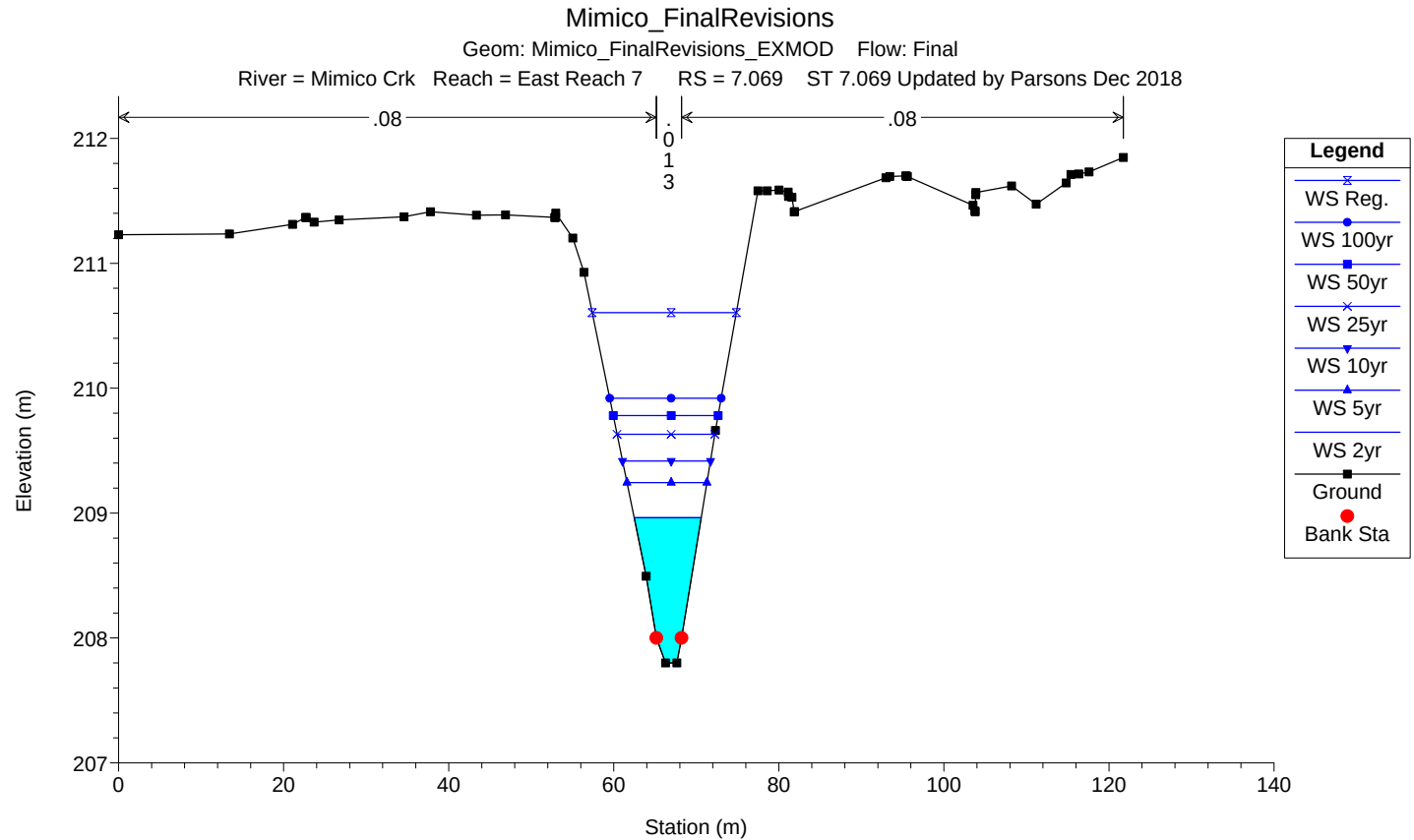
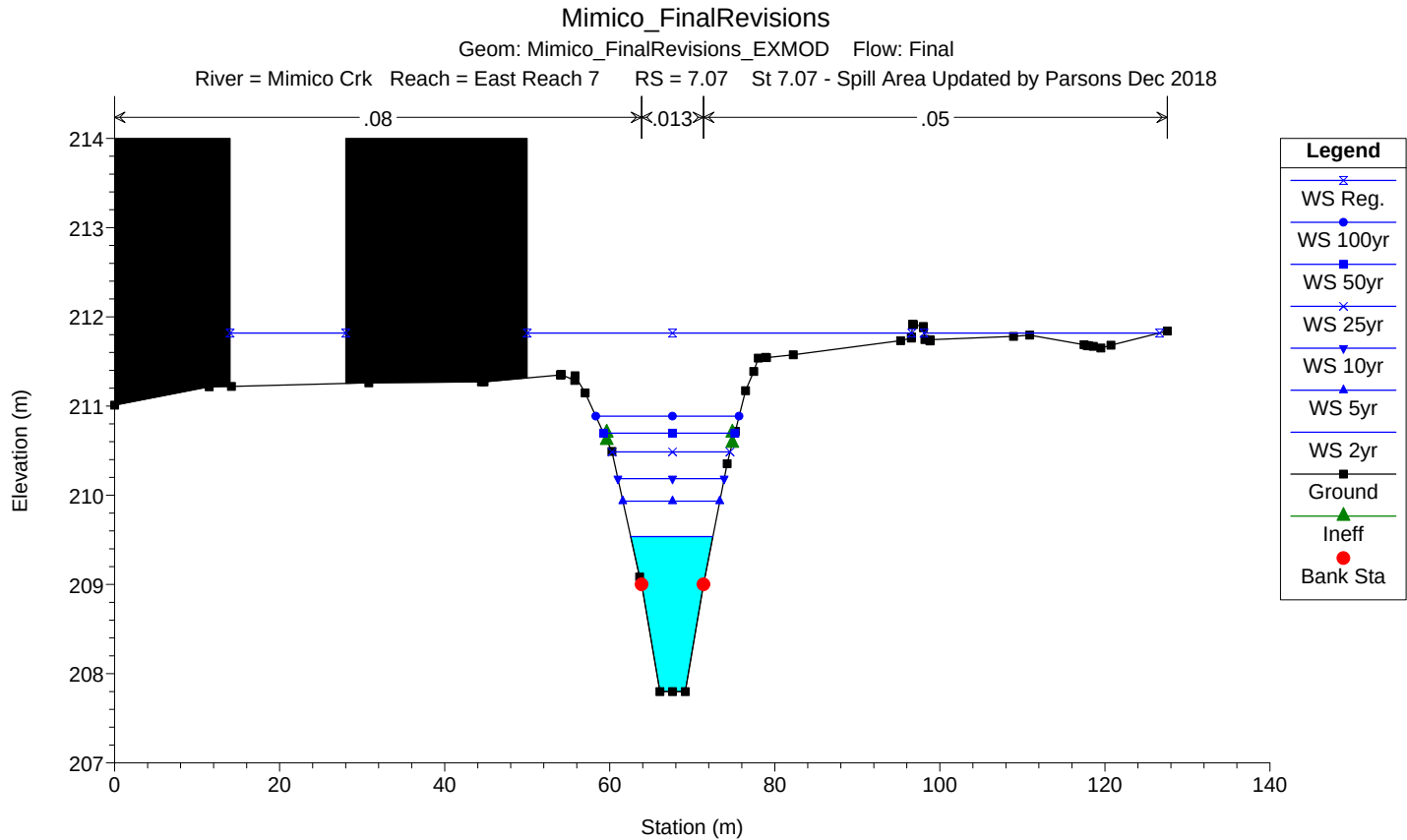
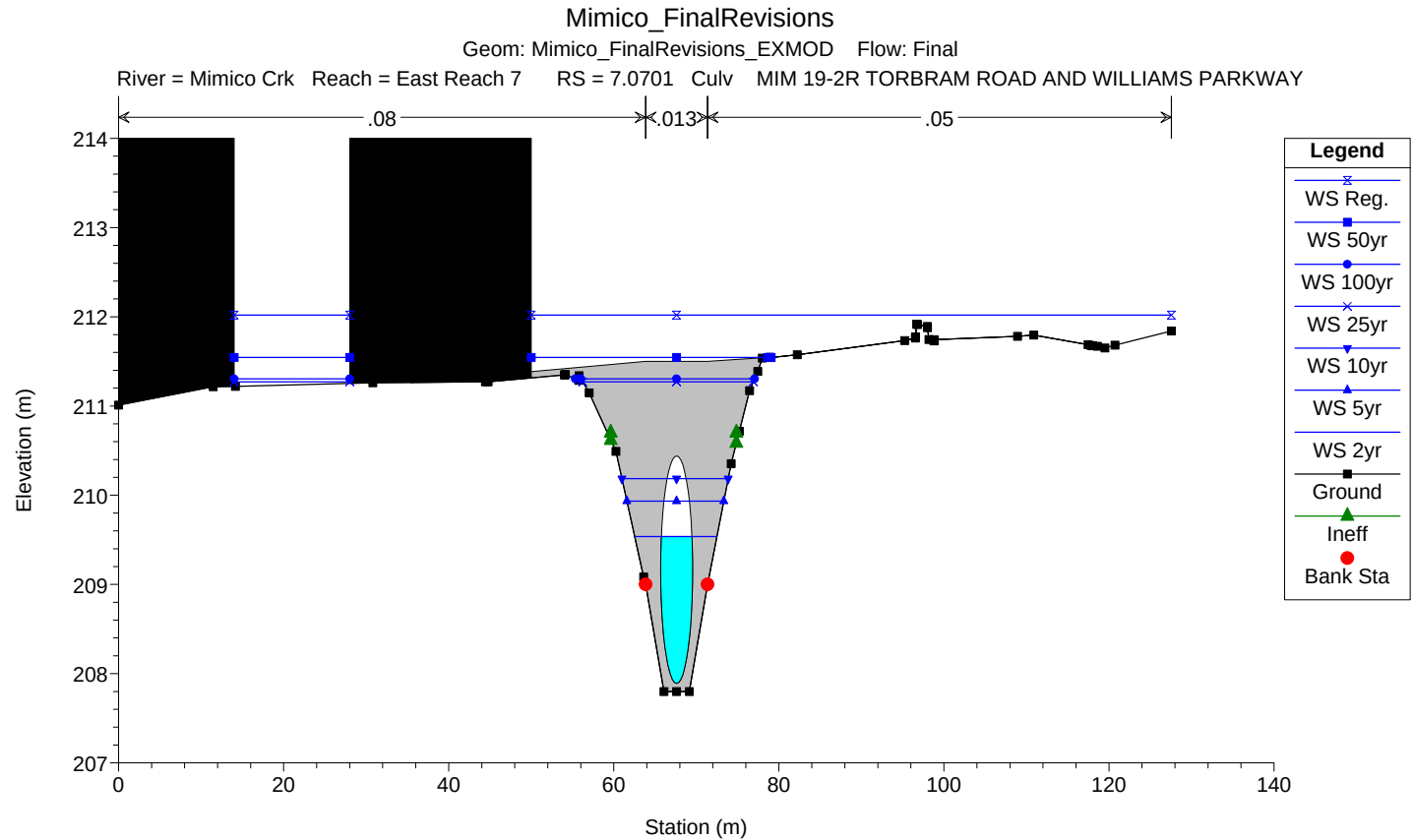
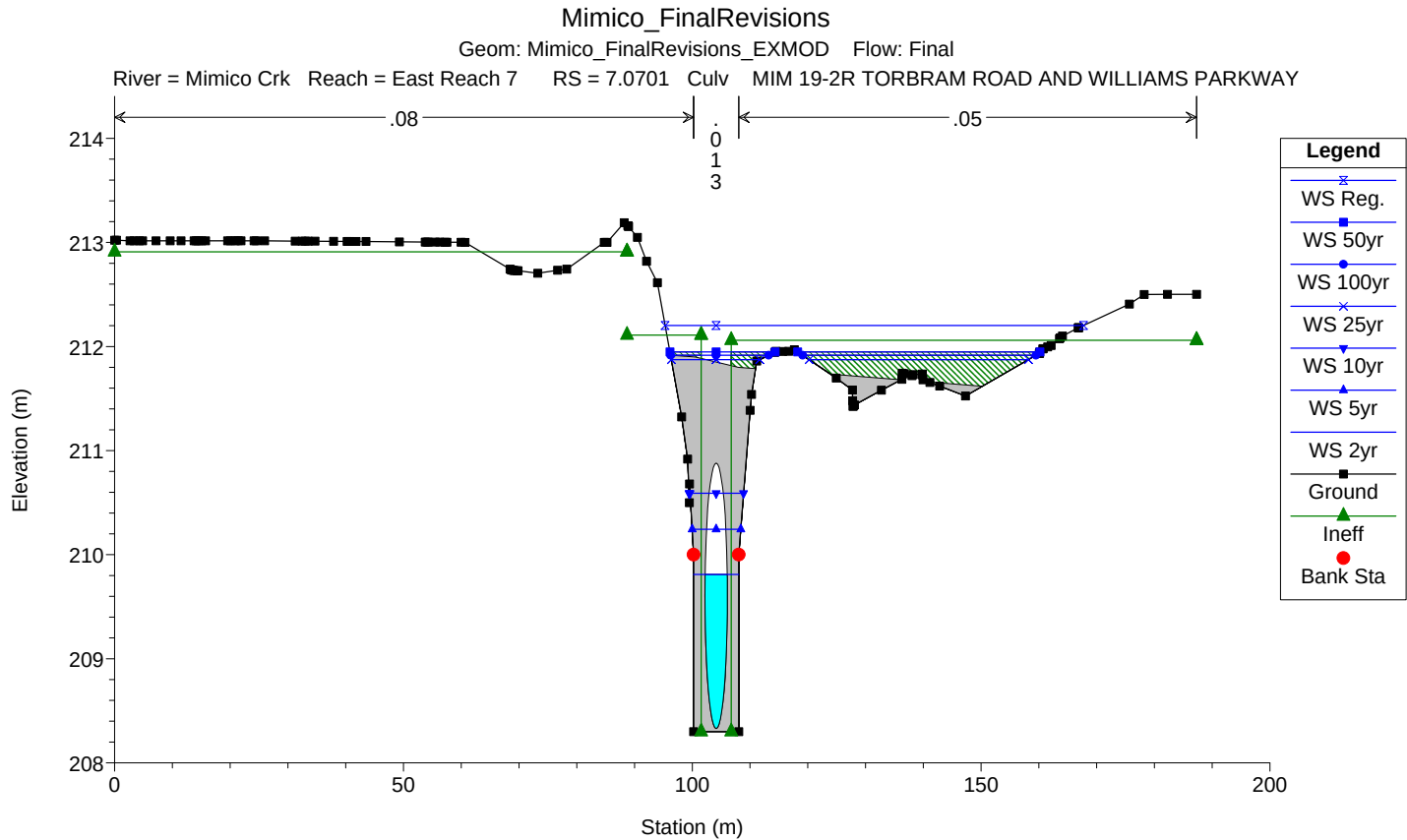
EXISTING CONDITION

WATER SURFACE PROFILE - MODIFIED EXISTING

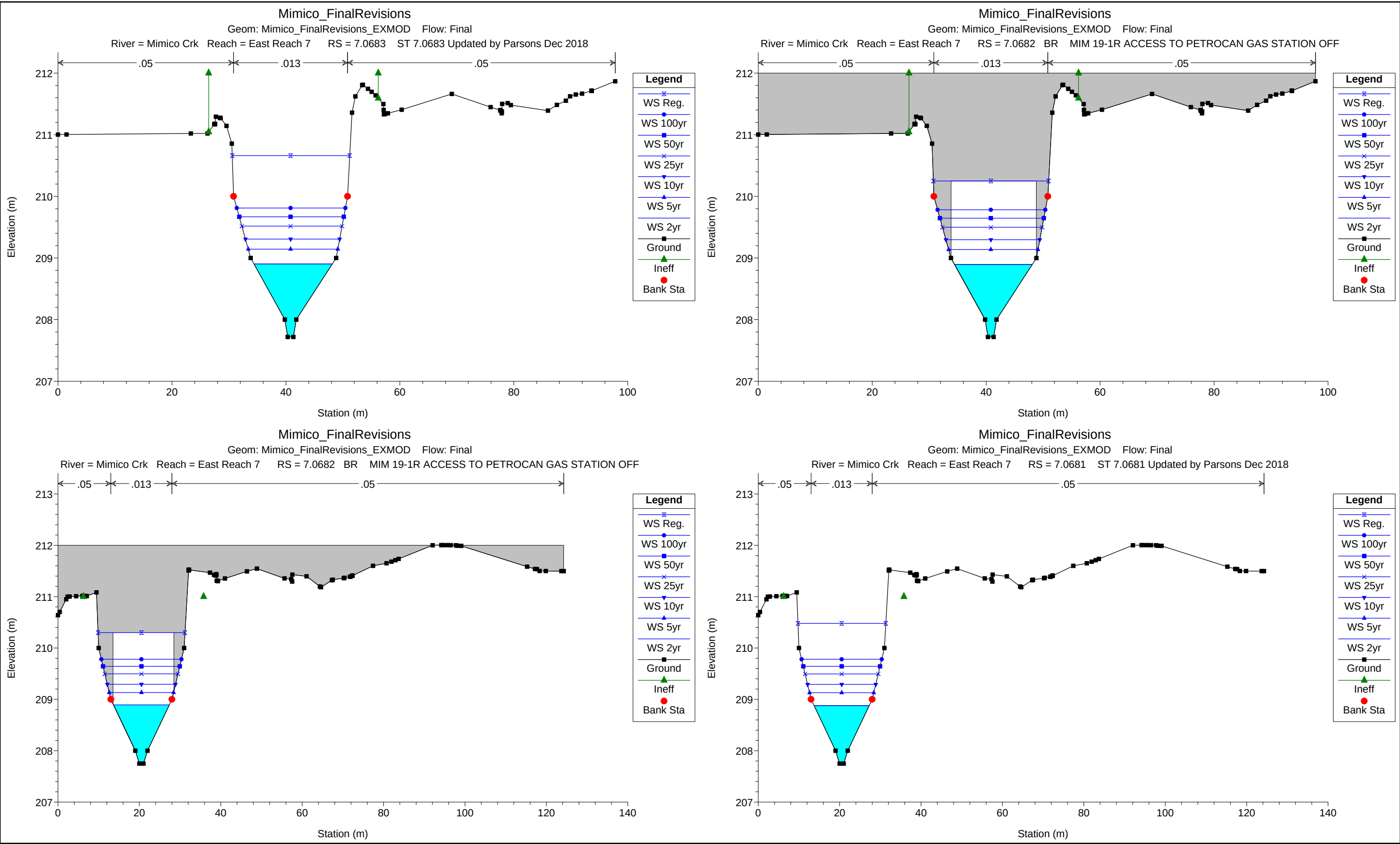


MODIFIED EXISTING CONDITION GEOMETRY - UPSTREAM AND DOWNSTREAM OF CULVERT ST 7.0701





MODIFIED EXISTING CONDITION GEOMETRY- UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILES - MODIFIED EXISTING

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	11.60	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.49
Q Barrel (m3/s)	11.60	Culv Vel DS (m/s)	2.19
E.G. US. (m)	210.28	Culv Inv El Up (m)	208.33
W.S. US. (m)	210.21	Culv Inv El Dn (m)	207.89
E.G. DS (m)	209.60	Culv Frctn Ls (m)	0.34
W.S. DS (m)	209.54	Culv Exit Loss (m)	0.18
Delta EG (m)	0.68	Culv Entr Loss (m)	0.16
Delta WS (m)	0.67	Q Weir (m3/s)	
E.G. IC (m)	210.13	Weir Sta Lft (m)	
E.G. OC (m)	210.28	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.81	Weir Max Depth (m)	
Culv WS Outlet (m)	209.54	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.43	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.24	Min El Weir Flow (m)	211.82

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	16.50	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.64
Q Barrel (m3/s)	16.50	Culv Vel DS (m/s)	2.48
E.G. US. (m)	210.78	Culv Inv El Up (m)	208.33
W.S. US. (m)	210.69	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.01	Culv Frctn Ls (m)	0.35
W.S. DS (m)	209.93	Culv Exit Loss (m)	0.24
Delta EG (m)	0.77	Culv Entr Loss (m)	0.18
Delta WS (m)	0.75	Q Weir (m3/s)	
E.G. IC (m)	210.59	Weir Sta Lft (m)	
E.G. OC (m)	210.78	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.24	Weir Max Depth (m)	
Culv WS Outlet (m)	209.93	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.81	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.50	Min El Weir Flow (m)	211.82

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	20.00	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.75
Q Barrel (m3/s)	20.00	Culv Vel DS (m/s)	2.72
E.G. US. (m)	211.17	Culv Inv El Up (m)	208.33
W.S. US. (m)	211.07	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.27	Culv Frctn Ls (m)	0.41
W.S. DS (m)	210.19	Culv Exit Loss (m)	0.29
Delta EG (m)	0.90	Culv Entr Loss (m)	0.19
Delta WS (m)	0.88	Q Weir (m3/s)	
E.G. IC (m)	210.92	Weir Sta Lft (m)	
E.G. OC (m)	211.17	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.59	Weir Max Depth (m)	
Culv WS Outlet (m)	210.19	Weir Avg Depth (m)	
Culv Nml Depth (m)	2.16	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.66	Min El Weir Flow (m)	211.82

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	24.32	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	3.14
Q Barrel (m3/s)	24.32	Culv Vel DS (m/s)	3.14
E.G. US. (m)	211.96	Culv Inv El Up (m)	208.33
W.S. US. (m)	211.87	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.58	Culv Frctn Ls (m)	0.73
W.S. DS (m)	210.49	Culv Exit Loss (m)	0.41
Delta EG (m)	1.39	Culv Entr Loss (m)	0.25
Delta WS (m)	1.39	Q Weir (m3/s)	0.28
E.G. IC (m)	211.35	Weir Sta Lft (m)	101.54
E.G. OC (m)	211.96	Weir Sta Rgt (m)	106.74
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.15
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.11
Culv Nml Depth (m)		Weir Flow Area (m2)	0.59
Culv Crt Depth (m)	1.83	Min El Weir Flow (m)	211.82

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	23.36	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	3.01
Q Barrel (m3/s)	23.36	Culv Vel DS (m/s)	3.01
E.G. US. (m)	212.06	Culv Inv El Up (m)	208.33
W.S. US. (m)	211.95	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.80	Culv Frctn Ls (m)	0.67
W.S. DS (m)	210.70	Culv Exit Loss (m)	0.36
Delta EG (m)	1.26	Culv Entr Loss (m)	0.23
Delta WS (m)	1.25	Q Weir (m3/s)	13.45
E.G. IC (m)	211.75	Weir Sta Lft (m)	101.54
E.G. OC (m)	212.06	Weir Sta Rgt (m)	163.24
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.44
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.28
Culv Nml Depth (m)		Weir Flow Area (m2)	17.24
Culv Crt Depth (m)	1.79	Min El Weir Flow (m)	211.82

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	21.66	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	2.79
Q Barrel (m3/s)	21.66	Culv Vel DS (m/s)	2.79
E.G. US. (m)	212.06	Culv Inv El Up (m)	208.33
W.S. US. (m)	211.92	Culv Inv El Dn (m)	207.89
E.G. DS (m)	210.99	Culv Frctn Ls (m)	0.58
W.S. DS (m)	210.89	Culv Exit Loss (m)	0.29
Delta EG (m)	1.07	Culv Entr Loss (m)	0.20
Delta WS (m)	1.03	Q Weir (m3/s)	0.69
E.G. IC (m)	212.06	Weir Sta Lft (m)	101.54
E.G. OC (m)	212.06	Weir Sta Rgt (m)	106.74
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.24
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.21
Culv Nml Depth (m)		Weir Flow Area (m2)	1.08
Culv Crt Depth (m)	1.72	Min El Weir Flow (m)	211.82

Plan: Plan 45 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	14.04	Culv Full Len (m)	82.00
# Barrels	1	Culv Vel US (m/s)	1.81
Q Barrel (m3/s)	14.04	Culv Vel DS (m/s)	1.81
E.G. US. (m)	212.31	Culv Inv El Up (m)	208.33
W.S. US. (m)	212.20	Culv Inv El Dn (m)	207.89
E.G. DS (m)	211.96	Culv Frctn Ls (m)	0.24
W.S. DS (m)	211.82	Culv Exit Loss (m)	0.03
Delta EG (m)	0.36	Culv Entr Loss (m)	0.08
Delta WS (m)	0.38	Q Weir (m3/s)	36.55
E.G. IC (m)	212.14	Weir Sta Lft (m)	94.96
E.G. OC (m)	212.31	Weir Sta Rgt (m)	171.94
Culvert Control	Outlet	Weir Submerg	0.12
Culv WS Inlet (m)	210.88	Weir Max Depth (m)	0.69
Culv WS Outlet (m)	210.44	Weir Avg Depth (m)	0.47
Culv Nml Depth (m)		Weir Flow Area (m2)	36.16
Culv Crt Depth (m)	1.38	Min El Weir Flow (m)	211.82

PROFILE OUTPUT TABLE - MODIFIED EXISTING RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	210.21	209.58	210.29	0.000259	1.27	8.82	8.58	0.38
East Reach 7	7.072	5yr	15.70	208.53	210.70	209.78	210.78	0.000154	1.25	13.62	10.74	0.31
East Reach 7	7.072	10yr	18.90	208.53	211.10	209.91	211.18	0.000106	1.20	18.33	12.96	0.27
East Reach 7	7.072	25yr	23.10	208.53	211.93	210.04	211.98	0.000048	1.01	38.91	56.12	0.19
East Reach 7	7.072	50yr	26.30	208.53	212.02	210.14	212.08	0.000055	1.11	44.39	65.92	0.21
East Reach 7	7.072	100yr	29.40	208.53	212.00	210.22	212.08	0.000070	1.25	43.60	63.52	0.23
East Reach 7	7.072	Reg.	46.10	208.53	212.18	210.62	212.34	0.000136	1.80	56.28	74.43	0.33
East Reach 7	7.071	2yr	11.60	208.30	210.21	209.10	210.28	0.000097	1.17	9.94	8.34	0.27
East Reach 7	7.071	5yr	16.50	208.30	210.69	209.31	210.78	0.000094	1.33	12.41	9.65	0.27
East Reach 7	7.071	10yr	20.00	208.30	211.07	209.45	211.17	0.000084	1.39	14.40	10.74	0.27
East Reach 7	7.071	25yr	24.60	208.30	211.87	209.62	211.96	0.000054	1.32	18.59	53.25	0.22
East Reach 7	7.071	50yr	28.10	208.30	211.95	209.74	212.06	0.000066	1.48	18.97	60.14	0.25
East Reach 7	7.071	100yr	31.50	208.30	211.92	209.85	212.06	0.000085	1.68	18.80	57.37	0.28
East Reach 7	7.071	Reg.	50.90	208.30	212.20	210.44	212.31	0.000105	1.54	62.93	72.41	0.25
East Reach 7	7.0701		Culvert									
East Reach 7	7.07	2yr	11.60	207.80	209.54	208.74	209.60	0.000151	1.12	11.03	9.96	0.30
East Reach 7	7.07	5yr	16.50	207.80	209.93	208.93	210.01	0.000130	1.22	15.34	11.75	0.29
East Reach 7	7.07	10yr	20.00	207.80	210.19	209.05	210.27	0.000121	1.29	18.45	12.88	0.29
East Reach 7	7.07	25yr	24.60	207.80	210.49	209.19	210.58	0.000114	1.37	22.50	14.31	0.29
East Reach 7	7.07	50yr	28.10	207.80	210.70	209.29	210.80	0.000110	1.43	25.65	15.90	0.29
East Reach 7	7.07	100yr	31.50	207.80	210.89	209.38	210.99	0.000108	1.48	28.85	17.36	0.29
East Reach 7	7.07	Reg.	50.90	207.80	211.82	209.84	211.96	0.000097	1.71	64.55	89.14	0.29
East Reach 7	7.069	2yr	11.60	207.80	208.96	208.96	209.46	0.001561	3.22	5.76	8.13	0.98
East Reach 7	7.069	5yr	16.50	207.80	209.24	209.24	209.84	0.001422	3.57	8.27	9.69	0.97
East Reach 7	7.069	10yr	20.00	207.80	209.42	209.42	210.09	0.001377	3.80	10.02	10.65	0.97
East Reach 7	7.069	25yr	24.60	207.80	209.63	209.63	210.38	0.001312	4.04	12.43	11.85	0.97

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.78	209.78	210.58	0.001277	4.21	14.27	12.71	0.97
East Reach 7	7.069	100yr	31.50	207.80	209.92	209.92	210.77	0.001247	4.36	16.09	13.51	0.97
East Reach 7	7.069	Reg.	50.90	207.80	210.61	210.61	211.67	0.001128	5.02	26.71	17.47	0.97
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000919	1.54	7.53	13.74	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.12	15.72	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000472	1.45	13.76	16.53	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000360	1.42	17.34	17.59	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000306	1.40	20.08	18.35	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000268	1.39	22.73	19.06	0.41
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000117	1.28	39.86	20.62	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.70	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.011358	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511	Culvert										
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451	Culvert										
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

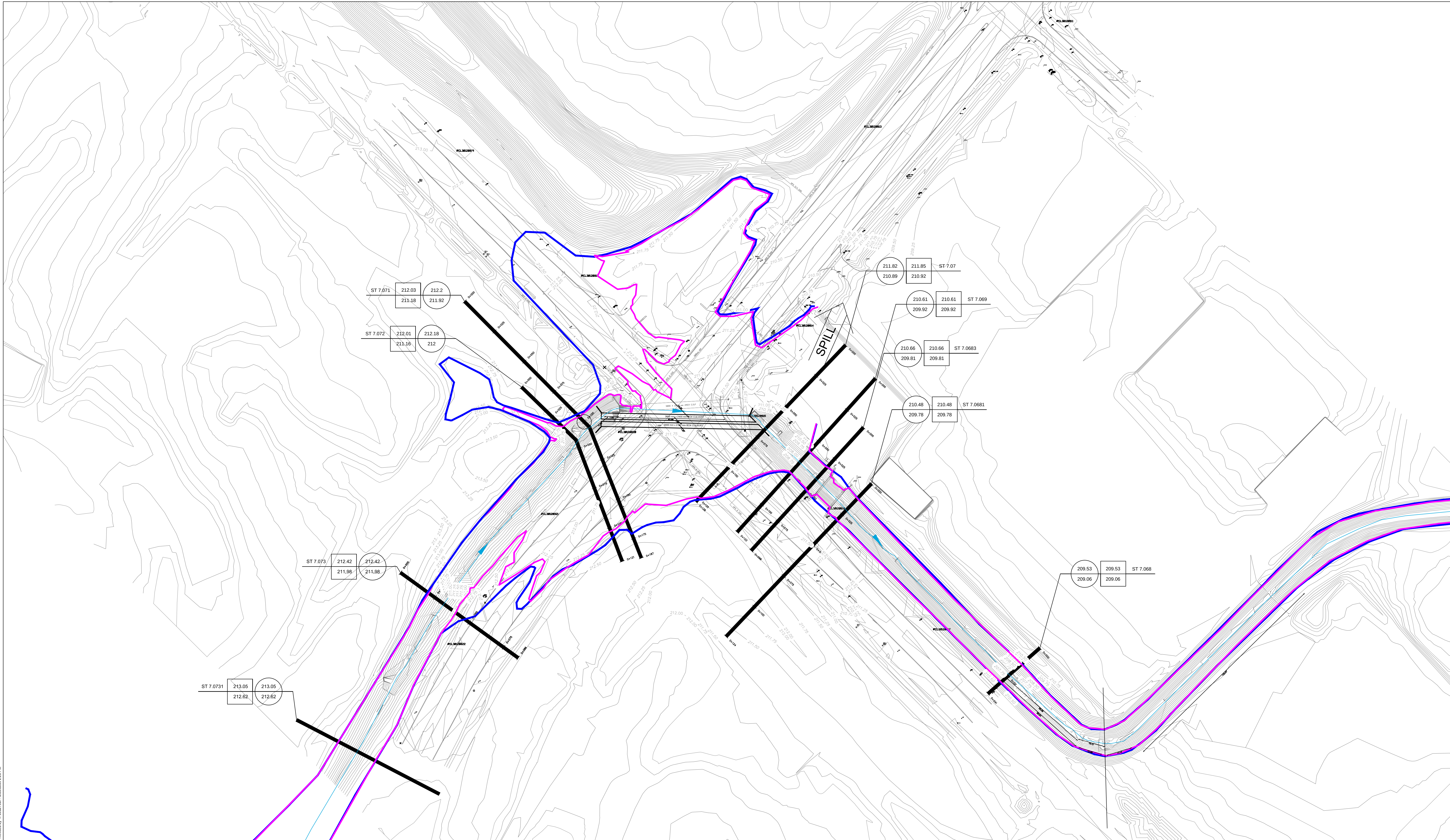
HEC-RAS Plan: Plan 45 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

PROPOSED OPTION 1

(3.4 x 2.4)m & (3.0 x 2.1)m TWIN CULVERT

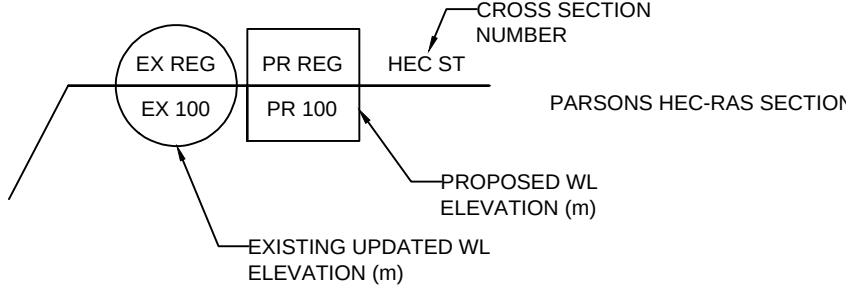
PROPOSED CONDITION



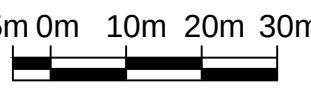
File: G:\18239 TORBRAM ROAD EXHAUSTION\SHED\TDS\K239-S-FP.DWG - revised by: PRL/STW - 10/26/2013 2:21 PM

LEGEND

- PROPOSED CULVERT
- EXISTING REGULATORY FLOODLINE (TRCA)
- PROPOSED REGULATORY FLOODLINE
- CREEK FLOW DIRECTION



SCALE HORIZONTAL
1:1000



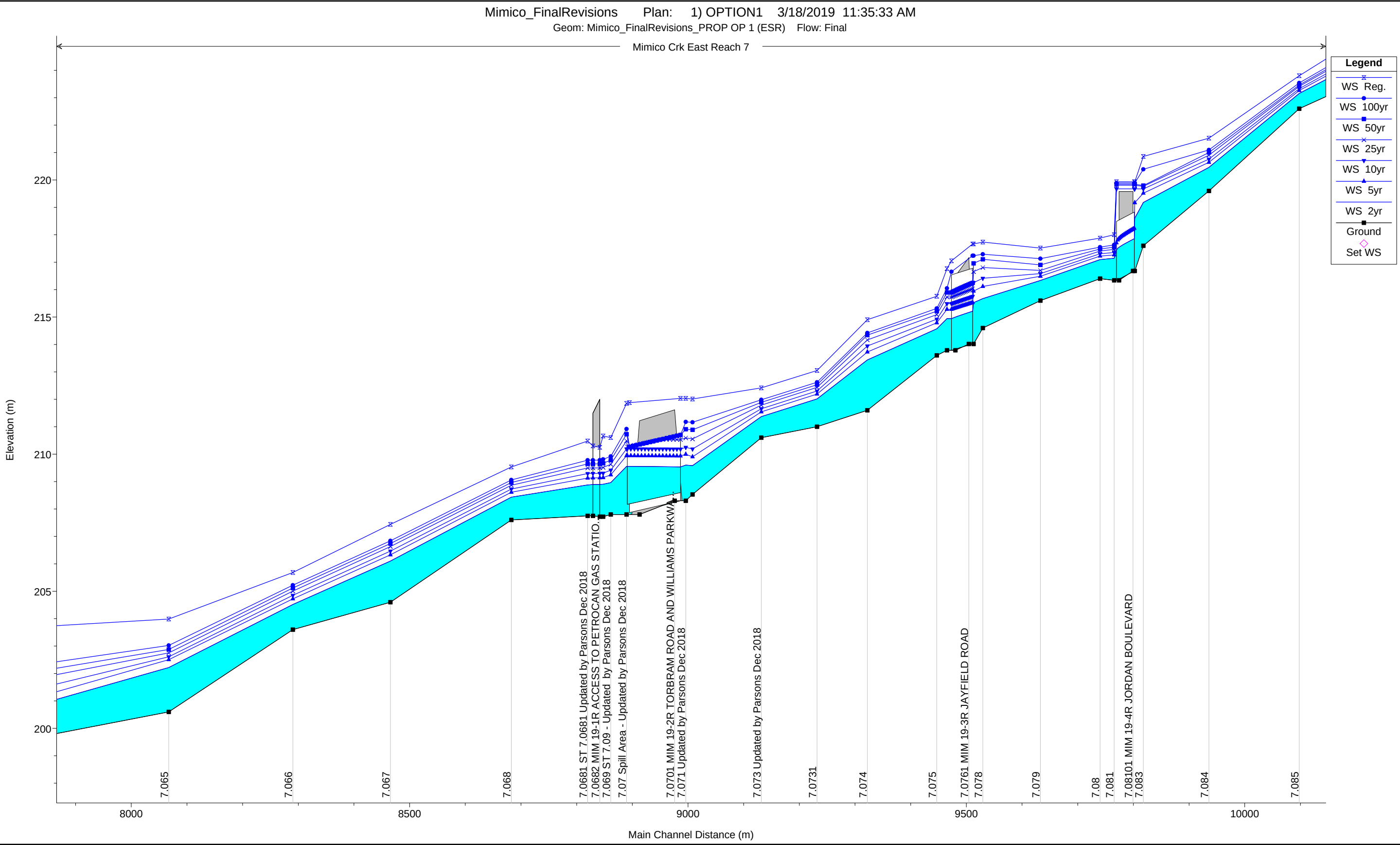
DATE: MARCH 2019
SCALE: 1 : 1000



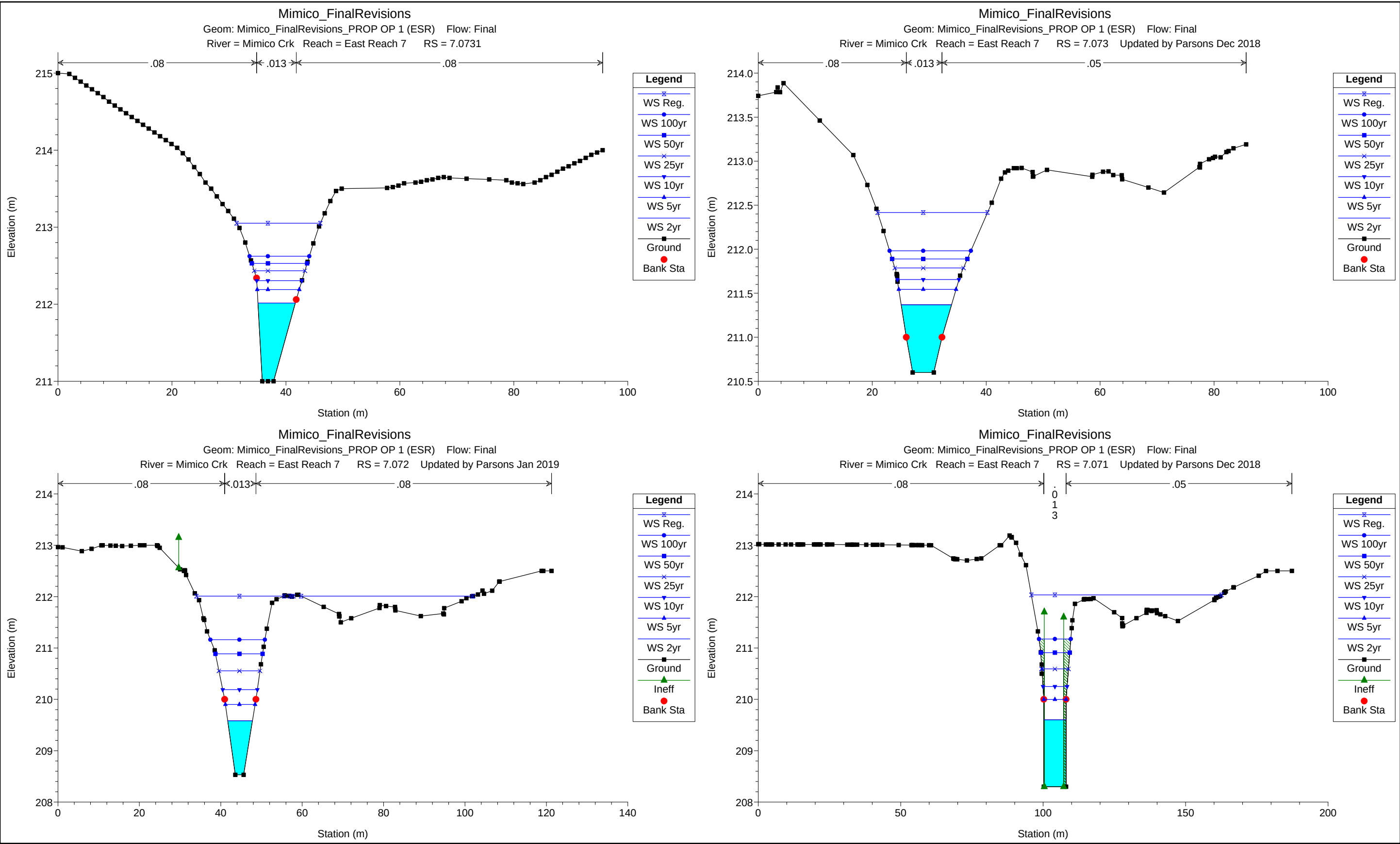
625 COCHRANE DRIVE, SUITE 500
MARKHAM, ONTARIO L3R 9R9
TEL: 905-943-0500
FAX: 905-943-0400

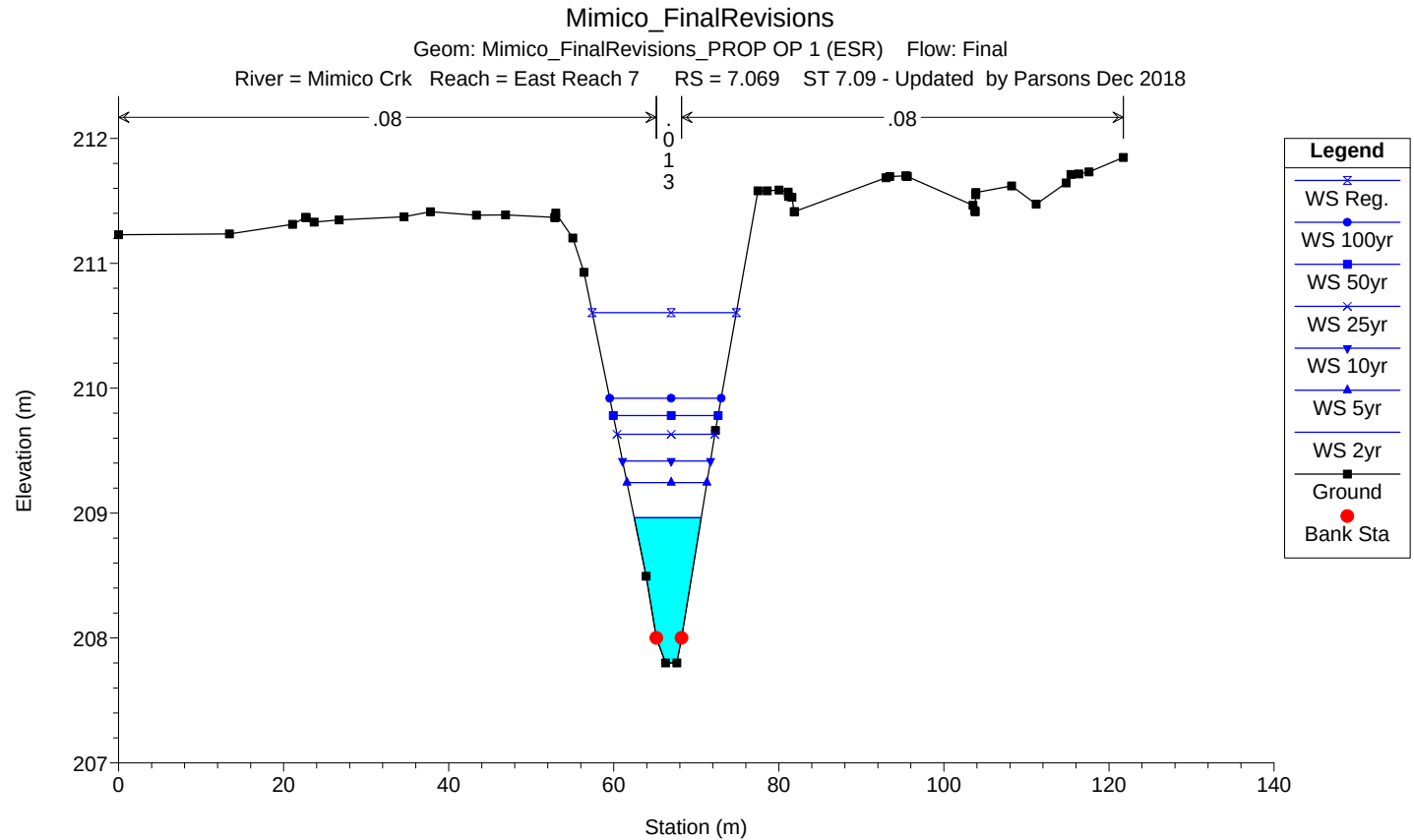
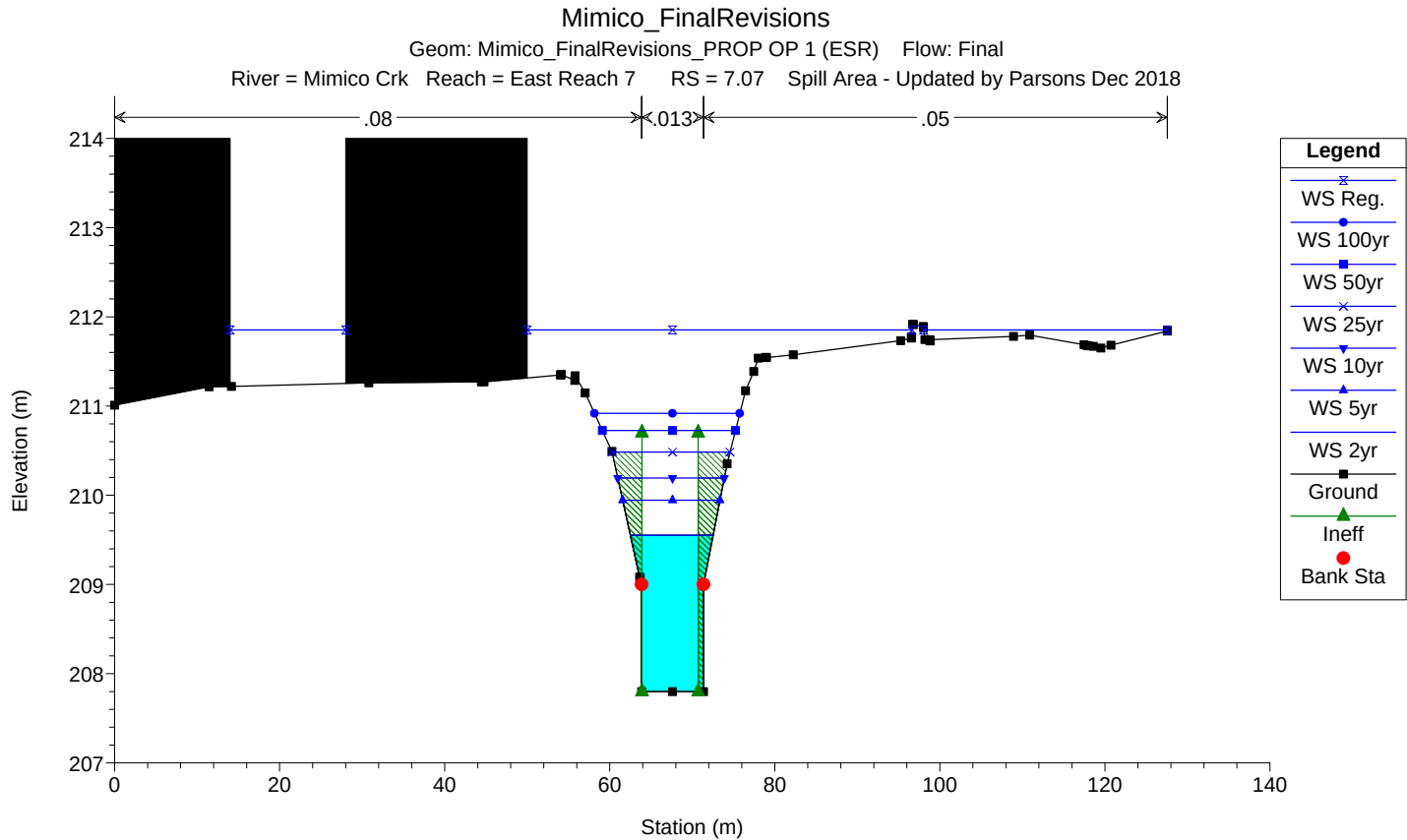
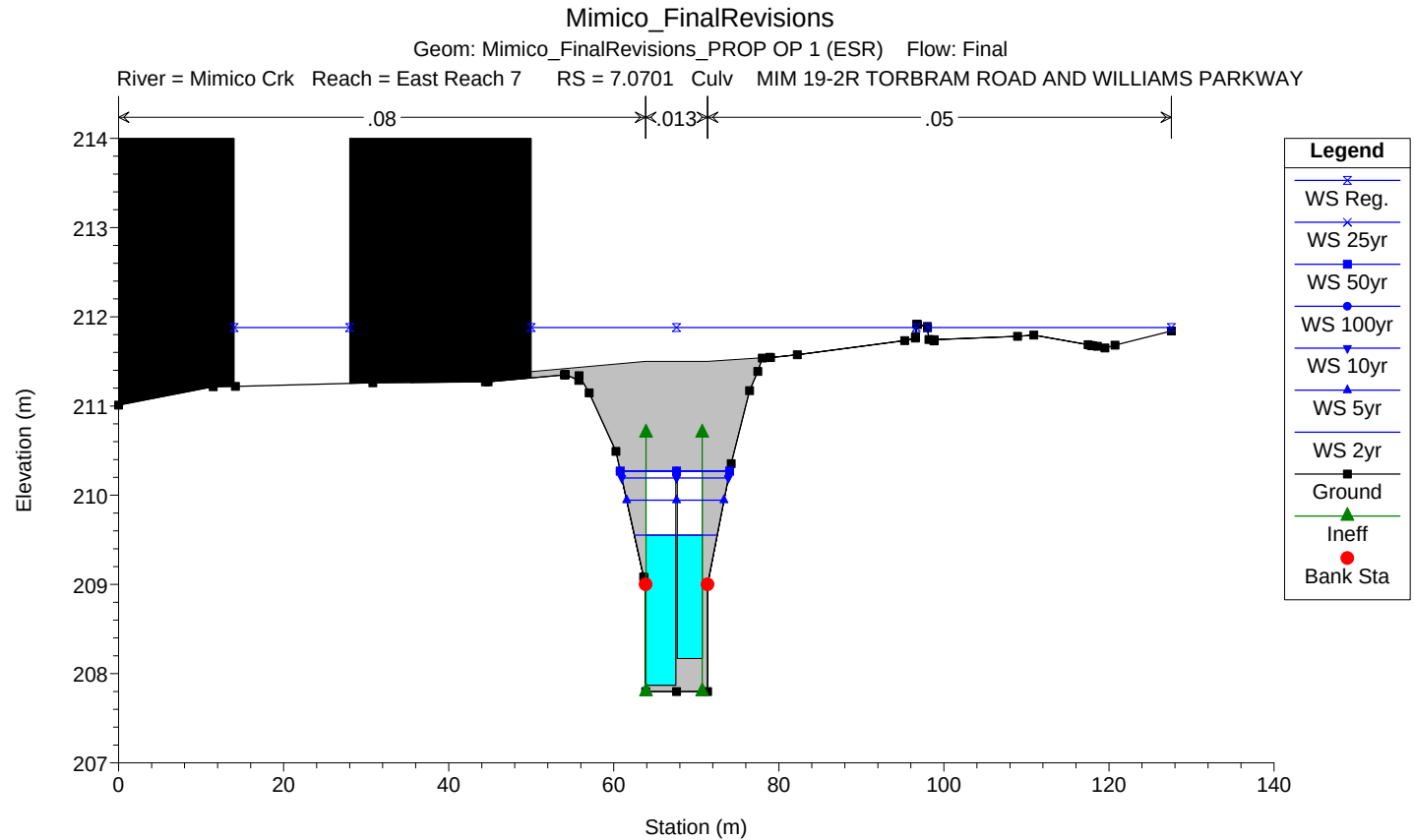
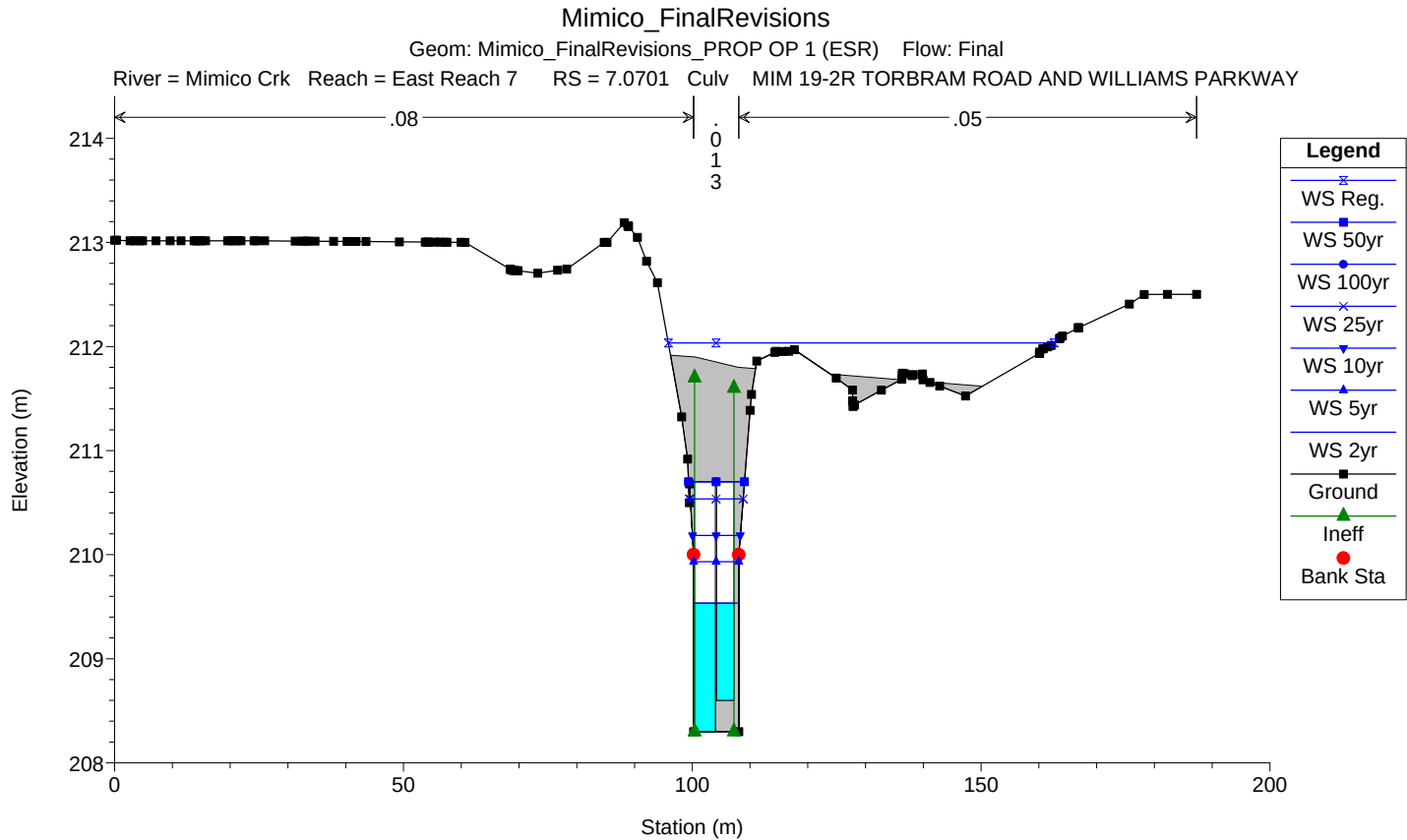
TORBRAM ROAD FROM BOVAIRD DRIVE TO QUEENS STREET EAST
ESR TWIN CULVERT
FLOODPLAIN MAP ESR TWIN CULVERT - TORBRAM ROAD AND WILLIAMS PARKWAY INTERSECTION

WATER SURFACE PROFILE - PROPOSED OPTION 1

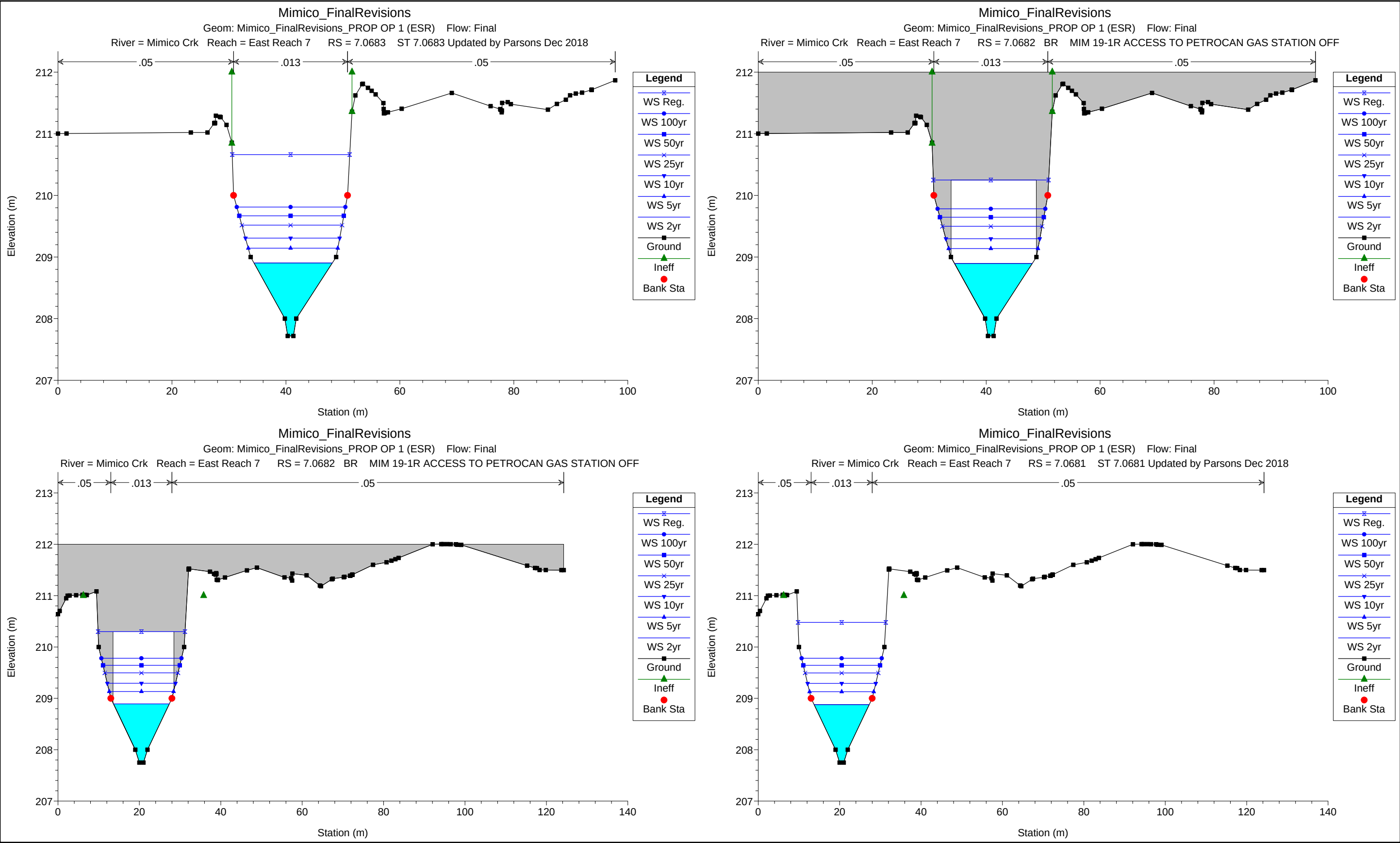


PROPOSED CONDITION: OPTION 1 - UPSTREAM AND DOWNSTREAM OF TWIN CULVERT ST 7.0701





PROPOSED CONDITION: OPTION 1 GEOMETRY- UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILES - PROPOSED OPTION 1

3.6 m x 2.4 m BOX CULVERT

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	7.36	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.66
Q Barrel (m3/s)	7.36	Culv Vel DS (m/s)	1.21
E.G. US. (m)	209.69	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.60	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.60	Culv Frctn Ls (m)	0.04
W.S. DS (m)	209.55	Culv Exit Loss (m)	0.03
Delta EG (m)	0.09	Culv Entr Loss (m)	0.03
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.48	Weir Sta Lft (m)	
E.G. OC (m)	209.70	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.53	Weir Max Depth (m)	
Culv WS Outlet (m)	209.55	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.64	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.75	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	10.17	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.74
Q Barrel (m3/s)	10.17	Culv Vel DS (m/s)	1.36
E.G. US. (m)	210.10	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.00	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.01	Culv Frctn Ls (m)	0.04
W.S. DS (m)	209.94	Culv Exit Loss (m)	0.03
Delta EG (m)	0.09	Culv Entr Loss (m)	0.03
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.78	Weir Sta Lft (m)	
E.G. OC (m)	210.11	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.93	Weir Max Depth (m)	
Culv WS Outlet (m)	209.94	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.80	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.93	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	12.18	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.80
Q Barrel (m3/s)	12.18	Culv Vel DS (m/s)	1.46
E.G. US. (m)	210.37	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.25	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.27	Culv Frctn Ls (m)	0.04
W.S. DS (m)	210.19	Culv Exit Loss (m)	0.03
Delta EG (m)	0.10	Culv Entr Loss (m)	0.03
Delta WS (m)	0.06	Q Weir (m3/s)	
E.G. IC (m)	209.98	Weir Sta Lft (m)	
E.G. OC (m)	210.38	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.18	Weir Max Depth (m)	
Culv WS Outlet (m)	210.19	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.90	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.05	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	14.12	Culv Full Len (m)	53.72
# Barrels	1	Culv Vel US (m/s)	1.77
Q Barrel (m3/s)	14.12	Culv Vel DS (m/s)	1.63
E.G. US. (m)	210.72	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.59	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.58	Culv Frctn Ls (m)	0.06
W.S. DS (m)	210.48	Culv Exit Loss (m)	0.04
Delta EG (m)	0.14	Culv Entr Loss (m)	0.03
Delta WS (m)	0.11	Q Weir (m3/s)	
E.G. IC (m)	210.16	Weir Sta Lft (m)	
E.G. OC (m)	210.71	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.52	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.00	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.16	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	16.59	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	1.92
Q Barrel (m3/s)	16.59	Culv Vel DS (m/s)	1.92
E.G. US. (m)	211.04	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.91	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.80	Culv Frctn Ls (m)	0.09
W.S. DS (m)	210.73	Culv Exit Loss (m)	0.11
Delta EG (m)	0.23	Culv Entr Loss (m)	0.04
Delta WS (m)	0.18	Q Weir (m3/s)	
E.G. IC (m)	210.37	Weir Sta Lft (m)	
E.G. OC (m)	211.04	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.29	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	18.48	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	2.14
Q Barrel (m3/s)	18.48	Culv Vel DS (m/s)	2.14
E.G. US. (m)	211.31	Culv Inv El Up (m)	208.30
W.S. US. (m)	211.18	Culv Inv El Dn (m)	207.87
E.G. DS (m)	211.00	Culv Frctn Ls (m)	0.11
W.S. DS (m)	210.92	Culv Exit Loss (m)	0.15
Delta EG (m)	0.31	Culv Entr Loss (m)	0.05
Delta WS (m)	0.26	Q Weir (m3/s)	
E.G. IC (m)	210.54	Weir Sta Lft (m)	
E.G. OC (m)	211.31	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.39	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	16.44	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	1.90
Q Barrel (m3/s)	16.44	Culv Vel DS (m/s)	1.90
E.G. US. (m)	212.17	Culv Inv El Up (m)	208.30
W.S. US. (m)	212.03	Culv Inv El Dn (m)	207.87
E.G. DS (m)	211.96	Culv Frctn Ls (m)	0.09
W.S. DS (m)	211.85	Culv Exit Loss (m)	0.07
Delta EG (m)	0.20	Culv Entr Loss (m)	0.04
Delta WS (m)	0.18	Q Weir (m3/s)	22.63
E.G. IC (m)	210.36	Weir Sta Lft (m)	95.42
E.G. OC (m)	212.16	Weir Sta Rgt (m)	166.46
Culvert Control	Outlet	Weir Submerg	0.23
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	0.55
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	0.36
Culv Nml Depth (m)		Weir Flow Area (m2)	25.64
Culv Crt Depth (m)	1.29	Min El Weir Flow (m)	211.62

CULVERT OUTPUT FILES - PROPOSED OPTION 1

3.0 m x 2.1 m BOX CULVERT

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 2yr

Q Culv Group (m3/s)	4.24	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.51
Q Barrel (m3/s)	4.24	Culv Vel DS (m/s)	1.02
E.G. US. (m)	209.69	Culv Inv El Up (m)	208.60
W.S. US. (m)	209.60	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.60	Culv Frctn Ls (m)	0.05
W.S. DS (m)	209.55	Culv Exit Loss (m)	0.01
Delta EG (m)	0.09	Culv Entr Loss (m)	0.02
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.52	Weir Sta Lft (m)	
E.G. OC (m)	209.67	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.53	Weir Max Depth (m)	
Culv WS Outlet (m)	209.55	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.52	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.59	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 5yr

Q Culv Group (m3/s)	6.33	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.58
Q Barrel (m3/s)	6.33	Culv Vel DS (m/s)	1.19
E.G. US. (m)	210.10	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.00	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.01	Culv Frctn Ls (m)	0.04
W.S. DS (m)	209.94	Culv Exit Loss (m)	0.01
Delta EG (m)	0.09	Culv Entr Loss (m)	0.03
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.82	Weir Sta Lft (m)	
E.G. OC (m)	210.09	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.93	Weir Max Depth (m)	
Culv WS Outlet (m)	209.94	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.68	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.77	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 10yr

Q Culv Group (m3/s)	7.82	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.65
Q Barrel (m3/s)	7.82	Culv Vel DS (m/s)	1.29
E.G. US. (m)	210.37	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.25	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.27	Culv Frctn Ls (m)	0.05
W.S. DS (m)	210.19	Culv Exit Loss (m)	0.01
Delta EG (m)	0.10	Culv Entr Loss (m)	0.03
Delta WS (m)	0.06	Q Weir (m3/s)	
E.G. IC (m)	210.01	Weir Sta Lft (m)	
E.G. OC (m)	210.35	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.18	Weir Max Depth (m)	
Culv WS Outlet (m)	210.19	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.79	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.88	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 25yr

Q Culv Group (m3/s)	10.48	Culv Full Len (m)	59.46
# Barrels	1	Culv Vel US (m/s)	1.80
Q Barrel (m3/s)	10.48	Culv Vel DS (m/s)	1.66
E.G. US. (m)	210.72	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.59	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.58	Culv Frctn Ls (m)	0.08
W.S. DS (m)	210.48	Culv Exit Loss (m)	0.05
Delta EG (m)	0.14	Culv Entr Loss (m)	0.03
Delta WS (m)	0.11	Q Weir (m3/s)	
E.G. IC (m)	210.32	Weir Sta Lft (m)	
E.G. OC (m)	210.73	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.54	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.97	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.08	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 50yr

Q Culv Group (m3/s)	11.51	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	1.83
Q Barrel (m3/s)	11.51	Culv Vel DS (m/s)	1.83
E.G. US. (m)	211.04	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.91	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.80	Culv Frctn Ls (m)	0.11
W.S. DS (m)	210.73	Culv Exit Loss (m)	0.09
Delta EG (m)	0.23	Culv Entr Loss (m)	0.03
Delta WS (m)	0.18	Q Weir (m3/s)	
E.G. IC (m)	210.44	Weir Sta Lft (m)	
E.G. OC (m)	211.03	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.14	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 100yr

Q Culv Group (m3/s)	13.02	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	2.07
Q Barrel (m3/s)	13.02	Culv Vel DS (m/s)	2.07
E.G. US. (m)	211.31	Culv Inv El Up (m)	208.60
W.S. US. (m)	211.18	Culv Inv El Dn (m)	208.17
E.G. DS (m)	211.00	Culv Frctn Ls (m)	0.13
W.S. DS (m)	210.92	Culv Exit Loss (m)	0.13
Delta EG (m)	0.31	Culv Entr Loss (m)	0.04
Delta WS (m)	0.26	Q Weir (m3/s)	
E.G. IC (m)	210.60	Weir Sta Lft (m)	
E.G. OC (m)	211.31	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.24	Min El Weir Flow (m)	211.62

Plan: PROP OP 1 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: Reg.

Q Culv Group (m3/s)	11.83	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	1.88
Q Barrel (m3/s)	11.83	Culv Vel DS (m/s)	1.88
E.G. US. (m)	212.17	Culv Inv El Up (m)	208.60
W.S. US. (m)	212.03	Culv Inv El Dn (m)	208.17
E.G. DS (m)	211.96	Culv Frctn Ls (m)	0.10
W.S. DS (m)	211.85	Culv Exit Loss (m)	0.07
Delta EG (m)	0.20	Culv Entr Loss (m)	0.04
Delta WS (m)	0.18	Q Weir (m3/s)	22.63
E.G. IC (m)	210.47	Weir Sta Lft (m)	95.42
E.G. OC (m)	212.18	Weir Sta Rgt (m)	166.46
Culvert Control	Outlet	Weir Submerg	0.23
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	0.55
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	0.36
Culv Nml Depth (m)		Weir Flow Area (m2)	25.64
Culv Crt Depth (m)	1.17	Min El Weir Flow (m)	211.62

PROFILE OUTPUT TABLE - PROPOSED OPTION 1

RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	209.58	209.58	209.93	0.002038	2.60	4.27	6.07	0.99
East Reach 7	7.072	5yr	15.70	208.53	209.90	209.78	210.21	0.001358	2.45	6.41	7.30	0.83
East Reach 7	7.072	10yr	18.90	208.53	210.19	209.91	210.44	0.000789	2.20	8.68	8.50	0.66
East Reach 7	7.072	25yr	23.10	208.53	210.56	210.04	210.76	0.000457	2.02	12.09	10.10	0.53
East Reach 7	7.072	50yr	26.30	208.53	210.89	210.14	211.06	0.000301	1.87	15.67	11.57	0.44
East Reach 7	7.072	100yr	29.40	208.53	211.16	210.22	211.33	0.000233	1.81	19.08	13.38	0.40
East Reach 7	7.072	Reg.	46.10	208.53	212.01	210.62	212.19	0.000172	1.95	43.95	64.58	0.36
East Reach 7	7.071	2yr	11.60	208.30	209.60	208.97	209.69	0.000204	1.31	8.85	7.82	0.37
East Reach 7	7.071	5yr	16.50	208.30	210.00	209.14	210.10	0.000171	1.43	11.54	7.82	0.35
East Reach 7	7.071	10yr	20.00	208.30	210.25	209.26	210.37	0.000158	1.51	13.26	8.43	0.34
East Reach 7	7.071	25yr	24.60	208.30	210.59	209.40	210.72	0.000139	1.58	15.59	9.35	0.33
East Reach 7	7.071	50yr	28.10	208.30	210.91	209.50	211.04	0.000118	1.58	17.74	10.11	0.31
East Reach 7	7.071	100yr	31.50	208.30	211.18	209.60	211.31	0.000107	1.61	19.56	11.16	0.30
East Reach 7	7.071	Reg.	50.90	208.30	212.03	210.09	212.17	0.000130	1.66	51.24	66.79	0.27
East Reach 7	7.0701		Culvert									
East Reach 7	7.07	2yr	11.60	207.80	209.55	208.47	209.60	0.000076	0.97	11.92	10.03	0.23
East Reach 7	7.07	5yr	16.50	207.80	209.94	208.65	210.01	0.000078	1.13	14.58	11.79	0.25
East Reach 7	7.07	10yr	20.00	207.80	210.19	208.76	210.27	0.000080	1.23	16.27	12.91	0.25
East Reach 7	7.07	25yr	24.60	207.80	210.48	208.90	210.58	0.000082	1.35	18.26	14.30	0.26
East Reach 7	7.07	50yr	28.10	207.80	210.73	209.01	210.80	0.000091	1.24	28.81	16.14	0.23
East Reach 7	7.07	100yr	31.50	207.80	210.92	209.10	211.00	0.000091	1.30	32.04	17.61	0.24
East Reach 7	7.07	Reg.	50.90	207.80	211.85	209.59	211.96	0.000090	1.54	70.29	90.14	0.24
East Reach 7	7.069	2yr	11.60	207.80	208.96	208.96	209.46	0.001561	3.22	5.76	8.13	0.98
East Reach 7	7.069	5yr	16.50	207.80	209.24	209.24	209.84	0.001422	3.57	8.27	9.69	0.97
East Reach 7	7.069	10yr	20.00	207.80	209.42	209.42	210.09	0.001377	3.80	10.02	10.65	0.97
East Reach 7	7.069	25yr	24.60	207.80	209.63	209.63	210.38	0.001312	4.04	12.43	11.85	0.97

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.78	209.78	210.58	0.001277	4.21	14.27	12.71	0.97
East Reach 7	7.069	100yr	31.50	207.80	209.92	209.92	210.77	0.001247	4.36	16.09	13.51	0.97
East Reach 7	7.069	Reg.	50.90	207.80	210.61	210.61	211.67	0.001128	5.02	26.71	17.47	0.97
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000919	1.54	7.53	13.74	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.12	15.72	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000472	1.45	13.76	16.53	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000360	1.42	17.34	17.59	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000306	1.40	20.08	18.35	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000268	1.39	22.73	19.06	0.41
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000117	1.28	39.86	20.62	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.70	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.011358	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511	Culvert										
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451	Culvert										
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

HEC-RAS Plan: PROP OP 1 River: Mimico Crk Reach: East Reach 7 (Continued)

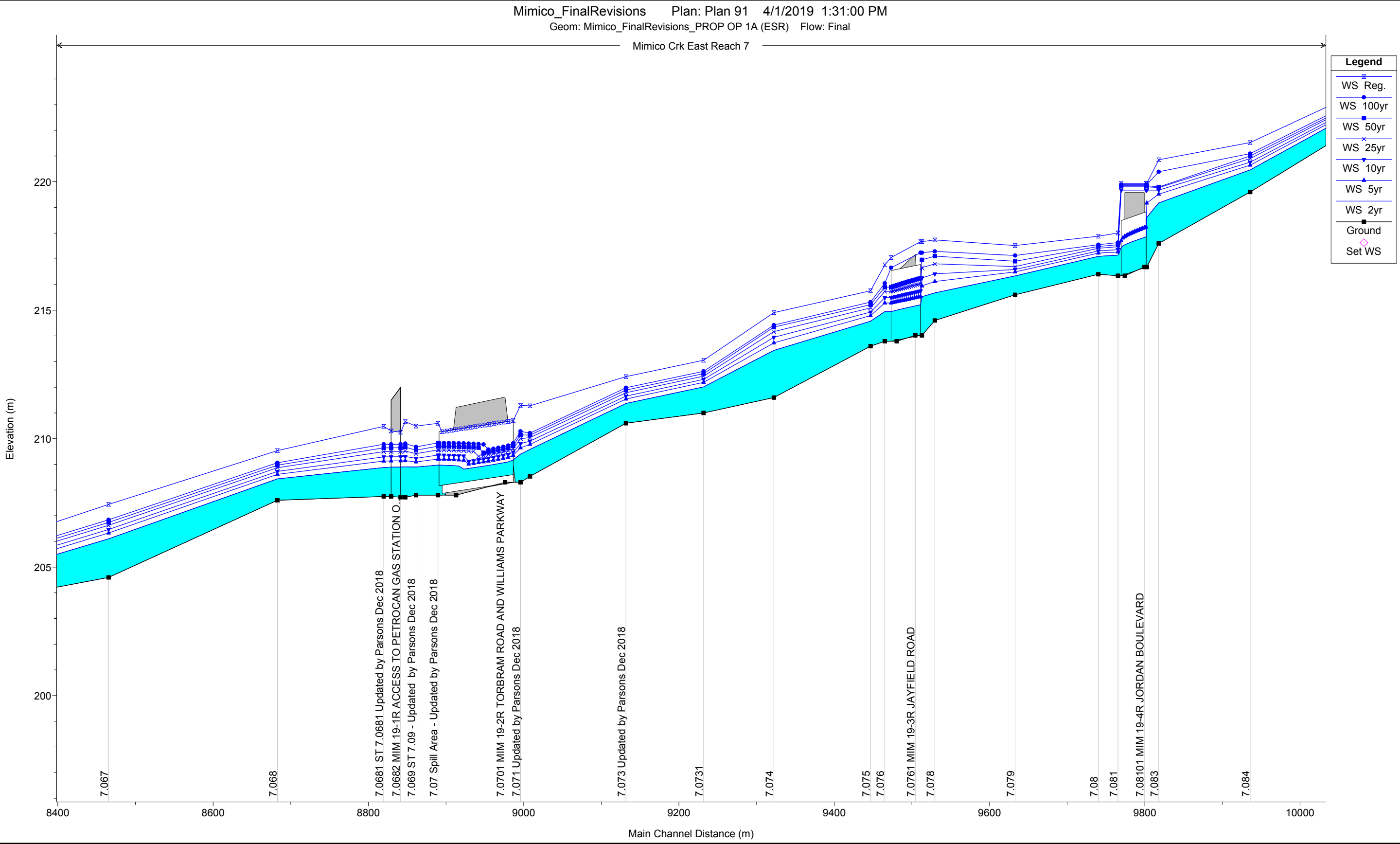
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

PROPOSED OPTION 2

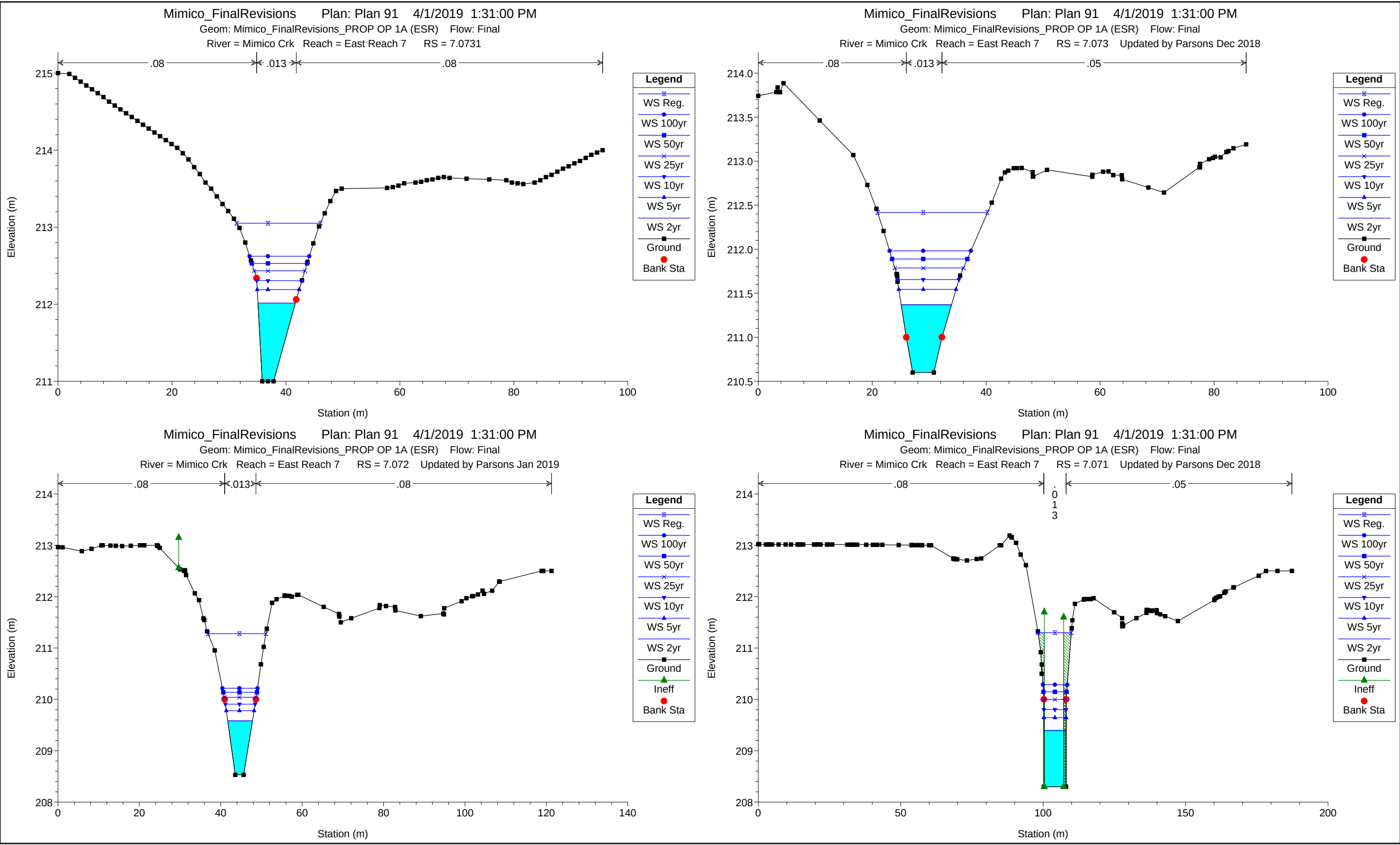
(3.4 x 2.4) m & (3.0 x 2.1) m TWIN CULVERT

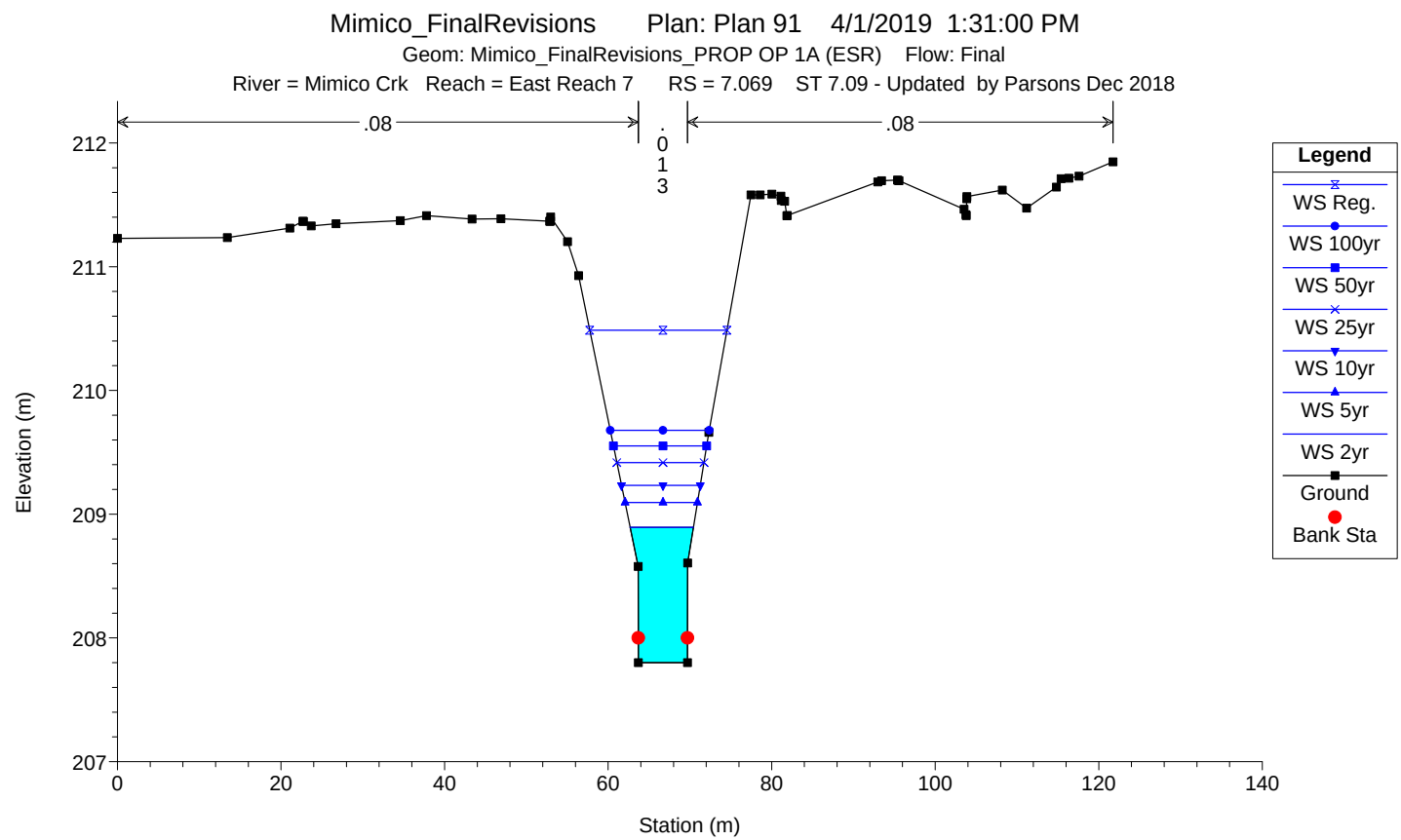
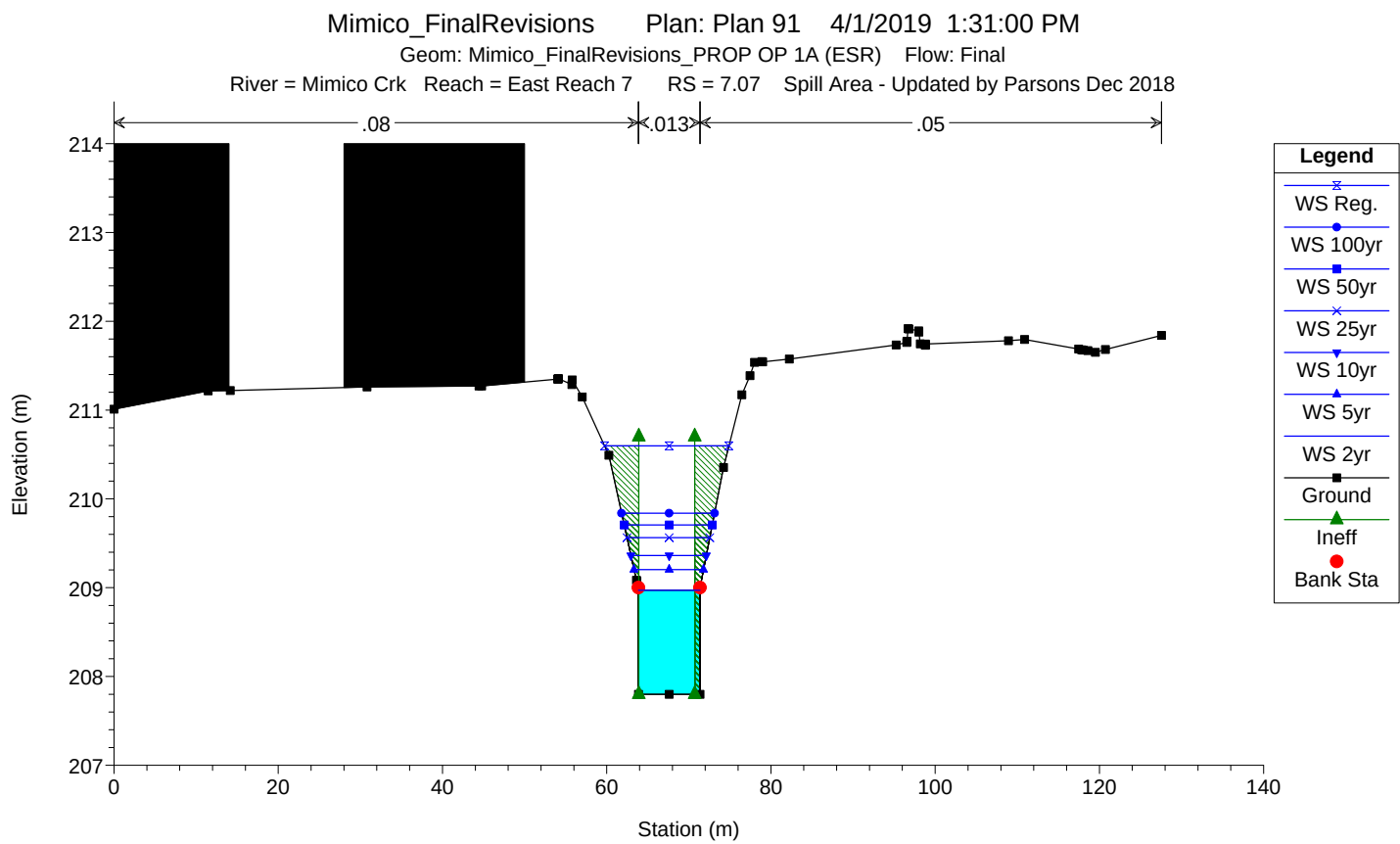
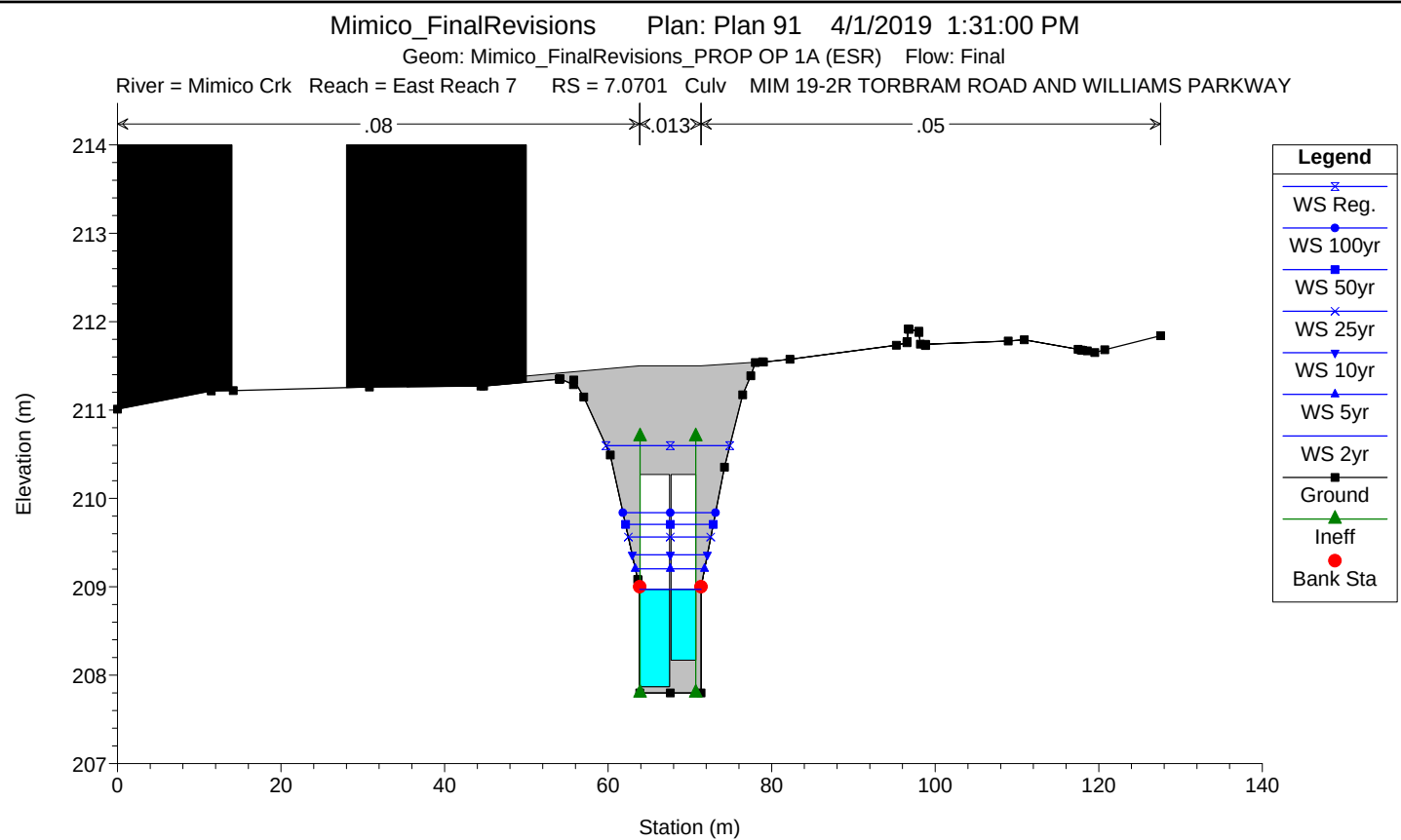
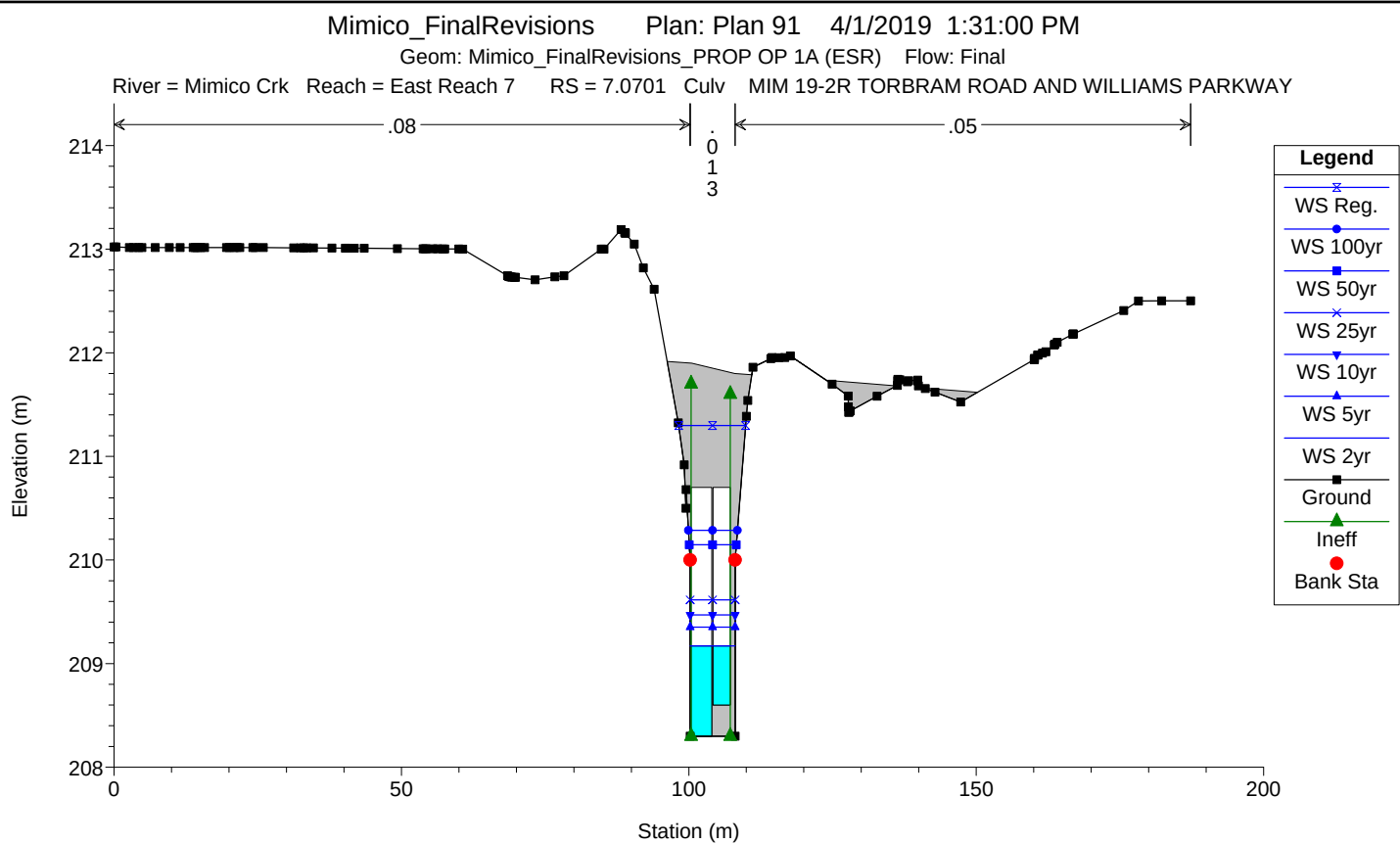
PROPOSED CONDITION - WIDENED CHANNEL

WATER SURFACE PROFILE - PROPOSED OPTION 2

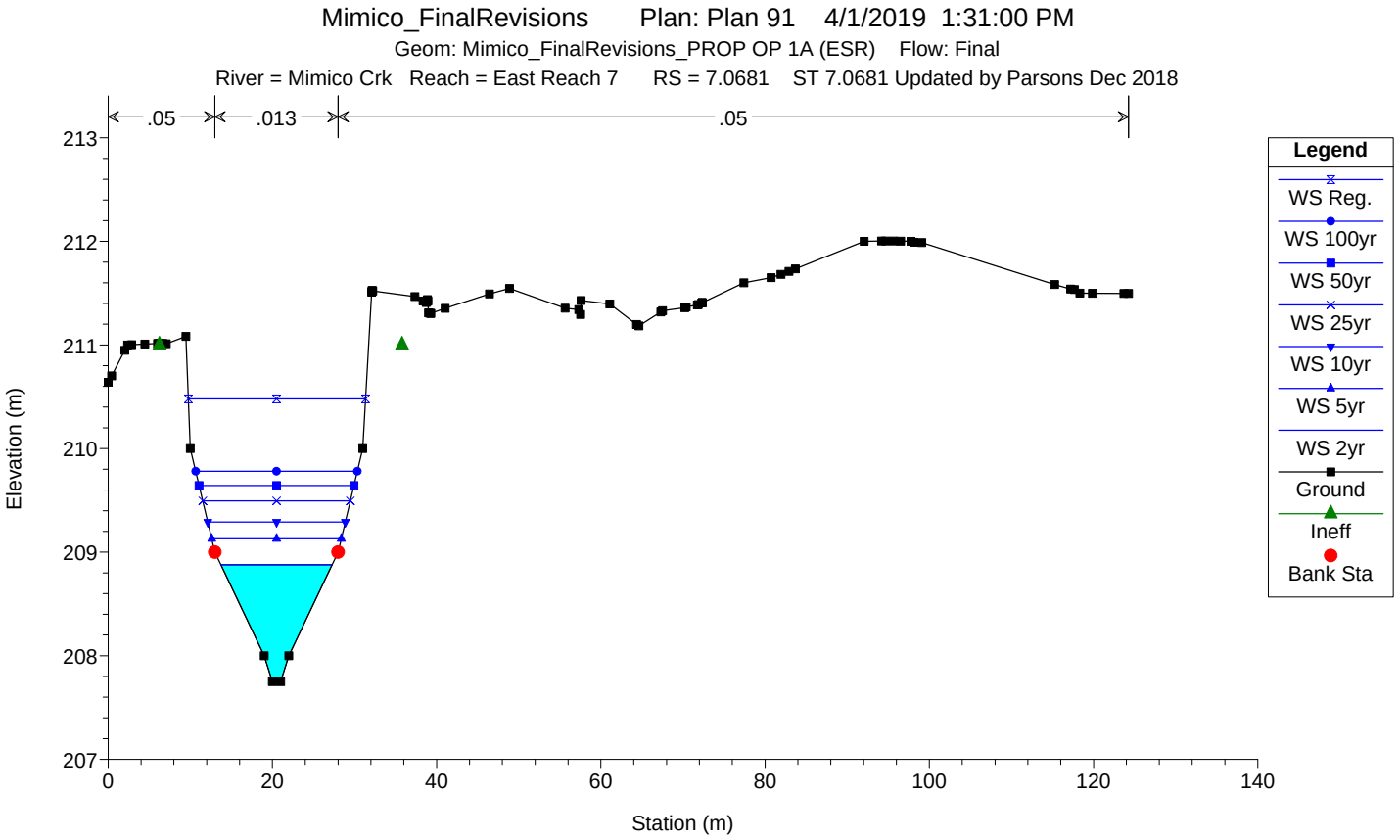
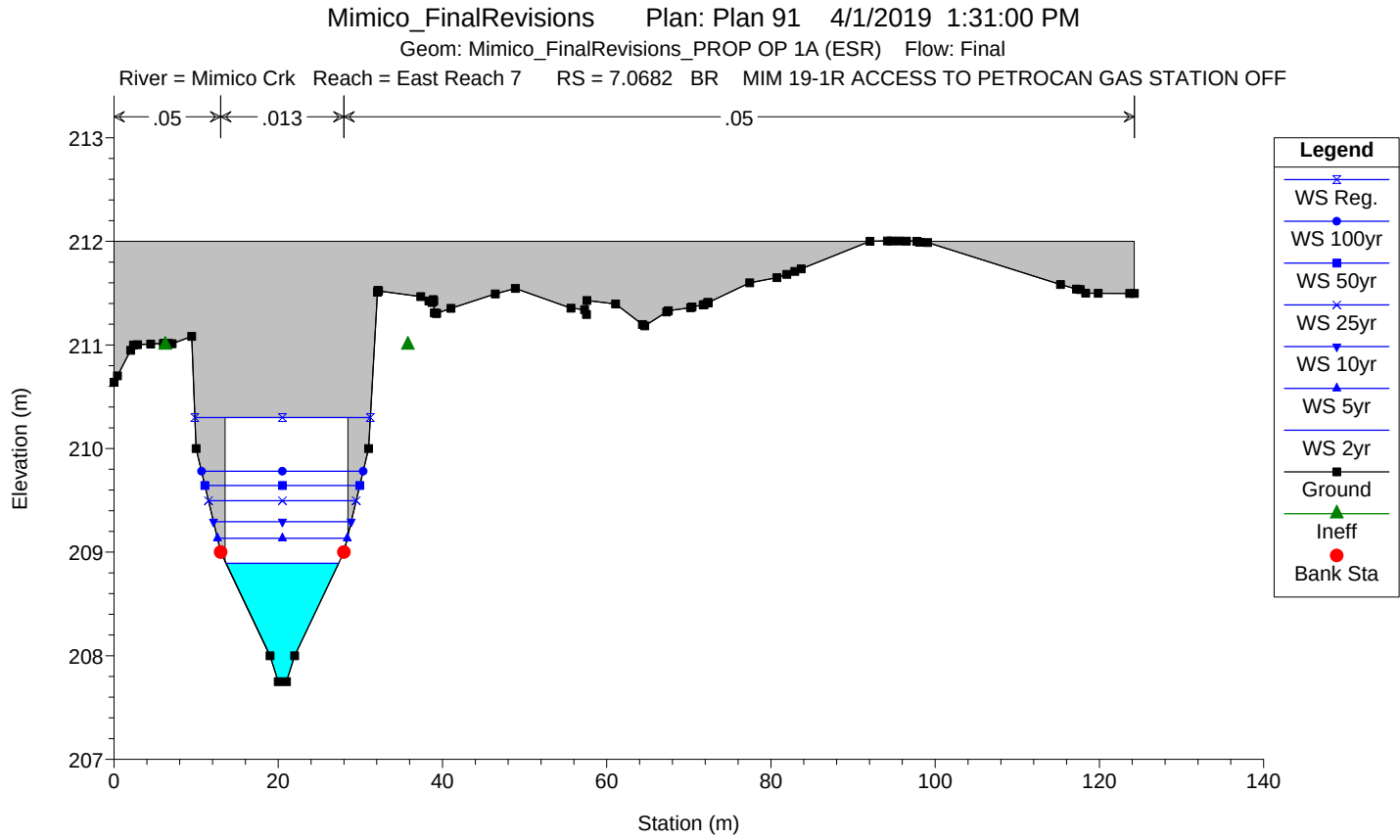
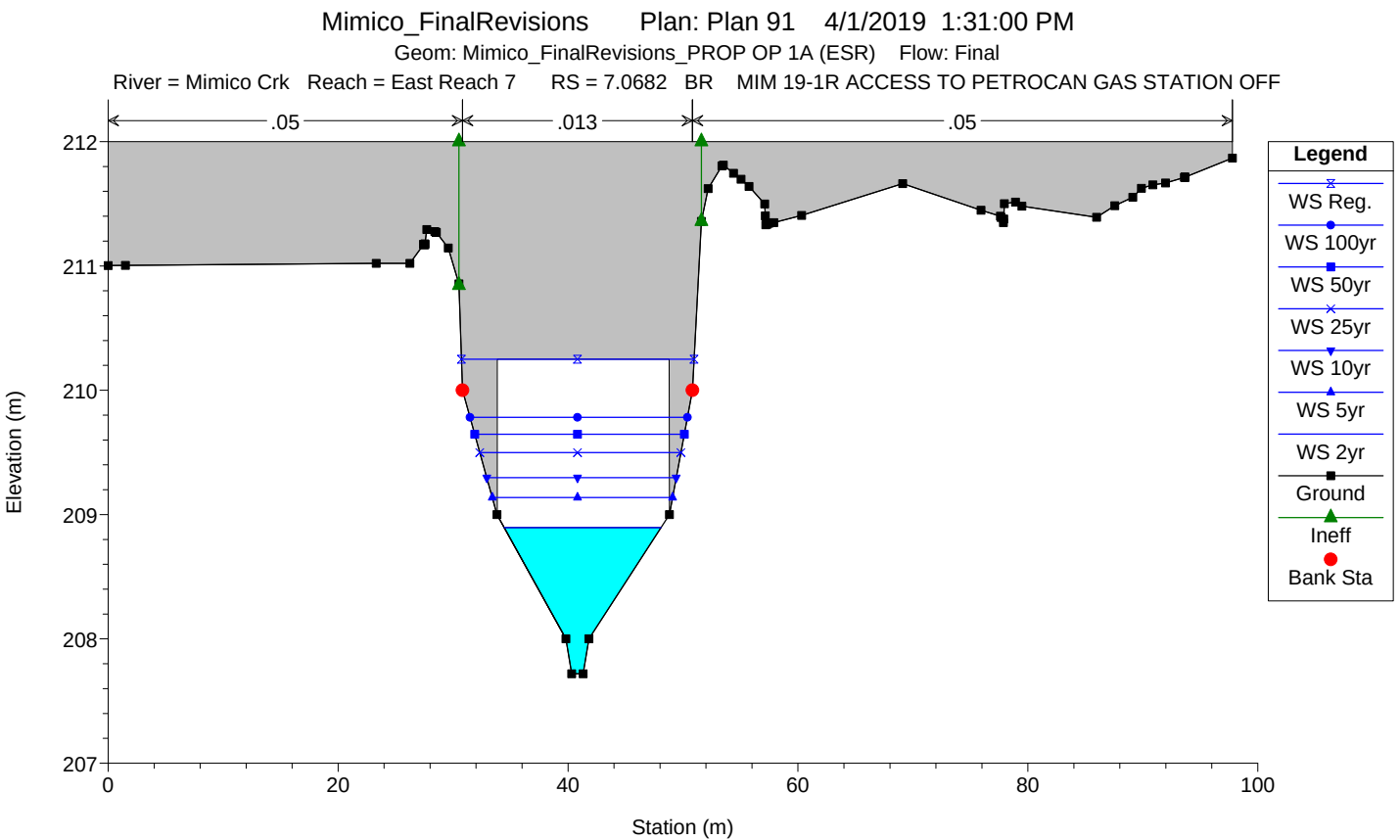
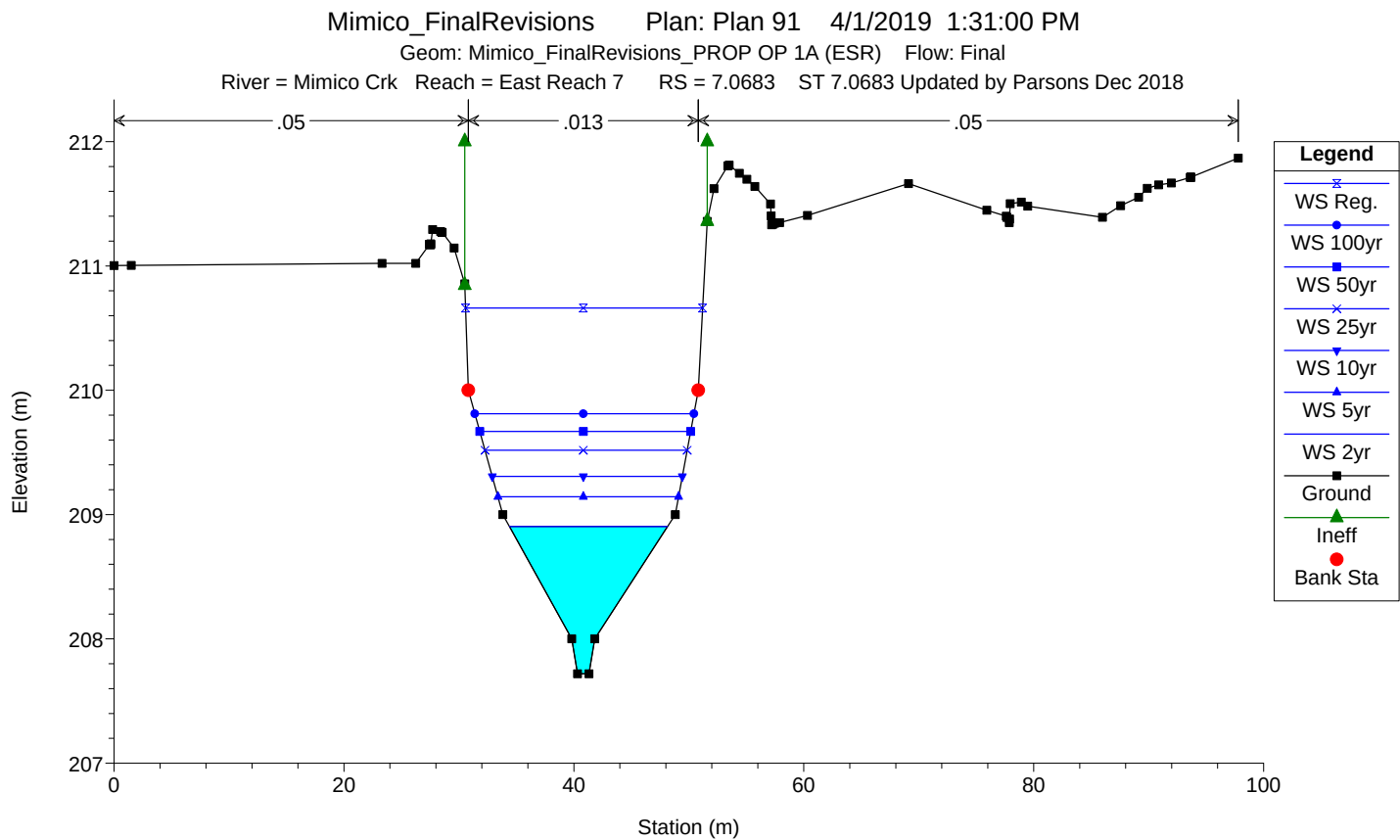


PROPOSED CONDITION: OPTION 2 - UPSTREAM AND DOWNSTREAM OF TWIN CULVERT ST 7.0701





PROPOSED CONDITION: OPTION 2 - UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILES - PROPOSED OPTION 2

3.6 m X 2.4 m BOX CULVERT

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	7.55	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.74
Q Barrel (m3/s)	7.55	Culv Vel DS (m/s)	1.91
E.G. US. (m)	209.52	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.40	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.08	Culv Frctn Ls (m)	0.29
W.S. DS (m)	208.97	Culv Exit Loss (m)	0.08
Delta EG (m)	0.44	Culv Entr Loss (m)	0.08
Delta WS (m)	0.43	Q Weir (m3/s)	
E.G. IC (m)	209.51	Weir Sta Lft (m)	
E.G. OC (m)	209.52	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.07	Weir Max Depth (m)	
Culv WS Outlet (m)	208.97	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.65	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.77	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	10.38	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.05
Q Barrel (m3/s)	10.38	Culv Vel DS (m/s)	2.16
E.G. US. (m)	209.81	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.64	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.36	Culv Frctn Ls (m)	0.28
W.S. DS (m)	209.20	Culv Exit Loss (m)	0.09
Delta EG (m)	0.45	Culv Entr Loss (m)	0.09
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	209.80	Weir Sta Lft (m)	
E.G. OC (m)	209.81	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.25	Weir Max Depth (m)	
Culv WS Outlet (m)	209.20	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.81	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.95	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	12.38	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.23
Q Barrel (m3/s)	12.38	Culv Vel DS (m/s)	2.30
E.G. US. (m)	210.00	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.80	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.54	Culv Frctn Ls (m)	0.26
W.S. DS (m)	209.36	Culv Exit Loss (m)	0.09
Delta EG (m)	0.46	Culv Entr Loss (m)	0.11
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	210.00	Weir Sta Lft (m)	
E.G. OC (m)	210.00	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.36	Weir Max Depth (m)	
Culv WS Outlet (m)	209.36	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.91	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.06	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	14.99	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.44
Q Barrel (m3/s)	14.99	Culv Vel DS (m/s)	2.46
E.G. US. (m)	210.23	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.00	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.78	Culv Frctn Ls (m)	0.24
W.S. DS (m)	209.56	Culv Exit Loss (m)	0.09
Delta EG (m)	0.45	Culv Entr Loss (m)	0.12
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	210.23	Weir Sta Lft (m)	
E.G. OC (m)	210.23	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.51	Weir Max Depth (m)	
Culv WS Outlet (m)	209.56	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.04	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.21	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	16.96	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.59
Q Barrel (m3/s)	16.96	Culv Vel DS (m/s)	2.57
E.G. US. (m)	210.40	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.15	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.95	Culv Frctn Ls (m)	0.23
W.S. DS (m)	209.71	Culv Exit Loss (m)	0.10
Delta EG (m)	0.46	Culv Entr Loss (m)	0.14
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	210.41	Weir Sta Lft (m)	
E.G. OC (m)	210.40	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.61	Weir Max Depth (m)	
Culv WS Outlet (m)	209.71	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.14	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.31	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	18.88	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.72
Q Barrel (m3/s)	18.88	Culv Vel DS (m/s)	2.66
E.G. US. (m)	210.56	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.29	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.10	Culv Frctn Ls (m)	0.21
W.S. DS (m)	209.84	Culv Exit Loss (m)	0.10
Delta EG (m)	0.46	Culv Entr Loss (m)	0.15
Delta WS (m)	0.45	Q Weir (m3/s)	
E.G. IC (m)	210.57	Weir Sta Lft (m)	
E.G. OC (m)	210.56	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.71	Weir Max Depth (m)	
Culv WS Outlet (m)	209.84	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.23	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.41	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	29.89	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	3.46
Q Barrel (m3/s)	29.89	Culv Vel DS (m/s)	3.46
E.G. US. (m)	211.62	Culv Inv El Up (m)	208.30
W.S. US. (m)	211.30	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.96	Culv Frctn Ls (m)	0.29
W.S. DS (m)	210.60	Culv Exit Loss (m)	0.24
Delta EG (m)	0.65	Culv Entr Loss (m)	0.12
Delta WS (m)	0.70	Q Weir (m3/s)	
E.G. IC (m)	211.72	Weir Sta Lft (m)	
E.G. OC (m)	211.61	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.72	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.91	Min El Weir Flow (m)	211.62

CULVERT OUTPUT FILES - PROPOSED OPTION 2

3.0 m X 2.1 m BOX CULVERT

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 2yr

Q Culv Group (m3/s)	4.05	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.37
Q Barrel (m3/s)	4.05	Culv Vel DS (m/s)	1.69
E.G. US. (m)	209.52	Culv Inv El Up (m)	208.60
W.S. US. (m)	209.40	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.08	Culv Frctn Ls (m)	0.34
W.S. DS (m)	208.97	Culv Exit Loss (m)	0.04
Delta EG (m)	0.44	Culv Entr Loss (m)	0.06
Delta WS (m)	0.43	Q Weir (m3/s)	
E.G. IC (m)	209.49	Weir Sta Lft (m)	
E.G. OC (m)	209.51	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.17	Weir Max Depth (m)	
Culv WS Outlet (m)	208.97	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.50	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.57	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 5yr

Q Culv Group (m3/s)	6.12	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.72
Q Barrel (m3/s)	6.12	Culv Vel DS (m/s)	1.97
E.G. US. (m)	209.81	Culv Inv El Up (m)	208.60
W.S. US. (m)	209.64	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.36	Culv Frctn Ls (m)	0.32
W.S. DS (m)	209.20	Culv Exit Loss (m)	0.05
Delta EG (m)	0.45	Culv Entr Loss (m)	0.08
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	209.79	Weir Sta Lft (m)	
E.G. OC (m)	209.80	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.35	Weir Max Depth (m)	
Culv WS Outlet (m)	209.20	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.66	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.75	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 10yr

Q Culv Group (m3/s)	7.62	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.92
Q Barrel (m3/s)	7.62	Culv Vel DS (m/s)	2.13
E.G. US. (m)	210.00	Culv Inv El Up (m)	208.60
W.S. US. (m)	209.80	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.54	Culv Frctn Ls (m)	0.31
W.S. DS (m)	209.36	Culv Exit Loss (m)	0.05
Delta EG (m)	0.46	Culv Entr Loss (m)	0.09
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	209.98	Weir Sta Lft (m)	
E.G. OC (m)	209.99	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.47	Weir Max Depth (m)	
Culv WS Outlet (m)	209.36	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.77	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.87	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 25yr

Q Culv Group (m3/s)	9.61	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.16
Q Barrel (m3/s)	9.61	Culv Vel DS (m/s)	2.30
E.G. US. (m)	210.23	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.00	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.78	Culv Frctn Ls (m)	0.29
W.S. DS (m)	209.56	Culv Exit Loss (m)	0.05
Delta EG (m)	0.45	Culv Entr Loss (m)	0.10
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	210.22	Weir Sta Lft (m)	
E.G. OC (m)	210.22	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.61	Weir Max Depth (m)	
Culv WS Outlet (m)	209.56	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.91	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.01	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 50yr

Q Culv Group (m3/s)	11.14	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.32
Q Barrel (m3/s)	11.14	Culv Vel DS (m/s)	2.42
E.G. US. (m)	210.40	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.15	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.95	Culv Frctn Ls (m)	0.28
W.S. DS (m)	209.71	Culv Exit Loss (m)	0.06
Delta EG (m)	0.46	Culv Entr Loss (m)	0.12
Delta WS (m)	0.44	Q Weir (m3/s)	
E.G. IC (m)	210.40	Weir Sta Lft (m)	
E.G. OC (m)	210.39	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.72	Weir Max Depth (m)	
Culv WS Outlet (m)	209.71	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.01	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.12	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 100yr

Q Culv Group (m3/s)	12.62	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.46
Q Barrel (m3/s)	12.62	Culv Vel DS (m/s)	2.52
E.G. US. (m)	210.56	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.29	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.10	Culv Frctn Ls (m)	0.26
W.S. DS (m)	209.84	Culv Exit Loss (m)	0.06
Delta EG (m)	0.46	Culv Entr Loss (m)	0.13
Delta WS (m)	0.45	Q Weir (m3/s)	
E.G. IC (m)	210.56	Weir Sta Lft (m)	
E.G. OC (m)	210.55	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.82	Weir Max Depth (m)	
Culv WS Outlet (m)	209.84	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.10	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.22	Min El Weir Flow (m)	211.62

Plan: OP 1A (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: Reg.

Q Culv Group (m3/s)	21.01	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	3.34
Q Barrel (m3/s)	21.01	Culv Vel DS (m/s)	3.34
E.G. US. (m)	211.62	Culv Inv El Up (m)	208.60
W.S. US. (m)	211.30	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.96	Culv Frctn Ls (m)	0.34
W.S. DS (m)	210.60	Culv Exit Loss (m)	0.20
Delta EG (m)	0.65	Culv Entr Loss (m)	0.11
Delta WS (m)	0.70	Q Weir (m3/s)	
E.G. IC (m)	211.67	Weir Sta Lft (m)	
E.G. OC (m)	211.62	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.61	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.71	Min El Weir Flow (m)	211.62

PROFILE OUTPUT TABLE - PROPOSED OPTION 2

RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	209.58	209.58	209.93	0.002038	2.60	4.27	6.07	0.99
East Reach 7	7.072	5yr	15.70	208.53	209.78	209.78	210.19	0.002007	2.83	5.55	6.83	1.00
East Reach 7	7.072	10yr	18.90	208.53	209.91	209.91	210.34	0.001940	2.93	6.44	7.32	1.00
East Reach 7	7.072	25yr	23.10	208.53	210.04	210.04	210.53	0.001892	3.09	7.47	7.86	1.00
East Reach 7	7.072	50yr	26.30	208.53	210.14	210.14	210.66	0.001798	3.21	8.24	8.27	0.99
East Reach 7	7.072	100yr	29.40	208.53	210.22	210.22	210.78	0.001764	3.34	8.91	8.62	0.99
East Reach 7	7.072	Reg.	46.10	208.53	211.28	210.62	211.64	0.000474	2.68	20.71	14.25	0.57
East Reach 7	7.071	2yr	11.60	208.30	209.40	208.97	209.52	0.000361	1.55	7.46	7.82	0.47
East Reach 7	7.071	5yr	16.50	208.30	209.64	209.14	209.81	0.000372	1.81	9.13	7.82	0.50
East Reach 7	7.071	10yr	20.00	208.30	209.80	209.26	210.00	0.000376	1.96	10.22	7.82	0.51
East Reach 7	7.071	25yr	24.60	208.30	210.00	209.40	210.23	0.000378	2.13	11.55	7.82	0.52
East Reach 7	7.071	50yr	28.10	208.30	210.15	209.50	210.40	0.000373	2.24	12.56	8.18	0.53
East Reach 7	7.071	100yr	31.50	208.30	210.29	209.60	210.56	0.000368	2.33	13.51	8.52	0.53
East Reach 7	7.071	Reg.	50.90	208.30	211.30	210.09	211.62	0.000244	2.50	20.38	11.65	0.46
East Reach 7	7.0701		Culvert									
East Reach 7	7.07	2yr	11.60	207.80	208.97	208.47	209.08	0.000292	1.46	7.95	7.48	0.43
East Reach 7	7.07	5yr	16.50	207.80	209.20	208.65	209.36	0.000321	1.73	9.54	8.46	0.47
East Reach 7	7.07	10yr	20.00	207.80	209.36	208.76	209.54	0.000330	1.88	10.62	9.18	0.48
East Reach 7	7.07	25yr	24.60	207.80	209.56	208.90	209.78	0.000334	2.05	11.99	10.08	0.49
East Reach 7	7.07	50yr	28.10	207.80	209.71	209.01	209.95	0.000336	2.17	12.96	10.72	0.50
East Reach 7	7.07	100yr	31.50	207.80	209.84	209.10	210.10	0.000338	2.27	13.86	11.32	0.51
East Reach 7	7.07	Reg.	50.90	207.80	210.60	209.59	210.96	0.000307	2.68	19.01	15.14	0.51
East Reach 7	7.069	2yr	11.60	207.80	208.89		209.05	0.000509	1.76	6.85	7.74	0.54
East Reach 7	7.069	5yr	16.50	207.80	209.09		209.32	0.000585	2.12	8.51	8.86	0.59
East Reach 7	7.069	10yr	20.00	207.80	209.23		209.50	0.000608	2.31	9.80	9.63	0.62
East Reach 7	7.069	25yr	24.60	207.80	209.42		209.73	0.000610	2.51	11.66	10.65	0.63

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.55		209.90	0.000605	2.63	13.15	11.40	0.64
East Reach 7	7.069	100yr	31.50	207.80	209.68		210.05	0.000598	2.74	14.63	12.11	0.64
East Reach 7	7.069	Reg.	50.90	207.80	210.49		210.93	0.000447	3.01	26.32	16.79	0.59
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000919	1.54	7.53	13.74	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.12	15.72	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000472	1.45	13.76	16.53	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000360	1.42	17.34	17.59	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000306	1.40	20.08	18.35	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000268	1.39	22.73	19.06	0.41
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000117	1.28	39.86	20.62	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.70	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.011358	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511	Culvert										
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451	Culvert										
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

HEC-RAS Plan: OP 1A (ESR) River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

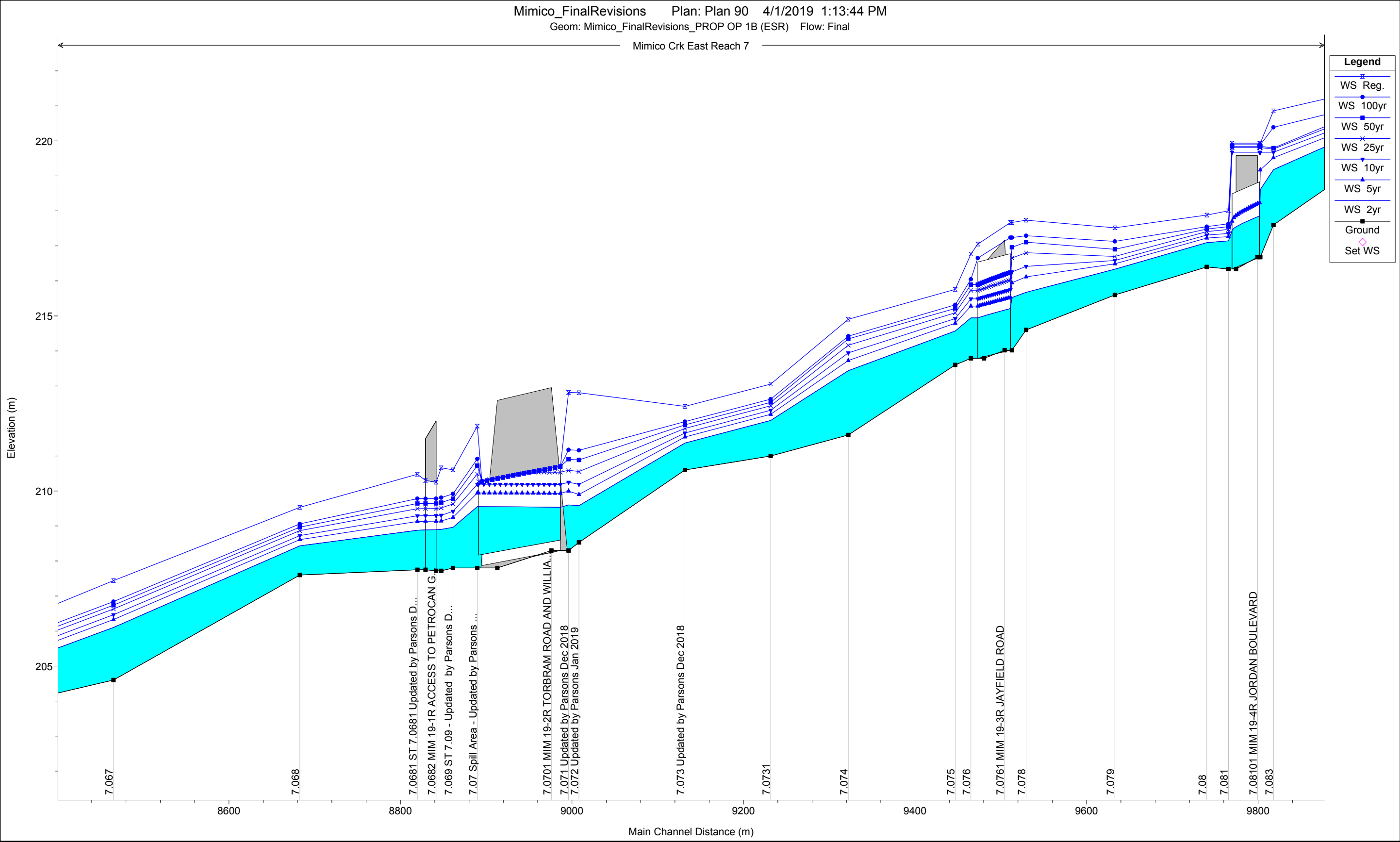
PROPOSED OPTION 3

(3.4 x 2.4) m & (3.0 x 2.1) m TWIN BOX CULVERT

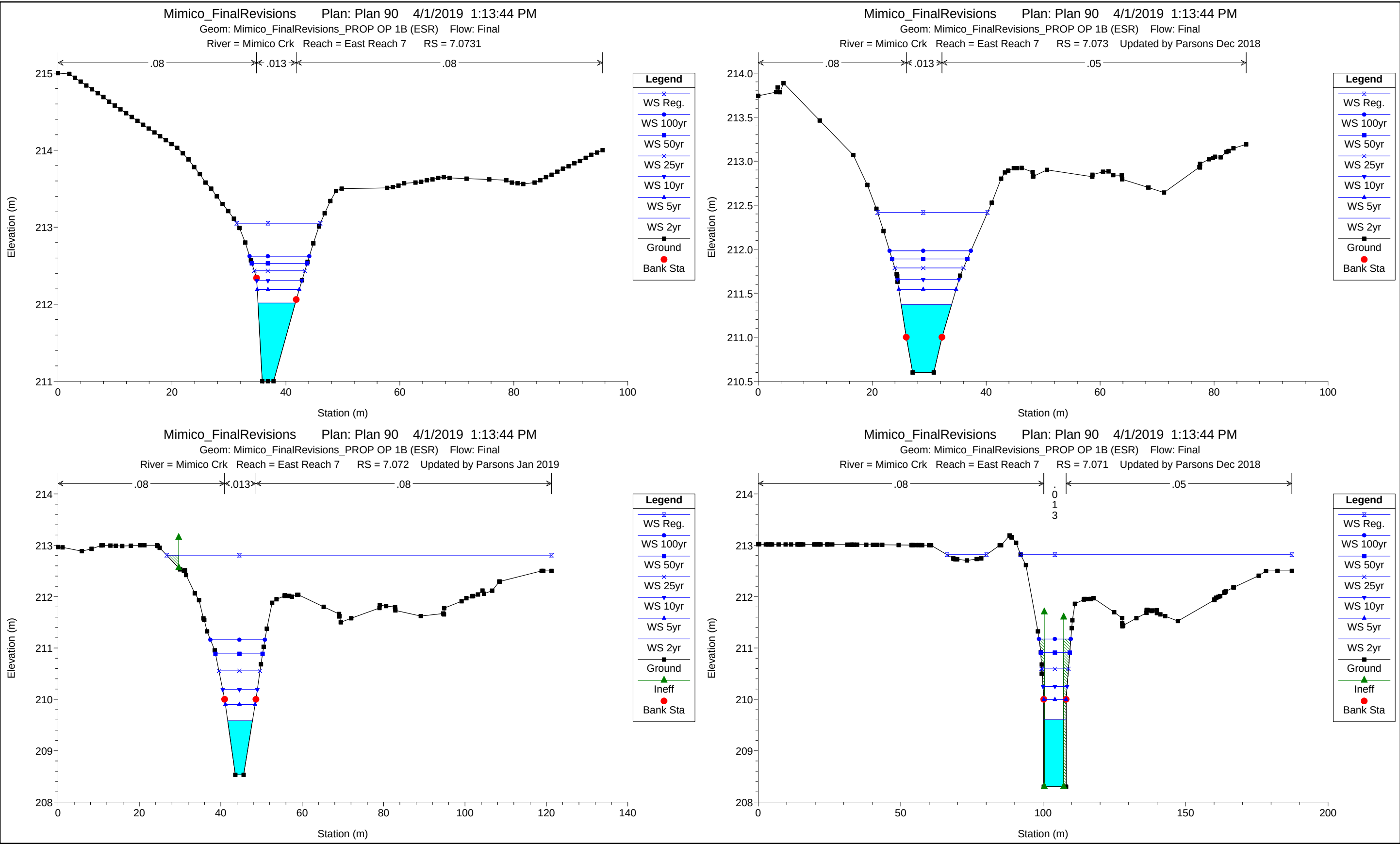
PROPOSED CONDITION

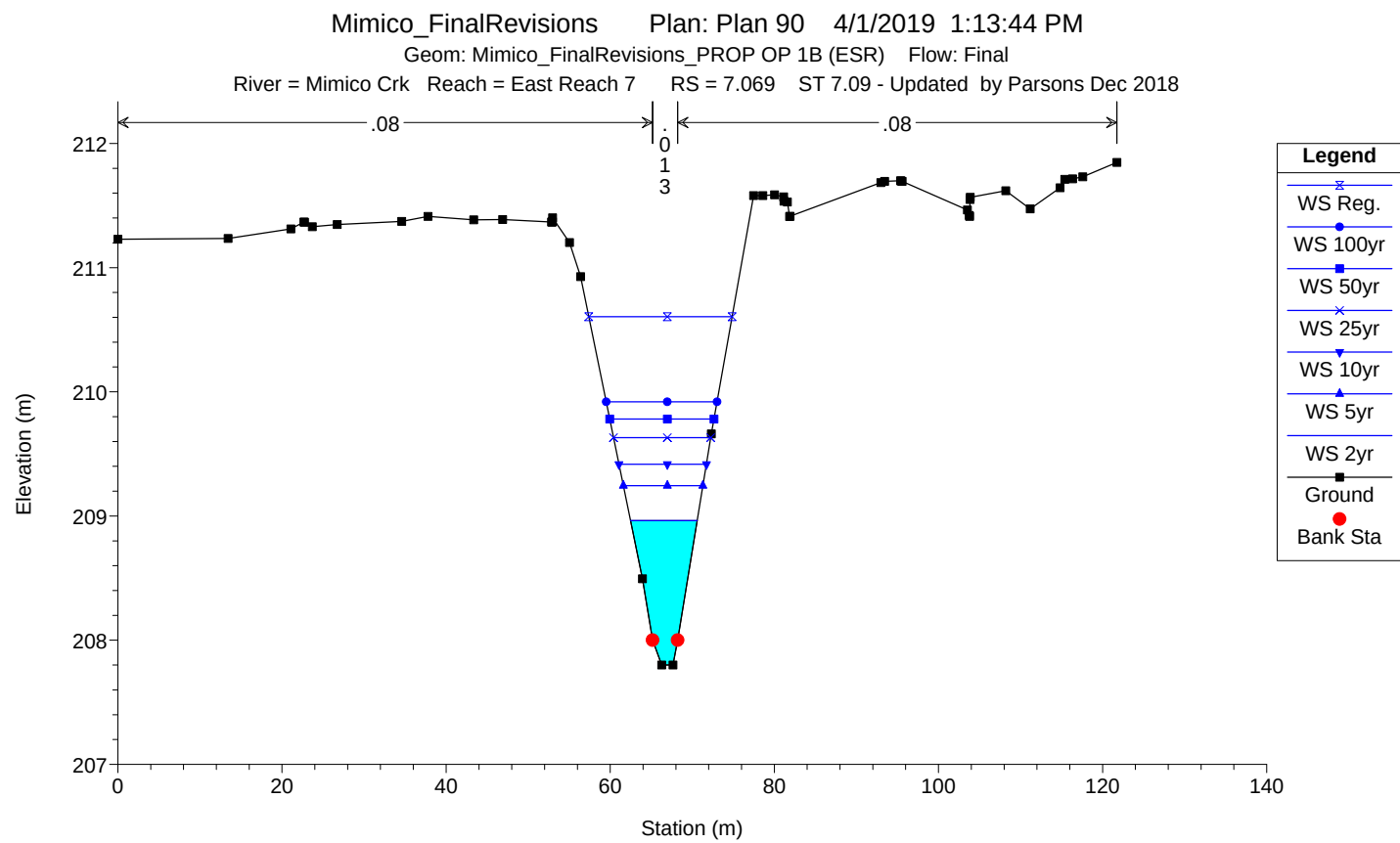
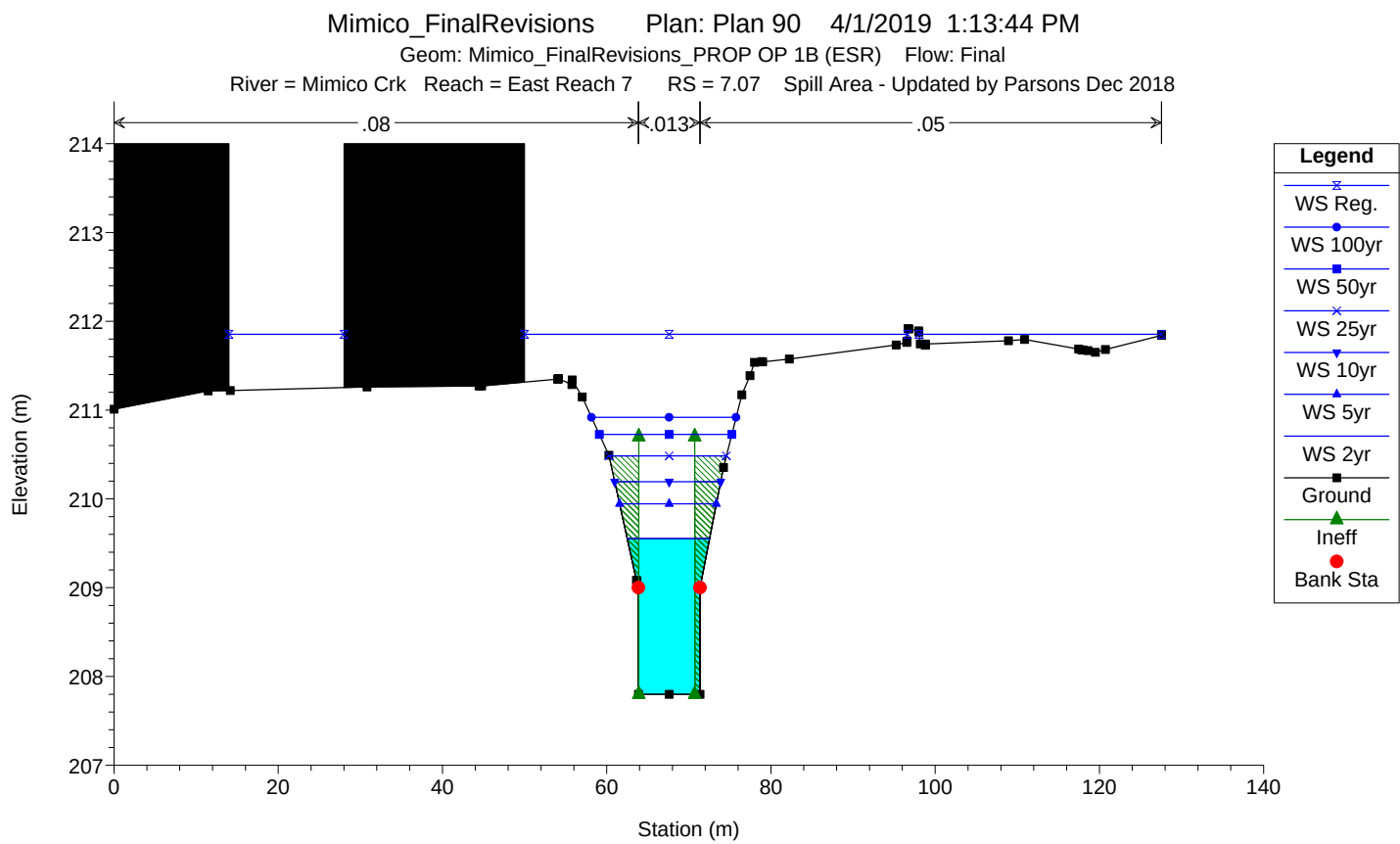
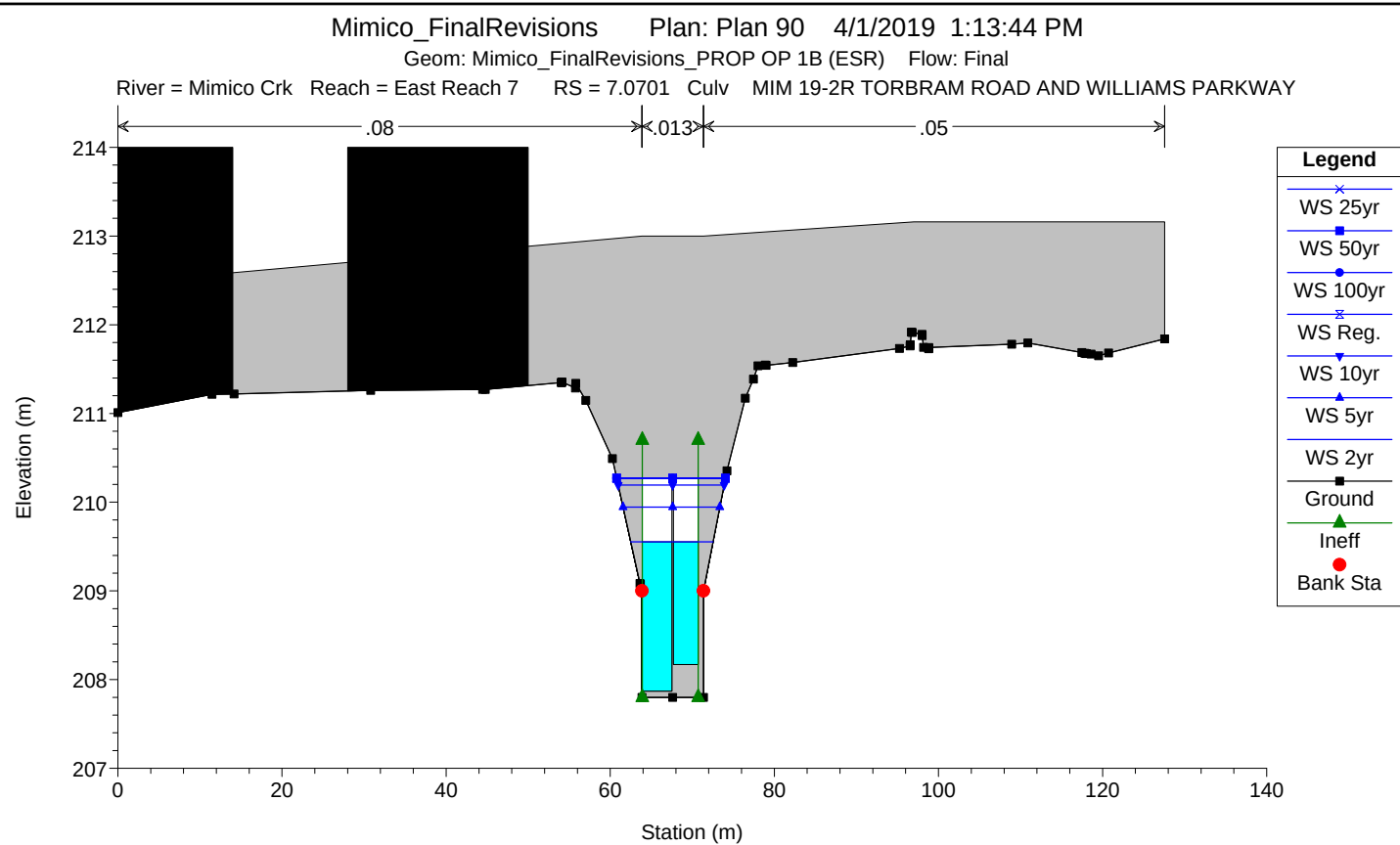
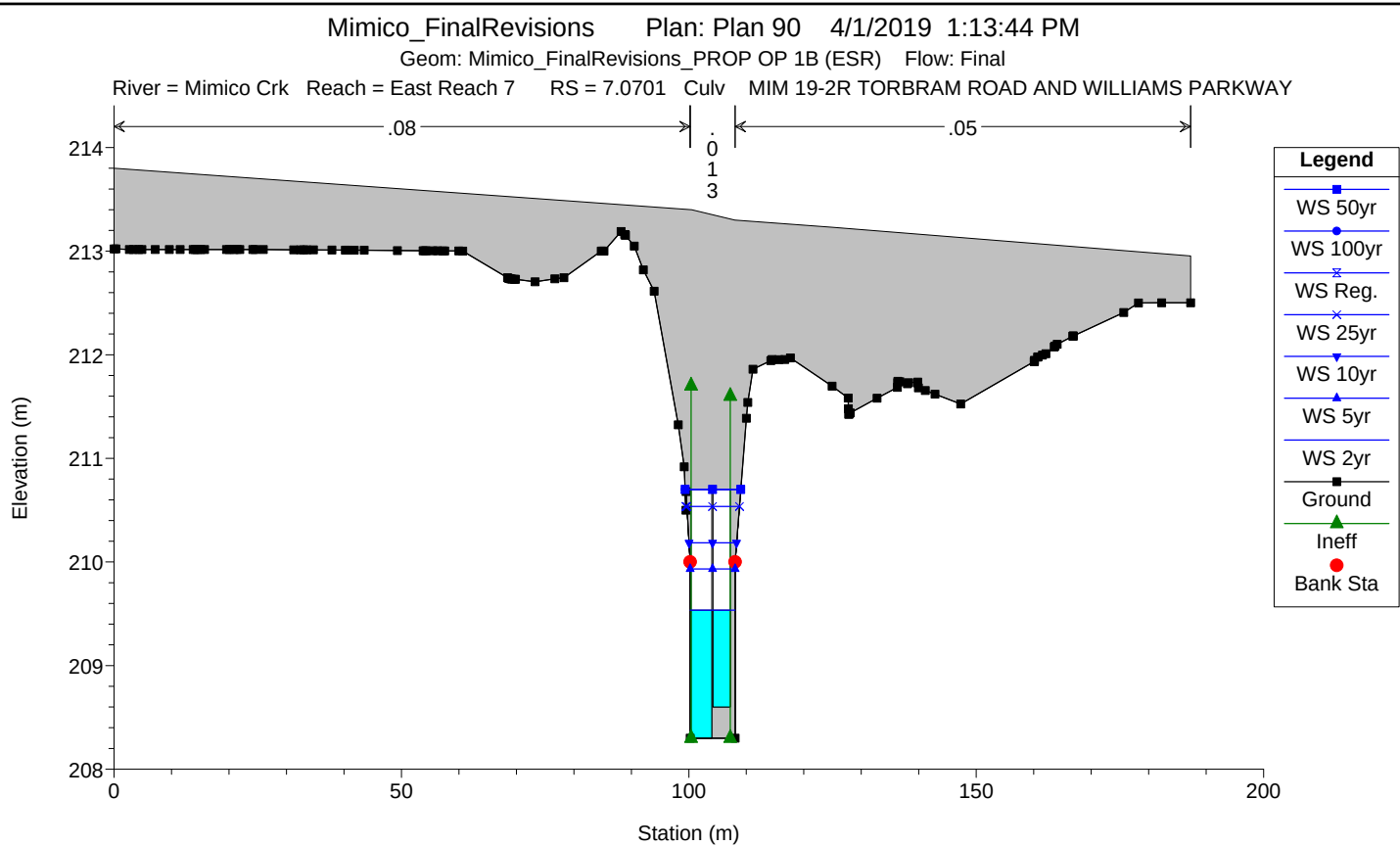
WITH RAISED ROAD

WATER SURFACE PROFILE - PROPOSED OPTION 3

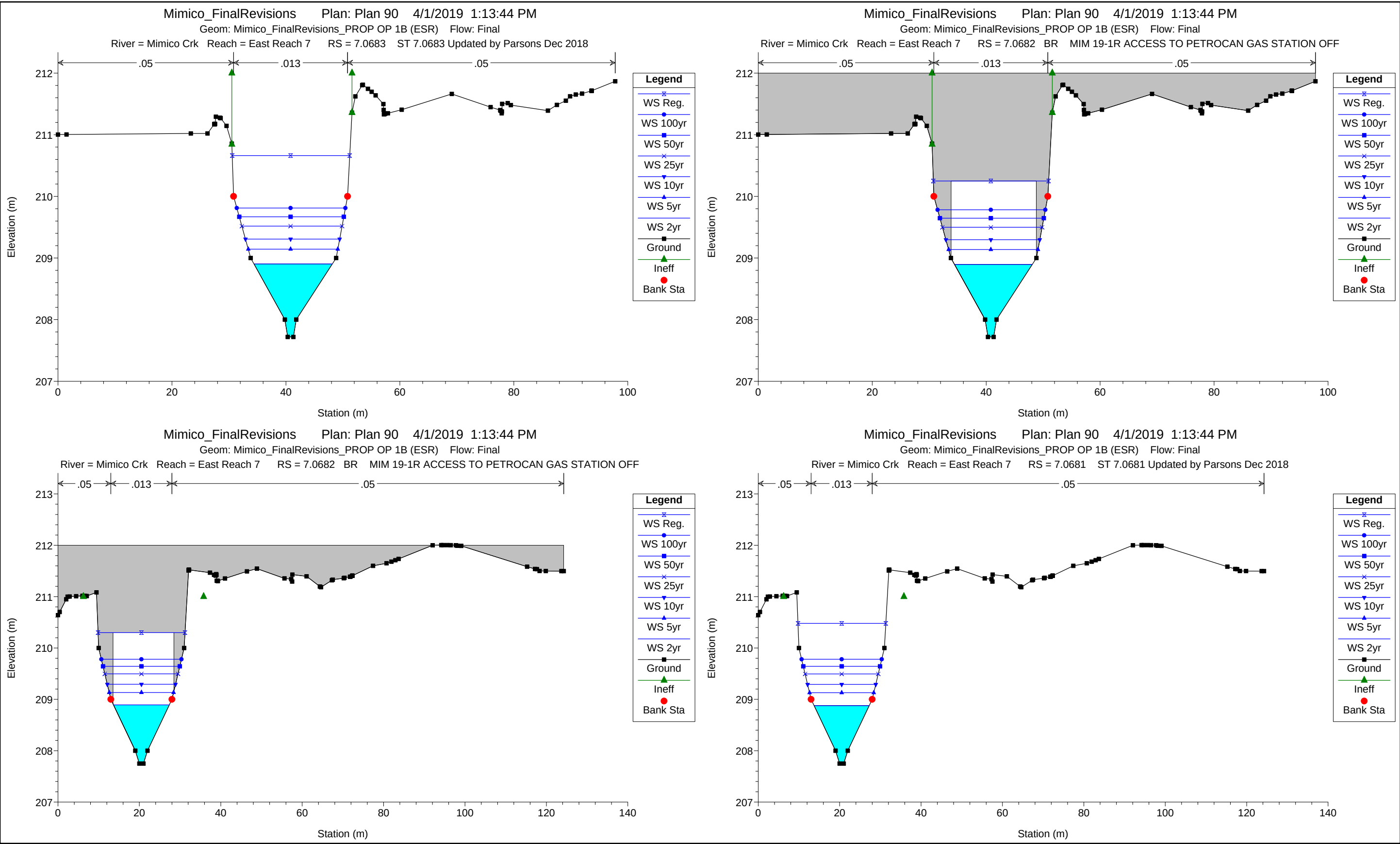


PROPOSED CONDITION: OPTION 3 - UPSTREAM AND DOWNSTREAM OF TWIN CULVERT ST 7.0701





PROPOSED CONDITION: OPTION 3 - UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILES - PROPOSED OPTION 3

3.6 m x 2.4 m BOX CULVERT

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	7.36	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.66
Q Barrel (m3/s)	7.36	Culv Vel DS (m/s)	1.21
E.G. US. (m)	209.69	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.60	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.60	Culv Frctn Ls (m)	0.04
W.S. DS (m)	209.55	Culv Exit Loss (m)	0.03
Delta EG (m)	0.09	Culv Entr Loss (m)	0.03
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.48	Weir Sta Lft (m)	
E.G. OC (m)	209.70	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.53	Weir Max Depth (m)	
Culv WS Outlet (m)	209.55	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.64	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.75	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	10.17	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.74
Q Barrel (m3/s)	10.17	Culv Vel DS (m/s)	1.36
E.G. US. (m)	210.10	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.00	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.01	Culv Frctn Ls (m)	0.04
W.S. DS (m)	209.94	Culv Exit Loss (m)	0.03
Delta EG (m)	0.09	Culv Entr Loss (m)	0.03
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.78	Weir Sta Lft (m)	
E.G. OC (m)	210.11	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.93	Weir Max Depth (m)	
Culv WS Outlet (m)	209.94	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.80	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.93	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	12.18	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.80
Q Barrel (m3/s)	12.18	Culv Vel DS (m/s)	1.46
E.G. US. (m)	210.37	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.25	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.27	Culv Frctn Ls (m)	0.04
W.S. DS (m)	210.19	Culv Exit Loss (m)	0.03
Delta EG (m)	0.10	Culv Entr Loss (m)	0.03
Delta WS (m)	0.06	Q Weir (m3/s)	
E.G. IC (m)	209.98	Weir Sta Lft (m)	
E.G. OC (m)	210.38	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.18	Weir Max Depth (m)	
Culv WS Outlet (m)	210.19	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.90	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.05	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	14.12	Culv Full Len (m)	53.72
# Barrels	1	Culv Vel US (m/s)	1.77
Q Barrel (m3/s)	14.12	Culv Vel DS (m/s)	1.63
E.G. US. (m)	210.72	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.59	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.58	Culv Frctn Ls (m)	0.06
W.S. DS (m)	210.48	Culv Exit Loss (m)	0.04
Delta EG (m)	0.14	Culv Entr Loss (m)	0.03
Delta WS (m)	0.11	Q Weir (m3/s)	
E.G. IC (m)	210.16	Weir Sta Lft (m)	
E.G. OC (m)	210.71	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.52	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.00	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.16	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	16.59	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	1.92
Q Barrel (m3/s)	16.59	Culv Vel DS (m/s)	1.92
E.G. US. (m)	211.04	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.91	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.80	Culv Frctn Ls (m)	0.09
W.S. DS (m)	210.73	Culv Exit Loss (m)	0.11
Delta EG (m)	0.23	Culv Entr Loss (m)	0.04
Delta WS (m)	0.18	Q Weir (m3/s)	
E.G. IC (m)	210.37	Weir Sta Lft (m)	
E.G. OC (m)	211.04	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.29	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	18.48	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	2.14
Q Barrel (m3/s)	18.48	Culv Vel DS (m/s)	2.14
E.G. US. (m)	211.31	Culv Inv El Up (m)	208.30
W.S. US. (m)	211.18	Culv Inv El Dn (m)	207.87
E.G. DS (m)	211.00	Culv Frctn Ls (m)	0.11
W.S. DS (m)	210.92	Culv Exit Loss (m)	0.15
Delta EG (m)	0.31	Culv Entr Loss (m)	0.05
Delta WS (m)	0.26	Q Weir (m3/s)	
E.G. IC (m)	210.54	Weir Sta Lft (m)	
E.G. OC (m)	211.31	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.39	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	29.75	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	3.44
Q Barrel (m3/s)	29.75	Culv Vel DS (m/s)	3.44
E.G. US. (m)	212.87	Culv Inv El Up (m)	208.30
W.S. US. (m)	212.82	Culv Inv El Dn (m)	207.87
E.G. DS (m)	211.96	Culv Frctn Ls (m)	0.29
W.S. DS (m)	211.85	Culv Exit Loss (m)	0.49
Delta EG (m)	0.91	Culv Entr Loss (m)	0.12
Delta WS (m)	0.96	Q Weir (m3/s)	
E.G. IC (m)	211.71	Weir Sta Lft (m)	
E.G. OC (m)	212.86	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.91	Min El Weir Flow (m)	212.96

CULVERT OUTPUT FILES - PROPOSED OPTION 3

3.0 m x 2.1 m BOX CULVERT

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 2yr

Q Culv Group (m3/s)	4.24	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.51
Q Barrel (m3/s)	4.24	Culv Vel DS (m/s)	1.02
E.G. US. (m)	209.69	Culv Inv El Up (m)	208.60
W.S. US. (m)	209.60	Culv Inv El Dn (m)	208.17
E.G. DS (m)	209.60	Culv Frctn Ls (m)	0.05
W.S. DS (m)	209.55	Culv Exit Loss (m)	0.01
Delta EG (m)	0.09	Culv Entr Loss (m)	0.02
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.52	Weir Sta Lft (m)	
E.G. OC (m)	209.67	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.53	Weir Max Depth (m)	
Culv WS Outlet (m)	209.55	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.52	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.59	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 5yr

Q Culv Group (m3/s)	6.33	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.58
Q Barrel (m3/s)	6.33	Culv Vel DS (m/s)	1.19
E.G. US. (m)	210.10	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.00	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.01	Culv Frctn Ls (m)	0.04
W.S. DS (m)	209.94	Culv Exit Loss (m)	0.01
Delta EG (m)	0.09	Culv Entr Loss (m)	0.03
Delta WS (m)	0.05	Q Weir (m3/s)	
E.G. IC (m)	209.82	Weir Sta Lft (m)	
E.G. OC (m)	210.09	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.93	Weir Max Depth (m)	
Culv WS Outlet (m)	209.94	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.68	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.77	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 10yr

Q Culv Group (m3/s)	7.82	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	1.65
Q Barrel (m3/s)	7.82	Culv Vel DS (m/s)	1.29
E.G. US. (m)	210.37	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.25	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.27	Culv Frctn Ls (m)	0.05
W.S. DS (m)	210.19	Culv Exit Loss (m)	0.01
Delta EG (m)	0.10	Culv Entr Loss (m)	0.03
Delta WS (m)	0.06	Q Weir (m3/s)	
E.G. IC (m)	210.01	Weir Sta Lft (m)	
E.G. OC (m)	210.35	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.18	Weir Max Depth (m)	
Culv WS Outlet (m)	210.19	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.79	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.88	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 25yr

Q Culv Group (m3/s)	10.48	Culv Full Len (m)	59.46
# Barrels	1	Culv Vel US (m/s)	1.80
Q Barrel (m3/s)	10.48	Culv Vel DS (m/s)	1.66
E.G. US. (m)	210.72	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.59	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.58	Culv Frctn Ls (m)	0.08
W.S. DS (m)	210.48	Culv Exit Loss (m)	0.05
Delta EG (m)	0.14	Culv Entr Loss (m)	0.03
Delta WS (m)	0.11	Q Weir (m3/s)	
E.G. IC (m)	210.32	Weir Sta Lft (m)	
E.G. OC (m)	210.73	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.54	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.97	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.08	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 50yr

Q Culv Group (m3/s)	11.51	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	1.83
Q Barrel (m3/s)	11.51	Culv Vel DS (m/s)	1.83
E.G. US. (m)	211.04	Culv Inv El Up (m)	208.60
W.S. US. (m)	210.91	Culv Inv El Dn (m)	208.17
E.G. DS (m)	210.80	Culv Frctn Ls (m)	0.11
W.S. DS (m)	210.73	Culv Exit Loss (m)	0.09
Delta EG (m)	0.23	Culv Entr Loss (m)	0.03
Delta WS (m)	0.18	Q Weir (m3/s)	
E.G. IC (m)	210.44	Weir Sta Lft (m)	
E.G. OC (m)	211.03	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.14	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 100yr

Q Culv Group (m3/s)	13.02	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	2.07
Q Barrel (m3/s)	13.02	Culv Vel DS (m/s)	2.07
E.G. US. (m)	211.31	Culv Inv El Up (m)	208.60
W.S. US. (m)	211.18	Culv Inv El Dn (m)	208.17
E.G. DS (m)	211.00	Culv Frctn Ls (m)	0.13
W.S. DS (m)	210.92	Culv Exit Loss (m)	0.13
Delta EG (m)	0.31	Culv Entr Loss (m)	0.04
Delta WS (m)	0.26	Q Weir (m3/s)	
E.G. IC (m)	210.60	Weir Sta Lft (m)	
E.G. OC (m)	211.31	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.24	Min El Weir Flow (m)	212.96

Plan: OP 1B (ESR) Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: Reg.

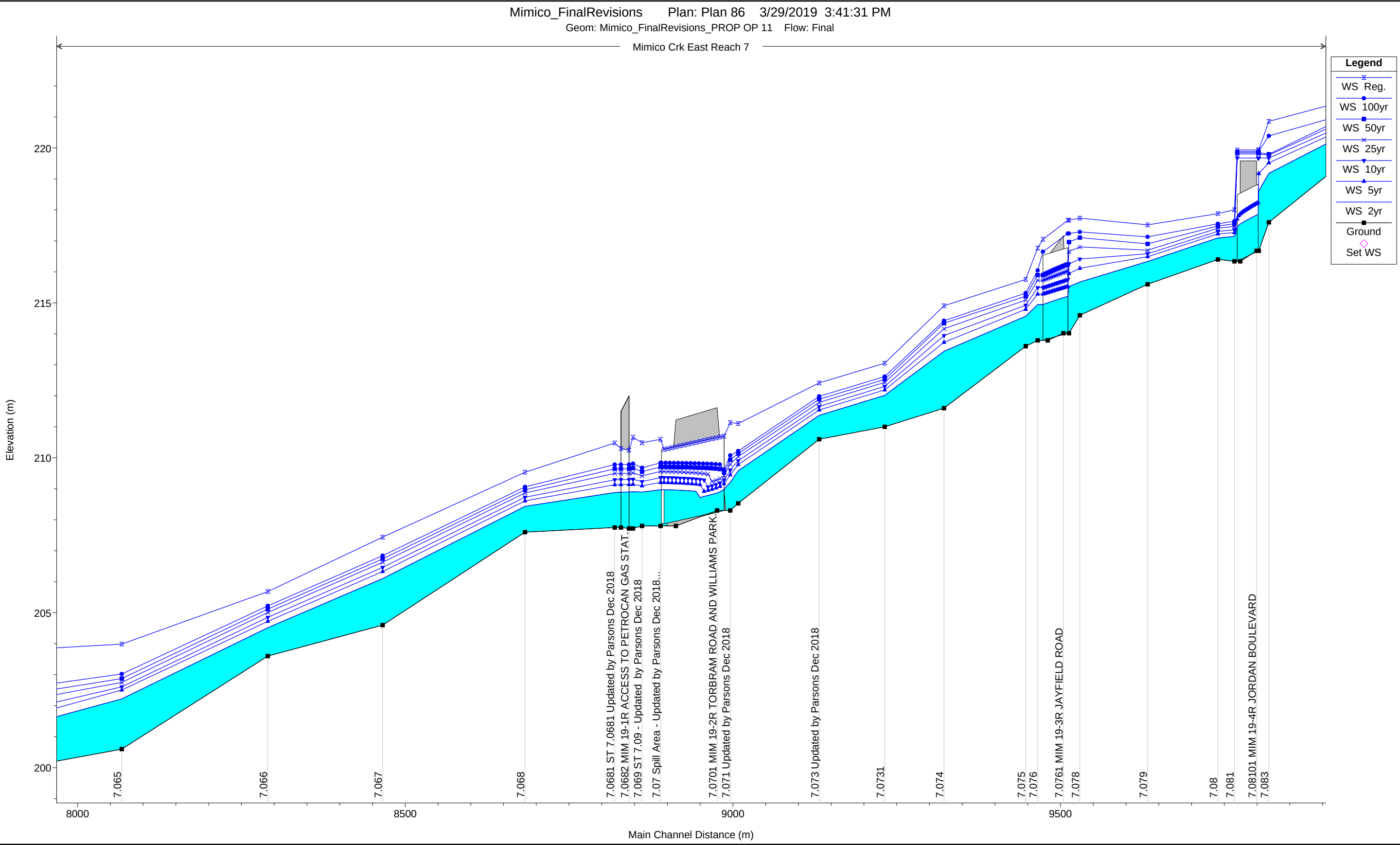
Q Culv Group (m3/s)	21.15	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	3.36
Q Barrel (m3/s)	21.15	Culv Vel DS (m/s)	3.36
E.G. US. (m)	212.87	Culv Inv El Up (m)	208.60
W.S. US. (m)	212.82	Culv Inv El Dn (m)	208.17
E.G. DS (m)	211.96	Culv Frctn Ls (m)	0.33
W.S. DS (m)	211.85	Culv Exit Loss (m)	0.46
Delta EG (m)	0.91	Culv Entr Loss (m)	0.11
Delta WS (m)	0.96	Q Weir (m3/s)	
E.G. IC (m)	211.68	Weir Sta Lft (m)	
E.G. OC (m)	212.89	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.72	Min El Weir Flow (m)	212.96

PROPOSED OPTION 4

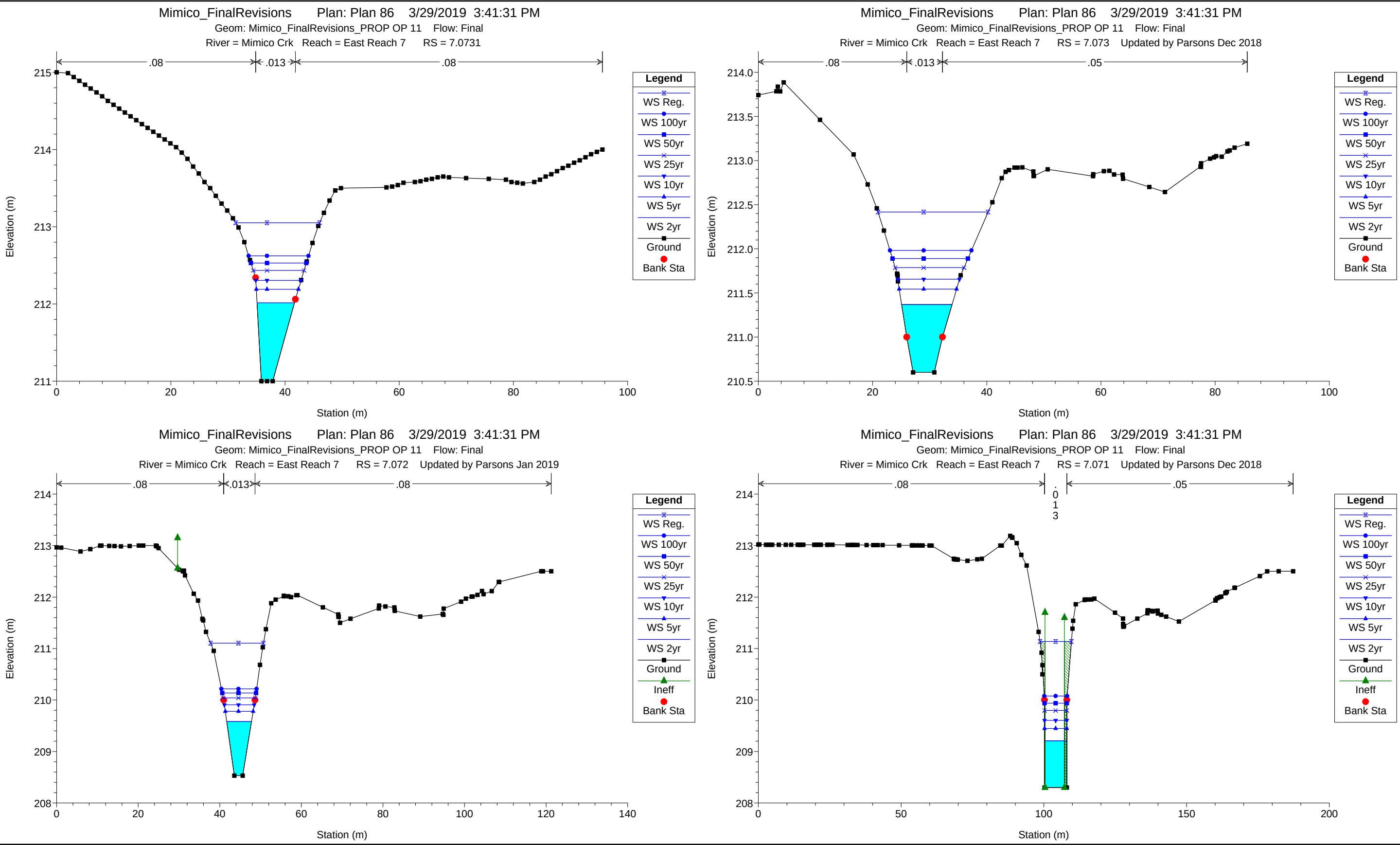
(3.4 x 2.4) m & (3.0 x 2.4) m TWIN BOX CULVERT

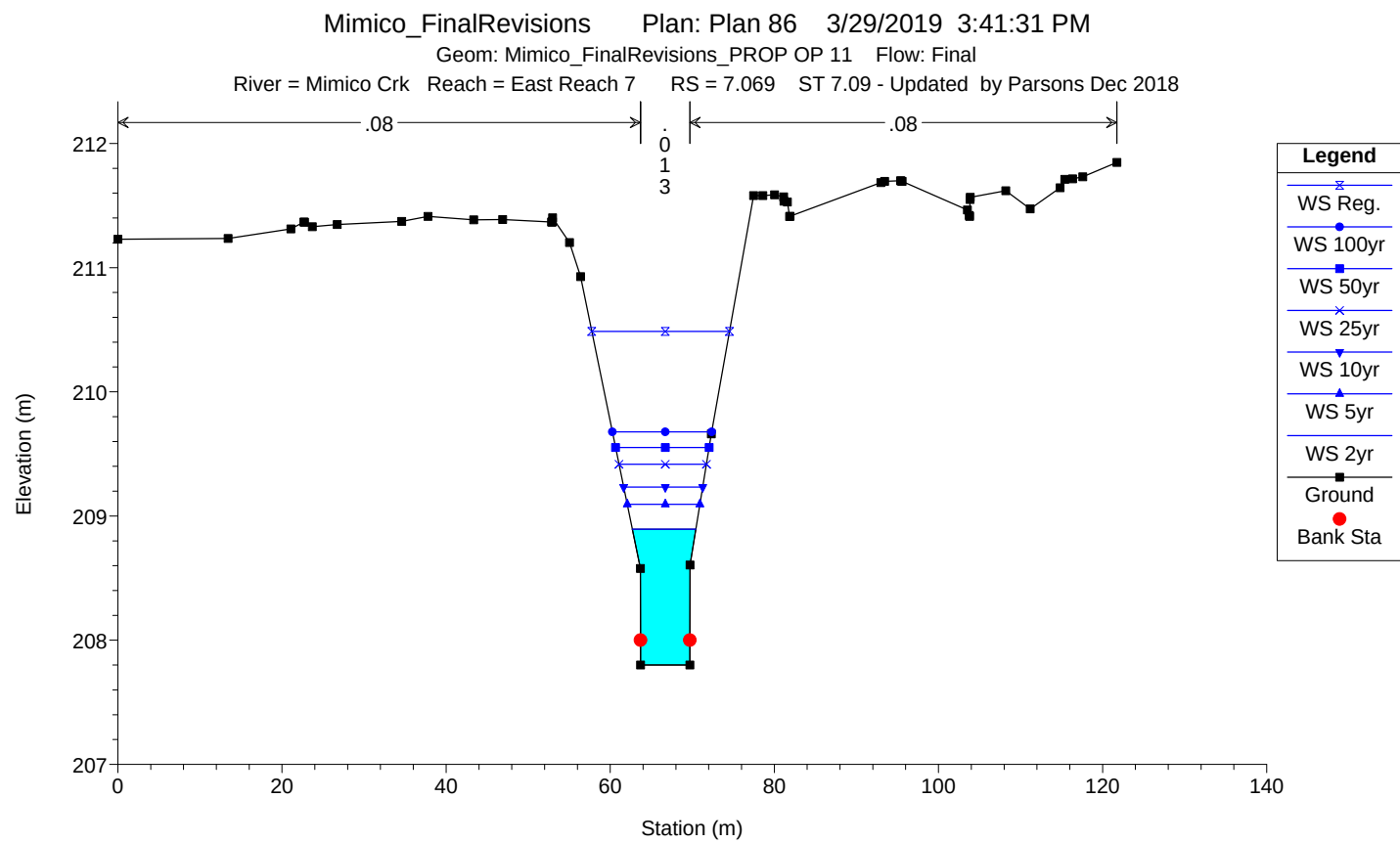
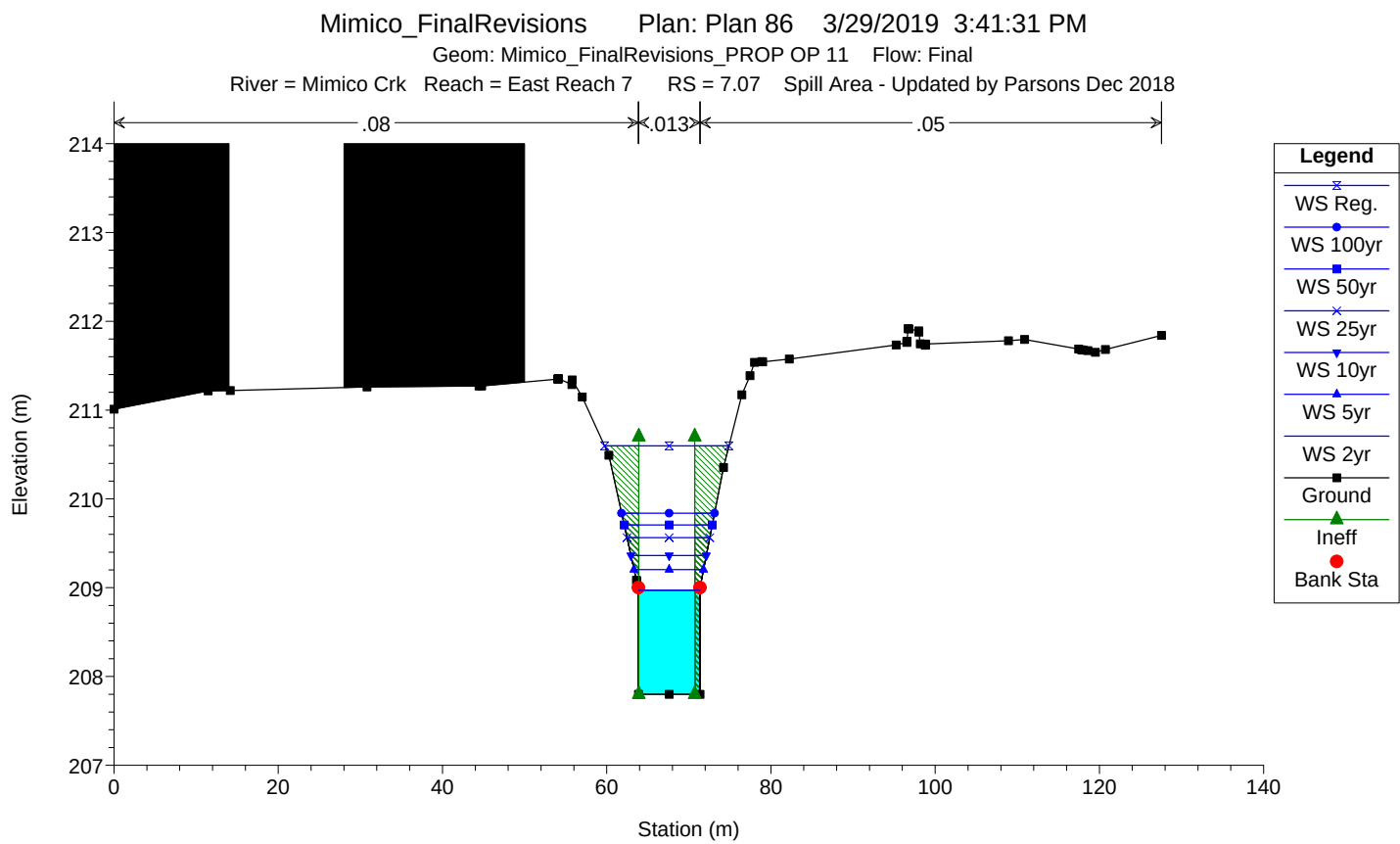
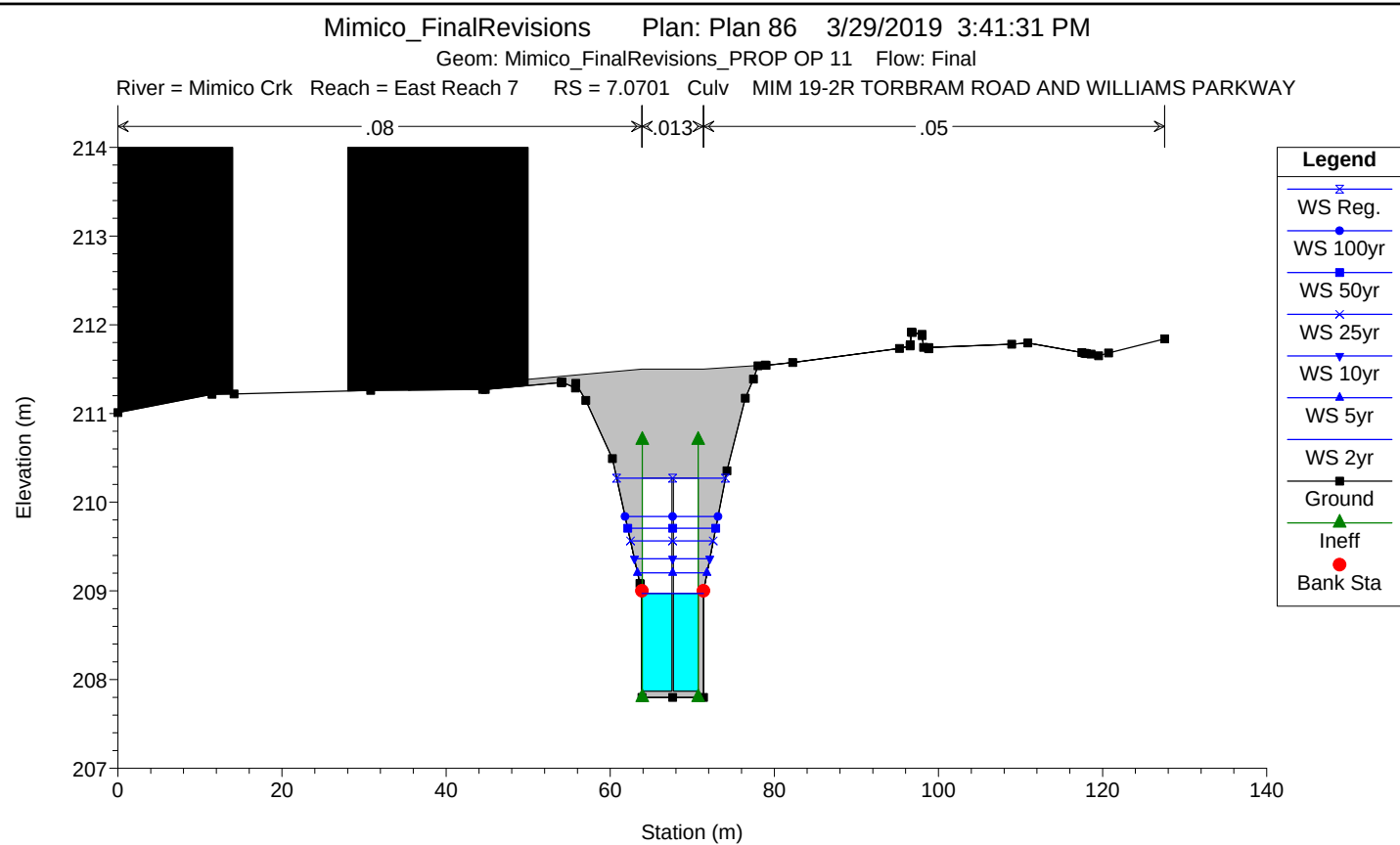
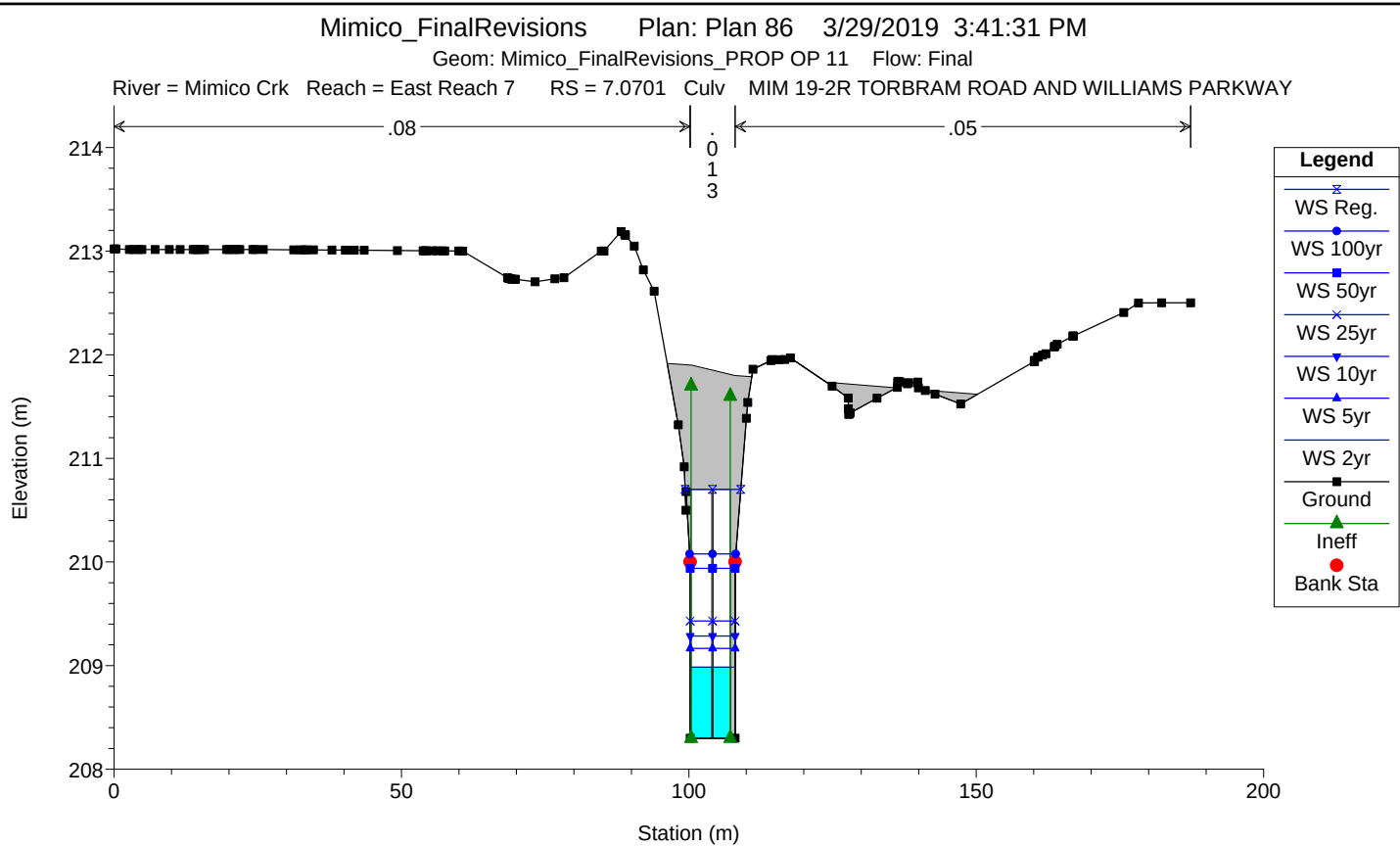
PROPOSED CONDITION - WIDENED CHANNEL

WATER SURFACE PROFILE - PROPOSED OPTION 4

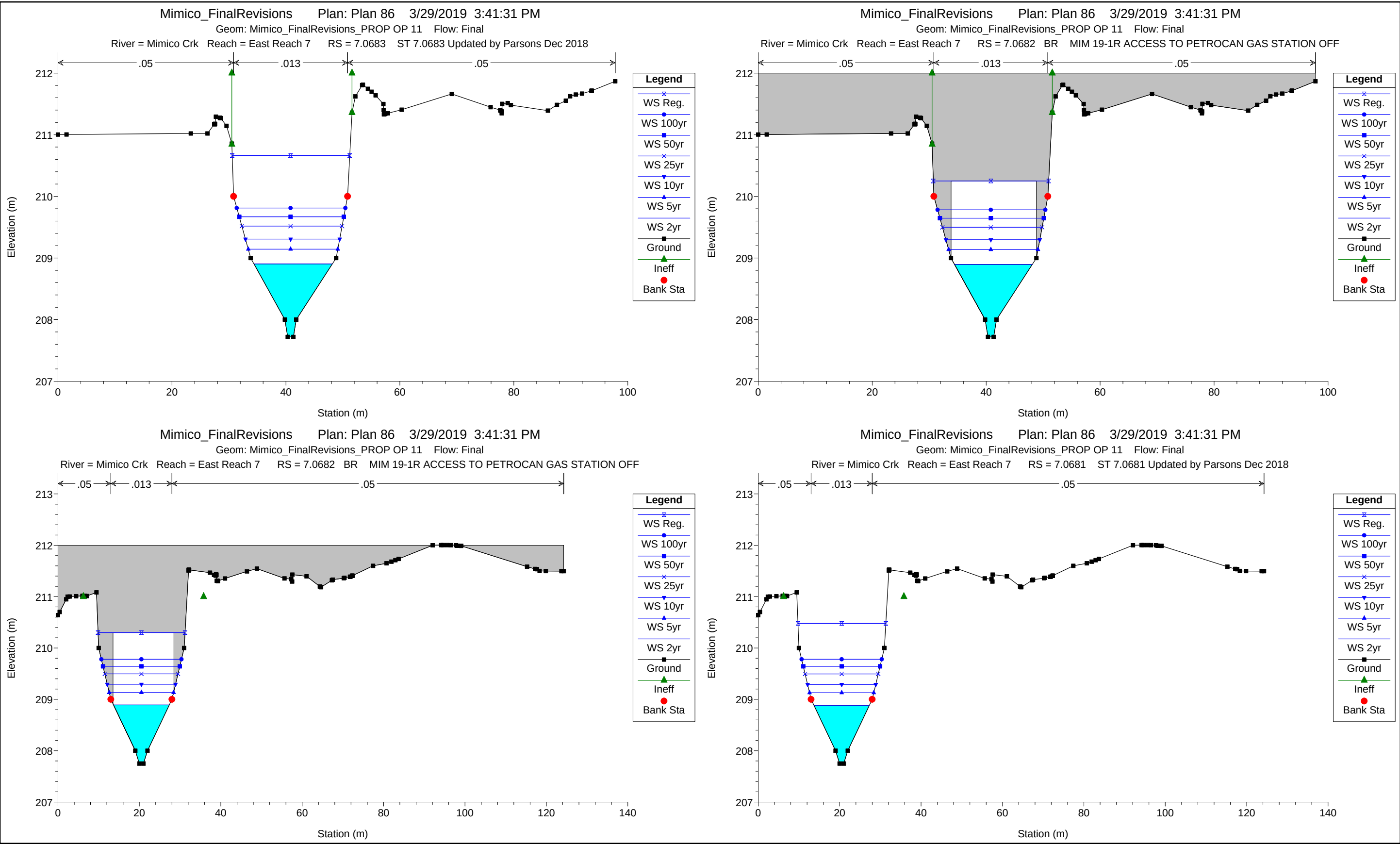


PROPOSED CONDITION: OPTION 4 - UPSTREAM AND DOWNSTREAM OF TWIN CULVERT ST 7.071





PROPOSED CONDITION: OPTION 4 - UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILE - PROPOSED OPTION 4

3.6 x 2.4 m BOX CULVERT

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	6.38	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.59
Q Barrel (m3/s)	6.38	Culv Vel DS (m/s)	1.61
E.G. US. (m)	209.39	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.21	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.08	Culv Frctn Ls (m)	0.22
W.S. DS (m)	208.97	Culv Exit Loss (m)	0.02
Delta EG (m)	0.31	Culv Entr Loss (m)	0.07
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	209.37	Weir Sta Lft (m)	
E.G. OC (m)	209.39	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	208.98	Weir Max Depth (m)	
Culv WS Outlet (m)	208.97	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.58	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.68	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	9.09	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.92
Q Barrel (m3/s)	9.09	Culv Vel DS (m/s)	1.89
E.G. US. (m)	209.68	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.45	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.36	Culv Frctn Ls (m)	0.21
W.S. DS (m)	209.20	Culv Exit Loss (m)	0.03
Delta EG (m)	0.32	Culv Entr Loss (m)	0.09
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	209.67	Weir Sta Lft (m)	
E.G. OC (m)	209.69	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.17	Weir Max Depth (m)	
Culv WS Outlet (m)	209.20	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.74	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.87	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	11.03	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.11
Q Barrel (m3/s)	11.03	Culv Vel DS (m/s)	2.05
E.G. US. (m)	209.87	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.60	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.54	Culv Frctn Ls (m)	0.20
W.S. DS (m)	209.36	Culv Exit Loss (m)	0.03
Delta EG (m)	0.32	Culv Entr Loss (m)	0.10
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	209.87	Weir Sta Lft (m)	
E.G. OC (m)	209.88	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.29	Weir Max Depth (m)	
Culv WS Outlet (m)	209.36	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.84	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.98	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	13.55	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.33
Q Barrel (m3/s)	13.55	Culv Vel DS (m/s)	2.22
E.G. US. (m)	210.10	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.80	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.78	Culv Frctn Ls (m)	0.18
W.S. DS (m)	209.56	Culv Exit Loss (m)	0.04
Delta EG (m)	0.32	Culv Entr Loss (m)	0.11
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	210.10	Weir Sta Lft (m)	
E.G. OC (m)	210.11	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.43	Weir Max Depth (m)	
Culv WS Outlet (m)	209.56	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.97	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.13	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	15.38	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.47
Q Barrel (m3/s)	15.38	Culv Vel DS (m/s)	2.33
E.G. US. (m)	210.26	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.94	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.95	Culv Frctn Ls (m)	0.16
W.S. DS (m)	209.71	Culv Exit Loss (m)	0.04
Delta EG (m)	0.32	Culv Entr Loss (m)	0.12
Delta WS (m)	0.23	Q Weir (m3/s)	
E.G. IC (m)	210.27	Weir Sta Lft (m)	
E.G. OC (m)	210.27	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.53	Weir Max Depth (m)	
Culv WS Outlet (m)	209.71	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.06	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.23	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	17.24	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.50
Q Barrel (m3/s)	17.24	Culv Vel DS (m/s)	2.43
E.G. US. (m)	210.43	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.08	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.10	Culv Frctn Ls (m)	0.15
W.S. DS (m)	209.84	Culv Exit Loss (m)	0.04
Delta EG (m)	0.32	Culv Entr Loss (m)	0.14
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	210.43	Weir Sta Lft (m)	
E.G. OC (m)	210.42	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.67	Weir Max Depth (m)	
Culv WS Outlet (m)	209.84	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.15	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.33	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	27.92	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	3.23
Q Barrel (m3/s)	27.92	Culv Vel DS (m/s)	3.23
E.G. US. (m)	211.49	Culv Inv El Up (m)	208.30
W.S. US. (m)	211.14	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.96	Culv Frctn Ls (m)	0.26
W.S. DS (m)	210.60	Culv Exit Loss (m)	0.17
Delta EG (m)	0.53	Culv Entr Loss (m)	0.11
Delta WS (m)	0.54	Q Weir (m3/s)	
E.G. IC (m)	211.43	Weir Sta Lft (m)	
E.G. OC (m)	211.48	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.83	Min El Weir Flow (m)	211.62

CULVERT OUTPUT FILE - PROPOSED OPTION 4

3.0 x 2.4 m BOX CULVERT

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 2yr

Q Culv Group (m3/s)	5.22	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.57
Q Barrel (m3/s)	5.22	Culv Vel DS (m/s)	1.58
E.G. US. (m)	209.39	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.21	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.08	Culv Frctn Ls (m)	0.22
W.S. DS (m)	208.97	Culv Exit Loss (m)	0.02
Delta EG (m)	0.31	Culv Entr Loss (m)	0.07
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	209.36	Weir Sta Lft (m)	
E.G. OC (m)	209.38	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	208.98	Weir Max Depth (m)	
Culv WS Outlet (m)	208.97	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.60	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.68	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 5yr

Q Culv Group (m3/s)	7.41	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.89
Q Barrel (m3/s)	7.41	Culv Vel DS (m/s)	1.85
E.G. US. (m)	209.68	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.45	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.36	Culv Frctn Ls (m)	0.20
W.S. DS (m)	209.20	Culv Exit Loss (m)	0.02
Delta EG (m)	0.32	Culv Entr Loss (m)	0.09
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	209.65	Weir Sta Lft (m)	
E.G. OC (m)	209.67	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.15	Weir Max Depth (m)	
Culv WS Outlet (m)	209.20	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.76	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.85	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 10yr

Q Culv Group (m3/s)	8.97	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.08
Q Barrel (m3/s)	8.97	Culv Vel DS (m/s)	2.00
E.G. US. (m)	209.87	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.60	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.54	Culv Frctn Ls (m)	0.19
W.S. DS (m)	209.36	Culv Exit Loss (m)	0.02
Delta EG (m)	0.32	Culv Entr Loss (m)	0.10
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	209.84	Weir Sta Lft (m)	
E.G. OC (m)	209.85	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.27	Weir Max Depth (m)	
Culv WS Outlet (m)	209.36	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.86	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.97	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 25yr

Q Culv Group (m3/s)	11.05	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.31
Q Barrel (m3/s)	11.05	Culv Vel DS (m/s)	2.18
E.G. US. (m)	210.10	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.80	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.78	Culv Frctn Ls (m)	0.17
W.S. DS (m)	209.56	Culv Exit Loss (m)	0.03
Delta EG (m)	0.32	Culv Entr Loss (m)	0.11
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	210.08	Weir Sta Lft (m)	
E.G. OC (m)	210.08	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.41	Weir Max Depth (m)	
Culv WS Outlet (m)	209.56	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.00	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.11	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 50yr

Q Culv Group (m3/s)	12.72	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.22
Q Barrel (m3/s)	12.72	Culv Vel DS (m/s)	2.31
E.G. US. (m)	210.26	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.94	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.95	Culv Frctn Ls (m)	0.17
W.S. DS (m)	209.71	Culv Exit Loss (m)	0.03
Delta EG (m)	0.32	Culv Entr Loss (m)	0.11
Delta WS (m)	0.23	Q Weir (m3/s)	
E.G. IC (m)	210.26	Weir Sta Lft (m)	
E.G. OC (m)	210.25	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.62	Weir Max Depth (m)	
Culv WS Outlet (m)	209.71	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.11	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.22	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: 100yr

Q Culv Group (m3/s)	14.26	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.23
Q Barrel (m3/s)	14.26	Culv Vel DS (m/s)	2.41
E.G. US. (m)	210.43	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.08	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.10	Culv Frctn Ls (m)	0.17
W.S. DS (m)	209.84	Culv Exit Loss (m)	0.03
Delta EG (m)	0.32	Culv Entr Loss (m)	0.12
Delta WS (m)	0.24	Q Weir (m3/s)	
E.G. IC (m)	210.42	Weir Sta Lft (m)	
E.G. OC (m)	210.41	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.77	Weir Max Depth (m)	
Culv WS Outlet (m)	209.84	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.20	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.32	Min El Weir Flow (m)	211.62

Plan: Plan 86 Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #2 Profile: Reg.

Q Culv Group (m3/s)	22.98	Culv Full Len (m)	95.50
# Barrels	1	Culv Vel US (m/s)	3.19
Q Barrel (m3/s)	22.98	Culv Vel DS (m/s)	3.19
E.G. US. (m)	211.49	Culv Inv El Up (m)	208.30
W.S. US. (m)	211.14	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.96	Culv Frctn Ls (m)	0.27
W.S. DS (m)	210.60	Culv Exit Loss (m)	0.15
Delta EG (m)	0.53	Culv Entr Loss (m)	0.10
Delta WS (m)	0.54	Q Weir (m3/s)	
E.G. IC (m)	211.38	Weir Sta Lft (m)	
E.G. OC (m)	211.50	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	210.70	Weir Max Depth (m)	
Culv WS Outlet (m)	210.27	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	1.82	Min El Weir Flow (m)	211.62

PROFILE OUTPUT TABLE - PROPOSED OPTION 4

RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	209.58	209.58	209.93	0.002038	2.60	4.27	6.07	0.99
East Reach 7	7.072	5yr	15.70	208.53	209.78	209.78	210.19	0.002007	2.83	5.55	6.83	1.00
East Reach 7	7.072	10yr	18.90	208.53	209.91	209.91	210.34	0.001940	2.93	6.44	7.32	1.00
East Reach 7	7.072	25yr	23.10	208.53	210.04	210.04	210.53	0.001892	3.09	7.47	7.86	1.00
East Reach 7	7.072	50yr	26.30	208.53	210.14	210.14	210.66	0.001798	3.21	8.24	8.27	0.99
East Reach 7	7.072	100yr	29.40	208.53	210.22	210.22	210.78	0.001764	3.34	8.91	8.62	0.99
East Reach 7	7.072	Reg.	46.10	208.53	211.11	210.62	211.53	0.000628	2.92	18.33	12.96	0.65
East Reach 7	7.071	2yr	11.60	208.30	209.21	208.97	209.39	0.000680	1.88	6.17	7.82	0.63
East Reach 7	7.071	5yr	16.50	208.30	209.45	209.14	209.68	0.000629	2.11	7.80	7.82	0.63
East Reach 7	7.071	10yr	20.00	208.30	209.60	209.26	209.86	0.000602	2.25	8.87	7.82	0.63
East Reach 7	7.071	25yr	24.60	208.30	209.80	209.40	210.09	0.000575	2.42	10.18	7.82	0.63
East Reach 7	7.071	50yr	28.10	208.30	209.94	209.50	210.26	0.000557	2.52	11.14	7.82	0.63
East Reach 7	7.071	100yr	31.50	208.30	210.08	209.60	210.42	0.000533	2.61	12.09	8.01	0.62
East Reach 7	7.071	Reg.	50.90	208.30	211.14	210.09	211.49	0.000293	2.64	19.29	11.01	0.50
East Reach 7	7.0701		Culvert									
East Reach 7	7.07	2yr	11.60	207.80	208.97	208.47	209.08	0.000292	1.46	7.95	7.48	0.43
East Reach 7	7.07	5yr	16.50	207.80	209.20	208.65	209.36	0.000321	1.73	9.54	8.46	0.47
East Reach 7	7.07	10yr	20.00	207.80	209.36	208.76	209.54	0.000330	1.88	10.62	9.18	0.48
East Reach 7	7.07	25yr	24.60	207.80	209.56	208.90	209.78	0.000334	2.05	11.99	10.08	0.49
East Reach 7	7.07	50yr	28.10	207.80	209.71	209.01	209.95	0.000336	2.17	12.96	10.72	0.50
East Reach 7	7.07	100yr	31.50	207.80	209.84	209.10	210.10	0.000338	2.27	13.86	11.32	0.51
East Reach 7	7.07	Reg.	50.90	207.80	210.60	209.59	210.96	0.000307	2.68	19.01	15.14	0.51
East Reach 7	7.069	2yr	11.60	207.80	208.89		209.05	0.000509	1.76	6.85	7.74	0.54
East Reach 7	7.069	5yr	16.50	207.80	209.09		209.32	0.000585	2.12	8.51	8.86	0.59
East Reach 7	7.069	10yr	20.00	207.80	209.23		209.50	0.000608	2.31	9.80	9.63	0.62
East Reach 7	7.069	25yr	24.60	207.80	209.42		209.73	0.000610	2.51	11.66	10.65	0.63

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.55		209.90	0.000605	2.63	13.15	11.40	0.64
East Reach 7	7.069	100yr	31.50	207.80	209.68		210.05	0.000598	2.74	14.63	12.11	0.64
East Reach 7	7.069	Reg.	50.90	207.80	210.49		210.93	0.000447	3.01	26.32	16.79	0.59
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000919	1.54	7.53	13.74	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.12	15.72	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000472	1.45	13.76	16.53	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000360	1.42	17.34	17.59	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000306	1.40	20.08	18.35	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000268	1.39	22.73	19.06	0.41
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000117	1.28	39.86	20.62	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.70	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.011358	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511		Culvert									
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451		Culvert									
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

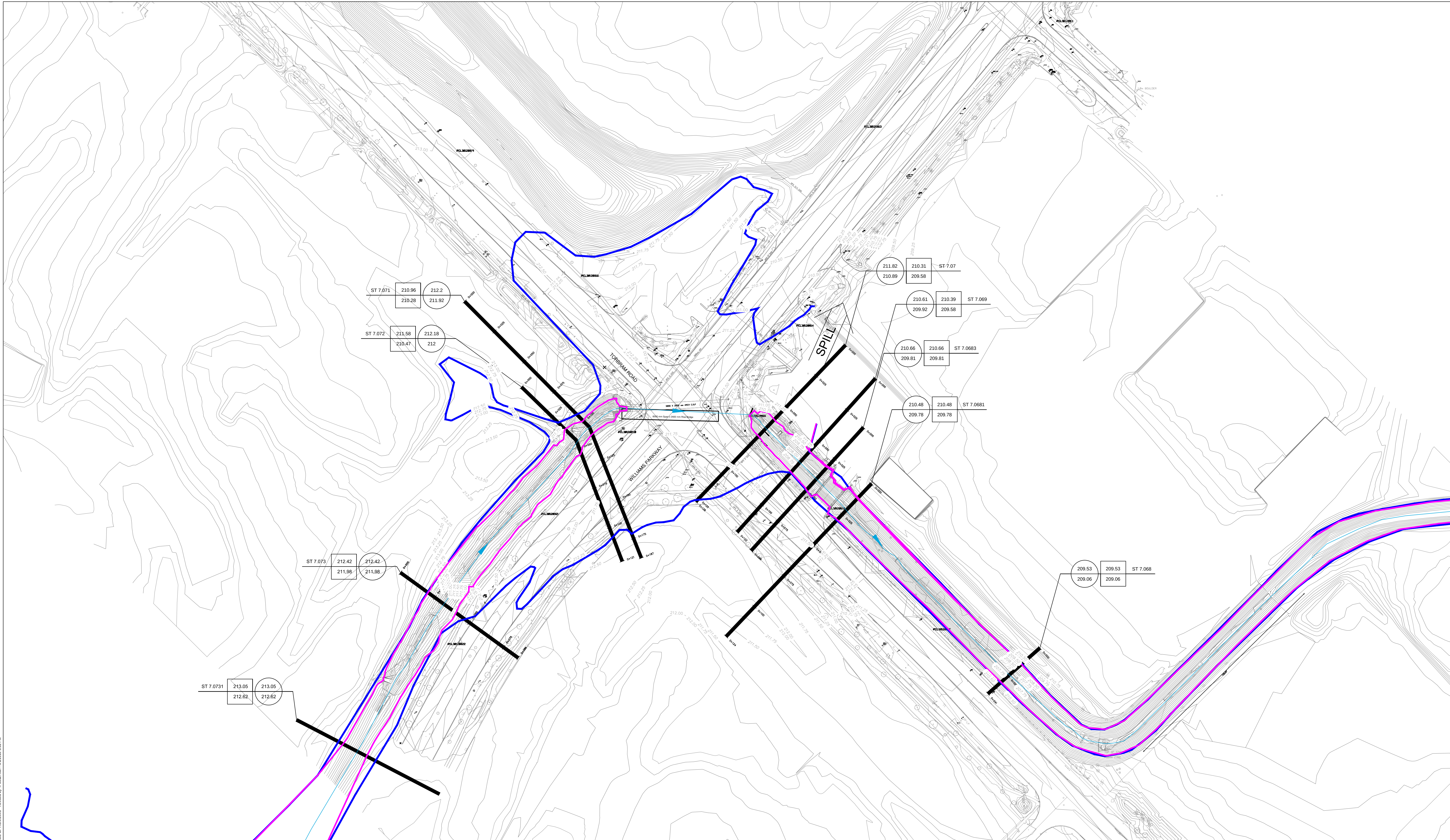
HEC-RAS Plan: Plan 86 River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

PROPOSED OPTION 5

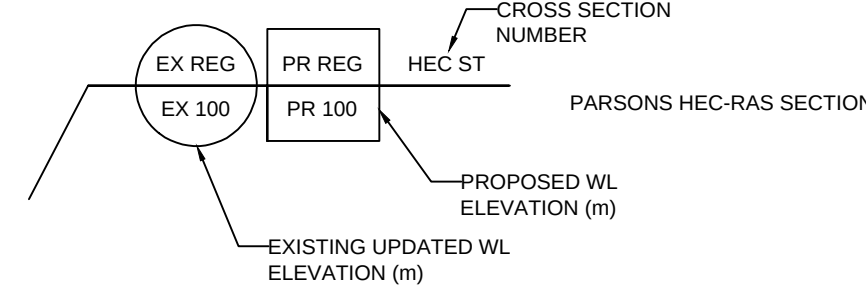
BRIDGE

PROPOSED CONDITION - WIDENED CHANNEL

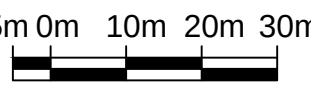


LEGEND

- PROPOSED CULVERT
- EXISTING REGULATORY FLOODLINE (TRCA)
- PROPOSED REGULATORY FLOODLINE
- CREEK FLOW DIRECTION



SCALE HORIZONTAL
1:1000



DATE: MARCH 2019
SCALE: 1 : 1000



625 COCHRANE DRIVE, SUITE 500
MARKHAM, ONTARIO L3R 9R9
TEL: 905-943-0500
FAX: 905-943-0400

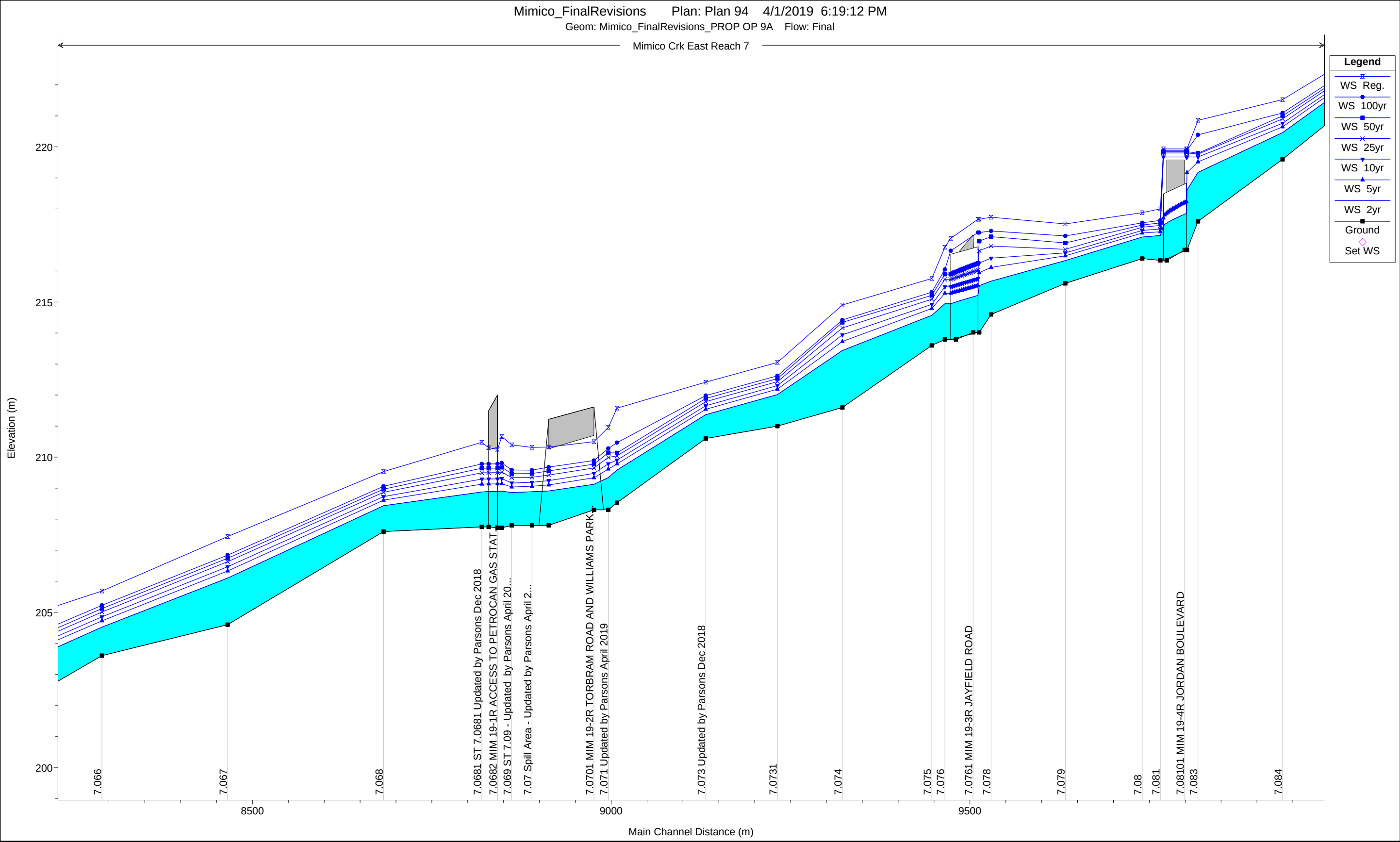
TORBRAM ROAD FROM BOVAIRD DRIVE TO QUEENS STREET EAST

6.6m Span Bridge Option

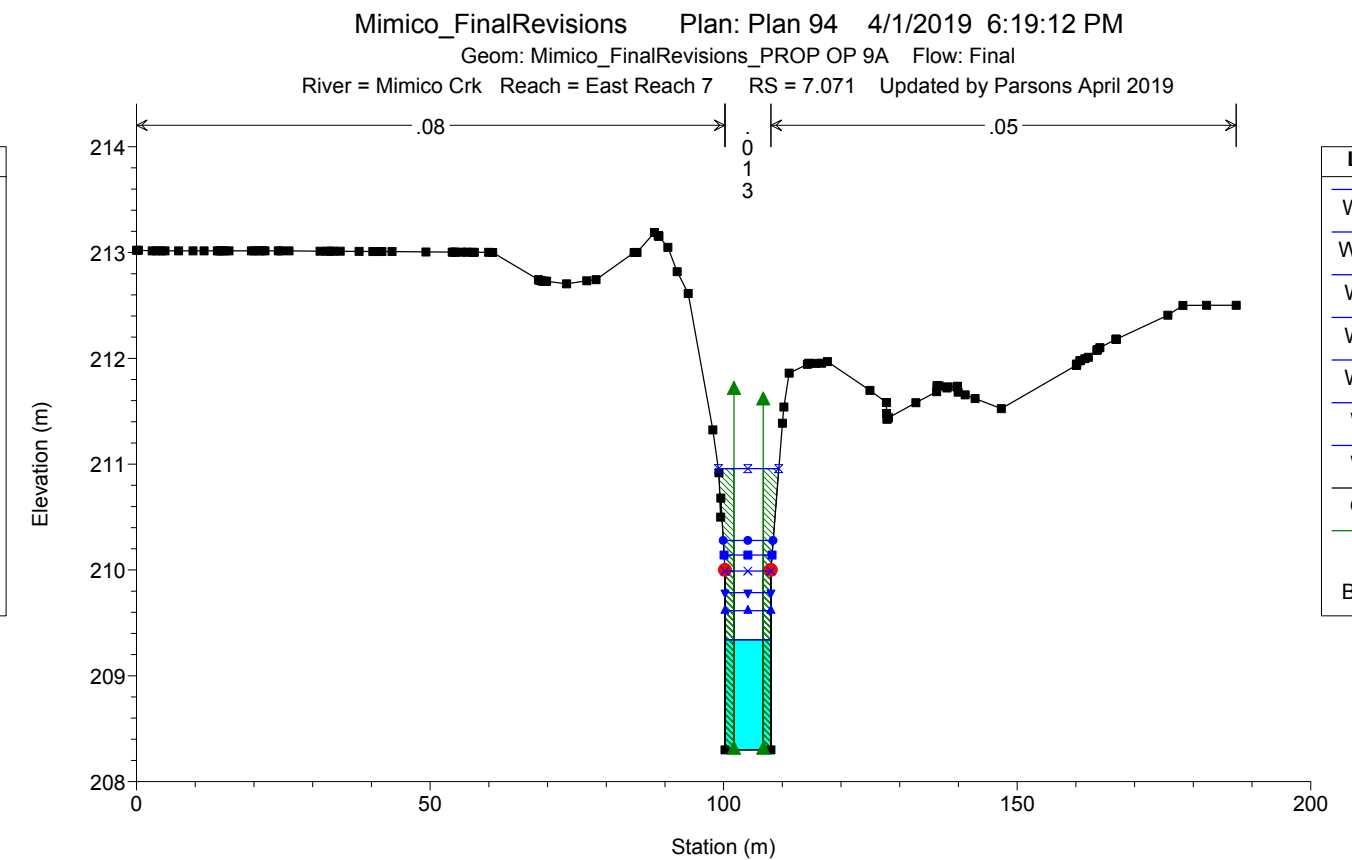
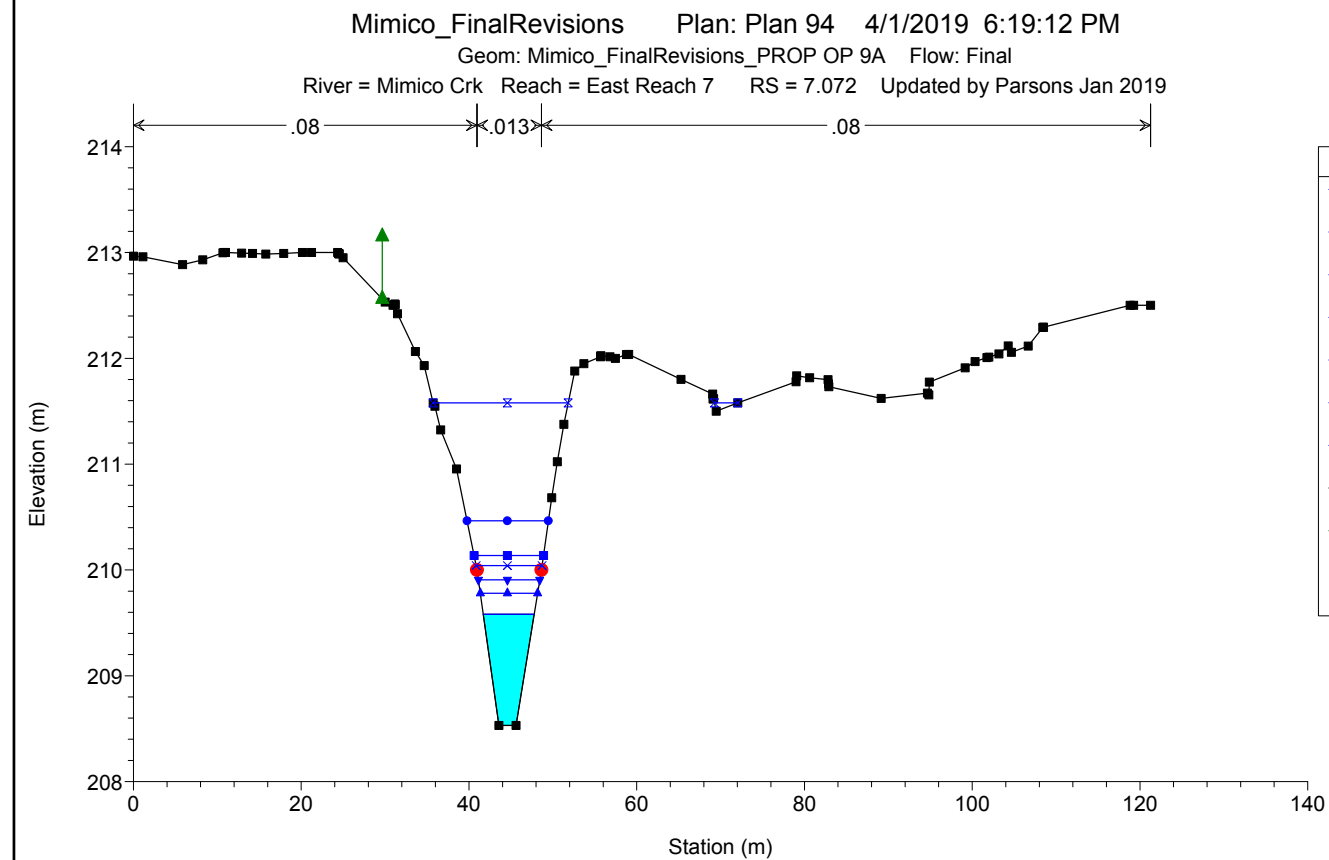
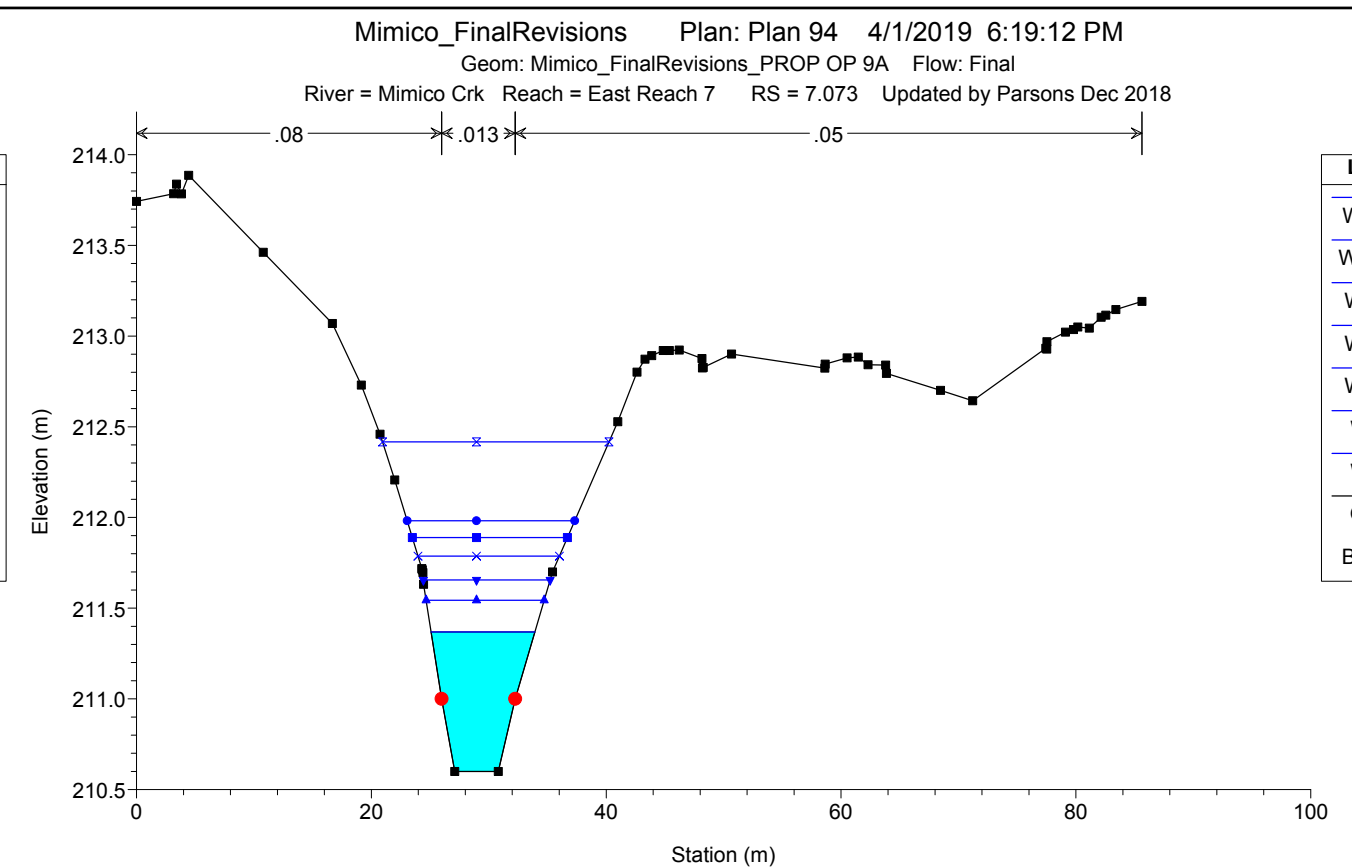
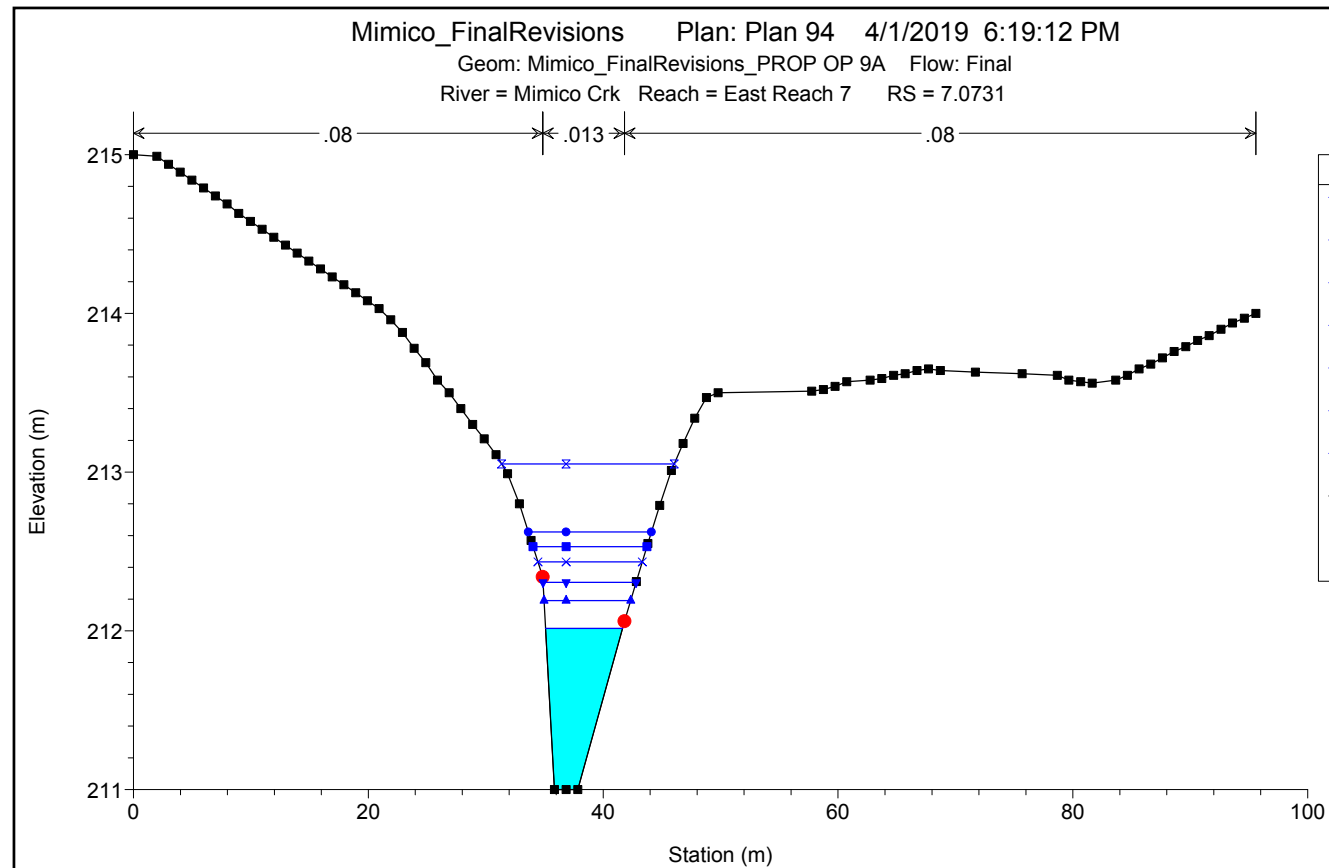
FLOODPLAIN MAP ESR TWIN CULVERT - TORBRAM ROAD AND WILLIAMS PARKWAY INTERSECTION

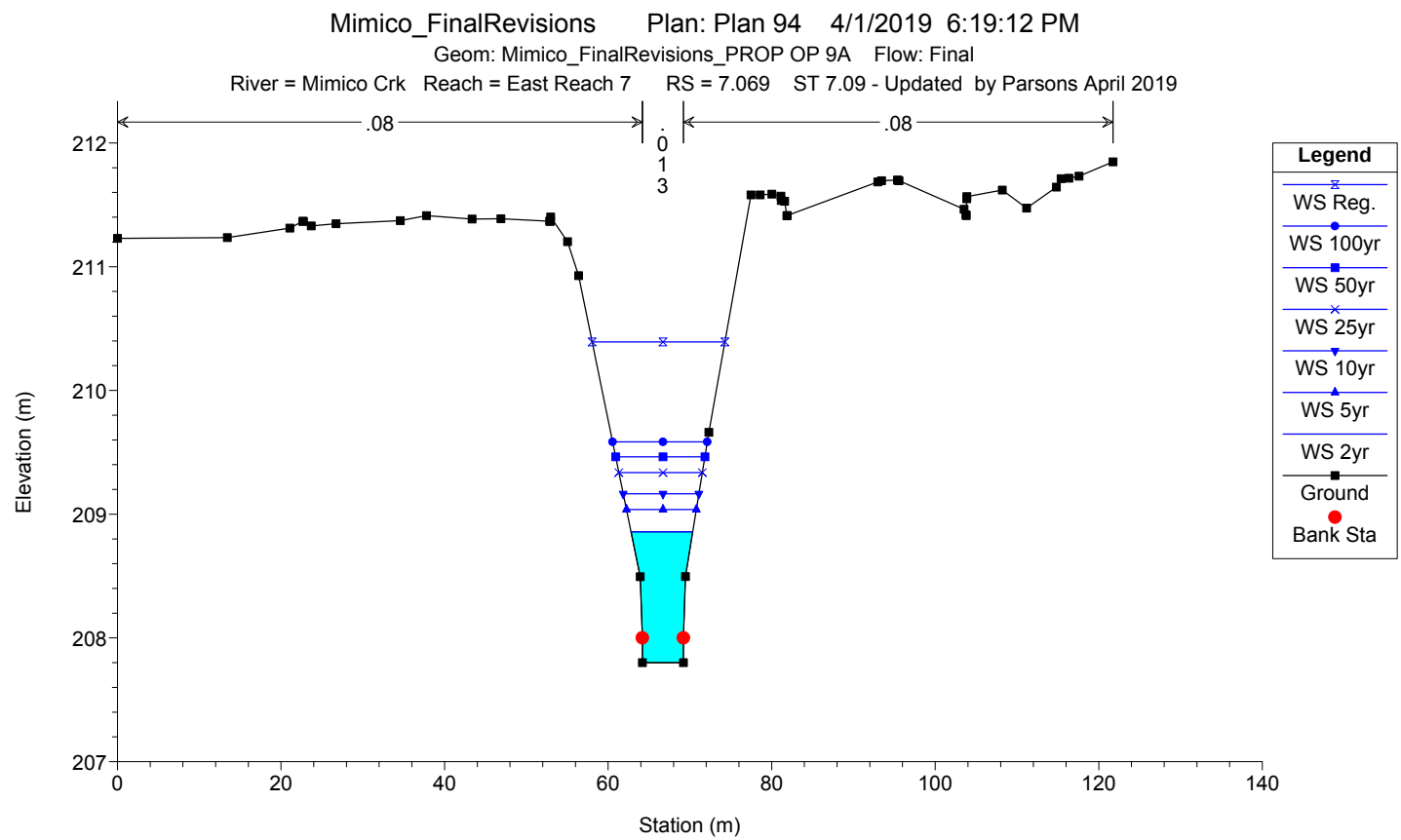
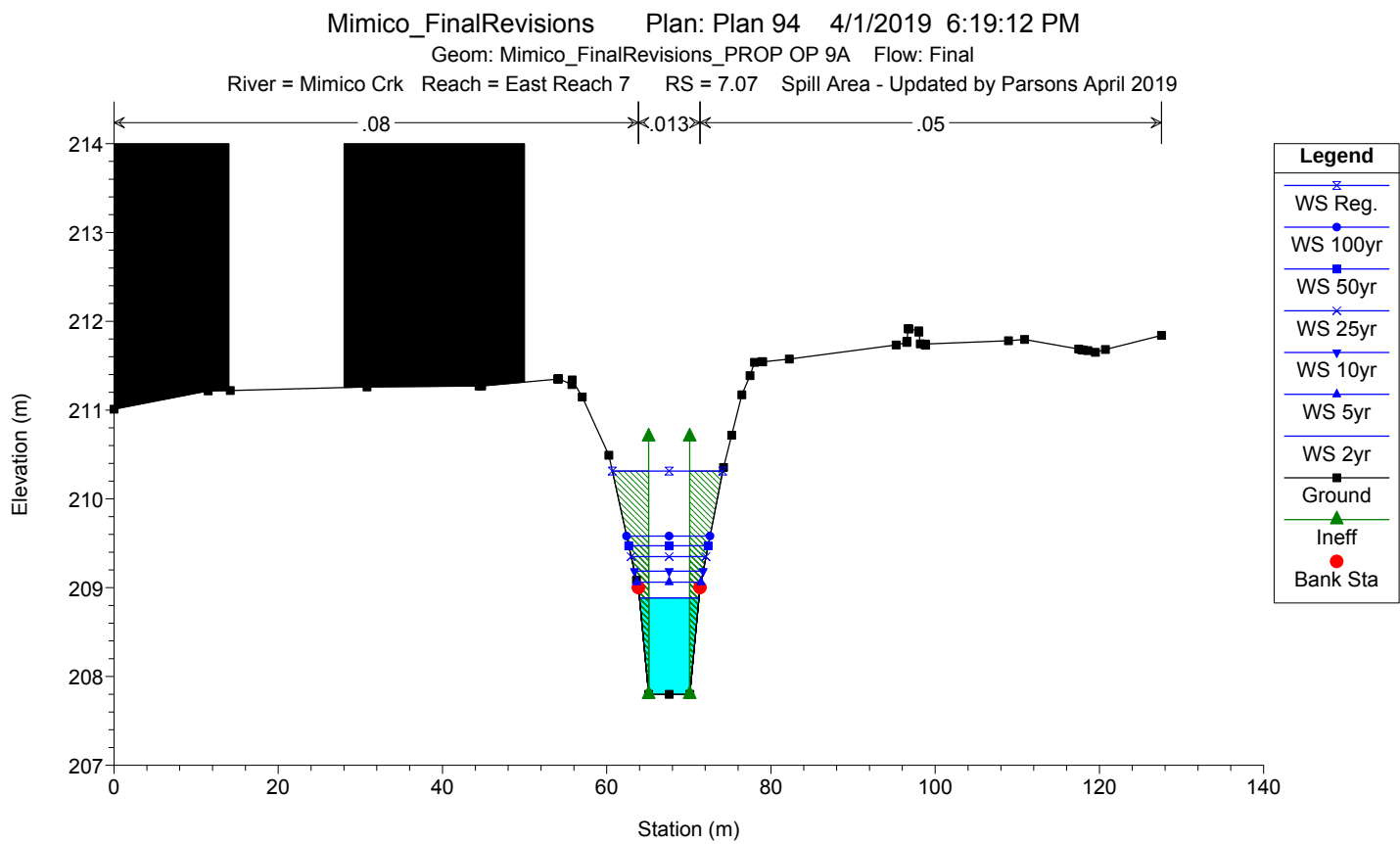
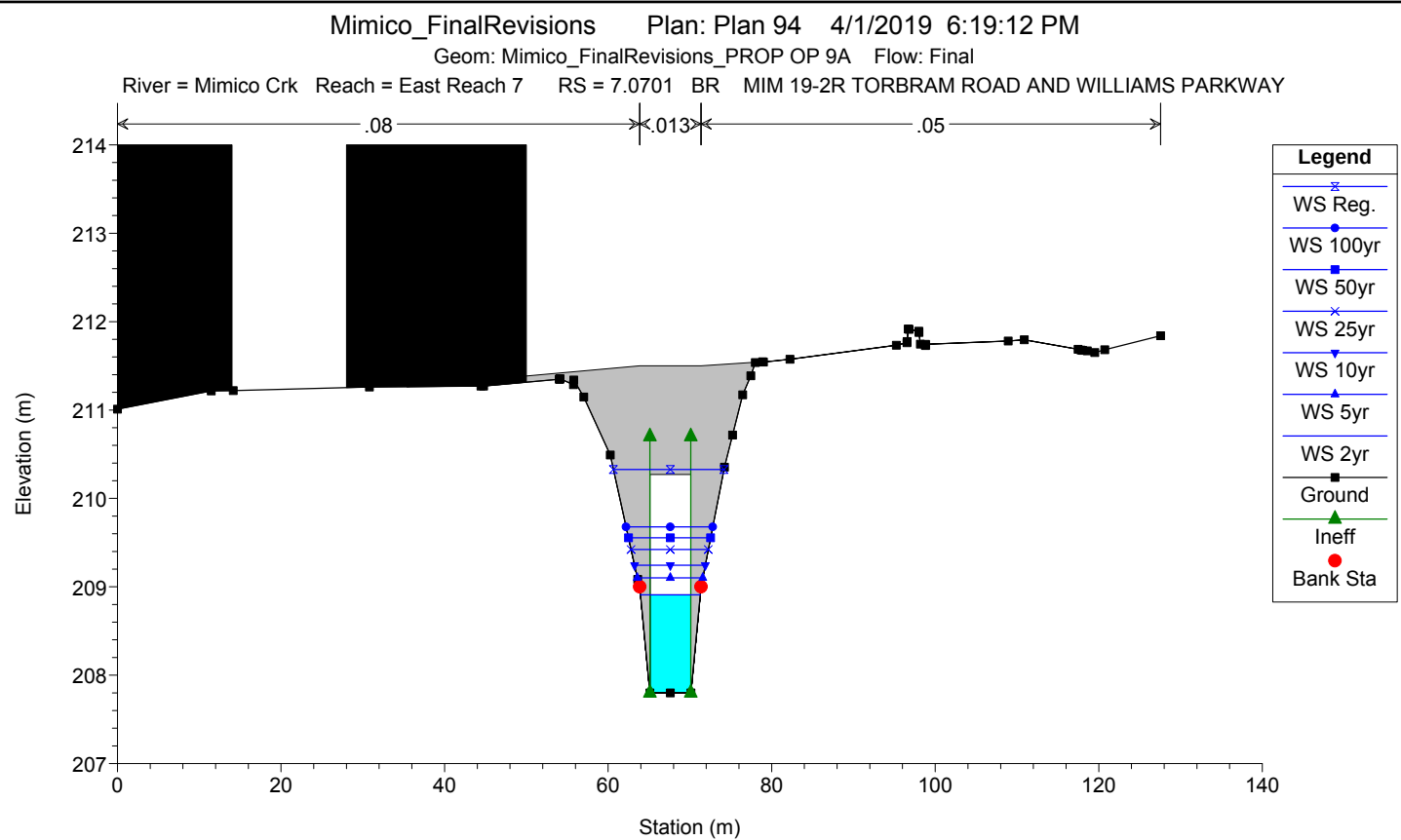
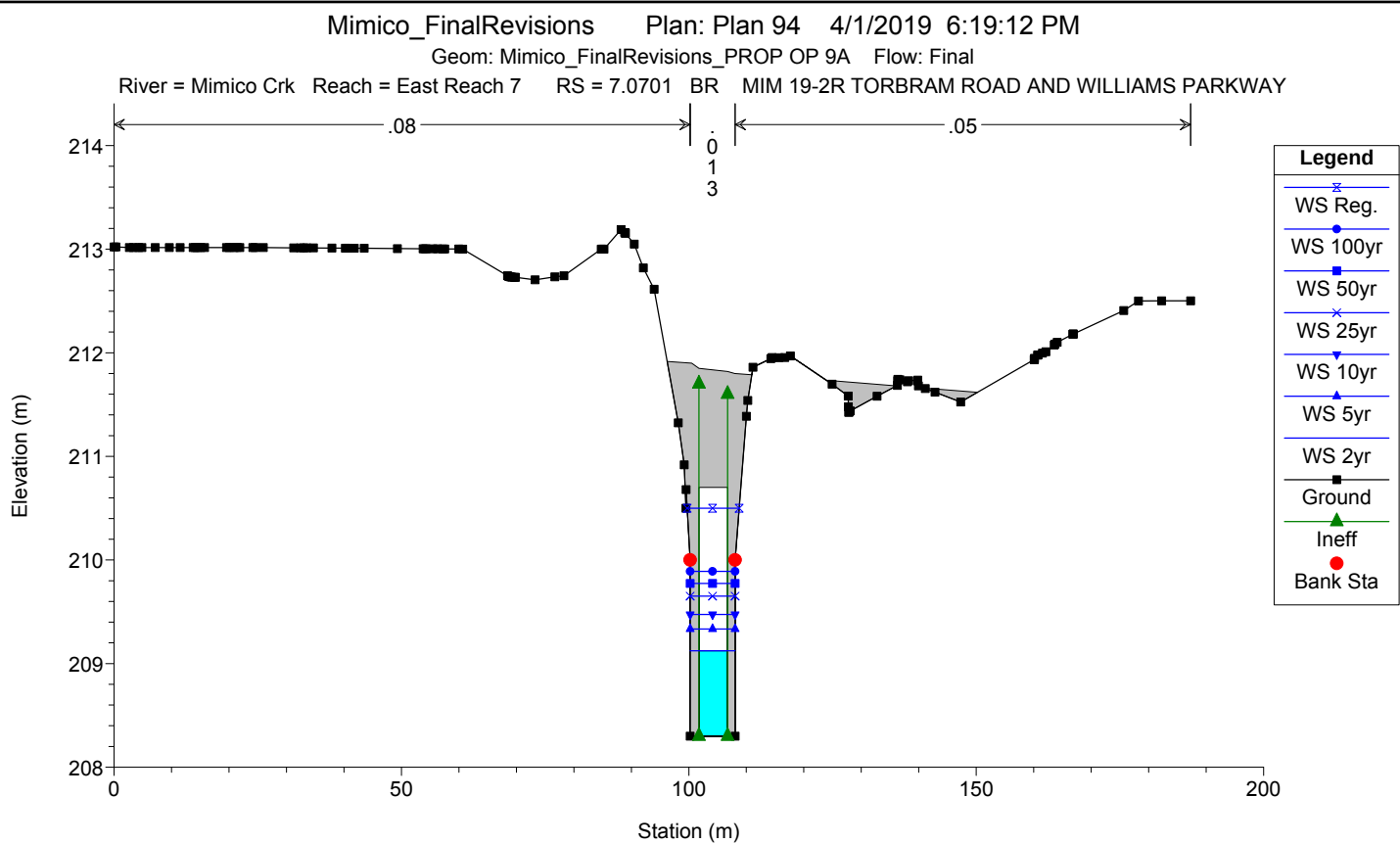
File: G:\10239 TORBRAM ROAD EXHAUSTIVE STUDY\10239-5-FP - BRIDGE OPTION.DWG - Revised by: P0012780 - 4/20/19 3:02 PM

WATER SURFACE PROFILE - PROPOSED OPTION 5

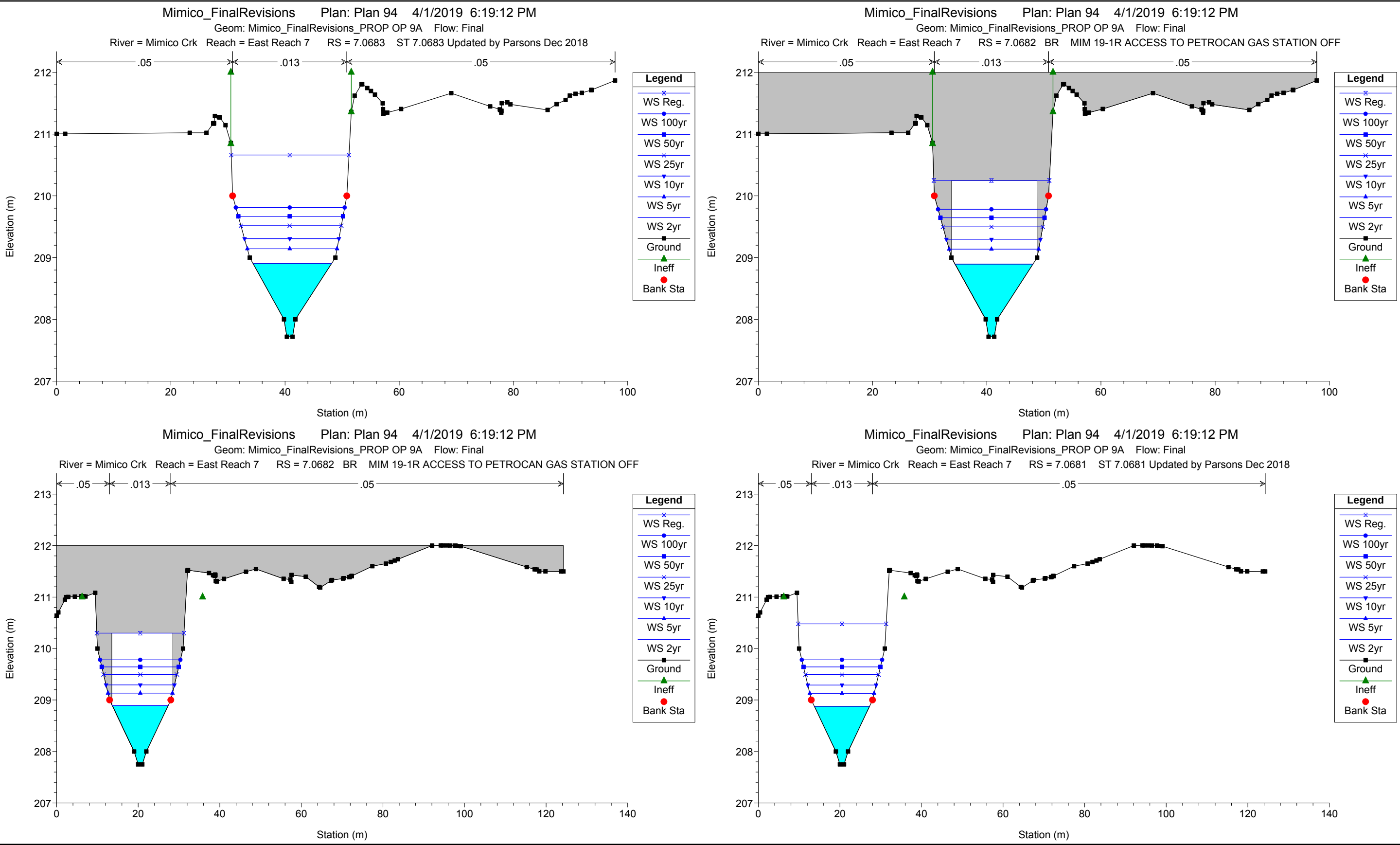


PROPOSED CONDITION: OPTION 5 - UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.071





PROPOSED CONDITION: OPTION 5 - UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



BRIDGE OUTPUT FILE - PROPOSED OPTION 5

BRIDGE - 6.6m SPAN AND 2.4m RISE

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 2yr

E.G. US. (m)	209.59	Element	Inside BR US	Inside BR DS
W.S. US. (m)	209.34	E.G. Elev (m)	209.53	209.13
Q Total (m3/s)	11.60	W.S. Elev (m)	209.12	208.91
Q Bridge (m3/s)	11.60	Crit W.S. (m)	209.12	208.61
Q Weir (m3/s)		Max Chl Dpth (m)	0.82	1.11
Weir Sta Lft (m)		Vel Total (m/s)	2.82	2.09
Weir Sta Rgt (m)		Flow Area (m2)	4.12	5.54
Weir Submerg		Froude # Chl	0.99	0.63
Weir Max Depth (m)		Specif Force (m3)	5.03	5.55
Min El Weir Flow (m)	211.62	Hydr Depth (m)	0.82	1.11
Min El Prs (m)	210.70	W.P. Total (m)	5.00	5.00
Delta EG (m)	0.48	Conv. Total (m3/s)	278.2	456.9
Delta WS (m)	0.46	Top Width (m)	5.01	5.01
BR Open Area (m2)	12.00	Frctn Loss (m)	0.06	0.02
BR Open Vel (m/s)	2.82	C & E Loss (m)	0.09	0.00
Coef of Q		Shear Total (N/m2)	14.04	7.01
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 5yr

E.G. US. (m)	209.94	Element	Inside BR US	Inside BR DS
W.S. US. (m)	209.62	E.G. Elev (m)	209.85	209.43
Q Total (m3/s)	16.50	W.S. Elev (m)	209.33	209.10
Q Bridge (m3/s)	16.50	Crit W.S. (m)	209.33	208.83
Q Weir (m3/s)		Max Chl Dpth (m)	1.03	1.30
Weir Sta Lft (m)		Vel Total (m/s)	3.19	2.54
Weir Sta Rgt (m)		Flow Area (m2)	5.17	6.51
Weir Submerg		Froude # Chl	1.00	0.71
Weir Max Depth (m)		Specif Force (m3)	8.04	8.50
Min El Weir Flow (m)	211.62	Hydr Depth (m)	1.03	1.30
Min El Prs (m)	210.70	W.P. Total (m)	5.00	5.00
Delta EG (m)	0.53	Conv. Total (m3/s)	406.8	596.5
Delta WS (m)	0.55	Top Width (m)	5.01	5.01
BR Open Area (m2)	12.00	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	3.19	C & E Loss (m)	0.10	0.01
Coef of Q		Shear Total (N/m2)	16.69	9.76
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 10yr

E.G. US. (m)	210.15	Element	Inside BR US	Inside BR DS
W.S. US. (m)	209.79	E.G. Elev (m)	210.07	209.63
Q Total (m3/s)	20.00	W.S. Elev (m)	209.47	209.24
Q Bridge (m3/s)	20.00	Crit W.S. (m)	209.47	208.98
Q Weir (m3/s)		Max Chl Dpth (m)	1.17	1.44
Weir Sta Lft (m)		Vel Total (m/s)	3.41	2.77
Weir Sta Rgt (m)		Flow Area (m2)	5.87	7.22
Weir Submerg		Froude # Chl	1.00	0.74
Weir Max Depth (m)		Specif Force (m3)	10.39	10.86
Min El Weir Flow (m)	211.62	Hydr Depth (m)	1.17	1.44
Min El Prs (m)	210.70	W.P. Total (m)	5.00	5.00
Delta EG (m)	0.54	Conv. Total (m3/s)	502.7	708.9
Delta WS (m)	0.60	Top Width (m)	5.01	5.01
BR Open Area (m2)	12.00	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	3.41	C & E Loss (m)	0.10	0.01

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 10yr (Continued)

Coef of Q		Shear Total (N/m2)	18.23	11.26
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 25yr

E.G. US. (m)	210.42	Element	Inside BR US	Inside BR DS
W.S. US. (m)	209.99	E.G. Elev (m)	210.33	209.89
Q Total (m3/s)	24.60	W.S. Elev (m)	209.65	209.42
Q Bridge (m3/s)	24.60	Crit W.S. (m)	209.65	209.15
Q Weir (m3/s)		Max Chl Dpth (m)	1.35	1.62
Weir Sta Lft (m)		Vel Total (m/s)	3.64	3.03
Weir Sta Rgt (m)		Flow Area (m2)	6.76	8.11
Weir Submerg		Froude # Chl	1.00	0.76
Weir Max Depth (m)		Specif Force (m3)	13.69	14.18
Min El Weir Flow (m)	211.62	Hydr Depth (m)	1.35	1.62
Min El Prs (m)	210.70	W.P. Total (m)	5.00	5.00
Delta EG (m)	0.56	Conv. Total (m3/s)	635.3	861.3
Delta WS (m)	0.64	Top Width (m)	5.01	5.01
BR Open Area (m2)	12.00	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	3.64	C & E Loss (m)	0.10	0.01
Coef of Q		Shear Total (N/m2)	19.87	12.98
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 50yr

E.G. US. (m)	210.62	Element	Inside BR US	Inside BR DS
W.S. US. (m)	210.14	E.G. Elev (m)	210.51	210.08
Q Total (m3/s)	28.10	W.S. Elev (m)	209.77	209.55
Q Bridge (m3/s)	28.10	Crit W.S. (m)	209.77	209.28
Q Weir (m3/s)		Max Chl Dpth (m)	1.47	1.75
Weir Sta Lft (m)		Vel Total (m/s)	3.81	3.20
Weir Sta Rgt (m)		Flow Area (m2)	7.37	8.77
Weir Submerg		Froude # Chl	1.00	0.77
Weir Max Depth (m)		Specif Force (m3)	16.35	16.87
Min El Weir Flow (m)	211.62	Hydr Depth (m)	1.47	1.75
Min El Prs (m)	210.70	W.P. Total (m)	5.00	5.00
Delta EG (m)	0.57	Conv. Total (m3/s)	733.8	981.9
Delta WS (m)	0.67	Top Width (m)	5.01	5.01
BR Open Area (m2)	12.00	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	3.81	C & E Loss (m)	0.11	0.02
Coef of Q		Shear Total (N/m2)	21.19	14.09
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 100yr

E.G. US. (m)	210.80	Element	Inside BR US	Inside BR DS
W.S. US. (m)	210.28	E.G. Elev (m)	210.69	210.25
Q Total (m3/s)	31.50	W.S. Elev (m)	209.89	209.68
Q Bridge (m3/s)	31.50	Crit W.S. (m)	209.89	209.40
Q Weir (m3/s)		Max Chl Dpth (m)	1.59	1.88
Weir Sta Lft (m)		Vel Total (m/s)	3.96	3.35
Weir Sta Rgt (m)		Flow Area (m2)	7.95	9.39
Weir Submerg		Froude # Chl	1.00	0.78
Weir Max Depth (m)		Specif Force (m3)	19.04	19.59
Min El Weir Flow (m)	211.62	Hydr Depth (m)	1.59	1.88
Min El Prs (m)	210.70	W.P. Total (m)	5.00	5.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: 100yr (Continued)

Delta EG (m)	0.58	Conv. Total (m3/s)	833.8	1100.0
Delta WS (m)	0.70	Top Width (m)	5.01	5.01
BR Open Area (m2)	12.00	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	3.96	C & E Loss (m)	0.11	0.02
Coef of Q		Shear Total (N/m2)	22.27	15.11
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: OP 9A Mimico Crk East Reach 7 RS: 7.0701 Profile: Reg.

E.G. US. (m)	211.70	Element	Inside BR US	Inside BR DS
W.S. US. (m)	210.96	E.G. Elev (m)	211.59	211.19
Q Total (m3/s)	50.90	W.S. Elev (m)	210.50	210.33
Q Bridge (m3/s)	50.90	Crit W.S. (m)	210.50	209.99
Q Weir (m3/s)		Max Chl Dpth (m)	2.20	2.53
Weir Sta Lft (m)		Vel Total (m/s)	4.63	4.12
Weir Sta Rgt (m)		Flow Area (m2)	11.00	12.35
Weir Submerg		Froude # Chl	1.00	0.83
Weir Max Depth (m)		Specif Force (m3)	36.10	37.33
Min El Weir Flow (m)	211.62	Hydr Depth (m)	2.20	
Min El Prs (m)	210.70	W.P. Total (m)	5.00	10.00
Delta EG (m)	0.56	Conv. Total (m3/s)	1430.3	1093.4
Delta WS (m)	0.64	Top Width (m)	5.01	
BR Open Area (m2)	12.00	Frctn Loss (m)	0.10	0.03
BR Open Vel (m/s)	4.63	C & E Loss (m)	0.11	0.01
Coef of Q		Shear Total (N/m2)	27.31	26.24
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	209.58	209.58	209.93	0.002038	2.60	4.27	6.07	0.99
East Reach 7	7.072	5yr	15.70	208.53	209.78	209.78	210.19	0.002007	2.83	5.55	6.83	1.00
East Reach 7	7.072	10yr	18.90	208.53	209.91	209.91	210.34	0.001940	2.93	6.44	7.32	1.00
East Reach 7	7.072	25yr	23.10	208.53	210.04	210.04	210.53	0.001892	3.09	7.47	7.86	1.00
East Reach 7	7.072	50yr	26.30	208.53	210.14	210.14	210.66	0.001798	3.21	8.24	8.27	0.99
East Reach 7	7.072	100yr	29.40	208.53	210.47	210.22	210.85	0.000915	2.74	11.19	9.70	0.74
East Reach 7	7.072	Reg.	46.10	208.53	211.58	210.62	211.85	0.000306	2.34	25.34	18.88	0.47
East Reach 7	7.071	2yr	11.60	208.30	209.34	209.12	209.59	0.000800	2.23	5.20	7.82	0.70
East Reach 7	7.071	5yr	16.50	208.30	209.62	209.34	209.94	0.000739	2.51	6.58	7.82	0.70
East Reach 7	7.071	10yr	20.00	208.30	209.79	209.48	210.15	0.000723	2.69	7.43	7.82	0.71
East Reach 7	7.071	25yr	24.60	208.30	209.99	209.65	210.42	0.000712	2.91	8.45	7.82	0.72
East Reach 7	7.071	50yr	28.10	208.30	210.14	209.78	210.62	0.000697	3.05	9.21	8.17	0.72
East Reach 7	7.071	100yr	31.50	208.30	210.28	209.89	210.80	0.000689	3.18	9.90	8.51	0.72
East Reach 7	7.071	Reg.	50.90	208.30	210.96	210.50	211.70	0.000674	3.83	13.29	10.29	0.75
East Reach 7	7.0701		Bridge									
East Reach 7	7.07	2yr	11.60	207.80	208.88	208.62	209.12	0.000696	2.14	5.42	7.24	0.66
East Reach 7	7.07	5yr	16.50	207.80	209.06	208.84	209.41	0.000849	2.62	6.31	7.81	0.74
East Reach 7	7.07	10yr	20.00	207.80	209.19	208.97	209.61	0.000911	2.89	6.93	8.38	0.78
East Reach 7	7.07	25yr	24.60	207.80	209.35	209.15	209.86	0.000948	3.17	7.75	9.12	0.81
East Reach 7	7.07	50yr	28.10	207.80	209.47	209.28	210.05	0.000964	3.36	8.36	9.67	0.83
East Reach 7	7.07	100yr	31.50	207.80	209.58	209.39	210.22	0.000979	3.54	8.91	10.16	0.85
East Reach 7	7.07	Reg.	50.90	207.80	210.31	209.99	211.15	0.000812	4.05	12.56	13.45	0.82
East Reach 7	7.069	2yr	11.60	207.80	208.86		209.10	0.000816	2.17	5.97	7.54	0.67
East Reach 7	7.069	5yr	16.50	207.80	209.04	208.84	209.38	0.000967	2.62	7.42	8.54	0.75
East Reach 7	7.069	10yr	20.00	207.80	209.17	208.98	209.58	0.001015	2.87	8.56	9.25	0.78
East Reach 7	7.069	25yr	24.60	207.80	209.34	209.15	209.82	0.001022	3.12	10.23	10.21	0.80

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.46	209.28	209.99	0.001012	3.27	11.57	10.92	0.81
East Reach 7	7.069	100yr	31.50	207.80	209.58	209.39	210.16	0.000998	3.40	12.92	11.58	0.81
East Reach 7	7.069	Reg.	50.90	207.80	210.39	209.97	211.03	0.000697	3.65	24.17	16.24	0.72
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000919	1.54	7.53	13.74	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.12	15.72	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000472	1.45	13.76	16.53	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000360	1.42	17.34	17.59	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000306	1.40	20.08	18.35	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000268	1.39	22.73	19.06	0.41
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000117	1.28	39.86	20.62	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.70	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.011358	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511	Culvert										
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451	Culvert										
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

HEC-RAS Plan: OP 9A River: Mimico Crk Reach: East Reach 7 (Continued)

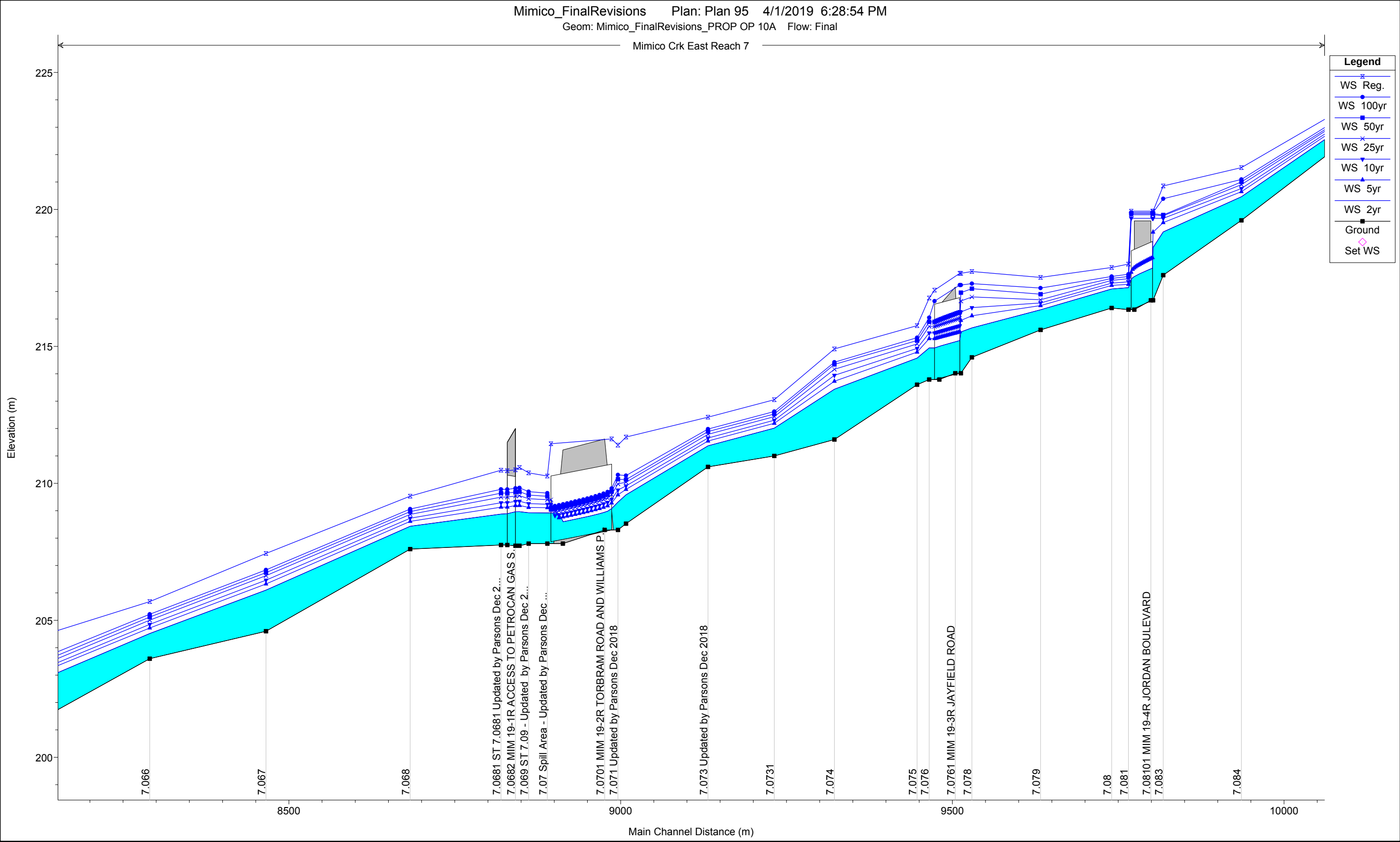
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

PROPOSED OPTION 6

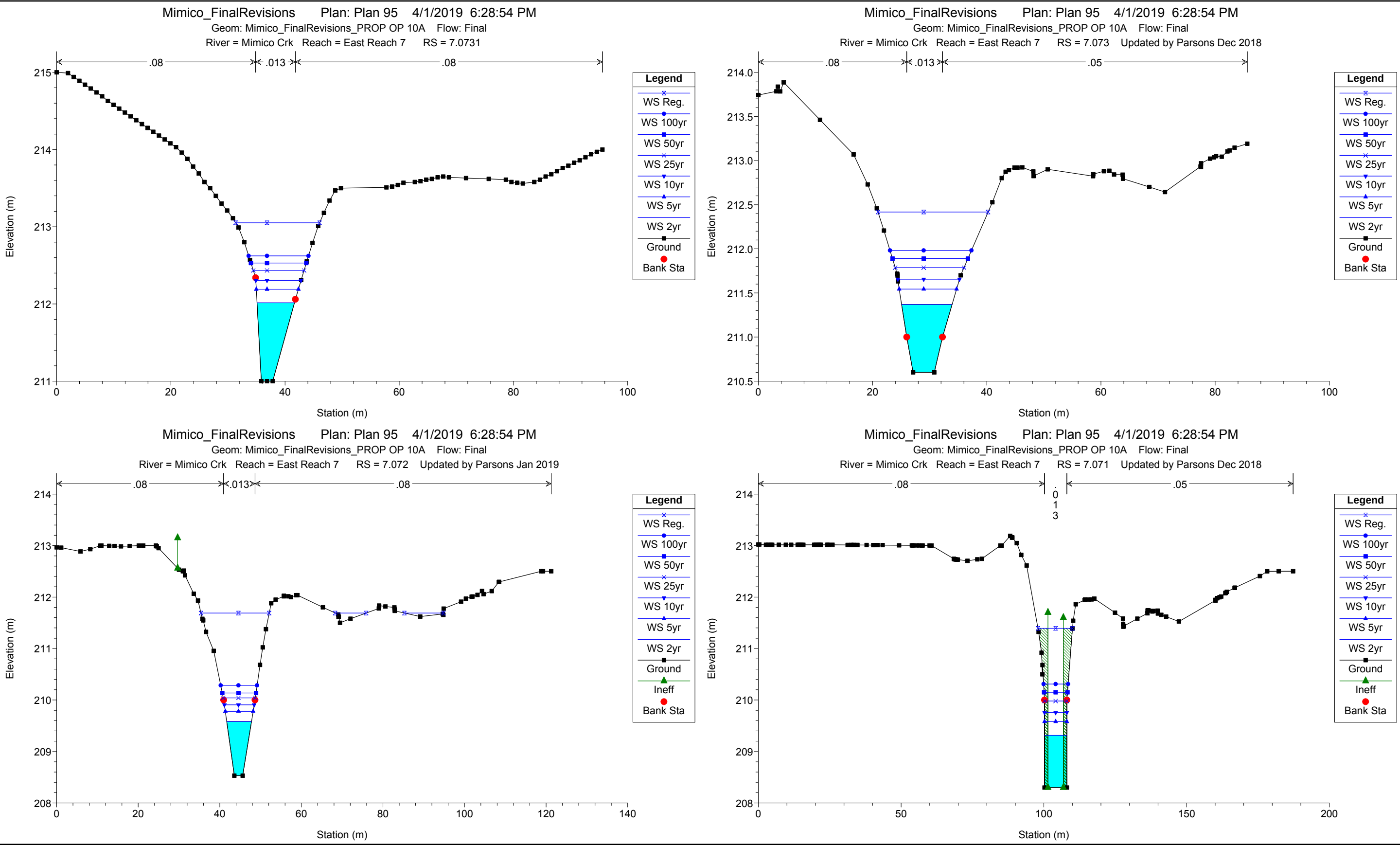
(5.4 x 2.4) m SINGLE BOX CULVERT

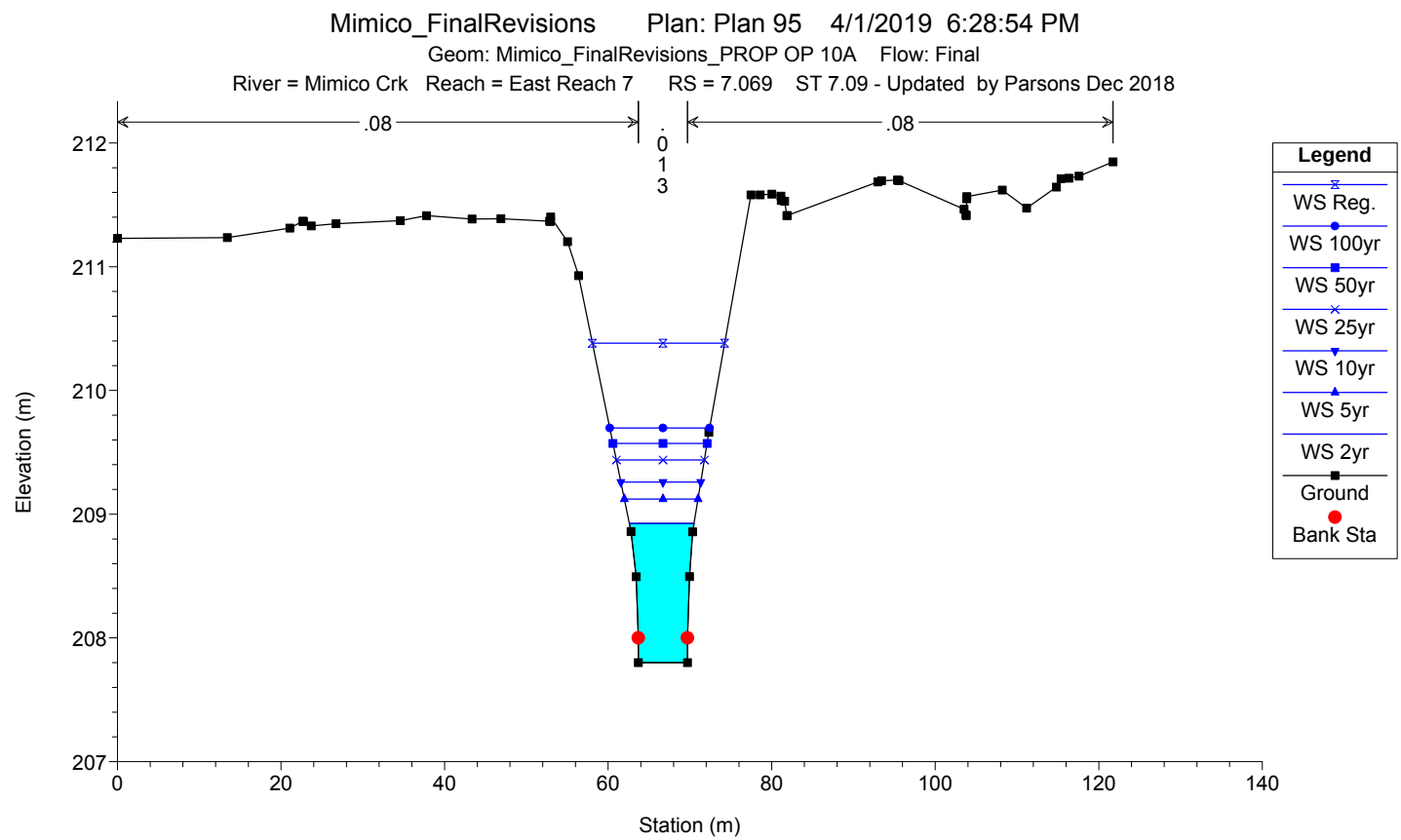
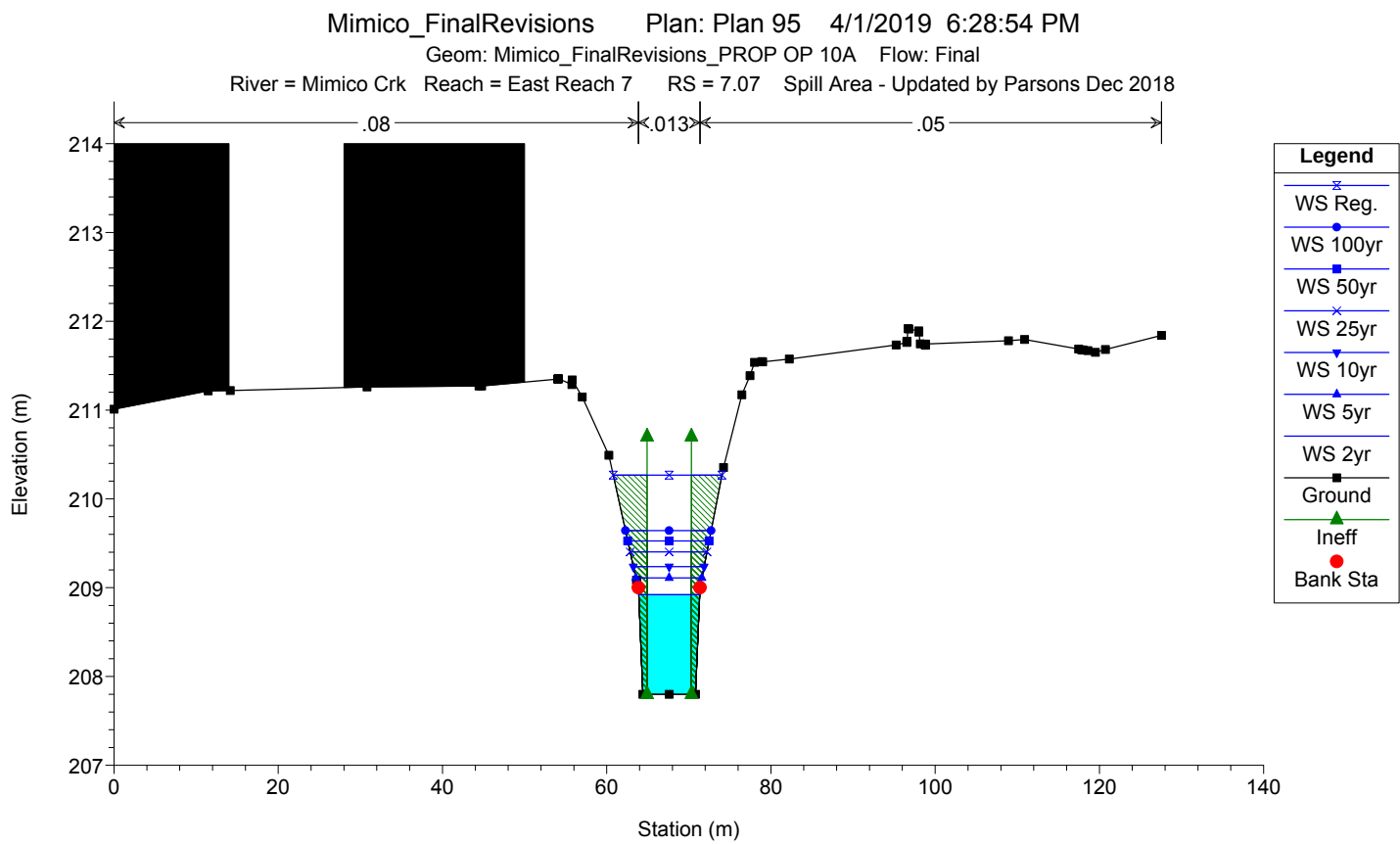
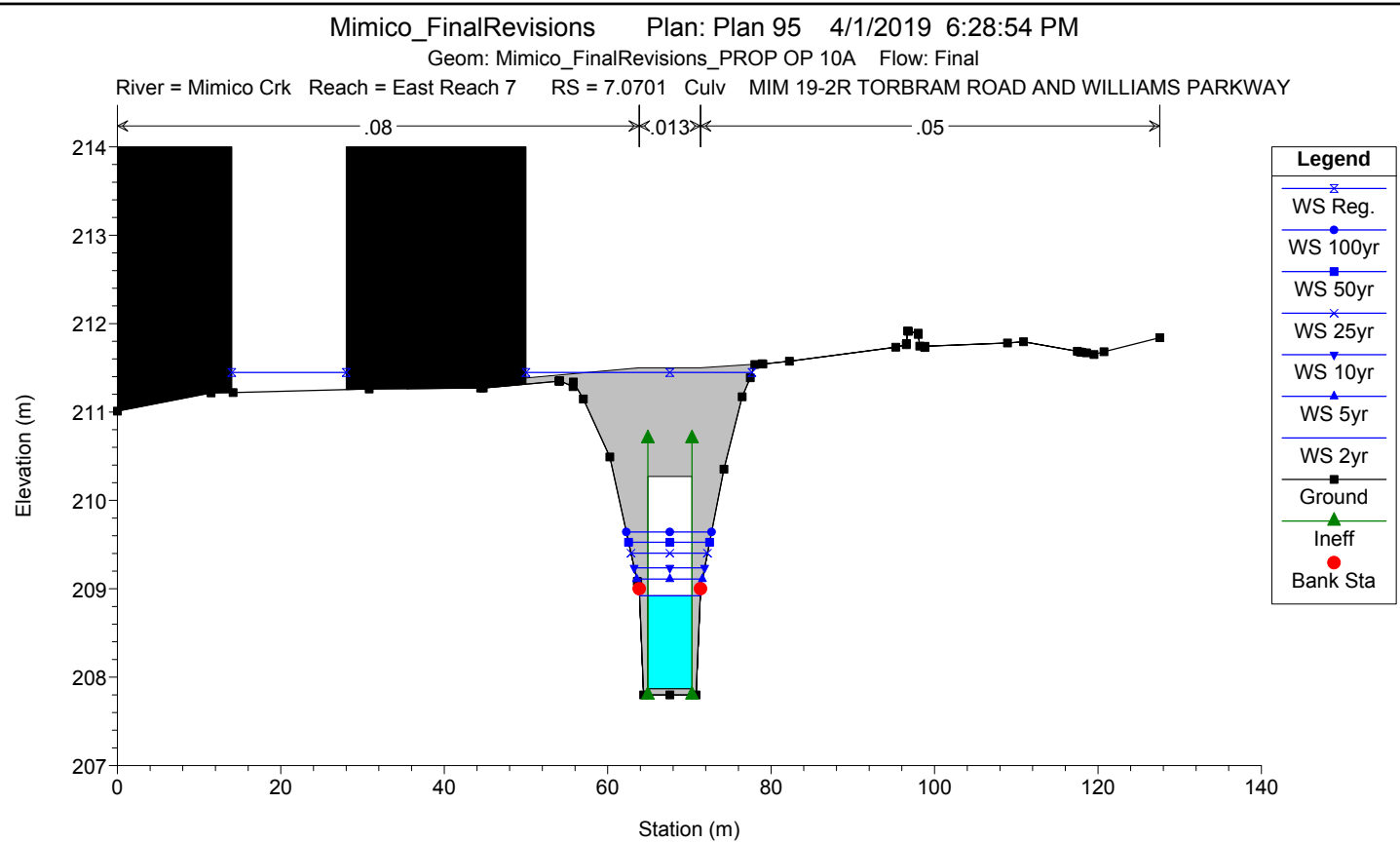
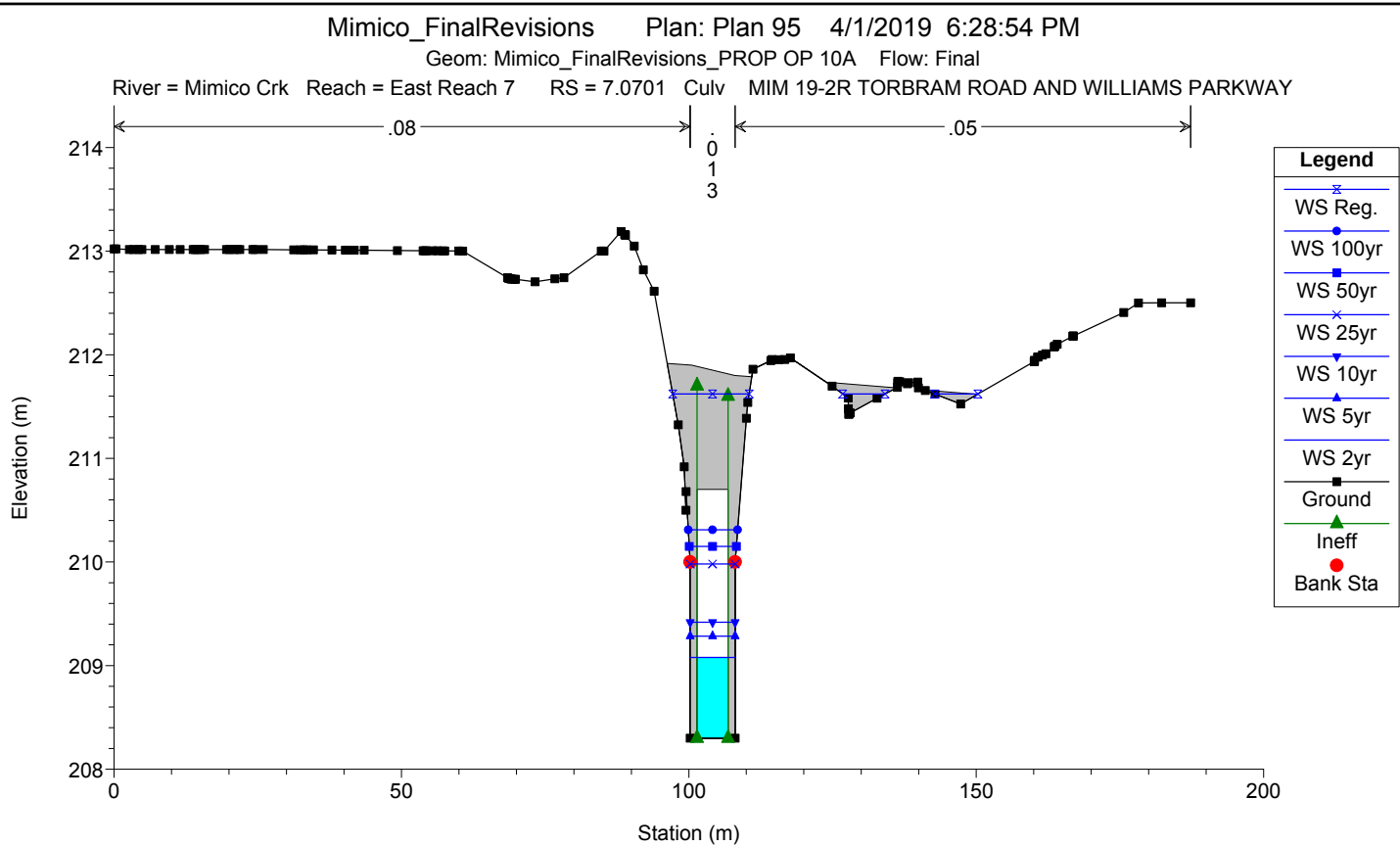
PROPOSED CONDITION - WIDENED CHANNEL

WATER SURFACE PROFILE - PROPOSED OPTION 6

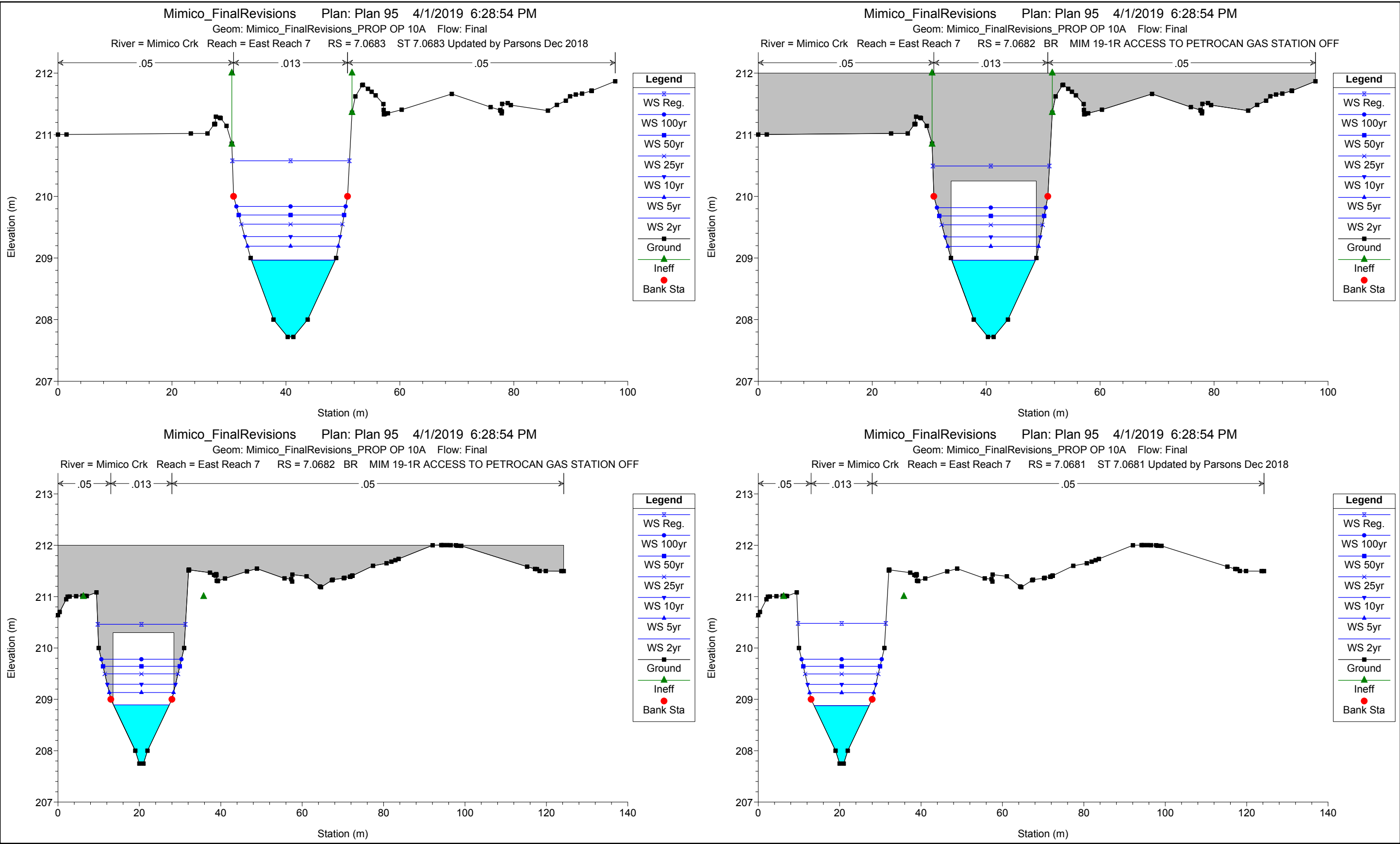


PROPOSED CONDITION: OPTION 6 - UPSTREAM AND DOWNSTREAM OF CULVERT ST 7.071





PROPOSED CONDITION: OPTION 6 - UPSTREAM AND DOWNSTREAM OF BRIDGE ST 7.0682



CULVERT OUTPUT FILE - PROPOSED OPTION 6

5.4 x 2.4 m BOX CULVERT

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 2yr

Q Culv Group (m3/s)	11.60	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	2.76
Q Barrel (m3/s)	11.60	Culv Vel DS (m/s)	2.04
E.G. US. (m)	209.54	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.31	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.11	Culv Frctn Ls (m)	0.33
W.S. DS (m)	208.92	Culv Exit Loss (m)	0.03
Delta EG (m)	0.44	Culv Entr Loss (m)	0.08
Delta WS (m)	0.39	Q Weir (m3/s)	
E.G. IC (m)	209.53	Weir Sta Lft (m)	
E.G. OC (m)	209.54	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.08	Weir Max Depth (m)	
Culv WS Outlet (m)	208.92	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.64	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.78	Min El Weir Flow (m)	211.62

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 5yr

Q Culv Group (m3/s)	16.50	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.11
Q Barrel (m3/s)	16.50	Culv Vel DS (m/s)	2.46
E.G. US. (m)	209.87	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.58	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.39	Culv Frctn Ls (m)	0.36
W.S. DS (m)	209.11	Culv Exit Loss (m)	0.03
Delta EG (m)	0.49	Culv Entr Loss (m)	0.10
Delta WS (m)	0.47	Q Weir (m3/s)	
E.G. IC (m)	209.86	Weir Sta Lft (m)	
E.G. OC (m)	209.87	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.28	Weir Max Depth (m)	
Culv WS Outlet (m)	209.11	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.80	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.98	Min El Weir Flow (m)	211.62

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 10yr

Q Culv Group (m3/s)	20.00	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.31
Q Barrel (m3/s)	20.00	Culv Vel DS (m/s)	2.71
E.G. US. (m)	210.09	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.76	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.58	Culv Frctn Ls (m)	0.37
W.S. DS (m)	209.24	Culv Exit Loss (m)	0.04
Delta EG (m)	0.51	Culv Entr Loss (m)	0.11
Delta WS (m)	0.52	Q Weir (m3/s)	
E.G. IC (m)	210.08	Weir Sta Lft (m)	
E.G. OC (m)	210.09	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	209.42	Weir Max Depth (m)	
Culv WS Outlet (m)	209.24	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.91	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.12	Min El Weir Flow (m)	211.62

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 25yr

Q Culv Group (m3/s)	24.60	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.55
Q Barrel (m3/s)	24.60	Culv Vel DS (m/s)	2.97
E.G. US. (m)	210.36	Culv Inv El Up (m)	208.30
W.S. US. (m)	209.98	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.81	Culv Frctn Ls (m)	0.37
W.S. DS (m)	209.40	Culv Exit Loss (m)	0.04
Delta EG (m)	0.54	Culv Entr Loss (m)	0.13
Delta WS (m)	0.58	Q Weir (m3/s)	
E.G. IC (m)	210.36	Weir Sta Lft (m)	
E.G. OC (m)	210.35	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.58	Weir Max Depth (m)	
Culv WS Outlet (m)	209.40	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.04	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.28	Min El Weir Flow (m)	211.62

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 50yr

Q Culv Group (m3/s)	28.10	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.71
Q Barrel (m3/s)	28.10	Culv Vel DS (m/s)	4.44
E.G. US. (m)	210.56	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.15	Culv Inv El Dn (m)	207.87
E.G. DS (m)	209.99	Culv Frctn Ls (m)	0.36
W.S. DS (m)	209.53	Culv Exit Loss (m)	0.06
Delta EG (m)	0.57	Culv Entr Loss (m)	0.15
Delta WS (m)	0.62	Q Weir (m3/s)	
E.G. IC (m)	210.56	Weir Sta Lft (m)	
E.G. OC (m)	210.54	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.70	Weir Max Depth (m)	
Culv WS Outlet (m)	209.04	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.14	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.40	Min El Weir Flow (m)	211.62

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: 100yr

Q Culv Group (m3/s)	31.50	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.85
Q Barrel (m3/s)	31.50	Culv Vel DS (m/s)	4.59
E.G. US. (m)	210.74	Culv Inv El Up (m)	208.30
W.S. US. (m)	210.31	Culv Inv El Dn (m)	207.87
E.G. DS (m)	210.15	Culv Frctn Ls (m)	0.36
W.S. DS (m)	209.64	Culv Exit Loss (m)	0.06
Delta EG (m)	0.59	Culv Entr Loss (m)	0.17
Delta WS (m)	0.67	Q Weir (m3/s)	
E.G. IC (m)	210.74	Weir Sta Lft (m)	
E.G. OC (m)	210.72	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	209.81	Weir Max Depth (m)	
Culv WS Outlet (m)	209.14	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.23	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.51	Min El Weir Flow (m)	211.62

Plan: OP 10A Mimico Crk East Reach 7 RS: 7.0701 Culv Group: Culvert #1 Profile: Reg.

Q Culv Group (m3/s)	47.19	Culv Full Len (m)	91.50
# Barrels	1	Culv Vel US (m/s)	4.46
Q Barrel (m3/s)	47.19	Culv Vel DS (m/s)	3.64
E.G. US. (m)	211.87	Culv Inv El Up (m)	208.30
W.S. US. (m)	211.39	Culv Inv El Dn (m)	207.87
E.G. DS (m)	211.01	Culv Frctn Ls (m)	0.26
W.S. DS (m)	210.27	Culv Exit Loss (m)	0.00
Delta EG (m)	0.86	Culv Entr Loss (m)	0.60
Delta WS (m)	1.13	Q Weir (m3/s)	3.71
E.G. IC (m)	211.87	Weir Sta Lft (m)	102.73
E.G. OC (m)	211.63	Weir Sta Rgt (m)	158.07
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (m)	210.26	Weir Max Depth (m)	0.25
Culv WS Outlet (m)	210.34	Weir Avg Depth (m)	0.14
Culv Nml Depth (m)	1.64	Weir Flow Area (m2)	6.53
Culv Crt Depth (m)	1.98	Min El Weir Flow (m)	211.62

PROFILE OUTPUT TABLE - PROPOSED OPTION 6

RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	209.58	209.58	209.93	0.002038	2.60	4.27	6.07	0.99
East Reach 7	7.072	5yr	15.70	208.53	209.78	209.78	210.19	0.002007	2.83	5.55	6.83	1.00
East Reach 7	7.072	10yr	18.90	208.53	209.91	209.91	210.34	0.001940	2.93	6.44	7.32	1.00
East Reach 7	7.072	25yr	23.10	208.53	210.04	210.04	210.53	0.001892	3.09	7.47	7.86	1.00
East Reach 7	7.072	50yr	26.30	208.53	210.14	210.14	210.66	0.001798	3.21	8.24	8.27	0.99
East Reach 7	7.072	100yr	29.40	208.53	210.28	210.22	210.79	0.001457	3.15	9.51	8.92	0.91
East Reach 7	7.072	Reg.	46.10	208.53	211.69	210.62	211.94	0.000263	2.23	28.11	33.91	0.44
East Reach 7	7.071	2yr	11.60	208.30	209.31	209.08	209.54	0.000746	2.12	5.47	7.82	0.67
East Reach 7	7.071	5yr	16.50	208.30	209.58	209.28	209.87	0.000690	2.38	6.92	7.82	0.67
East Reach 7	7.071	10yr	20.00	208.30	209.76	209.42	210.09	0.000661	2.54	7.87	7.82	0.67
East Reach 7	7.071	25yr	24.60	208.30	209.98	209.58	210.36	0.000621	2.71	9.08	7.82	0.67
East Reach 7	7.071	50yr	28.10	208.30	210.15	209.70	210.55	0.000588	2.81	9.99	8.19	0.66
East Reach 7	7.071	100yr	31.50	208.30	210.31	209.82	210.74	0.000561	2.90	10.85	8.58	0.65
East Reach 7	7.071	Reg.	50.90	208.30	211.39	210.38	211.87	0.000348	3.05	16.71	12.08	0.55
East Reach 7	7.0701		Culvert									
East Reach 7	7.07	2yr	11.60	207.80	208.92	208.58	209.11	0.000534	1.92	6.05	7.41	0.58
East Reach 7	7.07	5yr	16.50	207.80	209.11	208.79	209.39	0.000642	2.33	7.07	8.04	0.65
East Reach 7	7.07	10yr	20.00	207.80	209.24	208.91	209.58	0.000693	2.58	7.76	8.61	0.69
East Reach 7	7.07	25yr	24.60	207.80	209.40	209.09	209.81	0.000728	2.84	8.66	9.36	0.72
East Reach 7	7.07	50yr	28.10	207.80	209.53	209.20	209.99	0.000741	3.01	9.33	9.92	0.73
East Reach 7	7.07	100yr	31.50	207.80	209.64	209.32	210.15	0.000751	3.17	9.95	10.43	0.74
East Reach 7	7.07	Reg.	50.90	207.80	210.27	209.88	211.01	0.000741	3.82	13.32	13.24	0.78
East Reach 7	7.069	2yr	11.60	207.80	208.93		209.07	0.000460	1.71	7.37	7.92	0.51
East Reach 7	7.069	5yr	16.50	207.80	209.12		209.34	0.000540	2.06	9.04	9.02	0.57
East Reach 7	7.069	10yr	20.00	207.80	209.26		209.52	0.000568	2.26	10.33	9.78	0.60
East Reach 7	7.069	25yr	24.60	207.80	209.44		209.74	0.000579	2.46	12.16	10.77	0.61

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.57		209.91	0.000578	2.59	13.65	11.52	0.62
East Reach 7	7.069	100yr	31.50	207.80	209.70		210.06	0.000574	2.70	15.14	12.22	0.63
East Reach 7	7.069	Reg.	50.90	207.80	210.38		210.86	0.000512	3.14	24.86	16.18	0.62
East Reach 7	7.0683	2yr	11.60	207.72	208.97	208.52	209.02	0.000285	1.06	10.97	14.69	0.39
East Reach 7	7.0683	5yr	16.50	207.72	209.19	208.66	209.26	0.000259	1.14	14.44	15.96	0.38
East Reach 7	7.0683	10yr	20.00	207.72	209.35	208.75	209.42	0.000236	1.18	17.00	16.74	0.37
East Reach 7	7.0683	25yr	24.60	207.72	209.55	208.86	209.62	0.000209	1.20	20.46	17.74	0.36
East Reach 7	7.0683	50yr	28.10	207.72	209.70	208.93	209.77	0.000191	1.21	23.16	18.49	0.35
East Reach 7	7.0683	100yr	31.50	207.72	209.84	209.00	209.91	0.000177	1.22	25.77	19.18	0.34
East Reach 7	7.0683	Reg.	50.90	207.72	210.58	209.30	210.66	0.000108	1.26	40.68	20.54	0.28
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000810	1.50	7.76	13.53	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000516	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000307	1.45	17.67	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000264	1.46	20.40	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000235	1.47	23.05	19.69	0.39
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.70	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51	10.90	0.31
East Reach 7	7.062	5yr	15.60	199.40	200.91	200.12	200.97	0.000170	1.07	14.55	12.03	0.31
East Reach 7	7.062	10yr	19.60	199.40	201.13	200.24	201.20	0.000165	1.14	17.19	12.50	0.31
East Reach 7	7.062	25yr	25.20	199.40	201.40	200.40	201.47	0.000157	1.22	20.59	13.08	0.31
East Reach 7	7.062	50yr	29.30	199.40	201.58	200.49	201.66	0.000151	1.28	22.93	13.47	0.31

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.062	100yr	33.60	199.40	201.75	200.59	201.84	0.000145	1.33	25.23	13.86	0.31
East Reach 7	7.062	Reg.	65.30	199.40	202.82	201.17	202.95	0.000129	1.60	41.47	16.10	0.30
East Reach 7	7.061	2yr	10.00	199.40	200.52		200.59	0.002042	1.22	8.61	10.69	0.40
East Reach 7	7.061	5yr	15.60	199.40	200.86		200.95	0.001712	1.38	12.48	11.90	0.39
East Reach 7	7.061	10yr	19.60	199.40	201.07		201.17	0.001603	1.48	15.05	12.76	0.39
East Reach 7	7.061	25yr	25.20	199.40	201.33		201.45	0.001513	1.60	18.51	13.96	0.39
East Reach 7	7.061	50yr	29.30	199.40	201.50		201.64	0.001467	1.67	21.01	14.86	0.39
East Reach 7	7.061	100yr	33.60	199.40	201.67		201.82	0.001426	1.75	23.63	15.74	0.39
East Reach 7	7.061	Reg.	65.30	199.40	202.72		202.93	0.001241	2.14	44.44	25.28	0.38
East Reach 7	7.06	2yr	10.00	198.80	200.15	199.79	200.34	0.003665	2.04	6.87	8.07	0.57
East Reach 7	7.06	5yr	15.60	198.80	200.41	200.09	200.70	0.004594	2.57	9.12	9.52	0.65
East Reach 7	7.06	10yr	19.60	198.80	200.55	200.28	200.91	0.005149	2.89	10.58	10.35	0.70
East Reach 7	7.06	25yr	25.20	198.80	200.72	200.52	201.18	0.005944	3.30	12.39	11.29	0.77
East Reach 7	7.06	50yr	29.30	198.80	200.83	200.68	201.35	0.006447	3.57	13.65	11.90	0.81
East Reach 7	7.06	100yr	33.60	198.80	200.93	200.82	201.53	0.006932	3.83	14.92	12.48	0.84
East Reach 7	7.06	Reg.	65.30	198.80	201.59	201.59	202.61	0.008894	5.21	24.73	18.54	1.00
East Reach 7	7.059	2yr	10.00	198.60	199.39	199.39	199.70	0.013040	2.49	4.49	8.75	0.97
East Reach 7	7.059	5yr	15.60	198.60	199.62	199.62	200.00	0.013558	2.82	6.69	10.49	0.95
East Reach 7	7.059	10yr	19.60	198.60	199.76	199.76	200.19	0.010768	3.01	8.20	11.52	0.94
East Reach 7	7.059	25yr	25.20	198.60	199.93	199.93	200.41	0.010135	3.24	10.29	12.67	0.94
East Reach 7	7.059	50yr	29.30	198.60	200.04	200.04	200.57	0.009984	3.40	11.71	13.40	0.94
East Reach 7	7.059	100yr	33.60	198.60	200.15	200.15	200.71	0.009585	3.53	13.32	14.18	0.94
East Reach 7	7.059	Reg.	65.30	198.60	201.05	200.83	201.63	0.005770	3.78	28.45	20.06	0.79
East Reach 7	7.058	2yr	7.90	197.25	198.28	197.91	198.39	0.000533	1.48	5.32	5.89	0.50
East Reach 7	7.058	5yr	13.90	197.25	198.76	198.19	198.90	0.000459	1.67	8.32	6.55	0.47
East Reach 7	7.058	10yr	18.00	197.25	199.05	198.36	199.21	0.000414	1.75	10.30	7.02	0.46
East Reach 7	7.058	25yr	24.40	197.25	199.47	198.59	199.65	0.000334	1.85	13.48	8.27	0.43
East Reach 7	7.058	50yr	28.70	197.25	199.73	198.74	199.92	0.000301	1.91	15.73	8.92	0.41
East Reach 7	7.058	100yr	33.60	197.25	200.01	198.89	200.21	0.000273	1.98	18.42	10.99	0.40
East Reach 7	7.058	Reg.	75.10	197.25	201.11	199.87	201.54	0.000380	2.98	37.67	29.25	0.50
East Reach 7	7.0571		Culvert									
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Int Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511	Culvert										
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00
East Reach 7	7.049	5yr	12.60	186.60	187.32	187.32	187.63	0.013875	2.46	5.31	9.49	0.99
East Reach 7	7.049	10yr	17.10	186.60	187.46	187.46	187.83	0.012900	2.72	6.70	10.15	0.99
East Reach 7	7.049	25yr	24.80	186.60	187.68	187.68	188.14	0.011612	3.04	9.04	11.50	0.97
East Reach 7	7.049	50yr	29.70	186.60	187.81	187.81	188.31	0.011021	3.21	10.54	12.49	0.97
East Reach 7	7.049	100yr	35.20	186.60	187.94	187.94	188.49	0.010429	3.36	12.28	13.60	0.96
East Reach 7	7.049	Reg.	90.80	186.60	188.96	188.96	189.79	0.007741	4.32	30.69	22.36	0.91
East Reach 7	7.048	2yr	6.90	184.60	185.25	185.21	185.47	0.011560	2.10	3.49	7.60	0.88
East Reach 7	7.048	5yr	12.60	184.60	185.48	185.48	185.83	0.012031	2.68	5.50	9.86	0.95
East Reach 7	7.048	10yr	17.10	184.60	185.66	185.66	186.06	0.010800	2.90	7.43	11.77	0.93
East Reach 7	7.048	25yr	24.80	184.60	185.91	185.91	186.38	0.009739	3.20	10.72	14.16	0.91
East Reach 7	7.048	50yr	29.70	184.60	186.05	186.05	186.55	0.009286	3.35	12.77	15.23	0.91
East Reach 7	7.048	100yr	35.20	184.60	186.18	186.18	186.72	0.009125	3.53	14.85	16.05	0.91
East Reach 7	7.048	Reg.	90.80	184.60	188.43		188.68	0.001626	2.73	65.26	28.36	0.45
East Reach 7	7.047	2yr	6.90	184.00	184.68		184.82	0.009058	1.66	4.14	8.45	0.76
East Reach 7	7.047	5yr	12.60	184.00	185.02		185.17	0.005849	1.69	7.46	10.82	0.65
East Reach 7	7.047	10yr	17.10	184.00	185.26		185.41	0.003949	1.69	10.32	12.64	0.56
East Reach 7	7.047	25yr	24.80	184.00	185.63		185.78	0.002705	1.74	15.44	15.35	0.49
East Reach 7	7.047	50yr	29.70	184.00	185.85		186.00	0.002263	1.77	18.95	16.79	0.46
East Reach 7	7.047	100yr	35.20	184.00	186.08		186.24	0.001902	1.79	23.11	18.23	0.43
East Reach 7	7.047	Reg.	90.80	184.00	188.46		188.58	0.000557	1.71	84.84	38.28	0.27
East Reach 7	7.046	2yr	6.90	183.80	184.71	184.22	184.75	0.000192	0.89	7.74	8.70	0.30
East Reach 7	7.046	5yr	12.60	183.80	185.04	184.42	185.12	0.000242	1.18	10.65	8.86	0.34
East Reach 7	7.046	10yr	17.10	183.80	185.28	184.56	185.37	0.000260	1.34	12.74	8.97	0.36
East Reach 7	7.046	25yr	24.80	183.80	185.63	184.76	185.76	0.000281	1.55	15.95	9.14	0.38
East Reach 7	7.046	50yr	29.70	183.80	185.84	184.89	185.98	0.000288	1.66	17.89	9.24	0.38
East Reach 7	7.046	100yr	35.20	183.80	186.07	185.01	186.23	0.000290	1.76	20.00	9.40	0.38
East Reach 7	7.046	Reg.	90.80	183.80	188.34	186.05	188.55	0.000158	2.10	68.35	39.19	0.32
East Reach 7	7.0451	Culvert										
East Reach 7	7.045	2yr	6.90	183.70	184.64	184.17	184.69	0.000211	0.92	7.46	9.29	0.33
East Reach 7	7.045	5yr	12.60	183.70	184.90	184.38	184.98	0.000306	1.27	9.91	10.03	0.41
East Reach 7	7.045	10yr	17.10	183.70	185.06	184.53	185.17	0.000357	1.47	11.61	10.52	0.45
East Reach 7	7.045	25yr	24.80	183.70	185.29	184.74	185.45	0.000430	1.76	14.11	11.19	0.50
East Reach 7	7.045	50yr	29.70	183.70	185.42	184.87	185.60	0.000460	1.91	15.54	11.56	0.52
East Reach 7	7.045	100yr	35.20	183.70	185.55	185.00	185.76	0.000489	2.07	17.01	11.93	0.54
East Reach 7	7.045	Reg.	90.80	183.70	186.44	185.94	186.95	0.000698	3.17	29.46	17.66	0.69

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.044	2yr	6.90	183.60	184.63		184.67	0.001239	0.94	8.67	12.93	0.31
East Reach 7	7.044	5yr	12.60	183.60	184.88		184.96	0.001742	1.31	12.14	14.95	0.39
East Reach 7	7.044	10yr	17.10	183.60	185.04		185.15	0.001989	1.53	14.68	16.24	0.42
East Reach 7	7.044	25yr	24.80	183.60	185.27		185.42	0.002332	1.84	18.57	17.94	0.47
East Reach 7	7.044	50yr	29.70	183.60	185.40		185.58	0.002498	2.00	20.91	18.89	0.49
East Reach 7	7.044	100yr	35.20	183.60	185.52		185.73	0.002663	2.17	23.39	19.84	0.52
East Reach 7	7.044	Reg.	90.80	183.60	186.43		186.89	0.003776	3.39	44.14	26.30	0.66
East Reach 7	7.043	2yr	6.90	181.32	184.60	182.72	184.61	0.000163	0.61	27.13	20.31	0.11
East Reach 7	7.043	5yr	12.60	181.32	184.82	183.12	184.84	0.000382	0.97	31.76	22.48	0.17
East Reach 7	7.043	10yr	17.10	181.32	184.96	183.35	184.99	0.000566	1.21	34.97	23.88	0.21
East Reach 7	7.043	25yr	24.80	181.32	185.15	183.66	185.20	0.000885	1.57	39.65	25.47	0.26
East Reach 7	7.043	50yr	29.70	181.32	185.25	183.84	185.32	0.001081	1.77	42.39	26.31	0.29
East Reach 7	7.043	100yr	35.20	181.32	185.36	183.96	185.44	0.001299	1.98	45.22	27.16	0.32
East Reach 7	7.043	Reg.	90.80	181.32	186.10	185.16	186.33	0.003292	3.54	67.42	33.39	0.53
East Reach 7	7.042		Inl Struct									
East Reach 7	7.041	2yr	6.90	181.60	182.15	182.15	182.37	0.015410	2.11	3.38	8.68	0.99
East Reach 7	7.041	5yr	12.60	181.60	182.38	182.38	182.69	0.012658	2.50	5.70	11.15	0.96
East Reach 7	7.041	10yr	17.10	181.60	182.53	182.53	182.89	0.011709	2.74	7.48	12.60	0.95
East Reach 7	7.041	25yr	24.80	181.60	182.77	182.75	183.19	0.009914	2.98	10.82	15.08	0.91
East Reach 7	7.041	50yr	29.70	181.60	182.96	182.88	183.35	0.007747	2.93	13.90	16.74	0.83
East Reach 7	7.041	100yr	35.20	181.60	183.15	183.01	183.53	0.006555	2.95	17.11	18.16	0.78
East Reach 7	7.041	Reg.	90.80	181.60	184.20	184.20	184.84	0.005830	3.99	42.17	37.09	0.80
East Reach 7	7.04	2yr	7.90	181.34	182.18	181.78	182.21	0.001287	0.78	10.28	16.68	0.30
East Reach 7	7.04	5yr	13.10	181.34	182.43	181.93	182.47	0.001223	0.93	14.61	18.57	0.31
East Reach 7	7.04	10yr	17.80	181.34	182.62	182.04	182.68	0.001161	1.04	18.34	20.10	0.31
East Reach 7	7.04	25yr	25.90	181.34	182.92	182.18	182.99	0.001072	1.17	24.17	22.45	0.31
East Reach 7	7.04	50yr	31.20	181.34	183.10	182.28	183.18	0.001028	1.24	27.66	24.40	0.31
East Reach 7	7.04	100yr	36.80	181.34	183.28	182.37	183.37	0.000990	1.31	31.14	26.64	0.31
East Reach 7	7.04	Reg.	96.80	181.34	184.39	183.10	184.60	0.001285	2.06	52.72	129.94	0.39
East Reach 7	7.0391		Culvert									
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.86	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291	Culvert										
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

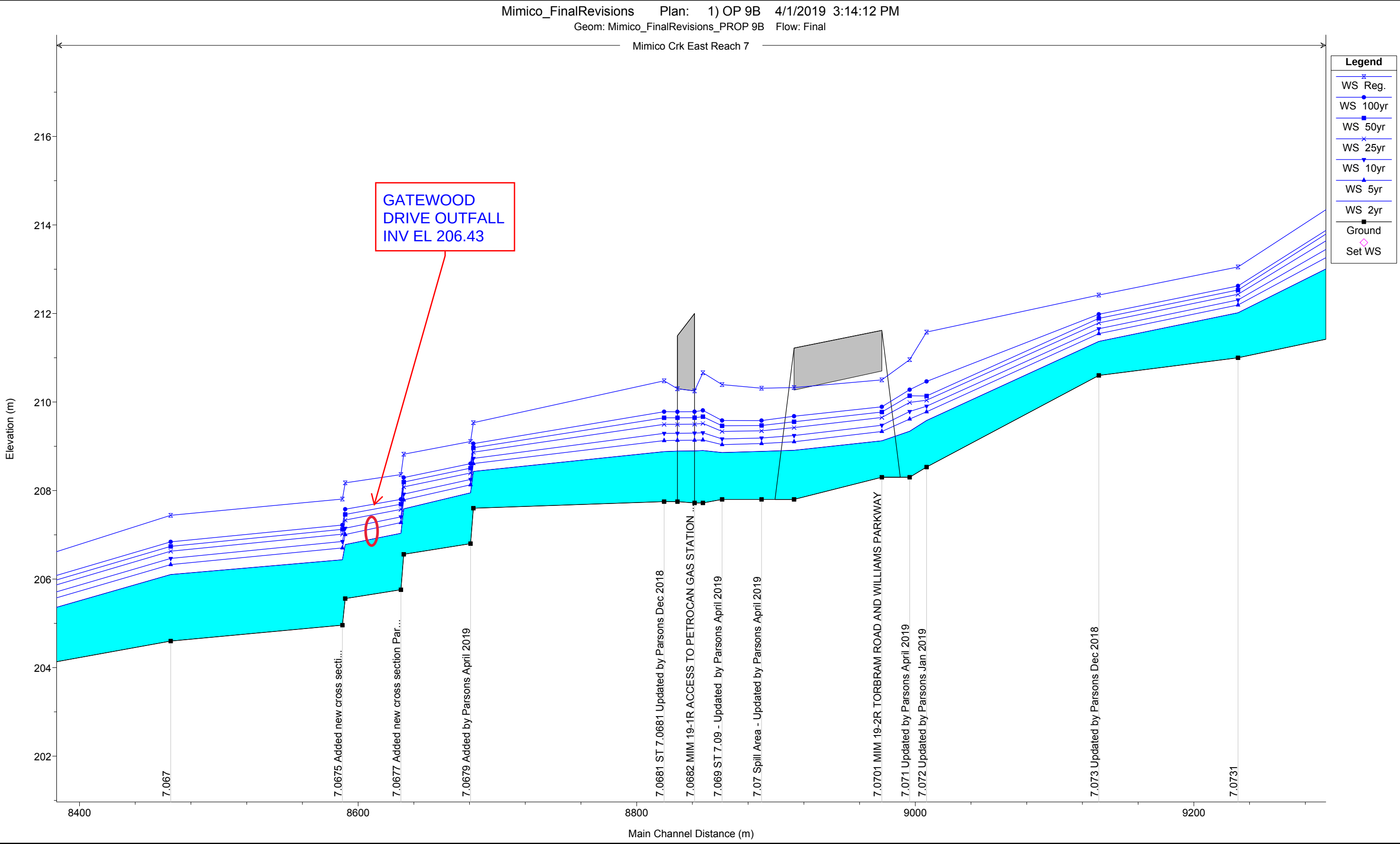
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									
East Reach 7	7.008	2yr	7.10	164.27	165.36	164.58	165.37	0.000271	0.50	14.25	17.20	0.15
East Reach 7	7.008	5yr	12.50	164.27	165.75	164.72	165.78	0.000302	0.65	19.36	17.34	0.17
East Reach 7	7.008	10yr	16.60	164.27	166.03	164.82	166.06	0.000301	0.72	22.96	17.43	0.17
East Reach 7	7.008	25yr	21.90	164.27	166.38	164.93	166.41	0.000288	0.80	27.50	17.55	0.18
East Reach 7	7.008	50yr	25.70	164.27	166.63	165.00	166.66	0.000272	0.83	30.78	17.65	0.17

HEC-RAS Plan: OP 10A River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.008	100yr	29.60	164.27	166.94	165.08	166.97	0.000240	0.85	34.80	18.77	0.17
East Reach 7	7.008	Reg.	138.60	164.27	169.06	166.53	169.31	0.000746	2.22	62.51	63.01	0.32
East Reach 7	7.007	2yr	7.10	164.30	165.36		165.37	0.000267	0.46	15.43	15.46	0.15
East Reach 7	7.007	5yr	12.50	164.30	165.75		165.77	0.000276	0.58	21.54	15.78	0.16
East Reach 7	7.007	10yr	16.60	164.30	166.03		166.05	0.000265	0.64	26.63	19.41	0.16
East Reach 7	7.007	25yr	21.90	164.30	166.38		166.40	0.000241	0.70	33.65	20.87	0.16
East Reach 7	7.007	50yr	25.70	164.30	166.63		166.66	0.000221	0.72	39.08	22.24	0.15
East Reach 7	7.007	100yr	29.60	164.30	166.94		166.97	0.000188	0.73	46.37	24.91	0.14
East Reach 7	7.007	Reg.	138.60	164.30	169.13		169.23	0.000389	1.57	174.25	129.30	0.23
East Reach 7	7.006	2yr	7.10	164.30	165.03	164.97	165.24	0.011549	2.04	3.48	6.33	0.86
East Reach 7	7.006	5yr	12.50	164.30	165.44		165.65	0.005753	2.07	6.51	8.49	0.67
East Reach 7	7.006	10yr	16.60	164.30	165.73		165.94	0.004056	2.07	9.25	10.12	0.58
East Reach 7	7.006	25yr	21.90	164.30	166.11		166.31	0.002767	2.03	13.48	12.14	0.50
East Reach 7	7.006	50yr	25.70	164.30	166.38		166.57	0.002193	2.00	17.13	14.83	0.46
East Reach 7	7.006	100yr	29.60	164.30	166.73		166.90	0.001562	1.89	23.56	21.76	0.40
East Reach 7	7.006	Reg.	138.60	164.30	168.81		169.11	0.001801	3.12	117.72	80.39	0.48
East Reach 7	7.005	2yr	7.10	163.60	164.79		164.87	0.001665	1.23	6.70	7.93	0.37
East Reach 7	7.005	5yr	12.50	163.60	165.27		165.37	0.001497	1.47	10.88	9.73	0.37
East Reach 7	7.005	10yr	16.60	163.60	165.59		165.71	0.001357	1.58	14.23	11.01	0.36
East Reach 7	7.005	25yr	21.90	163.60	166.00		166.12	0.001172	1.67	19.06	13.04	0.35
East Reach 7	7.005	50yr	25.70	163.60	166.28		166.41	0.001094	1.74	23.40	18.52	0.34
East Reach 7	7.005	100yr	29.60	163.60	166.66		166.78	0.000820	1.65	31.59	23.31	0.30
East Reach 7	7.005	Reg.	138.60	163.60	168.64		168.95	0.001614	3.24	122.43	82.20	0.46
East Reach 7	7.004	2yr	7.10	163.77	164.75	164.36	164.83	0.002284	1.31	6.51	8.73	0.43
East Reach 7	7.004	5yr	12.50	163.77	165.24	164.61	165.34	0.001627	1.46	11.20	10.41	0.39
East Reach 7	7.004	10yr	16.60	163.77	165.57	164.77	165.68	0.001376	1.54	14.84	11.71	0.37
East Reach 7	7.004	25yr	21.90	163.77	165.98	164.96	166.09	0.001116	1.59	20.02	13.34	0.34
East Reach 7	7.004	50yr	25.70	163.77	166.27	165.07	166.38	0.000981	1.62	24.08	15.00	0.33
East Reach 7	7.004	100yr	29.60	163.77	166.65	165.18	166.76	0.000787	1.60	30.91	20.99	0.30
East Reach 7	7.004	Reg.	138.60	163.77	168.39	167.53	168.86	0.002267	3.73	97.72	76.13	0.56
East Reach 7	7.0031		Culvert									
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30

GATEWOOD DRIVE OUTFALL ANALYSIS
BRIDGE SPAN 6.6m AND RISE 2.4m
PROPOSED CONDITION DOWNSTREAM
CHANNEL LOWERED

WATER SURFACE PROFILE - PROP OP 9B



PROFILE OUTPUT TABLE - PROP OP 9B

RIVER MIMICO CREEK, EAST REACH 7

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.086	2yr	11.10	224.60	225.45	225.45	225.80	0.001799	2.65	5.37	10.67	0.98
East Reach 7	7.086	5yr	15.70	224.60	225.64	225.64	226.06	0.001650	2.95	7.51	12.05	0.97
East Reach 7	7.086	10yr	18.90	224.60	225.75	225.75	226.23	0.001593	3.13	8.95	12.83	0.97
East Reach 7	7.086	25yr	23.10	224.60	225.90	225.90	226.43	0.001515	3.33	10.87	13.79	0.97
East Reach 7	7.086	50yr	26.30	224.60	226.00	226.00	226.57	0.001472	3.46	12.31	14.41	0.97
East Reach 7	7.086	100yr	29.40	224.60	226.08	226.08	226.70	0.001511	3.64	13.41	14.88	0.99
East Reach 7	7.086	Reg.	46.10	224.60	226.55	226.55	227.35	0.001328	4.16	21.74	21.64	0.98
East Reach 7	7.085	2yr	11.10	222.60	223.16	223.16	223.36	0.002253	2.00	5.67	15.67	1.00
East Reach 7	7.085	5yr	15.70	222.60	223.26	223.26	223.52	0.002074	2.24	7.43	17.52	1.00
East Reach 7	7.085	10yr	18.90	222.60	223.33	223.33	223.62	0.001968	2.38	8.68	18.70	0.99
East Reach 7	7.085	25yr	23.10	222.60	223.41	223.41	223.74	0.001878	2.53	10.32	21.15	0.99
East Reach 7	7.085	50yr	26.30	222.60	223.46	223.46	223.83	0.001906	2.68	11.41	22.68	1.01
East Reach 7	7.085	100yr	29.40	222.60	223.54	223.54	223.90	0.001675	2.69	13.34	26.37	0.96
East Reach 7	7.085	Reg.	46.10	222.60	223.80	223.80	224.28	0.001532	3.11	20.97	32.33	0.97
East Reach 7	7.084	2yr	11.10	219.60	220.46	220.46	220.80	0.001811	2.62	5.26	10.52	0.98
East Reach 7	7.084	5yr	15.70	219.60	220.65	220.65	221.07	0.001659	2.92	7.38	12.45	0.98
East Reach 7	7.084	10yr	18.90	219.60	220.76	220.76	221.23	0.001582	3.09	8.90	13.66	0.97
East Reach 7	7.084	25yr	23.10	219.60	220.90	220.90	221.42	0.001505	3.28	10.93	15.14	0.97
East Reach 7	7.084	50yr	26.30	219.60	221.00	221.00	221.56	0.001462	3.41	12.49	16.18	0.97
East Reach 7	7.084	100yr	29.40	219.60	221.10	221.10	221.69	0.001424	3.53	14.03	17.14	0.97
East Reach 7	7.084	Reg.	46.10	219.60	221.52	221.52	222.29	0.001313	4.07	22.36	21.89	0.97
East Reach 7	7.083	2yr	11.10	217.60	219.18	219.18	219.71	0.001614	3.56	8.44	11.87	0.93
East Reach 7	7.083	5yr	15.70	217.60	219.52	219.52	220.09	0.001422	3.84	13.09	15.56	0.90
East Reach 7	7.083	10yr	18.90	217.60	219.67	219.67	220.32	0.001479	4.13	15.68	17.78	0.94
East Reach 7	7.083	25yr	23.10	217.60	219.77	219.77	220.61	0.001836	4.75	17.42	19.47	1.05
East Reach 7	7.083	50yr	26.30	217.60	219.80	219.80	220.84	0.002252	5.30	17.97	19.98	1.17
East Reach 7	7.083	100yr	29.40	217.60	220.39	220.39	220.92	0.000943	4.05	37.22	42.64	0.79
East Reach 7	7.083	Reg.	46.10	217.60	220.86	220.86	221.42	0.000958	4.54	59.96	54.16	0.81
East Reach 7	7.082	2yr	11.10	216.68	218.61	217.92	218.73	0.000313	1.54	7.20	6.46	0.41
East Reach 7	7.082	5yr	15.70	216.68	219.17	218.15	219.30	0.000213	1.58	9.95	10.80	0.35
East Reach 7	7.082	10yr	18.90	216.68	219.68	218.29	219.75	0.000125	1.21	19.40	19.58	0.27
East Reach 7	7.082	25yr	23.10	216.68	219.81	218.46	219.90	0.000150	1.38	22.42	29.92	0.30
East Reach 7	7.082	50yr	26.30	216.68	219.85	218.58	219.96	0.000182	1.54	23.77	35.14	0.33
East Reach 7	7.082	100yr	29.40	216.68	219.89	218.68	220.03	0.000213	1.68	25.32	39.36	0.36
East Reach 7	7.082	Reg.	46.10	216.68	219.93	219.23	220.26	0.000486	2.58	27.24	42.71	0.54
East Reach 7	7.08101	Culvert										
East Reach 7	7.081	2yr	11.10	216.34	217.14	217.11	217.40	0.001700	2.22	5.06	9.20	0.92
East Reach 7	7.081	5yr	15.70	216.34	217.27	217.26	217.61	0.001833	2.61	6.21	9.89	0.98
East Reach 7	7.081	10yr	18.90	216.34	217.36	217.36	217.75	0.001786	2.78	7.13	10.40	0.99
East Reach 7	7.081	25yr	23.10	216.34	217.47	217.47	217.92	0.001706	2.97	8.37	11.27	0.99
East Reach 7	7.081	50yr	26.30	216.34	217.55	217.55	218.04	0.001665	3.11	9.30	11.64	0.99
East Reach 7	7.081	100yr	29.40	216.34	217.63	217.63	218.15	0.001595	3.20	10.27	12.02	0.98
East Reach 7	7.081	Reg.	46.10	216.34	218.00	218.00	218.69	0.001441	3.70	15.00	14.12	0.98
East Reach 7	7.08	2yr	11.10	216.40	217.09	217.09	217.35	0.002165	2.22	5.04	10.95	1.01
East Reach 7	7.08	5yr	15.70	216.40	217.22	217.22	217.54	0.001981	2.48	6.54	12.11	1.00
East Reach 7	7.08	10yr	18.90	216.40	217.31	217.31	217.66	0.001881	2.63	7.58	12.86	1.00
East Reach 7	7.08	25yr	23.10	216.40	217.41	217.41	217.81	0.001789	2.80	8.93	13.76	1.00
East Reach 7	7.08	50yr	26.30	216.40	217.48	217.48	217.91	0.001738	2.92	9.94	14.40	1.00
East Reach 7	7.08	100yr	29.40	216.40	217.55	217.55	218.01	0.001676	3.02	10.97	15.07	0.99
East Reach 7	7.08	Reg.	46.10	216.40	217.88	217.88	218.49	0.001495	3.48	16.44	18.16	0.98
East Reach 7	7.079	2yr	11.10	215.60	216.34	216.34	216.62	0.001933	2.38	5.15	10.85	0.99
East Reach 7	7.079	5yr	15.70	215.60	216.49	216.49	216.85	0.001785	2.67	6.91	12.15	0.98
East Reach 7	7.079	10yr	18.90	215.60	216.58	216.58	216.99	0.001717	2.83	8.11	12.98	0.98
East Reach 7	7.079	25yr	23.10	215.60	216.70	216.70	217.16	0.001651	3.03	9.67	14.01	0.99
East Reach 7	7.079	50yr	26.30	215.60	216.90	216.79	217.29	0.001106	2.82	12.71	15.82	0.83
East Reach 7	7.079	100yr	29.40	215.60	217.13		217.46	0.000749	2.61	16.50	17.82	0.71
East Reach 7	7.079	Reg.	46.10	215.60	217.52	217.25	217.99	0.000781	3.14	24.10	21.91	0.75
East Reach 7	7.078	2yr	11.10	214.60	215.67	215.31	215.77	0.000374	1.40	9.66	14.02	0.47
East Reach 7	7.078	5yr	15.70	214.60	216.12	215.47	216.20	0.000194	1.31	16.64	17.57	0.36
East Reach 7	7.078	10yr	18.90	214.60	216.41	215.56	216.49	0.000141	1.28	22.25	20.01	0.32
East Reach 7	7.078	25yr	23.10	214.60	216.81	215.67	216.88	0.000101	1.24	30.76	23.64	0.28
East Reach 7	7.078	50yr	26.30	214.60	217.11	215.75	217.18	0.000081	1.22	38.35	31.43	0.25
East Reach 7	7.078	100yr	29.40	214.60	217.29	215.82	217.36	0.000077	1.25	43.51	40.87	0.25
East Reach 7	7.078	Reg.	46.10	214.60	217.73	216.18	217.86	0.000108	1.65	59.31	81.64	0.31
East Reach 7	7.077	2yr	11.10	214.02	215.53	215.15	215.73	0.000782	2.00	5.55	4.64	0.58
East Reach 7	7.077	5yr	15.70	214.02	215.95	215.38	216.16	0.000732	2.03	7.74	7.45	0.57
East Reach 7	7.077	10yr	18.90	214.02	216.26	215.52	216.45	0.000542	1.96	9.62	9.56	0.50

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.077	25yr	23.10	214.02	216.66	215.70	216.84	0.000391	1.91	12.20	13.30	0.44
East Reach 7	7.077	50yr	26.30	214.02	216.96	215.90	217.14	0.000311	1.88	14.43	19.77	0.40
East Reach 7	7.077	100yr	29.40	214.02	217.24	216.01	217.35	0.000187	1.50	26.49	28.16	0.32
East Reach 7	7.077	Reg.	46.10	214.02	217.67	216.48	217.84	0.000236	1.90	40.86	37.88	0.38
East Reach 7	7.0761		Culvert									
East Reach 7	7.076	2yr	11.10	213.79	214.94	214.66	215.06	0.000622	1.53	7.24	9.77	0.57
East Reach 7	7.076	5yr	15.70	213.79	215.28	214.83	215.39	0.000435	1.43	11.00	12.66	0.49
East Reach 7	7.076	10yr	18.90	213.79	215.49	214.93	215.58	0.000355	1.37	13.82	14.59	0.45
East Reach 7	7.076	25yr	23.10	213.79	215.73	215.05	215.82	0.000288	1.31	17.66	17.05	0.41
East Reach 7	7.076	50yr	26.30	213.79	215.90	215.14	215.98	0.000254	1.28	20.61	19.00	0.39
East Reach 7	7.076	100yr	29.40	213.79	216.05	215.22	216.13	0.000215	1.25	23.51	21.09	0.36
East Reach 7	7.076	Reg.	46.10	213.79	216.77	215.56	216.83	0.000111	1.15	47.77	55.20	0.28
East Reach 7	7.075	2yr	11.10	213.60	214.57	214.57	214.97	0.001799	2.81	4.88	8.39	0.99
East Reach 7	7.075	5yr	15.70	213.60	214.79	214.79	215.26	0.001582	3.09	7.02	11.10	0.97
East Reach 7	7.075	10yr	18.90	213.60	214.93	214.93	215.45	0.001500	3.27	8.62	12.77	0.96
East Reach 7	7.075	25yr	23.10	213.60	215.09	215.09	215.66	0.001408	3.45	10.88	14.82	0.96
East Reach 7	7.075	50yr	26.30	213.60	215.21	215.21	215.82	0.001323	3.55	12.82	16.16	0.94
East Reach 7	7.075	100yr	29.40	213.60	215.32	215.32	215.95	0.001291	3.67	14.53	17.10	0.94
East Reach 7	7.075	Reg.	46.10	213.60	215.76	215.76	216.60	0.001271	4.30	22.96	21.09	0.97
East Reach 7	7.074	2yr	11.10	211.60	213.44	213.44	213.96	0.001450	3.64	10.00	13.67	0.89
East Reach 7	7.074	5yr	15.70	211.60	213.73	213.73	214.33	0.001481	4.09	14.42	16.98	0.92
East Reach 7	7.074	10yr	18.90	211.60	213.94	213.94	214.56	0.001371	4.21	18.45	20.12	0.90
East Reach 7	7.074	25yr	23.10	211.60	214.17	214.17	214.80	0.001331	4.42	23.26	23.27	0.90
East Reach 7	7.074	50yr	26.30	211.60	214.34	214.34	214.97	0.001242	4.47	27.61	25.76	0.88
East Reach 7	7.074	100yr	29.40	211.60	214.42	214.42	215.11	0.001346	4.75	29.69	26.84	0.92
East Reach 7	7.074	Reg.	46.10	211.60	214.91	214.91	215.83	0.001587	5.76	45.76	41.66	1.03
East Reach 7	7.0731	2yr	11.10	211.00	212.02	212.02	212.35	0.002171	2.56	4.34	6.56	1.00
East Reach 7	7.0731	5yr	15.70	211.00	212.19	212.19	212.60	0.002079	2.84	5.56	7.38	1.01
East Reach 7	7.0731	10yr	18.90	211.00	212.31	212.31	212.76	0.001979	2.99	6.44	7.92	1.00
East Reach 7	7.0731	25yr	23.10	211.00	212.43	212.43	212.95	0.001903	3.19	7.52	8.89	1.00
East Reach 7	7.0731	50yr	26.30	211.00	212.53	212.53	213.09	0.001830	3.32	8.41	9.70	1.00
East Reach 7	7.0731	100yr	29.40	211.00	212.62	212.62	213.22	0.001756	3.43	9.34	10.48	0.99
East Reach 7	7.0731	Reg.	46.10	211.00	213.05	213.05	213.82	0.001544	3.93	14.67	14.70	0.97
East Reach 7	7.073	2yr	11.10	210.60	211.37	211.37	211.70	0.001862	2.55	4.78	8.84	0.98
East Reach 7	7.073	5yr	15.70	210.60	211.54	211.54	211.95	0.001718	2.85	6.43	10.06	0.98
East Reach 7	7.073	10yr	18.90	210.60	211.66	211.66	212.11	0.001635	3.02	7.60	10.80	0.98
East Reach 7	7.073	25yr	23.10	210.60	211.79	211.79	212.30	0.001577	3.22	9.09	12.04	0.98
East Reach 7	7.073	50yr	26.30	210.60	211.89	211.89	212.44	0.001504	3.34	10.39	13.21	0.97
East Reach 7	7.073	100yr	29.40	210.60	211.98	211.98	212.56	0.001451	3.45	11.66	14.27	0.96
East Reach 7	7.073	Reg.	46.10	210.60	212.42	212.42	213.14	0.001274	3.91	18.93	19.29	0.95
East Reach 7	7.072	2yr	11.10	208.53	209.58	209.58	209.93	0.002038	2.60	4.27	6.07	0.99
East Reach 7	7.072	5yr	15.70	208.53	209.78	209.78	210.19	0.002007	2.83	5.55	6.83	1.00
East Reach 7	7.072	10yr	18.90	208.53	209.91	209.91	210.34	0.001940	2.93	6.44	7.32	1.00
East Reach 7	7.072	25yr	23.10	208.53	210.04	210.04	210.53	0.001892	3.09	7.47	7.86	1.00
East Reach 7	7.072	50yr	26.30	208.53	210.14	210.14	210.66	0.001798	3.21	8.24	8.27	0.99
East Reach 7	7.072	100yr	29.40	208.53	210.47	210.22	210.85	0.000915	2.74	11.19	9.70	0.74
East Reach 7	7.072	Reg.	46.10	208.53	211.58	210.62	211.85	0.000306	2.34	25.34	18.88	0.47
East Reach 7	7.071	2yr	11.60	208.30	209.34	209.12	209.59	0.000800	2.23	5.20	7.82	0.70
East Reach 7	7.071	5yr	16.50	208.30	209.62	209.34	209.94	0.000739	2.51	6.58	7.82	0.70
East Reach 7	7.071	10yr	20.00	208.30	209.79	209.48	210.15	0.000723	2.69	7.43	7.82	0.71
East Reach 7	7.071	25yr	24.60	208.30	209.99	209.65	210.42	0.000712	2.91	8.45	7.82	0.72
East Reach 7	7.071	50yr	28.10	208.30	210.14	209.78	210.62	0.000697	3.05	9.21	8.17	0.72
East Reach 7	7.071	100yr	31.50	208.30	210.28	209.89	210.80	0.000689	3.18	9.90	8.51	0.72
East Reach 7	7.071	Reg.	50.90	208.30	210.96	210.50	211.70	0.000674	3.83	13.29	10.29	0.75
East Reach 7	7.0701		Bridge									
East Reach 7	7.07	2yr	11.60	207.80	208.88	208.62	209.12	0.000695	2.14	5.42	7.24	0.66
East Reach 7	7.07	5yr	16.50	207.80	209.06	208.84	209.41	0.000849	2.62	6.31	7.80	0.74
East Reach 7	7.07	10yr	20.00	207.80	209.19	208.97	209.61	0.000912	2.89	6.93	8.80	0.78
East Reach 7	7.07	25yr	24.60	207.80	209.35	209.15	209.86	0.000950	3.17	7.75	9.12	0.81
East Reach 7	7.07	50yr	28.10	207.80	209.47	209.28	210.05	0.000966	3.37	8.35	9.66	0.83
East Reach 7	7.07	100yr	31.50	207.80	209.58	209.39	210.22	0.000982	3.54	8.90	10.15	0.85
East Reach 7	7.07	Reg.	50.90	207.80	210.31	209.99	211.15	0.000813	4.05	12.56	13.45	0.82
East Reach 7	7.069	2yr	11.60	207.80	208.86		209.10	0.000815	2.17	5.98	7.54	0.67
East Reach 7	7.069	5yr	16.50	207.80	209.04	208.84	209.38	0.000967	2.62	7.42	8.54	0.75
East Reach 7	7.069	10yr	20.00	207.80	209.16	208.98	209.58	0.001016	2.87	8.56	9.25	0.79
East Reach 7	7.069	25yr	24.60	207.80	209.34	209.15	209.82	0.001023	3.12	10.22	10.20	0.80

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.069	50yr	28.10	207.80	209.46	209.28	209.99	0.001015	3.27	11.56	10.91	0.81
East Reach 7	7.069	100yr	31.50	207.80	209.58	209.39	210.15	0.001001	3.41	12.91	11.58	0.81
East Reach 7	7.069	Reg.	50.90	207.80	210.39	209.97	211.03	0.000698	3.65	24.16	16.24	0.72
East Reach 7	7.0683	2yr	11.60	207.72	208.90	208.73	209.02	0.000916	1.54	7.54	13.75	0.66
East Reach 7	7.0683	5yr	16.50	207.72	209.14	208.88	209.26	0.000609	1.48	11.11	15.71	0.56
East Reach 7	7.0683	10yr	20.00	207.72	209.31	208.97	209.41	0.000473	1.45	13.75	16.53	0.51
East Reach 7	7.0683	25yr	24.60	207.72	209.52	209.06	209.62	0.000360	1.42	17.33	17.58	0.46
East Reach 7	7.0683	50yr	28.10	207.72	209.67	209.12	209.77	0.000306	1.40	20.06	18.34	0.43
East Reach 7	7.0683	100yr	31.50	207.72	209.81	209.18	209.91	0.000269	1.39	22.71	19.05	0.41
East Reach 7	7.0683	Reg.	50.90	207.72	210.66	209.47	210.75	0.000117	1.28	39.85	20.62	0.29
East Reach 7	7.0682		Bridge									
East Reach 7	7.0681	2yr	11.60	207.75	208.88	208.68	208.99	0.000807	1.49	7.77	13.54	0.63
East Reach 7	7.0681	5yr	16.50	207.75	209.13	208.83	209.23	0.000517	1.44	11.48	15.77	0.53
East Reach 7	7.0681	10yr	20.00	207.75	209.29	208.91	209.40	0.000397	1.44	14.12	16.75	0.48
East Reach 7	7.0681	25yr	24.60	207.75	209.50	209.02	209.60	0.000308	1.45	17.66	17.97	0.43
East Reach 7	7.0681	50yr	28.10	207.75	209.64	209.07	209.75	0.000265	1.46	20.38	18.86	0.41
East Reach 7	7.0681	100yr	31.50	207.75	209.78	209.13	209.89	0.000236	1.47	23.03	19.68	0.40
East Reach 7	7.0681	Reg.	50.90	207.75	210.48	209.43	210.60	0.000156	1.57	37.68	21.59	0.34
East Reach 7	7.068	2yr	11.60	207.60	208.43	208.43	208.77	0.001888	2.57	5.13	9.45	0.99
East Reach 7	7.068	5yr	16.50	207.60	208.61	208.61	209.02	0.001737	2.88	6.90	10.53	0.99
East Reach 7	7.068	10yr	20.00	207.60	208.73	208.73	209.19	0.001655	3.05	8.16	11.22	0.99
East Reach 7	7.068	25yr	24.60	207.60	208.87	208.87	209.39	0.001578	3.26	9.80	12.06	0.99
East Reach 7	7.068	50yr	28.10	207.60	208.97	208.97	209.54	0.001532	3.41	11.03	12.65	0.99
East Reach 7	7.068	100yr	31.50	207.60	209.06	209.06	209.67	0.001492	3.53	12.24	13.21	0.99
East Reach 7	7.068	Reg.	50.90	207.60	209.53	209.53	210.35	0.001338	4.11	19.15	16.03	0.98
East Reach 7	7.0679	2yr	11.60	206.80	207.95	207.95	208.29	0.002101	2.61	4.45	6.54	1.01
East Reach 7	7.0679	5yr	16.50	206.80	208.13	208.13	208.57	0.001943	2.93	5.73	7.68	1.01
East Reach 7	7.0679	10yr	20.00	206.80	208.25	208.25	208.74	0.001833	3.10	6.71	8.44	1.00
East Reach 7	7.0679	25yr	24.60	206.80	208.40	208.40	208.95	0.001735	3.31	8.02	9.34	1.00
East Reach 7	7.0679	50yr	28.10	206.80	208.51	208.51	209.11	0.001659	3.45	9.06	10.00	0.99
East Reach 7	7.0679	100yr	31.50	206.80	208.61	208.61	209.25	0.001590	3.56	10.12	10.61	0.98
East Reach 7	7.0679	Reg.	50.90	206.80	209.11	209.11	209.95	0.001401	4.12	16.16	13.61	0.97
East Reach 7	7.0678	2yr	11.60	206.56	207.59	207.59	207.96	0.001936	2.72	4.47	7.19	1.00
East Reach 7	7.0678	5yr	16.50	206.56	207.79	207.79	208.25	0.001757	3.03	6.03	8.34	0.99
East Reach 7	7.0678	10yr	20.00	206.56	207.92	207.92	208.44	0.001668	3.22	7.17	9.06	0.99
East Reach 7	7.0678	25yr	24.60	206.56	208.08	208.08	208.67	0.001560	3.42	8.73	9.96	0.98
East Reach 7	7.0678	50yr	28.10	206.56	208.19	208.19	208.83	0.001528	3.58	9.84	10.55	0.98
East Reach 7	7.0678	100yr	31.50	206.56	208.29	208.29	208.98	0.001495	3.72	10.95	11.10	0.98
East Reach 7	7.0678	Reg.	50.90	206.56	208.82	208.82	209.73	0.001338	4.32	17.66	14.46	0.98
East Reach 7	7.0677	2yr	11.60	205.76	207.03	207.03	207.45	0.002211	2.85	4.06	4.98	1.01
East Reach 7	7.0677	5yr	16.50	205.76	207.28	207.28	207.76	0.002113	3.08	5.36	5.68	1.01
East Reach 7	7.0677	10yr	20.00	205.76	207.41	207.41	207.96	0.002036	3.29	6.12	6.27	1.01
East Reach 7	7.0677	25yr	24.60	205.76	207.57	207.57	208.20	0.001897	3.50	7.26	7.22	1.00
East Reach 7	7.0677	50yr	28.10	205.76	207.69	207.69	208.37	0.001827	3.64	8.15	7.91	1.00
East Reach 7	7.0677	100yr	31.50	205.76	207.80	207.80	208.52	0.001768	3.77	9.05	8.51	0.99
East Reach 7	7.0677	Reg.	50.90	205.76	208.36	208.36	209.31	0.001532	4.35	14.67	11.60	0.97
East Reach 7	7.0676	2yr	11.60	205.56	206.78	206.78	207.20	0.002166	2.87	4.05	5.13	1.01
East Reach 7	7.0676	5yr	16.50	205.56	207.01	207.01	207.53	0.001944	3.20	5.32	6.19	1.00
East Reach 7	7.0676	10yr	20.00	205.56	207.15	207.15	207.74	0.001860	3.41	6.26	6.96	1.00
East Reach 7	7.0676	25yr	24.60	205.56	207.33	207.33	207.99	0.001732	3.62	7.63	7.96	0.98
East Reach 7	7.0676	50yr	28.10	205.56	207.46	207.46	208.17	0.001671	3.77	8.68	8.62	0.98
East Reach 7	7.0676	100yr	31.50	205.56	207.58	207.58	208.34	0.001620	3.90	9.73	9.25	0.98
East Reach 7	7.0676	Reg.	50.90	205.56	208.17	208.17	209.17	0.001424	4.50	16.18	12.41	0.97
East Reach 7	7.0675	2yr	11.60	204.96	206.44		206.79	0.001662	2.65	4.38	4.38	0.85
East Reach 7	7.0675	5yr	16.50	204.96	206.70	206.58	207.14	0.001709	2.93	5.62	4.92	0.87
East Reach 7	7.0675	10yr	20.00	204.96	206.85	206.74	207.36	0.001693	3.16	6.37	5.45	0.88
East Reach 7	7.0675	25yr	24.60	204.96	207.01	206.92	207.62	0.001715	3.44	7.35	6.33	0.91
East Reach 7	7.0675	50yr	28.10	204.96	207.12	207.05	207.80	0.001753	3.65	8.08	6.92	0.93
East Reach 7	7.0675	100yr	31.50	204.96	207.22	207.18	207.97	0.001799	3.85	8.78	7.47	0.95
East Reach 7	7.0675	Reg.	50.90	204.96	207.81	207.81	208.84	0.001670	4.54	14.07	10.58	0.96
East Reach 7	7.067	2yr	11.60	204.60	206.10	205.90	206.42	0.006424	2.67	6.22	7.46	0.71
East Reach 7	7.067	5yr	16.50	204.60	206.33	206.19	206.76	0.007375	3.15	8.03	8.61	0.78
East Reach 7	7.067	10yr	20.00	204.60	206.47	206.37	206.96	0.007905	3.43	9.27	9.31	0.81
East Reach 7	7.067	25yr	24.60	204.60	206.63	206.57	207.21	0.008429	3.76	10.86	10.15	0.85
East Reach 7	7.067	50yr	28.10	204.60	206.74	206.71	207.38	0.008812	3.98	12.01	10.72	0.88
East Reach 7	7.067	100yr	31.50	204.60	206.84	206.84	207.53	0.009108	4.18	13.12	11.25	0.90
East Reach 7	7.067	Reg.	50.90	204.60	207.44	207.44	208.25	0.008559	4.76	20.84	14.62	0.91

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.066	2yr	11.60	203.60	204.52	204.52	204.88	0.012582	2.72	4.75	7.51	0.97
East Reach 7	7.066	5yr	16.50	203.60	204.72	204.72	205.17	0.011553	3.03	6.35	8.40	0.97
East Reach 7	7.066	10yr	20.00	203.60	204.85	204.85	205.35	0.010938	3.20	7.50	8.98	0.96
East Reach 7	7.066	25yr	24.60	203.60	205.01	205.01	205.56	0.010510	3.42	8.93	9.65	0.96
East Reach 7	7.066	50yr	28.10	203.60	205.12	205.12	205.71	0.010173	3.55	10.04	10.17	0.96
East Reach 7	7.066	100yr	31.50	203.60	205.22	205.22	205.85	0.009882	3.67	11.12	10.67	0.96
East Reach 7	7.066	Reg.	50.90	203.60	205.68	205.68	206.53	0.009657	4.34	16.58	13.00	0.99
East Reach 7	7.065	2yr	12.10	200.60	202.22	201.71	202.37	0.002470	1.81	9.46	9.84	0.47
East Reach 7	7.065	5yr	17.40	200.60	202.50	201.96	202.69	0.002625	2.10	12.46	11.08	0.50
East Reach 7	7.065	10yr	21.10	200.60	202.61		202.85	0.003101	2.37	13.64	11.51	0.55
East Reach 7	7.065	25yr	26.00	200.60	202.75		203.05	0.003549	2.66	15.33	12.10	0.60
East Reach 7	7.065	50yr	29.80	200.60	202.88		203.21	0.003711	2.83	16.85	12.60	0.62
East Reach 7	7.065	100yr	33.70	200.60	203.02		203.38	0.003668	2.94	18.76	13.23	0.62
East Reach 7	7.065	Reg.	55.60	200.60	203.99		204.35	0.002598	3.13	35.50	23.81	0.55
East Reach 7	7.064	2yr	12.10	199.60	200.75	200.75	201.18	0.011080	3.00	5.06	7.26	0.94
East Reach 7	7.064	5yr	17.40	199.60	201.02	201.00	201.51	0.009651	3.28	7.25	8.55	0.91
East Reach 7	7.064	10yr	21.10	199.60	201.35	201.16	201.75	0.006194	3.04	10.31	10.26	0.76
East Reach 7	7.064	25yr	26.00	199.60	201.75		202.08	0.004068	2.85	14.81	12.37	0.63
East Reach 7	7.064	50yr	29.80	199.60	202.01		202.32	0.003315	2.78	18.23	13.71	0.58
East Reach 7	7.064	100yr	33.70	199.60	202.27		202.56	0.002768	2.73	21.94	15.07	0.54
East Reach 7	7.064	Reg.	55.60	199.60	203.68		203.87	0.001206	2.41	50.22	25.80	0.39
East Reach 7	7.063	2yr	10.00	199.50	200.74	200.41	200.83	0.000489	1.35	7.39	10.07	0.50
East Reach 7	7.063	5yr	15.60	199.50	201.21	200.62	201.29	0.000265	1.23	12.73	12.60	0.39
East Reach 7	7.063	10yr	19.60	199.50	201.50	200.73	201.57	0.000199	1.19	16.54	13.79	0.35
East Reach 7	7.063	25yr	25.20	199.50	201.87	200.88	201.94	0.000145	1.15	21.87	14.91	0.30
East Reach 7	7.063	50yr	29.30	199.50	202.12	200.98	202.19	0.000118	1.14	25.66	15.65	0.28
East Reach 7	7.063	100yr	33.60	199.50	202.37	201.07	202.44	0.000098	1.14	29.46	16.37	0.26
East Reach 7	7.063	Reg.	65.30	199.50	203.73	201.63	203.81	0.000062	1.29	58.93	45.77	0.23
East Reach 7	7.0621		Culvert									
East Reach 7	7.062	2yr	10.00	199.40	200.56	199.93	200.61	0.000179	0.95	10.51		

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.057	2yr	7.90	197.25	197.70	197.70	197.93	0.002167	2.11	3.75	10.10	1.00
East Reach 7	7.057	5yr	13.90	197.25	197.91	197.91	198.24	0.001891	2.53	5.49	10.28	1.00
East Reach 7	7.057	10yr	18.00	197.25	198.03	198.03	198.42	0.001797	2.77	6.50	10.36	1.00
East Reach 7	7.057	25yr	24.40	197.25	198.21	198.21	198.69	0.001662	3.05	7.99	10.39	0.99
East Reach 7	7.057	50yr	28.70	197.25	198.32	198.32	198.85	0.001611	3.23	8.89	10.42	1.00
East Reach 7	7.057	100yr	33.60	197.25	198.44	198.44	199.03	0.001563	3.41	9.86	10.44	1.00
East Reach 7	7.057	Reg.	75.10	197.25	199.20	199.20	199.91	0.001423	3.73	20.12	10.59	0.86
East Reach 7	7.056	2yr	7.90	193.01	195.86		195.87	0.000001	0.12	76.13	37.53	0.02
East Reach 7	7.056	5yr	13.90	193.01	196.26		196.26	0.000001	0.18	91.51	40.23	0.03
East Reach 7	7.056	10yr	18.00	193.01	196.50		196.50	0.000002	0.21	101.24	41.67	0.04
East Reach 7	7.056	25yr	24.40	193.01	196.83		196.84	0.000002	0.26	115.64	43.88	0.04
East Reach 7	7.056	50yr	28.70	193.01	197.04		197.05	0.000002	0.28	124.94	45.26	0.05
East Reach 7	7.056	100yr	33.60	193.01	197.25		197.26	0.000003	0.31	134.44	46.63	0.05
East Reach 7	7.056	Reg.	75.10	193.01	198.64		198.65	0.000005	0.51	209.82	59.09	0.07
East Reach 7	7.055	2yr	7.90	191.42	195.87		195.87	0.000000	0.05	371.08	123.30	0.01
East Reach 7	7.055	5yr	13.90	191.42	196.26		196.26	0.000001	0.08	420.43	126.09	0.01
East Reach 7	7.055	10yr	18.00	191.42	196.50		196.50	0.000001	0.09	450.66	127.78	0.01
East Reach 7	7.055	25yr	24.40	191.42	196.84		196.84	0.000002	0.11	494.07	129.77	0.02
East Reach 7	7.055	50yr	28.70	191.42	197.05		197.05	0.000002	0.13	521.31	130.94	0.02
East Reach 7	7.055	100yr	33.60	191.42	197.25		197.25	0.000003	0.14	548.60	132.14	0.02
East Reach 7	7.055	Reg.	75.10	191.42	198.65		198.65	0.000005	0.23	739.10	142.01	0.03
East Reach 7	7.0545	2yr	7.90	191.19	195.86	191.59	195.87	0.000001	0.11	68.76	19.84	0.02
East Reach 7	7.0545	5yr	13.90	191.19	196.26	191.77	196.26	0.000001	0.18	76.76	20.70	0.03
East Reach 7	7.0545	10yr	18.00	191.19	196.50	191.88	196.50	0.000002	0.22	81.73	21.23	0.04
East Reach 7	7.0545	25yr	24.40	191.19	196.83	192.03	196.84	0.000003	0.27	88.97	21.96	0.04
East Reach 7	7.0545	50yr	28.70	191.19	197.04	192.12	197.04	0.000003	0.31	93.59	22.42	0.05
East Reach 7	7.0545	100yr	33.60	191.19	197.25	192.22	197.25	0.000004	0.34	98.26	22.87	0.05
East Reach 7	7.0545	Reg.	75.10	191.19	198.63	192.91	198.64	0.000008	0.57	131.93	25.90	0.08
East Reach 7	7.0544		Inl Struct									
East Reach 7	7.054	2yr	5.80	190.77	191.56	191.39	191.68	0.000871	1.49	3.88	6.94	0.64
East Reach 7	7.054	5yr	12.10	190.77	191.85	191.69	192.05	0.001082	1.99	6.07	8.24	0.74
East Reach 7	7.054	10yr	16.40	190.77	192.00	191.85	192.25	0.001166	2.23	7.36	8.92	0.78
East Reach 7	7.054	25yr	23.60	190.77	192.21	192.08	192.54	0.001276	2.54	9.28	9.84	0.84
East Reach 7	7.054	50yr	28.20	190.77	192.31	192.20	192.69	0.001358	2.73	10.34	10.31	0.87
East Reach 7	7.054	100yr	33.50	190.77	192.43	192.33	192.85	0.001415	2.90	11.55	10.83	0.90
East Reach 7	7.054	Reg.	84.80	190.77	194.42		194.63	0.000276	2.02	41.92	19.52	0.44
East Reach 7	7.053	2yr	5.80	190.60	191.16	191.16	191.36	0.002368	1.97	2.94	7.55	1.01
East Reach 7	7.053	5yr	12.10	190.60	191.42	191.42	191.71	0.002079	2.40	5.05	8.70	1.00
East Reach 7	7.053	10yr	16.40	190.60	191.56	191.56	191.90	0.002000	2.60	6.31	9.29	1.01
East Reach 7	7.053	25yr	23.60	190.60	191.76	191.76	192.18	0.001900	2.85	8.28	10.15	1.01
East Reach 7	7.053	50yr	28.20	190.60	191.88	191.88	192.33	0.001840	2.97	9.48	10.64	1.01
East Reach 7	7.053	100yr	33.50	190.60	192.00	192.00	192.49	0.001808	3.11	10.78	11.12	1.01
East Reach 7	7.053	Reg.	84.80	190.60	194.41		194.56	0.000170	1.69	50.39	22.69	0.35
East Reach 7	7.052	2yr	6.90	189.43	190.28	189.87	190.33	0.000272	1.01	6.81	8.67	0.36
East Reach 7	7.052	5yr	12.60	189.43	190.71	190.08	190.78	0.000237	1.18	10.65	9.32	0.35
East Reach 7	7.052	10yr	17.10	189.43	191.00	190.23	191.08	0.000220	1.27	13.49	9.91	0.35
East Reach 7	7.052	25yr	24.80	189.43	191.46	190.44	191.55	0.000210	1.33	18.63	12.50	0.35
East Reach 7	7.052	50yr	29.70	189.43	191.73	190.57	191.82	0.000193	1.34	22.21	14.00	0.34
East Reach 7	7.052	100yr	35.20	189.43	192.02	190.69	192.11	0.000173	1.33	26.45	15.55	0.33
East Reach 7	7.052	Reg.	90.80	189.43	194.45	191.78	194.51	0.000067	1.08	91.16	79.94	0.22
East Reach 7	7.0511		Culvert									
East Reach 7	7.051	2yr	6.90	188.96	189.47	189.32	189.56	0.000753	1.34	5.14	10.93	0.60
East Reach 7	7.051	5yr	12.60	188.96	189.72	189.50	189.86	0.000670	1.65	7.65	11.37	0.60
East Reach 7	7.051	10yr	17.10	188.96	189.87	189.62	190.05	0.000657	1.85	9.24	11.65	0.62
East Reach 7	7.051	25yr	24.80	188.96	190.10	189.81	190.34	0.000662	2.15	11.51	13.70	0.64
East Reach 7	7.051	50yr	29.70	188.96	190.22	189.92	190.50	0.000678	2.33	12.74	15.79	0.66
East Reach 7	7.051	100yr	35.20	188.96	190.34	190.03	190.67	0.000699	2.52	13.98	17.72	0.68
East Reach 7	7.051	Reg.	90.80	188.96	191.02	190.98	191.99	0.001227	4.35	20.85	96.05	0.97
East Reach 7	7.05	2yr	6.90	188.60	189.15	189.13	189.34	0.013877	1.94	3.65	9.45	0.93
East Reach 7	7.05	5yr	12.60	188.60	189.34	189.34	189.64	0.013327	2.42	5.64	11.09	0.97
East Reach 7	7.05	10yr	17.10	188.60	189.48	189.48	189.83	0.012283	2.65	7.28	12.28	0.96
East Reach 7	7.05	25yr	24.80	188.60	189.69	189.69	190.12	0.011281	2.98	9.94	13.74	0.96
East Reach 7	7.05	50yr	29.70	188.60	189.81	189.81	190.28	0.010789	3.14	11.61	14.59	0.96
East Reach 7	7.05	100yr	35.20	188.60	189.93	189.93	190.44	0.010457	3.31	13.40	15.45	0.96
East Reach 7	7.05	Reg.	90.80	188.60	190.86	190.86	191.68	0.008538	4.37	31.14	22.52	0.95
East Reach 7	7.049	2yr	6.90	186.60	187.11	187.11	187.32	0.016382	2.04	3.40	8.51	1.00

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

[illegible]

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.039	2yr	7.90	180.60	181.66	180.95	181.67	0.000150	0.33	29.40	76.12	0.11
East Reach 7	7.039	5yr	13.10	180.60	181.85	181.05	181.96	0.000200	0.43	40.59	81.63	0.13
East Reach 7	7.039	10yr	17.80	180.60	181.99	181.12	182.00	0.000234	0.51	48.72	95.13	0.14
East Reach 7	7.039	25yr	25.90	180.60	182.17	181.22	182.19	0.000286	0.61	60.02	103.73	0.16
East Reach 7	7.039	50yr	31.20	180.60	182.28	181.29	182.30	0.000314	0.67	66.38	105.39	0.17
East Reach 7	7.039	100yr	36.80	180.60	182.38	181.35	182.41	0.000341	0.73	72.46	106.98	0.18
East Reach 7	7.039	Reg.	96.80	180.60	182.99	181.91	183.03	0.000509	1.11	170.16	126.65	0.24
East Reach 7	7.038	2yr	7.90	181.00	181.40	181.40	181.55	0.015469	1.76	5.65	24.58	0.95
East Reach 7	7.038	5yr	13.10	181.00	181.52	181.52	181.71	0.014230	2.05	8.95	30.80	0.96
East Reach 7	7.038	10yr	17.80	181.00	181.62	181.62	181.83	0.012455	2.19	12.38	36.71	0.92
East Reach 7	7.038	25yr	25.90	181.00	181.76	181.76	181.99	0.011562	2.42	17.70	43.43	0.92
East Reach 7	7.038	50yr	31.20	181.00	181.82	181.82	182.09	0.011538	2.58	20.82	47.10	0.94
East Reach 7	7.038	100yr	36.80	181.00	181.89	181.89	182.18	0.011584	2.72	24.00	50.92	0.95
East Reach 7	7.038	Reg.	96.80	181.00	182.37	182.37	182.73	0.009951	3.42	60.40	81.87	0.95
East Reach 7	7.037	2yr	7.70	178.60	179.16		179.21	0.004525	1.02	7.90	24.45	0.52
East Reach 7	7.037	5yr	13.00	178.60	179.29		179.37	0.004704	1.26	11.38	28.70	0.56
East Reach 7	7.037	10yr	17.60	178.60	179.38		179.48	0.004972	1.44	14.00	31.04	0.59
East Reach 7	7.037	25yr	25.20	178.60	179.51		179.64	0.005009	1.65	18.39	35.06	0.61
East Reach 7	7.037	50yr	30.60	178.60	179.59		179.74	0.005123	1.78	21.29	37.90	0.63
East Reach 7	7.037	100yr	36.90	178.60	179.68		179.85	0.005193	1.92	24.66	40.96	0.65
East Reach 7	7.037	Reg.	98.40	178.60	180.31		180.61	0.004895	2.66	58.14	63.85	0.69
East Reach 7	7.036	2yr	7.70	177.60	178.17		178.20	0.005187	1.22	13.73	37.88	0.57
East Reach 7	7.036	5yr	13.00	177.60	178.33		178.37	0.004792	1.43	20.20	41.86	0.57
East Reach 7	7.036	10yr	17.60	177.60	178.47		178.51	0.004276	1.54	26.06	45.64	0.56
East Reach 7	7.036	25yr	25.20	177.60	178.64		178.70	0.004029	1.71	34.56	50.93	0.56
East Reach 7	7.036	50yr	30.60	177.60	178.74		178.80	0.003875	1.79	39.73	51.76	0.56
East Reach 7	7.036	100yr	36.90	177.60	178.85		178.91	0.003750	1.88	45.54	55.54	0.56
East Reach 7	7.036	Reg.	98.40	177.60	179.67		179.76	0.003096	2.44	97.33	67.70	0.55
East Reach 7	7.035	2yr	7.70	176.60	177.24		177.27	0.003988	1.16	13.52	29.38	0.51
East Reach 7	7.035	5yr	13.00	176.60	177.42		177.46	0.004073	1.42	18.86	31.01	0.54
East Reach 7	7.035	10yr	17.60	176.60	177.51		177.56	0.004894	1.68	21.66	31.81	0.60
East Reach 7	7.035	25yr	25.20	176.60	177.67		177.75	0.005155	1.95	26.99	33.28	0.63
East Reach 7	7.035	50yr	30.60	176.60	177.78		177.87	0.005080	2.09	30.87	34.31	0.64
East Reach 7	7.035	100yr	36.90	176.60	177.91		178.01	0.004997	2.23	35.21	35.43	0.65
East Reach 7	7.035	Reg.	98.40	176.60	178.64		178.86	0.006435	3.46	63.31	41.95	0.80
East Reach 7	7.034	2yr	6.10	174.60	175.37	175.37	175.58	0.010352	2.15	4.39	14.52	0.84
East Reach 7	7.034	5yr	12.00	174.60	175.67	175.63	175.88	0.007574	2.37	10.26	23.83	0.77
East Reach 7	7.034	10yr	16.60	174.60	175.90		176.07	0.005402	2.30	16.41	30.66	0.67
East Reach 7	7.034	25yr	23.10	174.60	176.11		176.28	0.004923	2.44	23.44	38.58	0.66
East Reach 7	7.034	50yr	28.20	174.60	176.22		176.40	0.005015	2.59	28.04	43.50	0.67
East Reach 7	7.034	100yr	33.70	174.60	176.33		176.53	0.005143	2.76	33.37	51.35	0.69
East Reach 7	7.034	Reg.	100.80	174.60	177.25		177.44	0.003879	3.23	85.37	61.97	0.65
East Reach 7	7.033	2yr	6.10	173.60	174.78	174.29	174.81	0.001033	0.95	12.66	23.80	0.29
East Reach 7	7.033	5yr	12.00	173.60	175.03	174.57	175.09	0.001581	1.35	19.38	30.92	0.37
East Reach 7	7.033	10yr	16.60	173.60	175.18	174.72	175.27	0.002003	1.63	25.07	43.25	0.42
East Reach 7	7.033	25yr	23.10	173.60	175.34	174.89	175.44	0.002282	1.86	32.89	52.05	0.46
East Reach 7	7.033	50yr	28.20	173.60	175.45	175.02	175.55	0.002347	1.96	38.42	53.07	0.47
East Reach 7	7.033	100yr	33.70	173.60	175.55	175.05	175.66	0.002388	2.06	44.03	54.08	0.48
East Reach 7	7.033	Reg.	100.80	173.60	176.70		176.80	0.001683	2.38	112.74	65.20	0.44
East Reach 7	7.032	2yr	6.10	173.60	174.08		174.13	0.005543	0.95	6.47	23.17	0.55
East Reach 7	7.032	5yr	12.00	173.60	174.31		174.36	0.003036	1.03	12.62	29.85	0.45
East Reach 7	7.032	10yr	16.60	173.60	174.47		174.53	0.002310	1.07	17.72	33.74	0.41
East Reach 7	7.032	25yr	23.10	173.60	174.65		174.72	0.001949	1.15	24.28	38.08	0.39
East Reach 7	7.032	50yr	28.20	173.60	174.78		174.85	0.001787	1.21	29.29	41.09	0.39
East Reach 7	7.032	100yr	33.70	173.60	174.91		174.98	0.001655	1.26	34.71	44.11	0.38
East Reach 7	7.032	Reg.	100.80	173.60	176.39		176.47	0.000640	1.37	129.08	90.80	0.27
East Reach 7	7.031	2yr	6.10	173.14	174.02		174.02	0.000214	0.34	20.12	34.45	0.13
East Reach 7	7.031	5yr	12.00	173.14	174.22		174.23	0.000354	0.52	27.60	38.96	0.17
East Reach 7	7.031	10yr	16.60	173.14	174.38		174.40	0.000388	0.60	34.14	42.51	0.18
East Reach 7	7.031	25yr	23.10	173.14	174.56		174.58	0.000438	0.71	42.12	46.41	0.20
East Reach 7	7.031	50yr	28.20	173.14	174.69		174.71	0.000464	0.78	48.12	48.81	0.21
East Reach 7	7.031	100yr	33.70	173.14	174.81		174.85	0.000483	0.84	54.50	51.25	0.22
East Reach 7	7.031	Reg.	100.80	173.14	176.35		176.39	0.000309	1.06	170.38	145.88	0.19
East Reach 7	7.03	2yr	6.10	173.30	173.98	173.74	174.01	0.002386	0.72	8.49	23.21	0.38
East Reach 7	7.03	5yr	12.00	173.30	174.17	173.90	174.21	0.002393	0.94	12.75	23.83	0.40
East Reach 7	7.03	10yr	16.60	173.30	174.32	173.99	174.38	0.002003	1.02	16.34	23.86	0.38
East Reach 7	7.03	25yr	23.10	173.30	174.49	174.08	174.56	0.001909	1.14	20.22	23.90	0.39
East Reach 7	7.03	50yr	28.20	173.30	174.61	174.15	174.69	0.001875	1.23	22.92	23.92	0.39

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.03	100yr	33.70	173.30	174.73	174.21	174.82	0.001840	1.31	25.66	23.95	0.40
East Reach 7	7.03	Reg.	100.80	173.30	176.25	174.86	176.37	0.000788	1.52	91.19	122.86	0.30
East Reach 7	7.0291		Culvert									
East Reach 7	7.029	2yr	6.10	173.32	173.90	173.89	173.99	0.009355	1.79	7.89	35.13	0.79
East Reach 7	7.029	5yr	12.00	173.32	174.06	174.01	174.18	0.009438	2.15	12.73	43.92	0.83
East Reach 7	7.029	10yr	16.60	173.32	174.23	174.08	174.33	0.006739	2.10	17.66	45.37	0.72
East Reach 7	7.029	25yr	23.10	173.32	174.37	174.18	174.49	0.006758	2.32	21.83	46.61	0.74
East Reach 7	7.029	50yr	28.20	173.32	174.46	174.25	174.60	0.006889	2.49	24.64	47.43	0.76
East Reach 7	7.029	100yr	33.70	173.32	174.55	174.32	174.71	0.007028	2.66	27.40	48.25	0.78
East Reach 7	7.029	Reg.	100.80	173.32	175.43	174.96	175.75	0.007260	3.92	53.52	55.65	0.87
East Reach 7	7.028	2yr	6.10	173.10	173.81	173.59	173.84	0.002569	1.13	12.87	29.21	0.43
East Reach 7	7.028	5yr	12.00	173.10	173.82		173.93	0.009736	2.22	12.96	29.26	0.85
East Reach 7	7.028	10yr	16.60	173.10	173.82	173.82	174.03	0.018602	3.06	12.97	29.26	1.17
East Reach 7	7.028	25yr	23.10	173.10	173.92	173.92	174.17	0.019393	3.44	16.17	30.88	1.22
East Reach 7	7.028	50yr	28.20	173.10	174.00	174.00	174.28	0.019706	3.68	18.54	32.03	1.25
East Reach 7	7.028	100yr	33.70	173.10	174.07	174.07	174.38	0.019974	3.91	20.95	33.15	1.28
East Reach 7	7.028	Reg.	100.80	173.10	175.35		175.53	0.005065	3.46	76.77	52.82	0.74
East Reach 7	7.027	2yr	6.10	172.00	172.29	172.29	172.39	0.016755	1.55	5.80	31.46	0.95
East Reach 7	7.027	5yr	12.00	172.00	172.65		172.69	0.002594	1.07	20.81	52.88	0.43
East Reach 7	7.027	10yr	16.60	172.00	172.89		172.92	0.001304	0.94	35.67	67.41	0.32
East Reach 7	7.027	25yr	23.10	172.00	173.17		173.19	0.000771	0.87	55.73	74.94	0.26
East Reach 7	7.027	50yr	28.20	172.00	173.36		173.38	0.000599	0.85	69.91	76.49	0.23
East Reach 7	7.027	100yr	33.70	172.00	173.54		173.55	0.000505	0.85	83.75	77.90	0.22
East Reach 7	7.027	Reg.	100.80	172.00	175.30		175.32	0.000218	0.93	233.85	92.75	0.16
East Reach 7	7.026	2yr	6.10	171.00	172.23		172.23	0.000044	0.15	49.91	102.06	0.06
East Reach 7	7.026	5yr	12.00	171.00	172.66		172.66	0.000030	0.17	96.24	113.26	0.05
East Reach 7	7.026	10yr	16.60	171.00	172.90		172.90	0.000028	0.19	124.26	119.43	0.05
East Reach 7	7.026	25yr	23.10	171.00	173.17		173.18	0.000028	0.21	157.64	126.39	0.05
East Reach 7	7.026	50yr	28.20	171.00	173.36		173.36	0.000029	0.23	181.64	131.77	0.05
East Reach 7	7.026	100yr	33.70	171.00	173.54		173.54	0.000029	0.25	205.67	136.96	0.06
East Reach 7	7.026	Reg.	100.80	171.00	175.30		175.31	0.000026	0.36	477.79	184.32	0.06
East Reach 7	7.025	2yr	6.10	170.60	172.06	171.84	172.19	0.007365	1.62	3.77	6.02	0.65
East Reach 7	7.025	5yr	12.00	170.60	172.43	172.19	172.61	0.006961	1.85	6.48	8.34	0.67
East Reach 7	7.025	10yr	16.60	170.60	172.64	172.39	172.84	0.006925	2.00	8.31	9.59	0.69
East Reach 7	7.025	25yr	23.10	170.60	172.86	172.60	173.10	0.007101	2.19	10.56	10.94	0.71
East Reach 7	7.025	50yr	28.20	170.60	173.02	172.75	173.28	0.006928	2.28	12.39	11.92	0.71
East Reach 7	7.025	100yr	33.70	170.60	173.17	172.88	173.46	0.006744	2.36	14.31	12.87	0.71
East Reach 7	7.025	Reg.	100.80	170.60	175.05	173.96	175.25	0.001709	2.01	60.84	39.89	0.41
East Reach 7	7.0241		Bridge									
East Reach 7	7.024	2yr	6.10	170.60	171.50	171.27	171.61	0.005222	1.47	4.16	6.50	0.59
East Reach 7	7.024	5yr	12.00	170.60	171.84	171.57	172.00	0.005623	1.81	6.63	7.94	0.63
East Reach 7	7.024	10yr	16.60	170.60	172.06	171.75	172.25	0.005465	1.95	8.50	8.87	0.64
East Reach 7	7.024	25yr	23.10	170.60	172.37	171.98	172.58	0.004692	2.01	11.48	10.18	0.60
East Reach 7	7.024	50yr	28.20	170.60	172.57	172.13	172.79	0.004483	2.08	13.54	11.00	0.60
East Reach 7	7.024	100yr	33.70	170.60	172.76	172.27	172.99	0.004304	2.15	15.70	11.79	0.59
East Reach 7	7.024	Reg.	100.80	170.60	173.83	173.45	174.37	0.006243	3.27	31.75	25.80	0.76
East Reach 7	7.023	2yr	6.10	170.10	171.50		171.52	0.000585	0.81	14.10	24.88	0.22
East Reach 7	7.023	5yr	12.00	170.10	171.85		171.89	0.000734	1.06	24.54	33.10	0.26
East Reach 7	7.023	10yr	16.60	170.10	172.09		172.13	0.000765	1.18	32.83	39.50	0.27
East Reach 7	7.023	25yr	23.10	170.10	172.41		172.45	0.000709	1.26	48.05	54.80	0.27
East Reach 7	7.023	50yr	28.20	170.10	172.61		172.66	0.000673	1.31	60.14	64.41	0.27
East Reach 7	7.023	100yr	33.70	170.10	172.81		172.85	0.000626	1.33	73.93	73.86	0.26
East Reach 7	7.023	Reg.	100.80	170.10	174.04		174.08	0.000589	1.66	199.77	127.18	0.27
East Reach 7	7.022	2yr	6.10	170.03	171.49		171.49	0.000035	0.20	42.18	49.56	0.06
East Reach 7	7.022	5yr	12.00	170.03	171.85		171.85	0.000054	0.29	61.33	58.51	0.07
East Reach 7	7.022	10yr	16.60	170.03	172.08		172.08	0.000062	0.34	75.61	64.39	0.08
East Reach 7	7.022	25yr	23.10	170.03	172.40		172.41	0.000064	0.38	97.73	72.55	0.08
East Reach 7	7.022	50yr	28.20	170.03	172.60		172.61	0.000068	0.42	112.83	77.63	0.09
East Reach 7	7.022	100yr	33.70	170.03	172.80		172.81	0.000071	0.45	128.64	82.62	0.09
East Reach 7	7.022	Reg.	100.80	170.03	174.00		174.02	0.000137	0.81	249.92	121.01	0.13
East Reach 7	7.021	2yr	25.00	169.60	171.40		171.44	0.000483	0.88	38.46	31.81	0.22
East Reach 7	7.021	5yr	34.10	169.60	171.75		171.80	0.000468	0.99	50.35	39.90	0.22
East Reach 7	7.021	10yr	40.60	169.60	171.98		172.03	0.000441	1.03	60.24	45.33	0.22
East Reach 7	7.021	25yr	49.50	169.60	172.31		172.36	0.000387	1.06	76.38	52.96	0.21
East Reach 7	7.021	50yr	56.20	169.60	172.51		172.56	0.000371	1.09	87.51	57.83	0.21
East Reach 7	7.021	100yr	62.80	169.60	172.71		172.76	0.000351	1.11	99.91	70.86	0.20

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.021	Reg.	148.10	169.60	173.87		173.95	0.000470	1.59	250.05	206.47	0.25
East Reach 7	7.02	2yr	25.00	169.80	171.33	170.61	171.41	0.001250	1.32	23.34	22.02	0.34
East Reach 7	7.02	5yr	34.10	169.80	171.68	170.78	171.77	0.001089	1.42	31.20	26.18	0.33
East Reach 7	7.02	10yr	40.60	169.80	171.91	170.89	172.01	0.000996	1.47	36.63	28.81	0.32
East Reach 7	7.02	25yr	49.50	169.80	172.23	171.03	172.33	0.000862	1.50	44.31	32.55	0.31
East Reach 7	7.02	50yr	56.20	169.80	172.43	171.14	172.54	0.000833	1.56	48.91	34.78	0.31
East Reach 7	7.02	100yr	62.80	169.80	172.62	171.25	172.74	0.000800	1.60	53.47	37.00	0.31
East Reach 7	7.02	Reg.	148.10	169.80	173.74	172.19	173.91	0.001002	2.24	188.33	204.49	0.36
East Reach 7	7.0191		Culvert									
East Reach 7	7.019	2yr	25.00	169.80	170.65	170.52	170.90	0.007751	2.23	12.01	16.42	0.78
East Reach 7	7.019	5yr	34.10	169.80	170.75	170.69	171.12	0.009825	2.71	13.68	17.10	0.89
East Reach 7	7.019	10yr	40.60	169.80	170.81	170.81	171.26	0.011440	3.03	14.62	17.48	0.97
East Reach 7	7.019	25yr	49.50	169.80	171.54	170.94	171.73	0.002436	2.02	29.09	26.16	0.49
East Reach 7	7.019	50yr	56.20	169.80	171.59	171.04	171.82	0.002849	2.23	30.06	26.58	0.53
East Reach 7	7.019	100yr	62.80	169.80	171.65	171.13	171.92	0.003140	2.40	31.36	35.55	0.56
East Reach 7	7.019	Reg.	148.10	169.80	172.16	172.16	172.89	0.006604	4.09	57.54	54.15	0.85
East Reach 7	7.018	2yr	25.00	169.60	170.46	170.46	170.72	0.009964	2.29	14.16	44.20	0.86
East Reach 7	7.018	5yr	34.10	169.60	170.62	170.62	170.88	0.008494	2.40	22.28	62.28	0.82
East Reach 7	7.018	10yr	40.60	169.60	170.71	170.71	170.97	0.007690	2.45	28.74	73.76	0.79
East Reach 7	7.018	25yr	49.50	169.60	171.60	170.82	171.63	0.000501	0.97	113.66	104.98	0.23
East Reach 7	7.018	50yr	56.20	169.60	171.67	170.87	171.70	0.000553	1.04	120.42	108.04	0.24
East Reach 7	7.018	100yr	62.80	169.60	171.75	170.92	171.78	0.000575	1.09	128.87	113.30	0.25
East Reach 7	7.018	Reg.	148.10	169.60	172.20	171.36	172.28	0.001290	1.86	178.92	134.86	0.38
East Reach 7	7.017	2yr	16.20	168.30	170.24		170.25	0.000148	0.48	62.50	78.59	0.12
East Reach 7	7.017	5yr	21.80	168.30	170.33		170.34	0.000215	0.60	69.56	84.16	0.15
East Reach 7	7.017	10yr	28.30	168.30	170.47		170.49	0.000252	0.68	82.76	93.70	0.16
East Reach 7	7.017	25yr	34.60	168.30	171.57		171.57	0.000045	0.39	225.32	172.55	0.07
East Reach 7	7.017	50yr	39.40	168.30	171.63		171.63	0.000052	0.43	235.55	175.81	0.08
East Reach 7	7.017	100yr	44.40	168.30	171.70		171.71	0.000058	0.46	248.99	179.99	0.08
East Reach 7	7.017	Reg.	138.40	168.30	172.00		172.04	0.000345	1.19	304.22	188.98	0.21
East Reach 7	7.016	2yr	16.20	167.70	170.24		170.24	0.000007	0.12	193.55	158.26	0.03
East Reach 7	7.016	5yr	21.80	167.70	170.33		170.33	0.000011	0.16	207.76	165.92	0.03
East Reach 7	7.016	10yr	28.30	167.70	170.48		170.48	0.000014	0.19	233.48	178.95	0.04
East Reach 7	7.016	25yr	34.60	167.70	171.57		171.57	0.000004	0.13	474.91	248.56	0.02
East Reach 7	7.016	50yr	39.40	167.70	171.63		171.63	0.000005	0.15	489.63	251.81	0.03
East Reach 7	7.016	100yr	44.40	167.70	171.70		171.70	0.000006	0.16	508.83	255.99	0.03
East Reach 7	7.016	Reg.	138.40	167.70	172.00		172.01	0.000042	0.46	588.40	273.16	0.07
East Reach 7	7.015	2yr	16.20	167.30	170.23		170.23	0.000018	0.24	155.35	112.12	0.05
East Reach 7	7.015	5yr	21.80	167.30	170.32		170.32	0.000029	0.30	164.72	114.23	0.06
East Reach 7	7.015	10yr	28.30	167.30	170.46		170.46	0.000040	0.37	182.68	133.95	0.07
East Reach 7	7.015	25yr	34.60	167.30	171.56		171.56	0.000014	0.27	411.61	306.69	0.04
East Reach 7	7.015	50yr	39.40	167.30	171.62		171.62	0.000016	0.29	429.58	315.13	0.05
East Reach 7	7.015	100yr	44.40	167.30	171.70		171.70	0.000018	0.32	453.51	324.89	0.05
East Reach 7	7.015	Reg.	138.40	167.30	171.95		171.97	0.000120	0.84	539.73	348.48	0.13
East Reach 7	7.014	2yr	16.20	166.78	170.23	167.65	170.23	0.000019	0.26	92.29	115.14	0.05
East Reach 7	7.014	5yr	21.80	166.78	170.31	167.84	170.32	0.000031	0.33	102.15	129.11	0.06
East Reach 7	7.014	10yr	28.30	166.78	170.46	168.04	170.46	0.000042	0.40	122.09	151.31	0.07
East Reach 7	7.014	25yr	34.60	166.78	171.56	168.22	171.56	0.000012	0.26	388.32	327.70	0.04
East Reach 7	7.014	50yr	39.40	166.78	171.62	168.35	171.62	0.000014	0.28	407.41	334.70	0.04
East Reach 7	7.014	100yr	44.40	166.78	171.69	168.48	171.70	0.000016	0.30	432.63	340.92	0.05
East Reach 7	7.014	Reg.	138.40	166.78	171.95	170.03	171.97	0.000102	0.80	521.20	354.25	0.12
East Reach 7	7.0131		Culvert									
East Reach 7	7.013	2yr	16.20	166.78	170.00	167.66	170.00	0.000031	0.31	113.80	106.78	0.06
East Reach 7	7.013	5yr	21.80	166.78	170.00	167.80	170.01	0.000056	0.42	113.81	106.78	0.08
East Reach 7	7.013	10yr	28.30	166.78	170.29	167.94	170.30	0.000061	0.47	148.28	149.64	0.08
East Reach 7	7.013	25yr	34.60	166.78	171.56	168.07	171.56	0.000011	0.25	443.52	309.55	0.04
East Reach 7	7.013	50yr	39.40	166.78	171.62	168.16	171.62	0.000013	0.28	462.46	321.28	0.04
East Reach 7	7.013	100yr	44.40	166.78	171.69	168.24	171.69	0.000016	0.30	485.29	333.20	0.05
East Reach 7	7.013	Reg.	138.40	166.78	171.94	169.63	171.95	0.000108	0.82	573.08	367.43	0.12
East Reach 7	7.012	2yr	16.20	166.80	170.00		170.00	0.000009	0.17	182.88	115.63	0.03
East Reach 7	7.012	5yr	21.80	166.80	170.00		170.00	0.000016	0.23	183.00	115.66	0.04
East Reach 7	7.012	10yr	28.30	166.80	170.29		170.29	0.000019	0.27	219.47	141.91	0.05
East Reach 7	7.012	25yr	34.60	166.80	171.56		171.56	0.000006	0.19	474.43	261.60	0.03
East Reach 7	7.012	50yr	39.40	166.80	171.62		171.62	0.000007	0.21	490.25	265.98	0.03
East Reach 7	7.012	100yr	44.40	166.80	171.69		171.69	0.000009	0.23	508.97	270.62	0.03
East Reach 7	7.012	Reg.	138.40	166.80	171.94		171.95	0.000064	0.65	578.69	288.67	0.09

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.0111	2yr	16.20	166.80	170.00		170.00	0.000003	0.11	436.71	235.25	0.02
East Reach 7	7.0111	5yr	21.80	166.80	170.00		170.00	0.000006	0.14	436.95	236.09	0.03
East Reach 7	7.0111	10yr	28.30	166.80	170.29		170.29	0.000006	0.16	510.47	255.56	0.03
East Reach 7	7.0111	25yr	34.60	166.80	171.56		171.56	0.000002	0.11	848.75	279.74	0.02
East Reach 7	7.0111	50yr	39.40	166.80	171.62		171.62	0.000003	0.13	865.58	280.89	0.02
East Reach 7	7.0111	100yr	44.40	166.80	171.69		171.69	0.000003	0.14	885.24	282.23	0.02
East Reach 7	7.0111	Reg.	138.40	166.80	171.94		171.94	0.000023	0.40	956.78	287.11	0.06
East Reach 7	7.011	2yr	16.20	165.61	170.00		170.00	0.000001	0.06	620.73	340.16	0.01
East Reach 7	7.011	5yr	21.80	165.61	170.00		170.00	0.000001	0.08	621.07	340.19	0.01
East Reach 7	7.011	10yr	28.30	165.61	170.29		170.29	0.000001	0.09	721.45	349.62	0.01
East Reach 7	7.011	25yr	34.60	165.61	171.56		171.56	0.000000	0.06	1171.09	359.58	0.01
East Reach 7	7.011	50yr	39.40	165.61	171.62		171.62	0.000001	0.06	1192.70	360.05	0.01
East Reach 7	7.011	100yr	44.40	165.61	171.69		171.69	0.000001	0.07	1217.85	360.60	0.01
East Reach 7	7.011	Reg.	138.40	165.61	171.94		171.94	0.000005	0.20	1308.66	362.57	0.03
East Reach 7	7.01	2yr	16.20	165.50	170.00		170.00	0.000001	0.09	617.23	326.83	0.01
East Reach 7	7.01	5yr	21.80	165.50	170.00		170.00	0.000002	0.11	617.52	327.04	0.02
East Reach 7	7.01	10yr	28.30	165.50	170.29		170.29	0.000003	0.13	715.25	342.92	0.02
East Reach 7	7.01	25yr	34.60	165.50	171.56		171.56	0.000001	0.09	1166.06	367.84	0.01
East Reach 7	7.01	50yr	39.40	165.50	171.62		171.62	0.000001	0.10	1188.17	368.80	0.01
East Reach 7	7.01	100yr	44.40	165.50	171.69		171.69	0.000001	0.11	1213.95	369.74	0.01
East Reach 7	7.01	Reg.	138.40	165.50	171.94		171.94	0.000011	0.32	1306.93	373.58	0.04
East Reach 7	7.009	2yr	7.10	165.78	170.00		170.00	0.000002	0.09	102.30	314.71	0.01
East Reach 7	7.009	5yr	12.50	165.78	170.00		170.00	0.000005	0.16	102.30	314.71	0.03
East Reach 7	7.009	10yr	16.60	165.78	170.29		170.29	0.000007	0.20	110.88	329.01	0.03
East Reach 7	7.009	25yr	21.90	165.78	171.56		171.56	0.000000	0.05	1193.32	357.01	0.01
East Reach 7	7.009	50yr	25.70	165.78	171.62		171.62	0.000000	0.06	1214.93	362.76	0.01
East Reach 7	7.009	100yr	29.60	165.78	171.69		171.69	0.000001	0.07	1240.31	364.16	0.01
East Reach 7	7.009	Reg.	138.60	165.78	171.94		171.94	0.000010	0.28	1332.34	370.53	0.04
East Reach 7	7.0081		Culvert									

HEC-RAS Plan: OP 9B River: Mimico Crk Reach: East Reach 7 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
East Reach 7	7.003	2yr	7.10	163.60	164.49	164.07	164.56	0.001902	1.15	6.15	9.18	0.39
East Reach 7	7.003	5yr	12.50	163.60	164.96	164.29	165.05	0.001448	1.33	9.37	9.58	0.37
East Reach 7	7.003	10yr	16.60	163.60	165.26	164.44	165.36	0.001319	1.45	11.43	10.75	0.36
East Reach 7	7.003	25yr	21.90	163.60	165.64	164.61	165.77	0.001142	1.55	14.09	12.59	0.35
East Reach 7	7.003	50yr	25.70	163.60	165.91	164.72	166.05	0.001038	1.61	15.96	14.04	0.34
East Reach 7	7.003	100yr	29.60	163.60	166.28	164.83	166.41	0.000847	1.60	18.46	16.45	0.31
East Reach 7	7.003	Reg.	138.60	163.60	167.88	166.91	168.26	0.002022	2.95	81.12	60.78	0.46
East Reach 7	7.002	2yr	7.10	163.30	164.47		164.53	0.001268	1.03	7.46	8.80	0.31
East Reach 7	7.002	5yr	12.50	163.30	164.95		165.02	0.001112	1.22	12.21	11.24	0.31
East Reach 7	7.002	10yr	16.60	163.30	165.25		165.33	0.001035	1.32	15.81	12.58	0.31
East Reach 7	7.002	25yr	21.90	163.30	165.64		165.73	0.000893	1.39	21.11	14.34	0.30
East Reach 7	7.002	50yr	25.70	163.30	165.92		166.01	0.000800	1.43	25.24	15.57	0.29
East Reach 7	7.002	100yr	29.60	163.30	166.28		166.37	0.000679	1.44	32.63	28.41	0.27
East Reach 7	7.002	Reg.	138.60	163.30	167.87		168.20	0.001804	3.13	105.54	61.40	0.47
East Reach 7	7.001	2yr	7.10	162.80	164.28	163.42	164.32	0.000817	0.87	8.32	7.47	0.24
East Reach 7	7.001	5yr	12.50	162.80	164.76	163.69	164.82	0.000858	1.10	12.36	9.39	0.26
East Reach 7	7.001	10yr	16.60	162.80	165.06	163.87	165.14	0.000866	1.23	15.57	12.05	0.27
East Reach 7	7.001	25yr	21.90	162.80	165.48	164.06	165.56	0.000770	1.31	23.14	29.07	0.26
East Reach 7	7.001	50yr	25.70	162.80	165.79	164.18	165.86	0.000621	1.27	33.47	37.07	0.24
East Reach 7	7.001	100yr	29.60	162.80	166.21	164.30	166.26	0.000405	1.12	49.71	39.89	0.20
East Reach 7	7.001	Reg.	138.60	162.80	167.63	166.47	167.84	0.001374	2.65	128.41	107.15	0.39
East Reach 7	7.0	2yr	7.10	162.30	164.20		164.23	0.000426	0.78	10.95	9.27	0.18
East Reach 7	7.0	5yr	12.50	162.30	164.66		164.71	0.000579	1.06	15.75	11.60	0.22
East Reach 7	7.0	10yr	16.60	162.30	164.95		165.02	0.000651	1.22	19.47	14.22	0.24
East Reach 7	7.0	25yr	21.90	162.30	165.37		165.45	0.000658	1.35	27.73	29.70	0.25
East Reach 7	7.0	50yr	25.70	162.30	165.70		165.77	0.000553	1.32	39.46	43.96	0.23
East Reach 7	7.0	100yr	29.60	162.30	166.16		166.20	0.000336	1.12	68.80	74.67	0.18
East Reach 7	7.0	Reg.	138.60	162.30	167.57		167.66	0.000784	2.12	193.12	97.38	0.30