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Stormwater Management Report 211 Eliza Street, Arthur

Sarah Properties Limited
836 Normandy Drive
Woodstock ON N4T 0E6

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211 Eliza Street, Arthur

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836 Normandy Drive
Woodstock ON N4T 0E6

R.J. Burnside & Associates Limited
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December 2024
300042585.1000

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Record of Revisions

Revision	Date	Description
0	December 2024	First Submission

R.J. Burnside & Associates Limited

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Appendices

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1.0 Introduction and Background

1.1 Site Description and Context

R.J. Burnside & Associates Limited (Burnside) has been retained by Sarah Properties Limited to prepare a Stormwater Management (SWM) Report in support of the proposed development at 211 Eliza Street in Arthur. This SWM Report has been prepared to accompany the application for Draft Plan of Subdivision and demonstrates that the subject lands can provide adequate SWM measures using the “beat the peak” analysis while in accordance with the requirements outlined in the letter provided by the Grand River Conservation Authority (GRCA) dated October 31, 2023. A Functional Servicing Report (FSR) has been prepared under a separate cover and should be reviewed in conjunction with this report. The minor differences in routing and lot grades between the SWM and FSR reports have been deemed negligible and were therefore not addressed at this stage, as they do not significantly affect the explanation of the SWM strategy, specifically, the 'Beat the Peak' approach. All models will be reviewed and updated during the detailed design phase to incorporate the final grading adjustments.

The 18.5 ha site is primarily an agricultural field located north-east of Highway 6 and Wellington County Rd 109 intersection in the Township of Wellington North. The lands are bounded by Eliza Street to the west, a retirement home to the north-west, Eastridge Landing Subdivision (Schmidt Drive) to the north-east, Wellington County Rd 109 to the south and an agricultural property to the east. The site is classified as residential (RC1) and is bordered by the Conestoga River on the east and south-west property limits.

The proposed redevelopment will include 155 single family dwelling lots, 44 bungalow townhouses, a townhouse block (with 13 to 25 units), a 1.54 ha medium density block, and a 2.23 ha commercial block. Approximately 2.60 ha of the site is either considered undevelopable due to unstable slopes or will be used as park lands.

Refer to Figure 1 for the location of the site and Figure 2 for the draft plan of subdivision.

1.2 Stormwater Management Design Criteria

Through consultation with the GRCA, a list of requirements has been developed so that the “beat the peak” analysis method may be used in lieu of the conventional quantity control approach. The requirements have been outlined by the GRCA through email correspondence (dated June 27, 2024) and through their letter (dated October 31, 2023). Both have been attached to this report in Appendix A for reference. A summary of the SWM guidelines are outlined below.

Erosion Control:

- Ensure that there is adequate erosion protection at the site outlet(s) to protect against erosion to the watercourse.

- Complete a Slope Stability Study.
- Demonstrate that the risk of erosion to the Conestogo River will not be increased at the time the uncontrolled site-runoff reaches the watercourse.
- Complete an erosion threshold study (note that this study will be completed at detailed design stage).

Quantity Control Strategy:

- Existing drainage patterns must be maintained.
- Demonstrate that the risk of flooding of the Conestogo River will not be increased at the time the uncontrolled site-runoff reaches the watercourse and that there will be no impacts to upstream and downstream properties.
- Flood elevations within the Conestogo River must not be increased during any design storm event (2-year, 5-year, 10-year, 25-year, 50-year, and 100-year) as well as the Regional Storm event.
- Consider the extent to which the routing through the proposed storm sewer system would impact the time at which the post-development site peak flows reach the watercourse.

Quality Control:

The quality control design criteria that were used in this site's SWM design is in accordance with The Township of Wellington North Municipal Servicing Standards and the Ministry of the Environment, Conservation and Parks (MECP) SWM Guidelines. The design criteria are as follows:

- Enhanced Protection (80% S.S. Removal)

Water balance:

- Ensure existing infiltration / recharge rates are maintained or enhanced.

1.3 Background Studies and Documentation

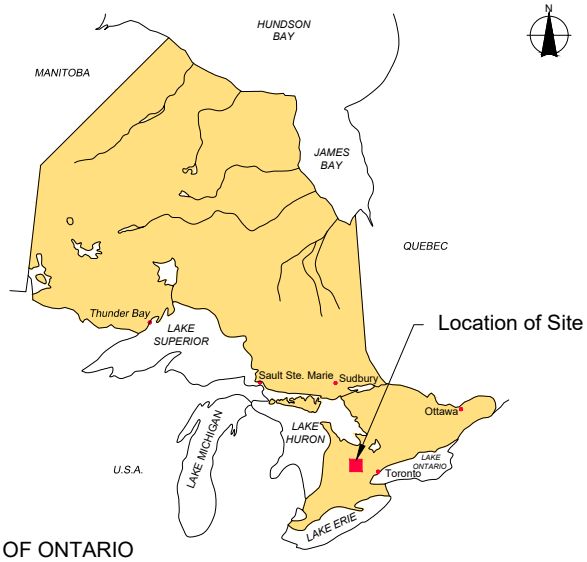
The design concepts presented within this report have been developed to comply with the information contained in the following reports, which were established for this area. Table 1 outlines documents, studies, and reports that have been incorporated:

Table 1: Background Studies

Document Title	Prepared By	Date
Municipal Servicing Standards	Township of Wellington North	March, 2023
Upper Conestogo HEC-RAS Hydraulic Model	GRCA	April 28, 2023
Hydrological Technical Memorandum	R.J. Burnside & Associates Limited	August 2, 2023

Document Title	Prepared By	Date
Geotechnical Investigation/Slope Stability Proposed Subdivision – 211 Eliza Street, Arthur, Ontario	CMT Engineering Inc.	January 6, 2020, Revised October 17, 2024
Hydrogeological Assessment	R.J. Burnside & Associates Limited	August 2020, Revised December 2024
Functional Servicing Report	R.J. Burnside & Associates Limited	December 2024





KEY MAP OF ONTARIO

BURNSIDE

Client

SARAH PROPERTIES LIMITED

Figure Title

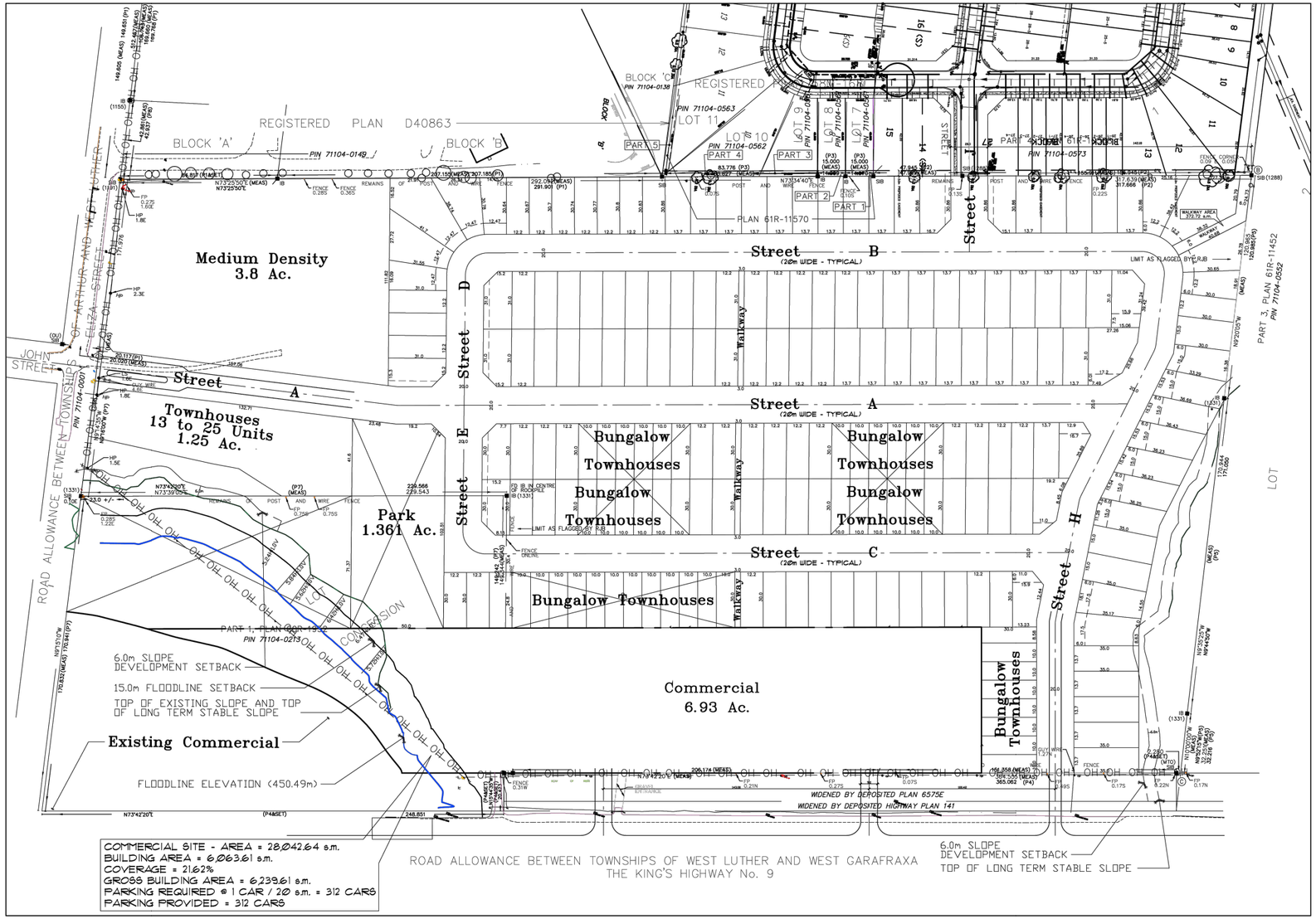
211 ELIZA DEVELOPMENT

TOWNSHIP OF WELLINGTON NORTH
(ARTHUR ONTARIO)

SITE LOCATION PLAN

Drawn	Checked	Date	Figure No.
RS	MB	DECEMBER 2024	1
Scale		Project No.	
N.T.S.		042585	

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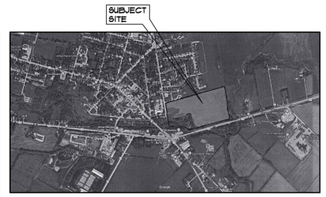


Draft Plan

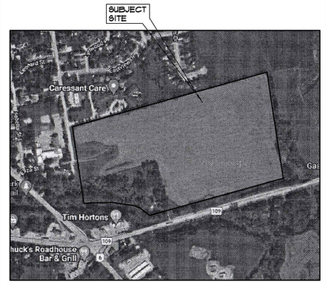
1 : 1000

0 10m 25m 50m 100m 200m

GROSS SITE AREA = 184,568.05 s.m. / 45.606 Ac.



Key Map



Google Site Photo

Site Data

GROSS SITE AREA	184,568.05 s.m.
ROAD ALLOW. AREA	34,266.75 s.m.
RESIDENTIAL AREA	98,696.68 s.m.
COMMERCIAL SITE	28,042.64 s.m.
PARK AREA	5,507.38 s.m.
PARK AREA	5.56% OF RESIDENTIAL
WALKWAY	828.73 s.m.
MUNICIPAL LAND	10,487.56 s.m.
UNDEVELOPED AREA	6,738.31 s.m.
NO. SINGLE FAMILY LOTS	155
NO. OF TOWNHOUSE UNITS	13 TO 25
NO. OF BUNGALOW TOWNHOUSES	44
MED. DENSITY RES. SITE	15,377.56 s.m.

PLAN OF SURVEY OF
PART OF LOT 1
CONCESSION 1
GEOGRAPHIC TOWNSHIP OF WEST LUTHER
NOW IN THE
TOWNSHIP OF WELLINGTON NORTH
COUNTY OF WELLINGTON

SCALE 1 : 1000

20 0 20 40 60 metres

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

BLACK, SHOEMAKER, ROBINSON & DONALDSON LTD.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON JULY 27, 2019.

AUGUST 7, 2019
DATE

RAYMOND J. SIBTHORP
ONTARIO LAND SURVEYOR

BSR&D ONTARIO LAND SURVEYORS SURVEYING
URBAN & RURAL PLANNERS MAPPING
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257 WOODLAWN ROAD WEST #101, GUELPH, ON N1H 8J1
T: (519) 822-4031 F: (519) 822-1220 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
RJS	RJS	19-14-004-00
FILE:		DATED: AUG. 8, 2019

- PLANS AND RELATED DOCUMENTS ARE "INSTRUMENTS OF SERVICE". THE INFORMATION CONTAINED REMAINS THE PROPERTY OF THE COORDINATOR AND THE PROFESSIONAL(S) AND MUST NOT BE REPRODUCED TO BENEFIT ANY OTHER PROJECT.
- THE OWNER WARRANTS THAT SITE PLANS AND CONCEPT PLANS WILL BE VERIFIED BY A SURVEYOR TO INCLUDE DIMENSIONS, BEARINGS, SET BACKS, AREA CALCULATIONS, GRADES, R.O.W., EASEMENTS, DEDICATIONS, AND ENCROACHMENTS.
- BUILDING FOUNDATION LAYOUT MUST BE VERIFIED BY A SURVEYOR.
- PLEASE ASK QUESTIONS IF YOU NEED CLARIFICATION OF INFORMATION FROM "INSTRUMENTS OF SERVICE".
- IT IS THE RESPONSIBILITY OF THE OWNER, VIEWER, TENANT, CONTRACTOR AND TRADES TO BE FAMILIAR WITH THE PROJECT AS A WHOLE. ALL DISCREPANCIES AND DIMENSIONAL ERRORS ON THE PLANS AND RELATED DOCUMENTS MUST BE REPORTED TO THIS OFFICE FOR CONSIDERATION AND CORRECTIVE RE-DESIGN AND RE-ISSUANCE PRIOR TO THE WORK.

2081788 ONTARIO CORPORATION
2 Prince Edward Road
Woodstock, Ontario N4V 1G7
ATTENTION: Mr. Walter Broos (519) 539-7116

date	item	by

Draft Plan

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION
ELIZA STREET
ARTHUR ONTARIO

SHEET TITLE:
DRAFT PLAN

DATE: DEC. 13 / 24
DRAWN: M.S.

DP:1

SHEET No.

SCALE: 1 : 1000
COMP. REF. /ARTHUR/SITE46A

DRAFT PLAN RECEIVED FROM: W. BROOS ON DECEMBER 12, 2024

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Figure Title
211 ELIZA DEVELOPMENT
TOWNSHIP OF WELLINGTON NORTH
(ARTHUR ONTARIO)
DRAFT PLAN OF SUBDIVISION

Client
SARAH PROPERTIES LIMITED

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2.0 Storm Drainage

2.1 Existing

The Conestogo River loops around the southern and eastern portions of the site and flows south and then west. Under existing conditions, the Site is divided into four drainage areas which drain overland and ultimately to the two portions of the Conestogo River.

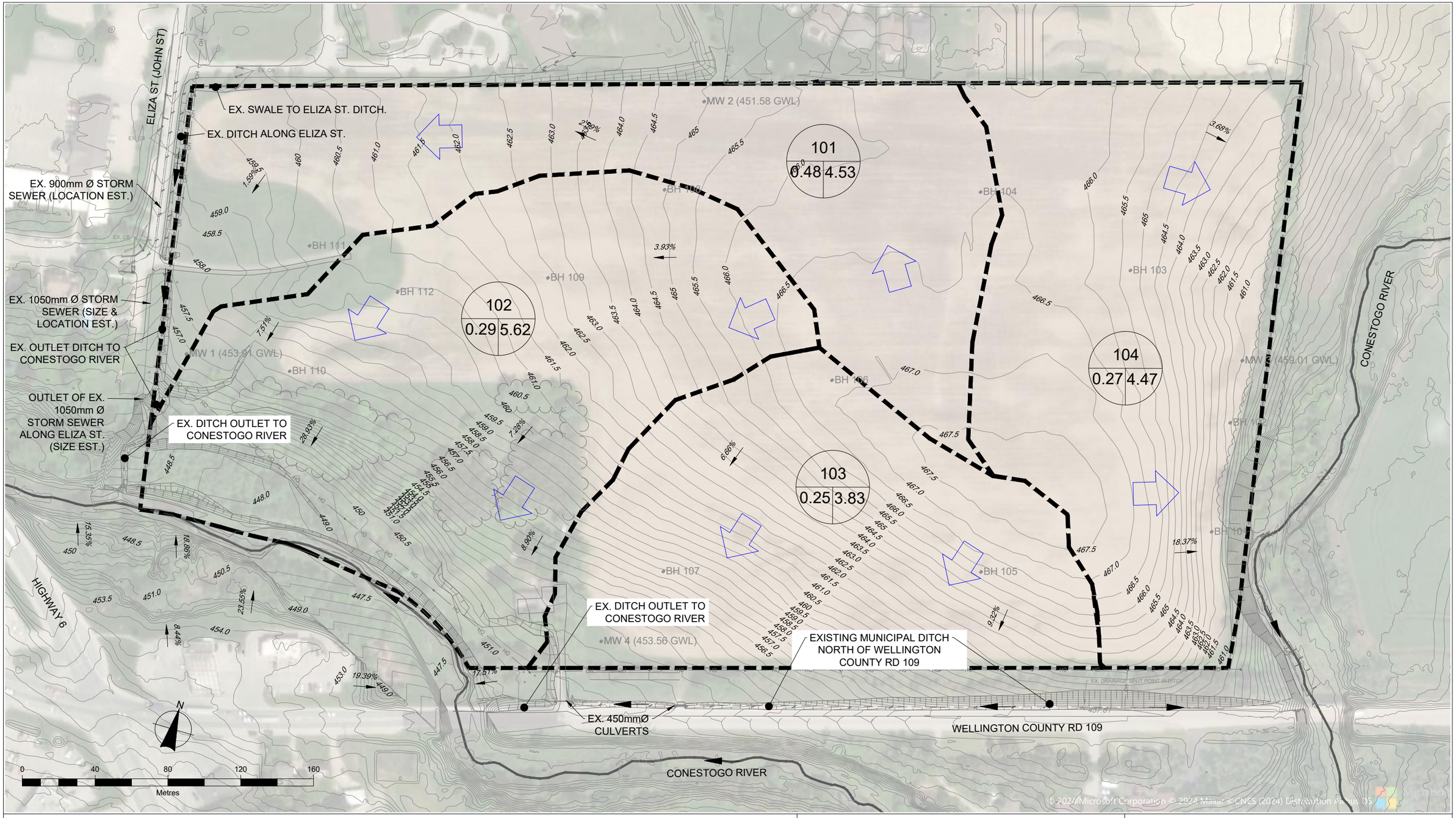
Catchment 101 (4.53 ha) drains overland west toward a small roadside ditch along Eliza Street which drains south toward the portion of the Conestogo River in between Wellington County Rd 109 and Highway 6, south-west of the site. A south draining 900mm diameter storm sewer with two catchbasins (CBs) exists along the roadside ditch and is assumed to pick up a portion of the runoff generated from Catchment 101. Refer to Appendix B for the Plan and Profile drawing showing the 900 mm diameter storm sewer within Eliza Street. An outlet of a 1050 mm diameter pipe south of Eliza St. within the Conestogo River valley was identified in the survey completed by Van Harten (dated September 9th, 2024). At this time, is assumed the 900 mm diameter storm sewer is connected to the 1050 mm storm sewer, which ultimately outlets to the same location within the Conestogo River valley that the roadside ditch outlets to. This connection, along with further details about the storm sewer system within Eliza Street will be verified during detailed design phase. Catchment 102 (5.63 ha) drains overland south and directly outlets to the same portion of the Conestogo River as Catchments 101. Catchment 103 (3.83 ha) drains overland south toward a municipal ditch along Wellington County Rd 109. The municipal ditch drains west and ultimately outlets to the same portion of the Conestogo River as Catchments 101 and 102. Catchment 104 (4.47 ha) drains overland east toward the Conestogo River and outlets to the portion of the river before it crosses under Wellington County Rd 109.

The Existing Catchment areas are summarized in Table 2 and are depicted in Figure 3.

Table 2: Existing Site Catchments

Catchment ID	Area (ha)	Outlet Location
101	4.53	Roadside ditch along Eliza St. (ultimate outlet: Conestogo River)
102	5.62	Conestogo River
103	3.83	Municipal Ditch North of Wellington County Rd 109 (ultimate outlet: Conestogo River)
104	4.47	Conestogo River

The Ontario soils mapping identifies Huron Loam (soil group C or D) for the site. Under existing conditions, the majority of the site is a farm that is used to farm hay. A small portion of the site in the south-west corner is wooded with a single standalone farmhouse. According to the Geotechnical Report, the predominant soil types on the site consist of sandy silt, silt, and clay silt.



LEGEND:

- PROPERTY BOUNDARY
- EXISTING STORM DRAINAGE BOUNDARY
- CONESTOGO RIVER CENTERLINE

103 / 0.18 | 3.83
- CATCHMENT ID
- DRAINAGE AREA (ha)
- TIME TO PEAK (hrs)

EXISTING OVERLAND FLOW DIRECTION

BURNSIDE

Client: SARAH PROPERTIES LIMITED

Figure Title:
211 ELIZA DEVELOPMENT
TOWNSHIP OF WELLINGTON NORTH
(ARTHUR, ONTARIO)
PRE DEVELOPMENT DRAINAGE PLAN

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File: U:\042585\2000\03-PRD\FIG\SWM FIGS\042585 - FIG 3 - PRE DEVELOPMENT DRAINAGE PLAN.dwg

2.2 Proposed

The sites overall existing drainage pattern is maintained under proposed conditions, which is outlined as a design requirement in Section 1.2. The Proposed Site is divided into four sections with four separate outlets: Catchment 201 (Outlet 1), Catchment 202 (Outlet 2), Catchment 203 (Outlet 3), and Catchment 204 (Outlet 4). Details about specific catchment outlet configurations is discussed in Section 4.0.

Catchment 201 is designed to maintain the overall existing drainage pattern of catchment 101. The major flows will outlet to the existing ditch along Eliza Street and the minor flows will outlet to the existing 900 mm diameter storm sewer along Eliza Street, both of which ultimately outlet to the Conestogo River in between Wellington County Road 109 and Highway 6. Catchment 201 includes a medium density block which will have its own block specific quantity and quality control before being released into the existing ditch/ storm sewer network along Eliza Street.

Catchment 202 is designed to maintain the drainage pattern of catchment 102 and will outlet directly to the portion of the Conestogo River in between Wellington County Rd 109 and Highway 6 via an outlet channel. Minor and major flows will both be directed to the outlet channel via a storm sewer network (minor flows) and/or by overland conveyance (major flows). Catchment 202 includes a Commercial Block, whose runoff will go through its own block specific quantity and quality control before being released directly to Catchment 202’s outlet channel.

Catchment 203 is designed to maintain the drainage pattern of catchment 103, will outlet to the right of way (ROW) on the north side of Wellington County Rd 109, and will flow west toward the portion of the Conestogo River in between Wellington County Rd 109 and Highway 6. Minor and major flows will both be directed to the ROW via a storm sewer network (minor flows) and/or by overland conveyance (major flows). Wellington County Rd 109 is to be upgraded to urban standard along the development frontage under proposed conditions. Flows will be conveyed from Catchment 203 to the Conestogo River via a storm sewer system. Details pertaining to the ROW upgrade will be determined during detail design phase.

Catchment 204 is designed to maintain the drainage pattern of catchment 104 and will outlet directly to the section of Conestogo River directly east of the site via an outlet channel. Minor and major flows will both be directed to the outlet channel via a storm sewer network (minor flows) and/or by overland conveyance (major flows).

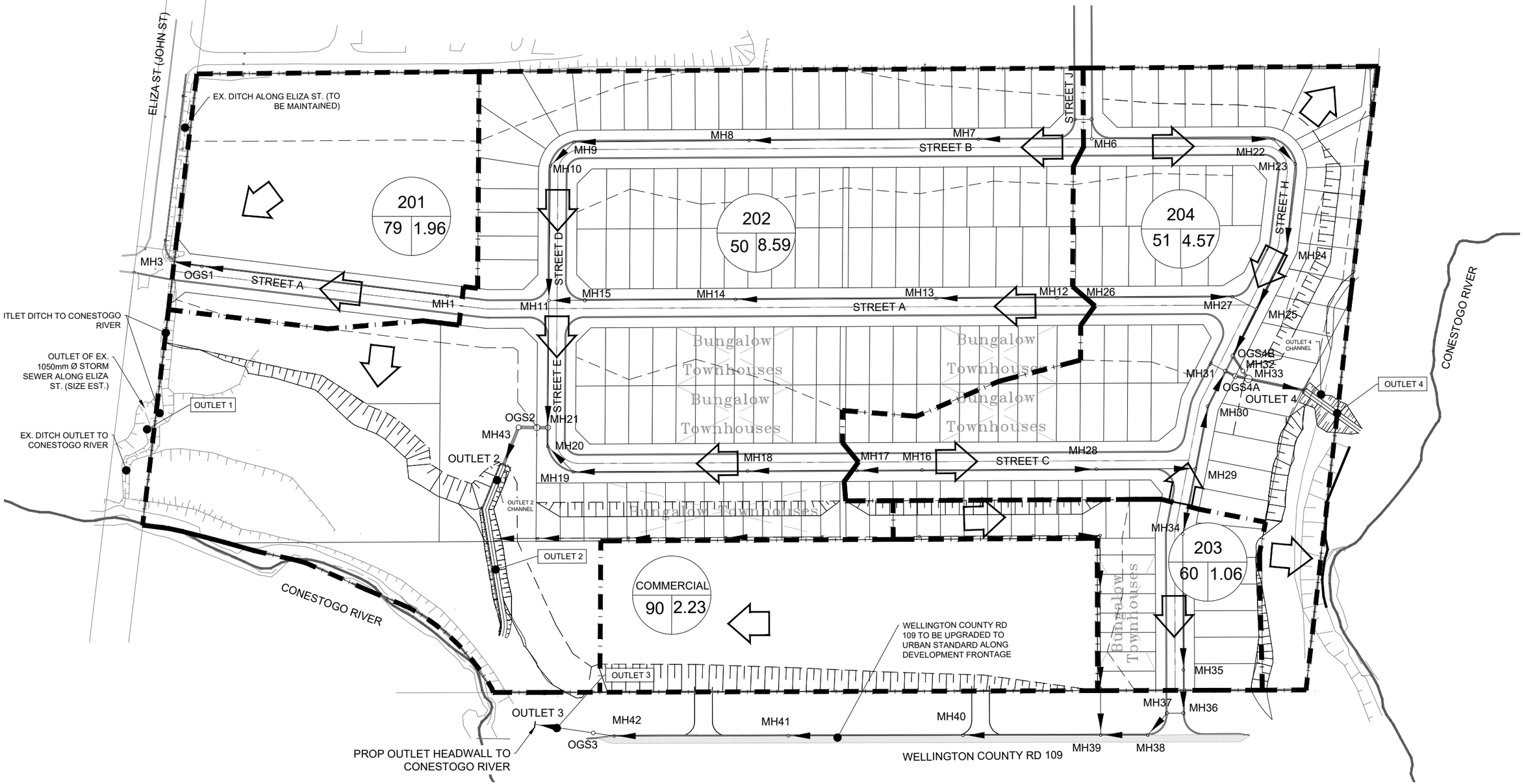
Appropriate erosion control measures have been considered and implemented for Catchments 202 and 204s outlet channels due to the outlet locations steep slopes. See Section 4.0 for further details.

The proposed drainage areas are presented on Figure 4 and summarized in Table 3. Refer to Section 4.0 for additional Outlet details.

Table 3: Proposed Site Catchments

Catchment ID	Area (ha)	Outlet #	Outlet Location
201	1.96	1	Existing 900 mm diameter storm sewer and ditch along Eliza Street
202	10.82*	2	Outlet Channel 2
203	1.06	3	Future storm sewer system within ROW of Wellinton County Rd 109
204	4.57	4	Outlet Channel 4

*Area includes Commercial Block (2.23 ha)



LEGEND:

- STORM DRAINAGE BOUNDARY
- SITE PROPERTY LINE
- CONESTOGO RIVER CENTERLINE
- OVERLAND FLOW DIRECTION

201 / 76 / 1.95
- CATCHMENT ID
- DRAINAGE AREA (ha)
- IMPERVIOUSNESS (%)

- PROPOSED STORM CATCHBASIN
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE

N

0 40 80 120 160 Metres

BURNSIDE

Client: **SARAH PROPERTIES LIMITED**

Figure Title: **211 ELIZA DEVELOPMENT TOWNSHIP OF WELLINGTON NORTH (ARTHUR, ONTARIO)**

POST DEVELOPMENT DRAINAGE PLAN

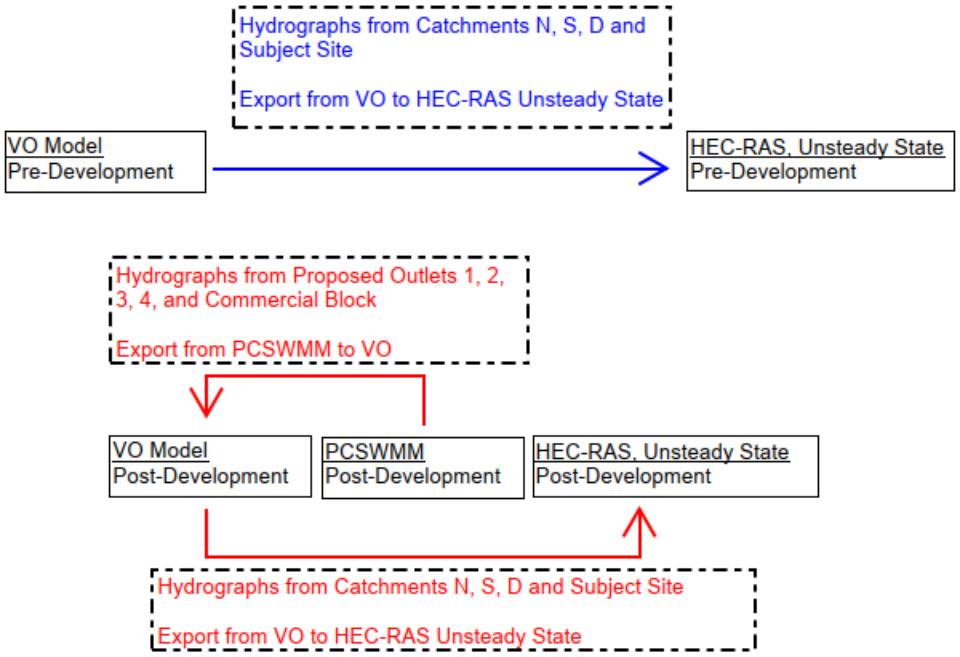
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File: U:\042585\2000\03-PRD\FIGS\WM FIGS\042585 - FIG 4 - POST DEVELOPMENT DRAINAGE PLAN.dwg Date Plotted: December 18, 2024 - 4:10 PM

3.0 Hydrologic and Hydraulic Analysis

To complete the “beat the peak” analysis and demonstrate its compliance with the design criteria outlined in Section 1.2, three separate computer models were utilized.

The overall “beat the peak” analysis was completed in Visual Otthymo (VO) which consisted of an existing and proposed conditions model. A PCSWMM model was used to model the site under proposed conditions and the resultant hydrographs from PCSWMM were input into the proposed conditions VO Model. Resultant hydrographs from both VO Models were exported to an un-steady state HEC-RAS model so that the water levels within the Conestogo River could be analyzed. Model interactions are depicted in the schematic below.



Schematic 1: Hydrologic and Hydraulic Models Workflow

3.1 VO Model

3.1.1 Methodology

The hydrologic modeling software VO was used to simulate pre-development and post-development peak flow rates to each proposed outlet for the entire drainage area of the Conestogo River upstream of the Site. The model was prepared with the anticipation that the flows from the proposed development would discharge to the watercourse at each outlet point before the peak of the upstream drainage arrived, thereby resulting in no increase in peak flows under proposed-development conditions. This “beat the peak” outcome allows for developments to proceed without the traditional need to provide peak flow detention and allows stormwater to flow uncontrolled offsite directly to the receiver.

The drainage area to a node just downstream of the site was delineated using Arc Hydro software, which generated the sub watershed areas from topographic contour data. Three separate drainage areas were discretized to flow to this node since the upstream watercourse split into two tributaries. Specifically, the north (Catchment N) and south (Catchment S) drainage catchments were delineated to capture the two tributaries while the third catchment (Catchment D) captures the area downstream of the confluence point of both tributaries. The modeled areas of catchments N and D do not include the site area, as the site was modeled separately to better reflect pre- and post-development conditions. Refer to Table 4 for the sub watershed areas. The flow path lengths and average slopes were confirmed using Arc Hydro and are summarized in Table 4.

Table 4: Sub Watershed Catchment Parameters

Sub Watershed Catchment	Drainage Area (ha)	Length of Flow Path (m)	Average Slope (%)
N	2878.4	10420	1.16
S	2922.70	10158	1.19
D	39.60	687.5	1.65

CN values for each catchment were determined from the land use and soil classification information, determined through Arc Hydro, by utilizing a weighted average approach and Table 2-2a and 2-2b in the USDA Urban Hydrology for Small Watersheds TR-55 Manual. Table 5 summarizes the weighted average of the three catchments. See Appendix C for individual CN characteristics provided by Arc Hydro.

Table 5: Sub Watershed Catchment CN Values

Sub Watershed Catchment	Weighted Average CN
N	84.35
S	83.42
D	85.20

Using the Ontario Ministry of Transportation (M.T.O.) Intensity-Duration-Frequency (IDF) curves the Chicago 3-hour and the 12-hour SCS Type II rainfall distribution were used to simulate the 2- through 100-year storm events. The 12-hour SCS Type II storm was applied to Catchments N and S only to better reflect the size of the catchment. The 3-hour Chicago storm was applied to Catchment D and the catchments associated with the Site. Peak flows generated from Regional Storm Hazel were also analyzed for each catchment, and an aerial reduction factor of 99.2% was applied to the Hurricane Hazel storm for catchments N and S only, which is a requirement outlined in 2002 MNR's River & Stream Systems: Flooding Hazard Limit Technical Guide for areas greater than 25 km^2. Refer to Appendix C for IDF Parameters.

Two Scenarios, reflecting the pre- and post-development conditions were created. In both scenarios, catchments N, S, and D are represented by NasHyds, reflective of rural conditions. Catchments N and S were routed through a variety of Route Channel

elements, included to capture the geometry of the upstream watercourse tributaries. Due to the significant size of the catchment areas and varying geometry of the upstream tributary, cross-sections were drawn every 1,000 m. Refer to Figures 5 to 10 for Sub Watershed details and cross-sections. Refer to Appendix C for VO Parameters and Appendix D for all VO model results.



LEGEND

FLOW PATH DIRECTION

DIRECTION OF DRAINAGE

NORTH CATHCMENT (N)	
FLOW PATH	LENGTH (m)
D/S-N1	1000
N1-N2	1000
N2-N3	1000
N3-N4	1000
N4-N5	1000
N5-N6	1000
N6-N7	1000
N7-N8	1000
N8-N9	1000
N9-N10	1420
TOTAL LENGTH	10420

SOUTH CATCHMENT (S)	
FLOW PATH	LENGTH (m)
D/S-S1	1000
S1-S2	1000
S2-S3	1000
S3-S4	1000
S4-S5	1000
S5-S6	1000
S6-S7	1000
S7-S8	1000
S8-S9	1000
S9-S10	1158
TOTAL LENGTH	10158

OUTLET CATCHMENT (D)	
FLOW PATH	LENGTH (m)
D/S-D1	343
D1-D2	72
D2-D3	218
TOTAL LENGTH	633

N

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BURNSIDE

Client

SARAH PROPERTIES LIMITED

Figure Title

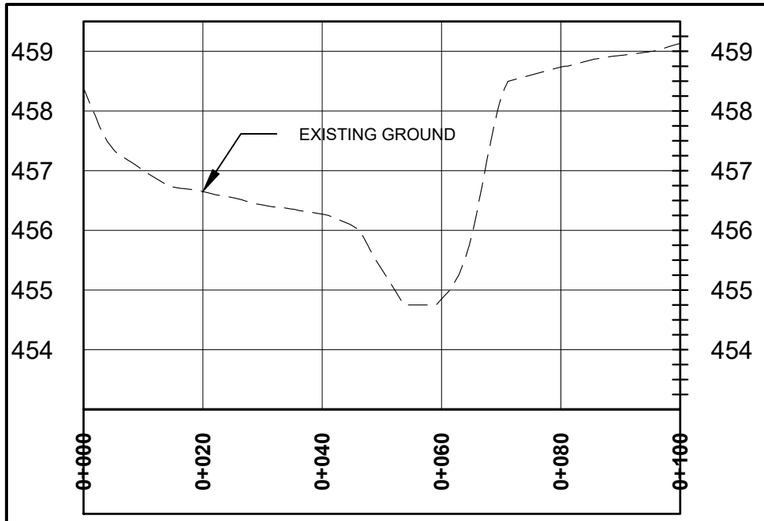
211 ELIZA DEVELOPMENT

TOWNSHIP OF WELLINGTON NORTH (ARTHUR ONTARIO)

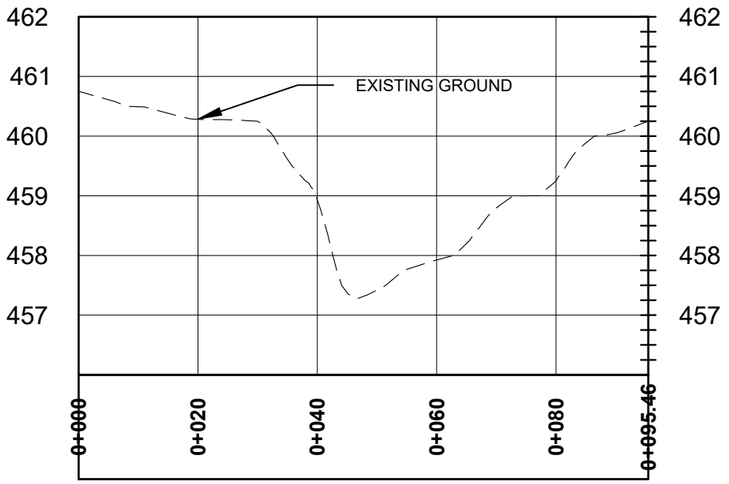
SUB WATERSHED CATCHMENTS

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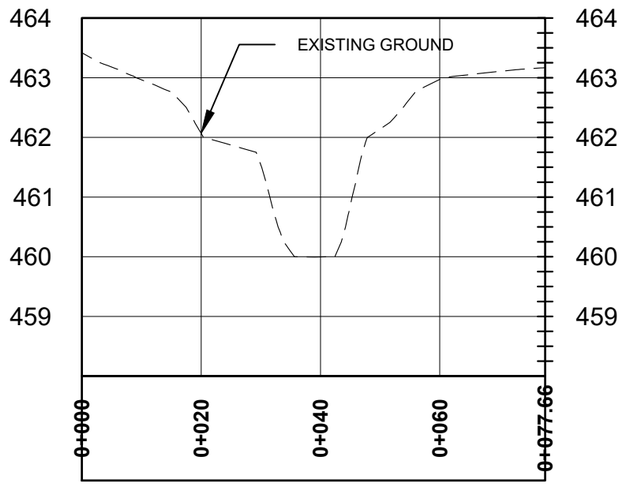
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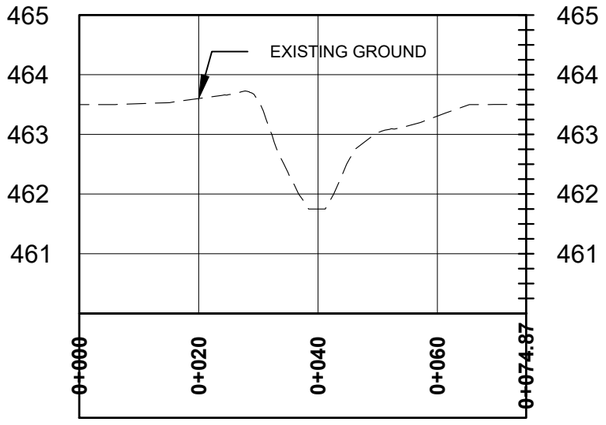
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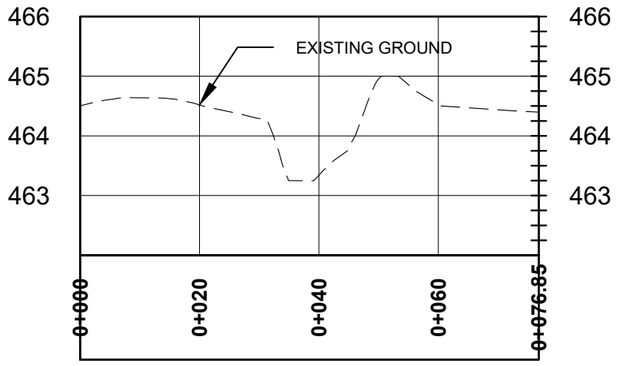
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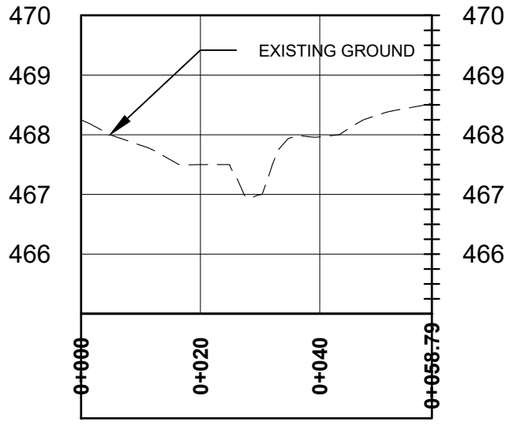
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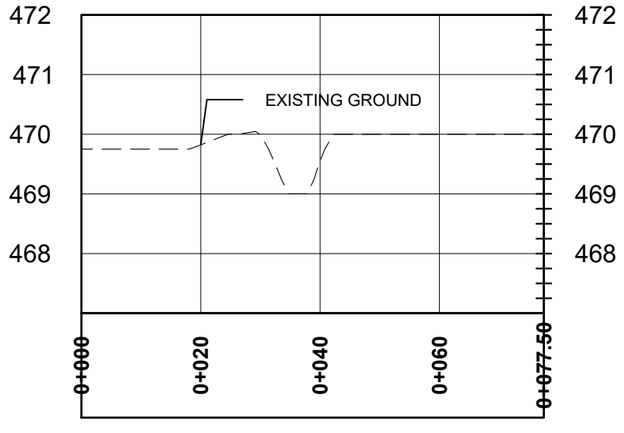
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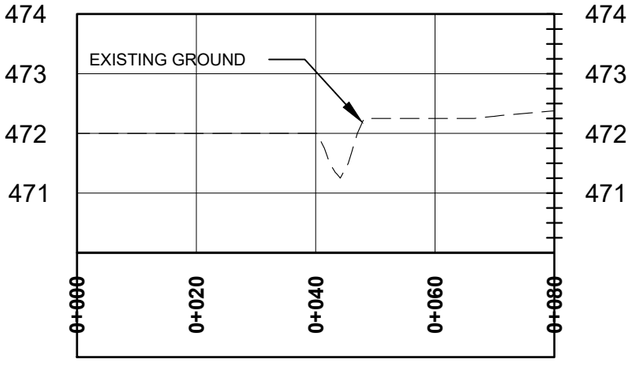
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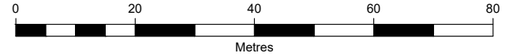
SECTION N6



SECTION N7



SECTION N8



NOTE: ELEVATION OF EXISTING GROUND DERIVED FROM CONTOUR_SWOOP2015 FROM GRCA

REFER TO FIGURE 5 "SUB WATERSHED CATCHMENTS" FOR CROSS-SECTION LOCATIONS

BURNSIDE

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Figure Title

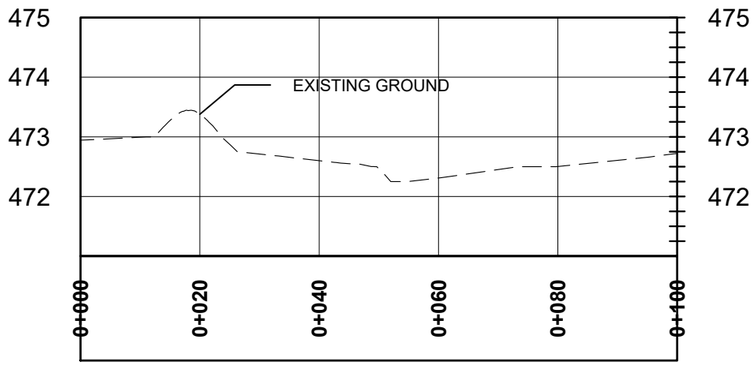
211 ELIZA DEVELOPMENT

TOWNSHIP OF WELLINGTON NORTH (ARTHUR ONTARIO)

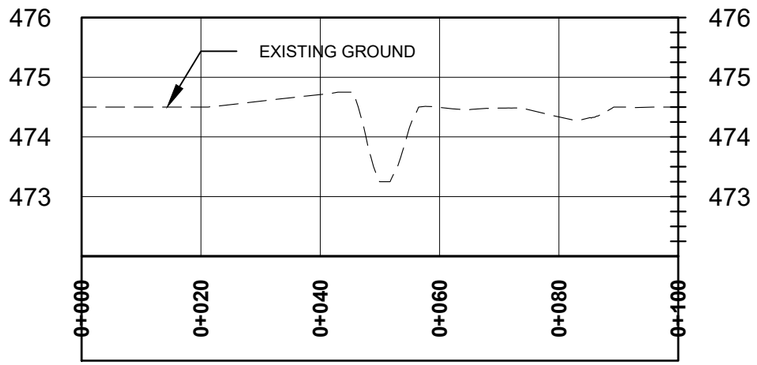
SUB WATERSHED CROSS-SECTIONS

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SECTION N9



SECTION N10

NOTE: ELEVATION OF EXISTING GROUND DERIVED FROM CONTOUR_SWOOP2015 FROM GRCA

REFER TO FIGURE 5 "SUB WATERSHED CATCHMENTS" FOR CROSS-SECTION LOCATIONS

0 20 40 60 80

Metres

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SARAH PROPERTIES LIMITED

Figure Title

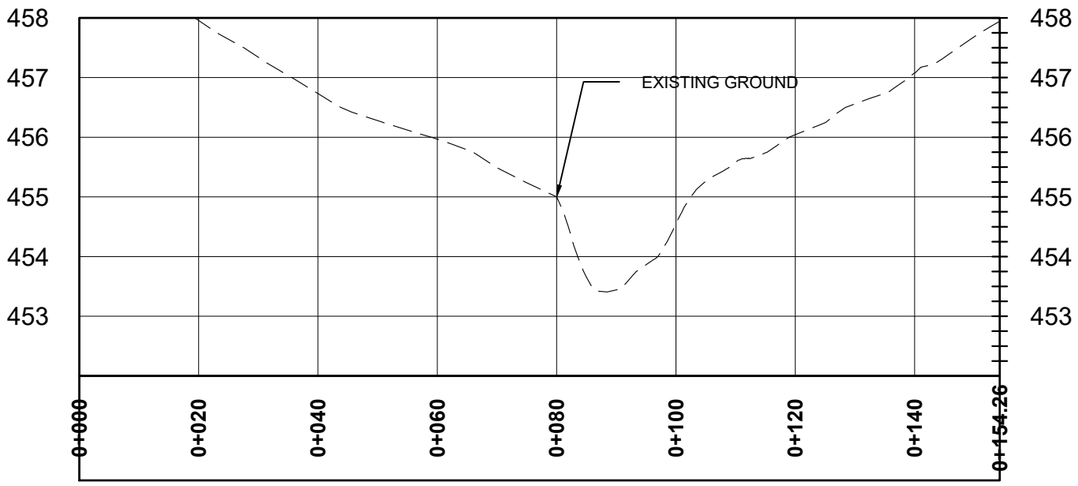
211 ELIZA DEVELOPMENT

TOWNSHIP OF WELLINGTON NORTH (ARTHUR ONTARIO)

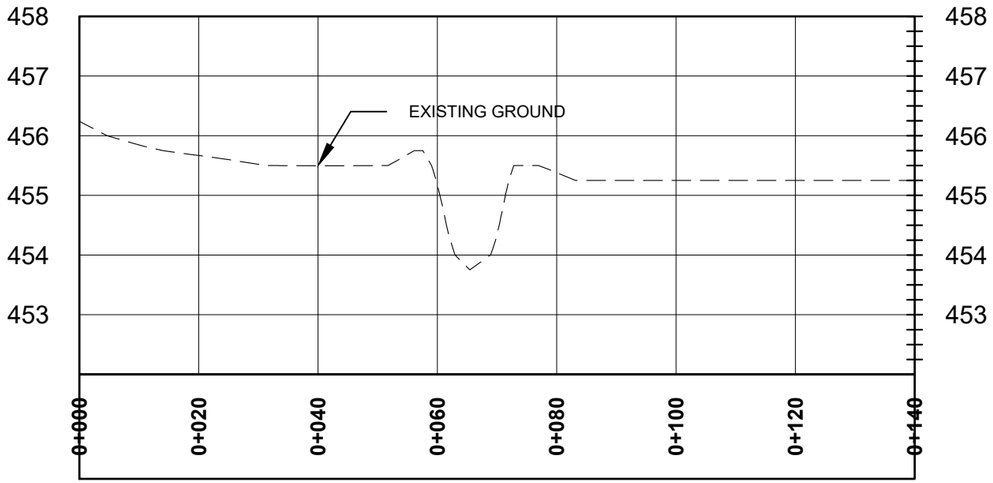
SUB WATERSHED CROSS-SECTIONS

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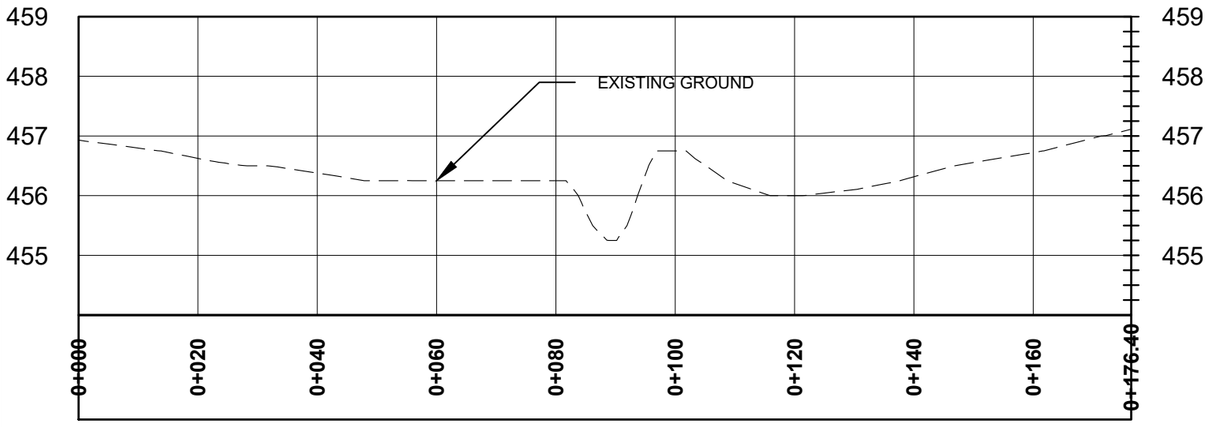
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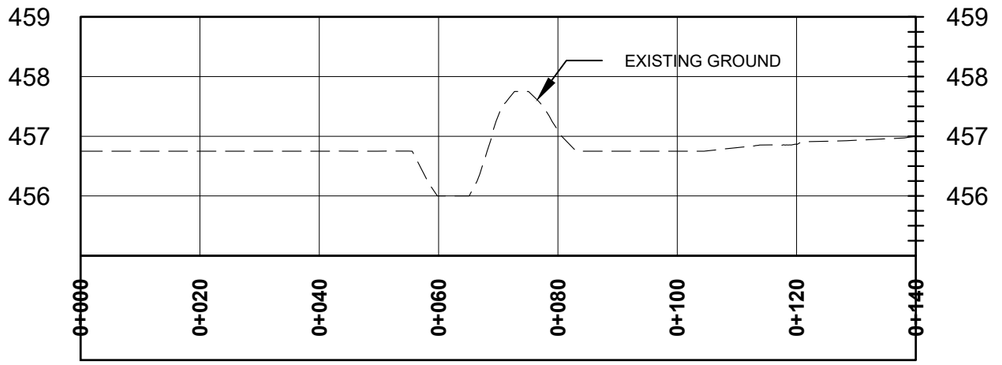
SECTION S1



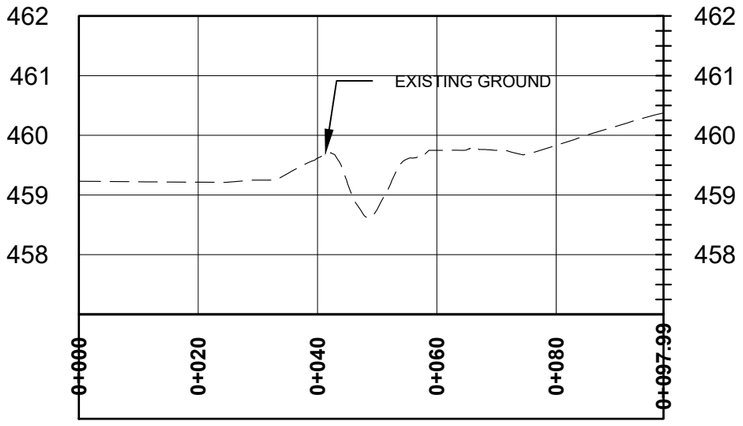
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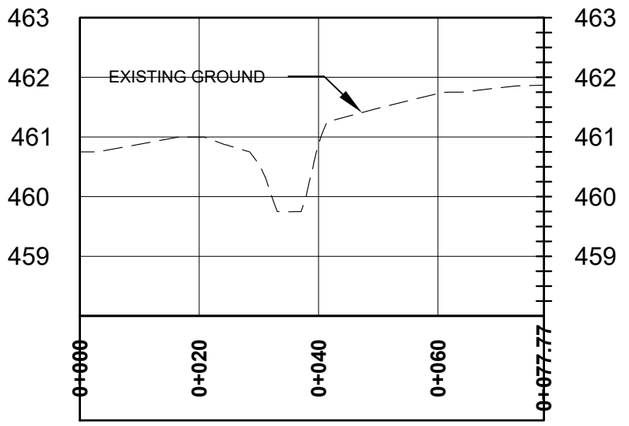
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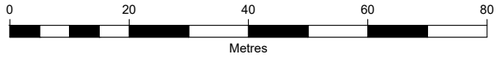
SECTION S5



SECTION S6

NOTE: ELEVATION OF EXISTING GROUND DERIVED FROM CONTOUR_SWOOP2015 FROM GRCA

REFER TO FIGURE 5 "SUB WATERSHED CATCHMENTS" FOR CROSS-SECTION LOCATIONS



BURNSIDE

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Figure Title

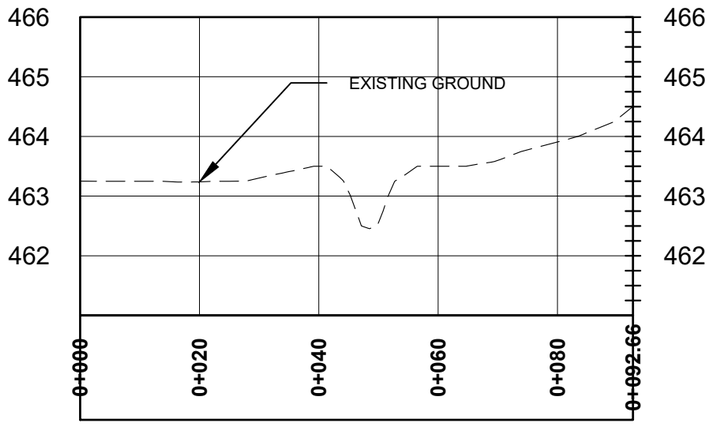
211 ELIZA DEVELOPMENT

TOWNSHIP OF WELLINGTON NORTH
(ARTHUR ONTARIO)

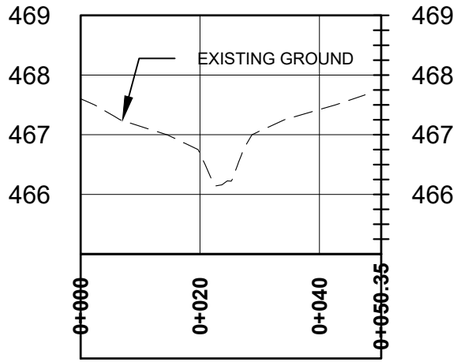
SUB WATERSHED CROSS-SECTIONS

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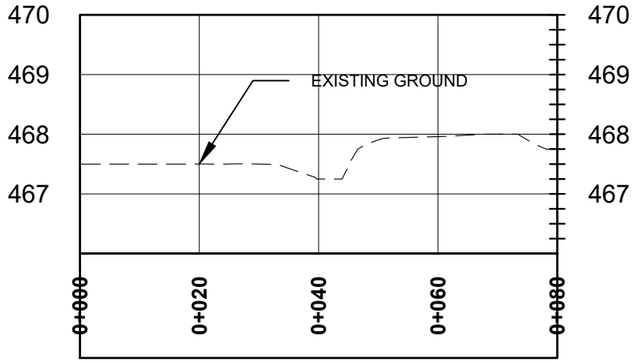
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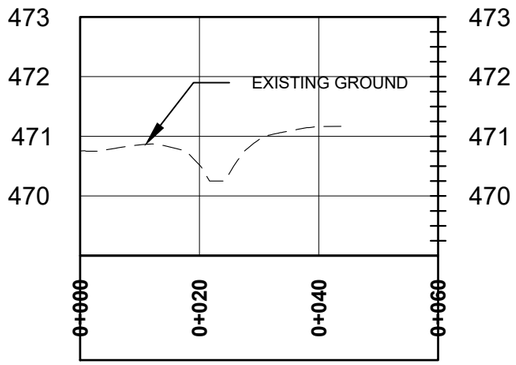
SECTION S7



SECTION S8



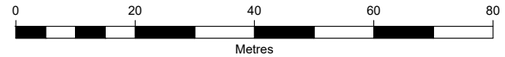
SECTION S9



SECTION S10

NOTE: ELEVATION OF EXISTING GROUND DERIVED FROM CONTOUR_SWOOP2015 FROM GRCA

REFER TO FIGURE 5 "SUB WATERSHED CATCHMENTS" FOR CROSS-SECTION LOCATIONS



BURNSIDE

Client

SARAH PROPERTIES LIMITED

Figure Title

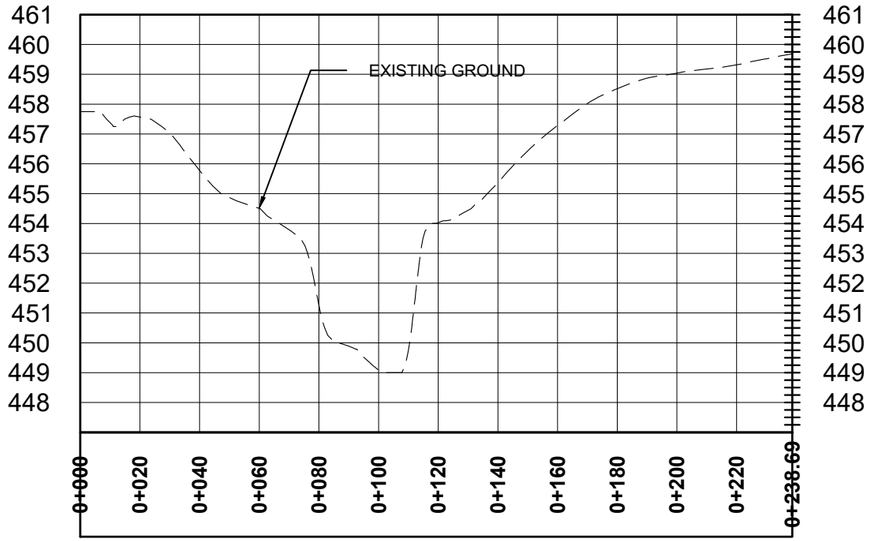
211 ELIZA DEVELOPMENT

TOWNSHIP OF WELLINGTON NORTH (ARTHUR ONTARIO)

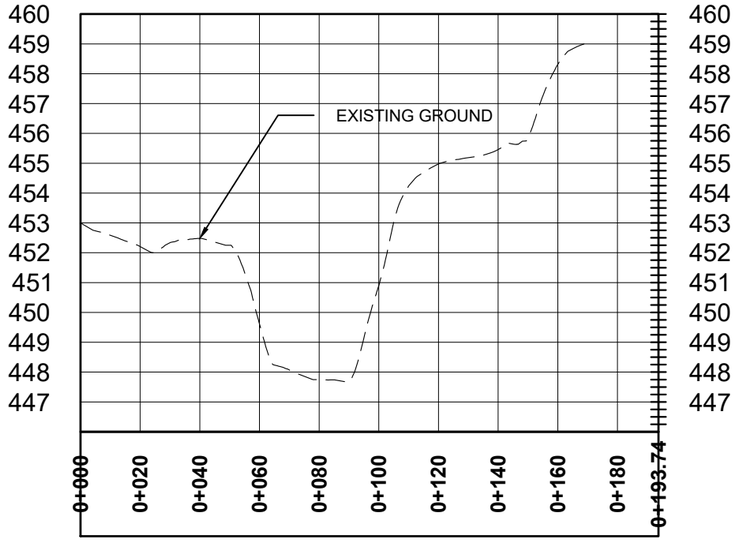
SUB WATERSHED CROSS-SECTIONS

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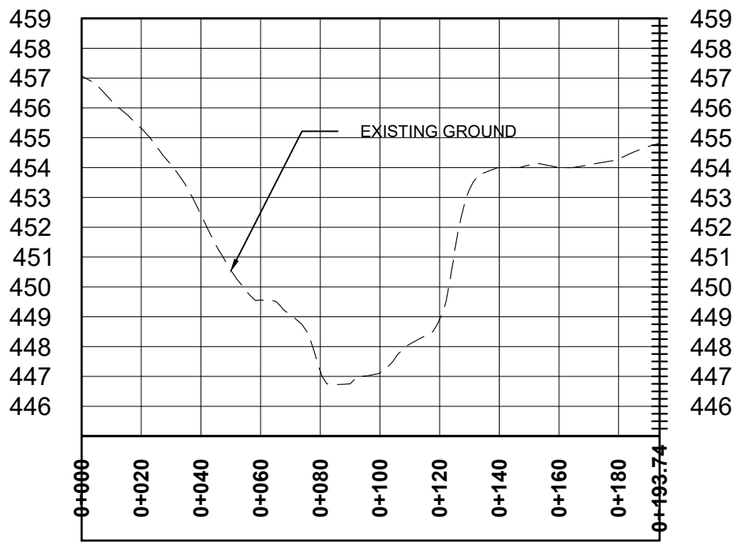
File: U:\042585\2000\03-PRD\FIG\SWM FIGS\042585 - FIG 5-10 SUB WATERSHED CATCHMENTS wXSECS.dwg Date Plotted: December 18, 2024 - 4:11 PM



SECTION D1



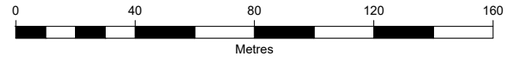
SECTION D2



SECTION D3

NOTE: ELEVATION OF EXISTING GROUND DERIVED FROM CONTOUR_SWOOP2015 FROM GRCA

REFER TO FIGURE 5 "SUB WATERSHED CATCHMENTS" FOR CROSS-SECTION LOCATIONS



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SARAH PROPERTIES LIMITED

Figure Title

211 ELIZA DEVELOPMENT
TOWNSHIP OF WELLINGTON NORTH
(ARTHUR ONTARIO)

SUB WATERSHED CROSS-SECTIONS

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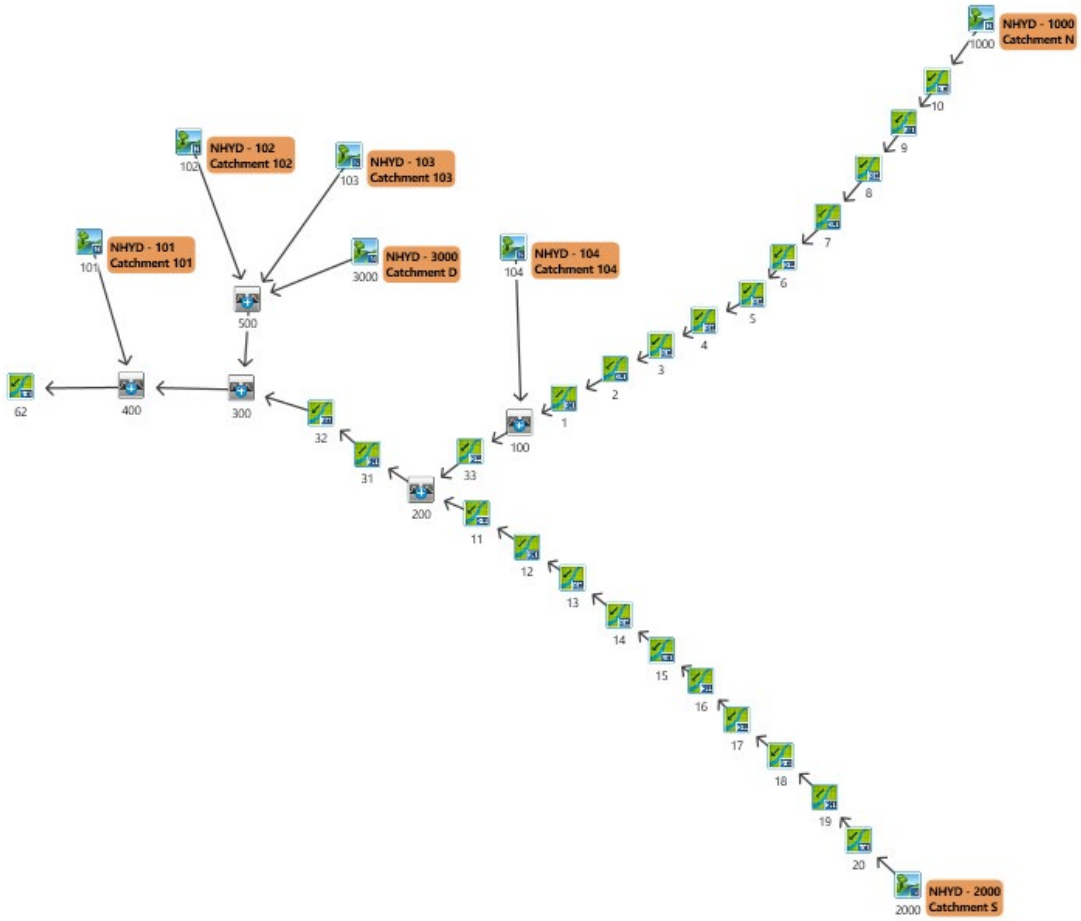
3.1.2 Existing Conditions Model

The pre-development VO model consists of Catchments N, S, D and 4 sub-site catchments which represent the four pre-development catchment areas. All sub-site catchments were modeled as Nashyds as the site is less than 20% impervious under existing conditions. The airport method was selected to calculate each catchment's Time to Peak value as the Ministry of Environment (MOE) Drainage Management Manual identifies this method as acceptable when runoff coefficients are less than 0.40. The longest flow path and average slope for the sub-site catchment areas were estimated based using the detailed survey of the site and longest flow path tool in CAD Civil 3D. As mentioned in Section 2.1 the site is mostly farmland that is mowed for hay with a small, wooded portion. The CN values for the sub-site catchments have been calculated based on Table 9-1 in the USDA Urban Hydrology for Small Watersheds TR-55 Manual.

A hydraulic HEC-RAS model containing approved regulatory flows under existing conditions was provided by the GRCA to be used for analysis and is discussed in further detail in Section 3.3. Unfortunately, the corresponding hydrology model was completed in GAWSER which is an older software that is not compatible with VO. Due to this, the existing conditions hydrology model created by Burnside in VO has been calibrated to reflect the flows provided in the approved HEC-RAS model. To calibrate the model, the CN number of Catchments N and S under a 12-hour SCS Type II rainfall distribution were adjusted until flows produced were similar to the approved flows found within the HEC-RAS model for the 100-Year storm event.

The existing conditions model schematic and a summary of the catchment characteristics in Table 6 can be found below. Additionally,

Table 7 shows the flows from the GRCA's HEC-RAS model and Burnside's VO model from corresponding locations along the watercourse. All catchment parameter details and calculations can be found in Appendix C.



Schematic 2: VO Existing Conditions Model Schematic

Table 6: VO Existing Conditions Model Catchment Parameters

Catchment ID (Name)	Area (ha)	Tp (hr)	CN	Calibrated CN
1000 (N)	2873.93	2.65	84.35	78.5
2000 (S)	2922.70	2.60	83.42	63
3000 (D)	25.69	0.57	85.20	N/A
101	4.53	0.48	74.50	
102	5.55	0.29	75.24	
103	3.83	0.25	74.50	
104	4.47	0.27	74.50	

Table 7: Hydrology Comparison between existing HEC-RAS and VO Model

	Flow Change Location in Models	100-Year Peak Flow Rate (m^3/s)*	Regional Storm Flow Rate (m^3/s)*
Hec-Ras Cross-Section ID	35.785	51.3	143
VO ID (Type)	100 (AddHyd)	51.22	157.63
Hec-Ras Cross-Section ID	35.36	82.9	235.1
VO ID (Type)	200 (AddHyd)	82.11	275.18

*Flow Rates from model with calibrated CN values for Catchments N & S

3.1.3 Proposed Conditions Model

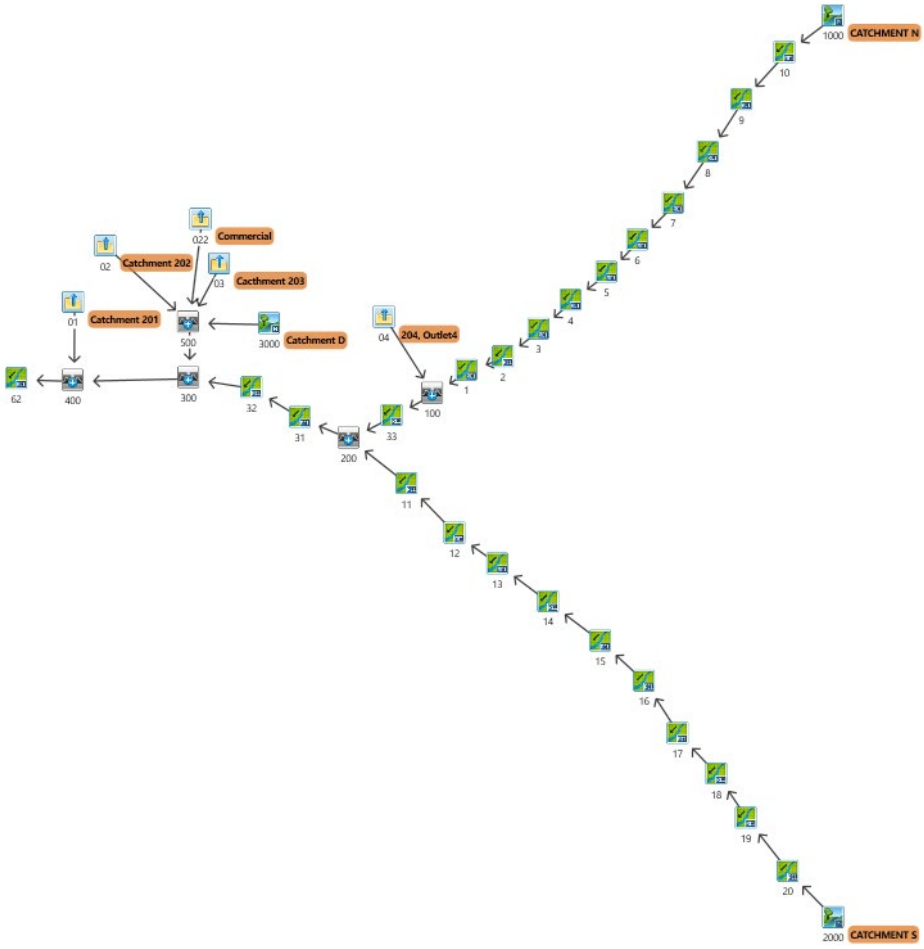
Under post-development conditions catchments N, S, and D are modeled the same way as they were in the pre-development VO model. The sub-site catchments under proposed conditions were modeled in a PCSWMM model and their resulting peak flow hydrographs were input into the proposed conditions VO model via 5 ReadHyds, one for each catchment's outlet and one for the commercial block. Further information about the PCSWMM model can be found in Section 3.2. This method of modeling the proposed conditions in the VO model was chosen to demonstrate the extent to which the routing through the proposed stormwater sewer system and overall site impacts the time at which the post-development site peak flows reach the watercourse, which is outlined as a design requirement in Section 1.2. Table 8 shows the peak flows from each of the five hydrographs taken from PCSWMM and Input into the proposed VO Model (see Section 3.2 for further detail).

Table 8: Peak Flow Rates from PCSWMM at Proposed Outlets

Storm Event	Outlet 1 Peak Flow (m^3/s)	Outlet 2 Peak Flow (m^3/s)	Outlet 3 Peak Flow (m^3/s)	Commercial Block Peak Flow (m^3/s)	Outlet 4 Peak Flow (m^3/s)
2-Year	0.10	0.96	0.14	0.08	0.56
5-Year	0.13	1.30	0.19	0.10	0.76
10-Year	0.16	1.64	0.23	0.11	0.95
25-Year	0.19	1.87	0.27	0.12	1.16
50-Year	0.21	2.15	0.32	0.14	1.37
100-Year	0.23	2.23	0.34	0.14	1.49
*Hazel (12hr)	0.14	1.20	0.15	0.16	0.62

* The models were also run for 48 hours for Hazel Storm, which recorded 285 mm of precipitation. The results remained largely consistent with those from the 12-hour simulations.

The proposed conditions model schematic can be found below. See Section 3.1.1 and 3.1.2 for Catchment N, S, and D details.



Schematic 3: VO Proposed Conditions Model Schematic

3.1.4 Results

Based on the model set-up and input parameters described in Sections 3.1.1, 3.1.2, and 3.1.3 the pre- and post-development models were run. Refer to Appendix D for VO model results. Table 9 summarizes the resultant peak flow rates under existing conditions from Catchment 101, 102, 103, and 104. An analysis comparing the total flows under pre- and post development conditions at each of the four outlet points is discussed in Section 3.2.2.

Table 9: Peak Flow Rates from Existing Conditions VO Model

Storm Event	Catchment 101 Peak Flow (m^3/s)	Catchment 102 Peak Flow (m^3/s)	Catchment 103 Flow (m^3/s)	Catchment 104 Peak Flow (m^3/s)
2-Year	0.05	0.08	0.05	0.06
5-Year	0.09	0.14	0.09	0.11
10-Year	0.11	0.19	0.13	0.15
25-Year	0.16	0.26	0.18	0.20
50-Year	0.19	0.31	0.22	0.25
100-Year	0.22	0.37	0.26	0.29
Hazel	0.50	0.67	0.46	0.54

Table 10 and Table 11 summarize the resultant pre- and post-development peak flows for each storm event at significant confluence points and the node just downstream of the site.

Table 10: VO Existing Conditions Model Results

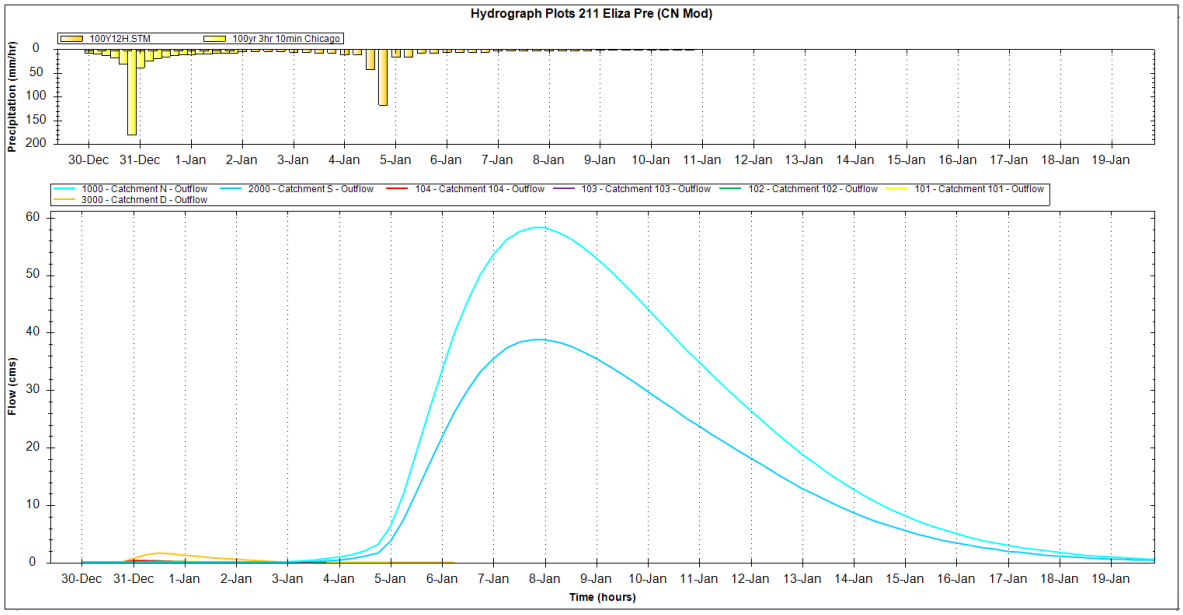
Storm Event	ADDHYD ID:100 Flow (m^3/s)	ADDHYD ID:200 Flow (m^3/s)	ADDHYD ID:300 Flow (m^3/s)	ADDHYD ID:400 Flow (m^3/s)	Downstream Node Flow (ID:62) (m^3/s)
2-Year	14.11	20.72	20.72	20.73	20.73
5-Year	22.56	33.78	33.80	33.80	33.82
10-Year	28.75	43.90	43.91	43.92	43.93
25-Year	37.17	58.50	58.49	58.49	58.49
50-Year	44.00	69.34	69.37	69.35	69.36
100-Year	51.22	82.08	82.13	82.13	82.13
Hazel	157.63	275.21	275.30	275.30	275.28

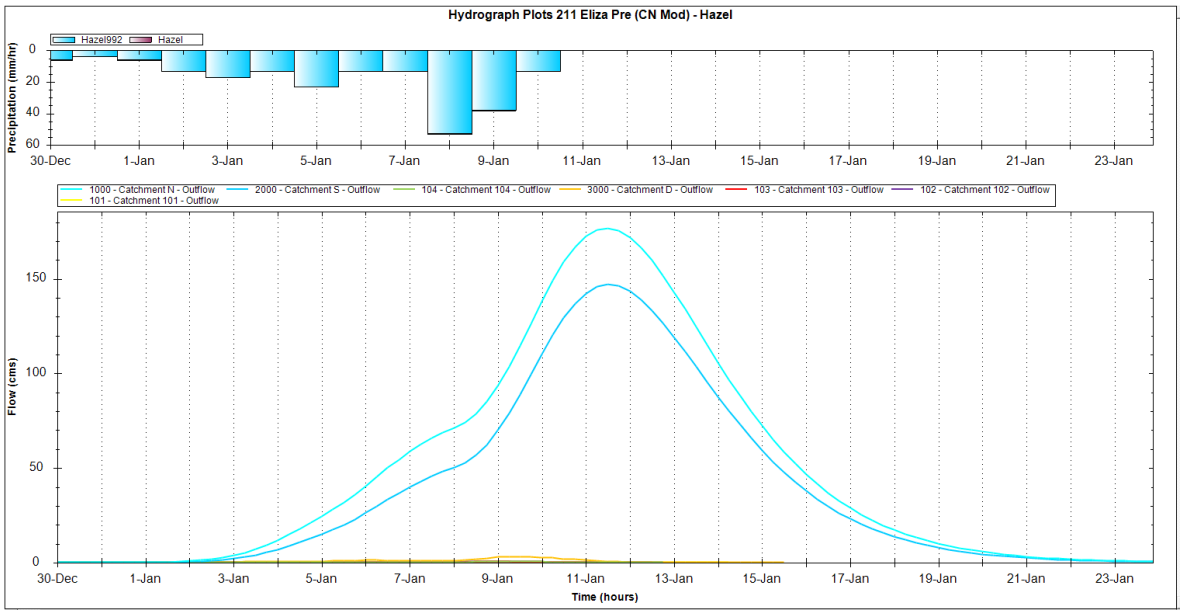
Table 11: VO Proposed Conditions Model Results

Storm Event	ADDHYD ID:100 Flow (m^3/s)	ADDHYD ID:200 Flow (m^3/s)	ADDHYD ID:300 Flow (m^3/s)	ADDHYD ID:400 Flow (m^3/s)	Downstream Node Flow (ID:62) (m^3/s)
2-Year	14.11	20.72	20.73	20.73	20.73
5-Year	22.56	33.78	33.80	33.80	33.82
10-Year	28.75	43.90	43.92	43.92	43.93
25-Year	37.17	58.50	58.49	58.49	58.49
50-Year	44.00	69.34	69.35	69.35	69.36
100-Year	51.22	82.08	82.13	82.13	82.13
Hazel	157.63	275.21	275.30	275.31	275.28

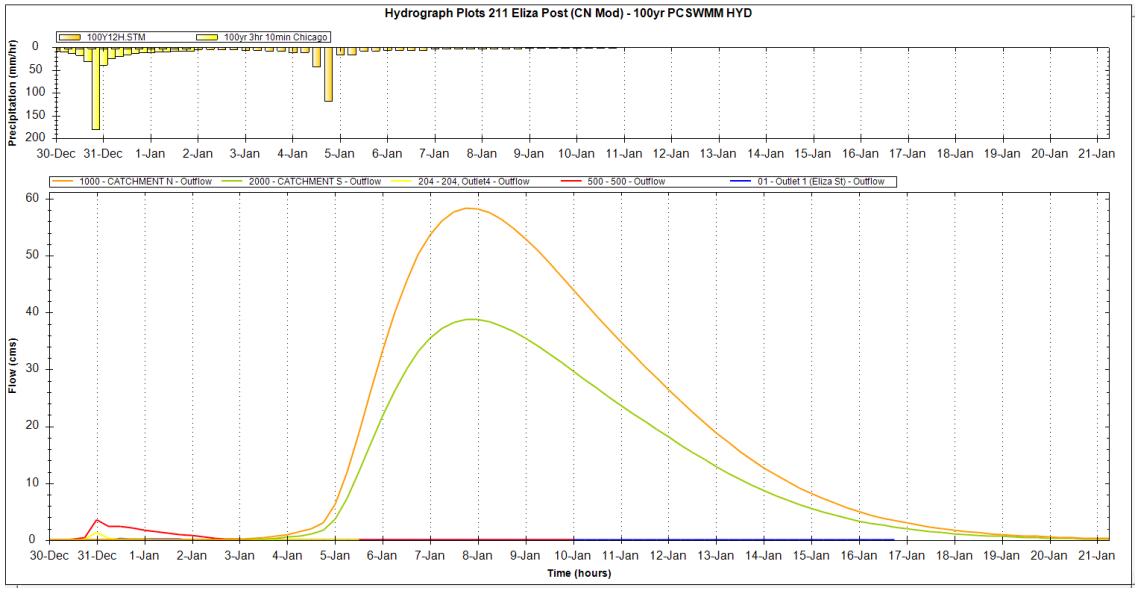
The modeling results show that although the peak flows of the site increase, the overall peak flow at the downstream node remains the same under pre- and post-development conditions. The external watersheds upstream of the site will peak after the proposed development and therefore the proposed development does not impact the flow of the receiving watercourse. This result is also shown in the hydrographs below.

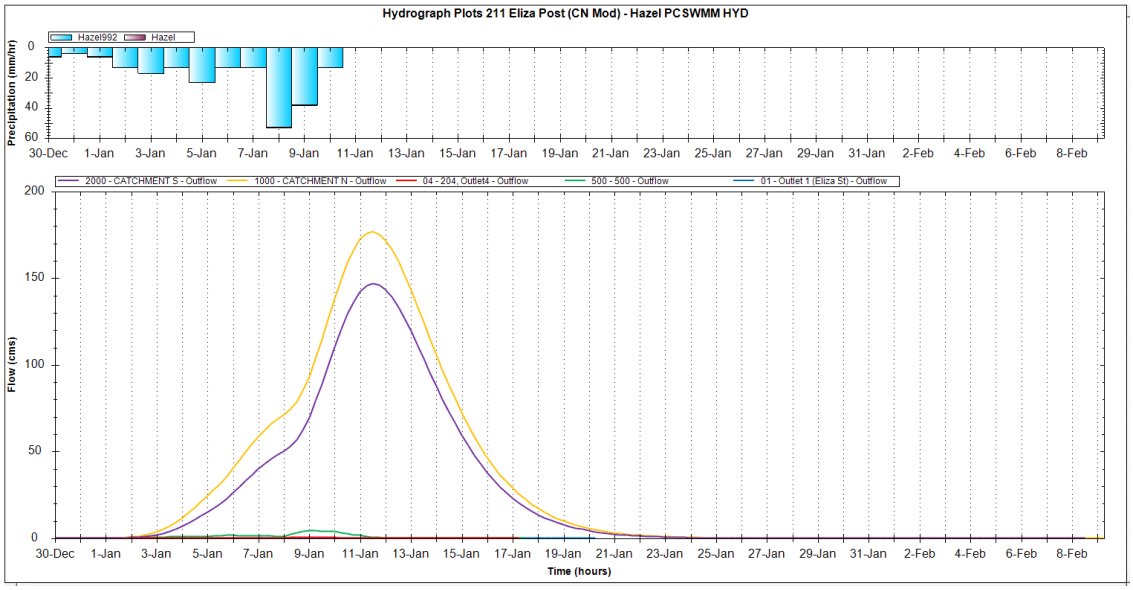
Pre-Development Hydrographs



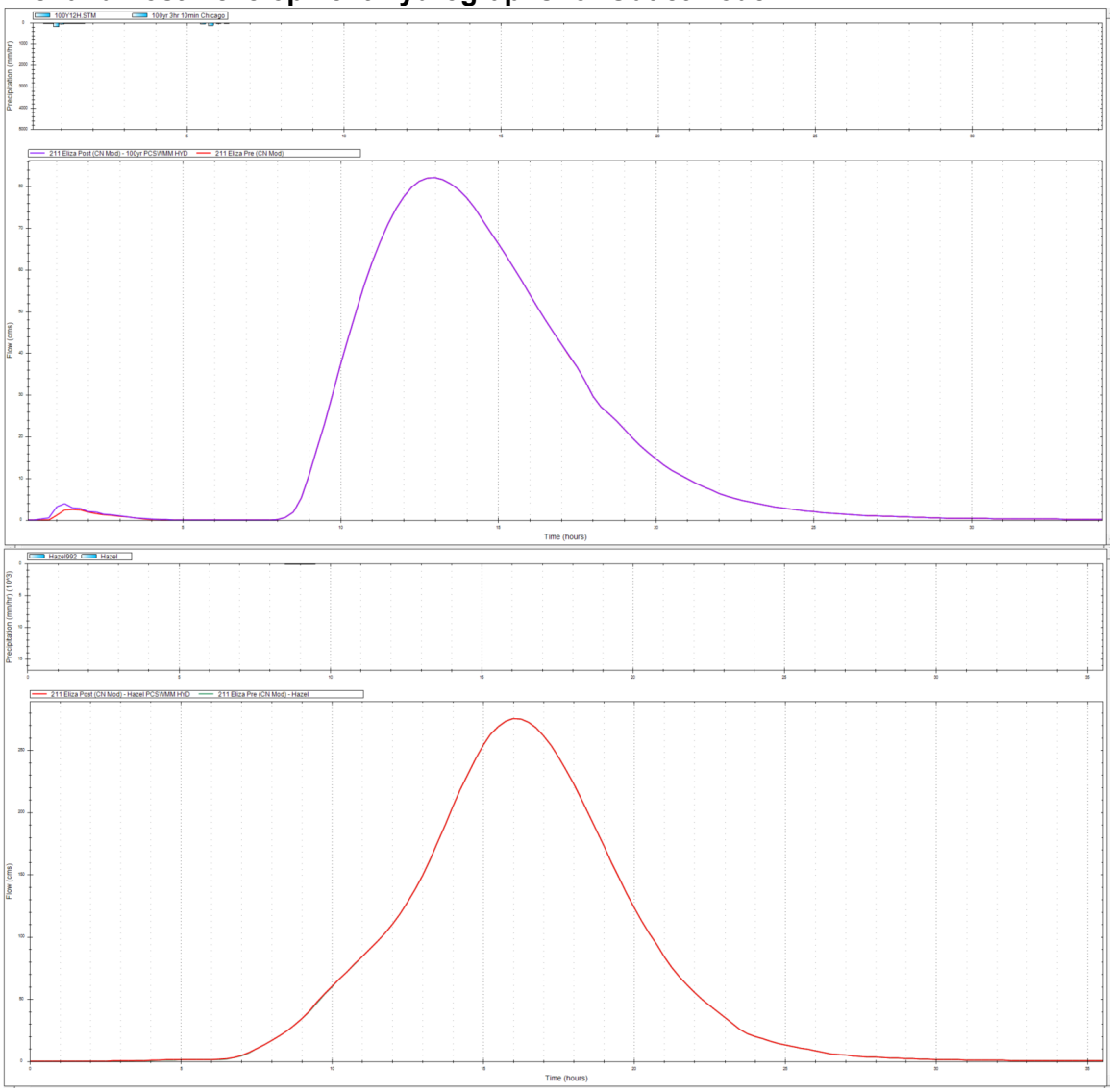


Post-Development Hydrographs





Pre- and Post-Development Hydrographs for Outlet Node



3.2 PCSWMM Model

3.2.1 Methodology

The computer model PCSWMM was used to model the post-development conditions and analyze the effect routing through the proposed storm sewer system within the site has on the time at which the post-development site peak flows reach the watercourse. The same Chicago 3-hour rainfall distribution used in the VO Model(s) for the site-specific catchments was used to simulate the 2- through 100-year storm events. Peak flows generated from Regional Storm Hazel were also analyzed in this model.

As mentioned in Section 2.2 the site is divided into 4 Catchments: Catchment 201 (Outlet 1), Catchment 202 (Outlet 2), Catchment 203 (Outlet 3), and Catchment 204 (Outlet 4). Each catchment was divided further into sub-catchments based on site grading and manhole locations. Conduits were used to represent the internal storm sewer pipe network and/or the proposed outlet channels to model the routing through the site. A storm sewer design sheet was created to size the pipes through the site and can be found in Appendix C. Storage nodes were introduced for the medium density and commercial block to represent the future block specific quantity storage that will be implemented.

Based on the land use from the proposed Draft Plan a composite imperviousness value for each sub catchment area was calculated. The proposed conditions model schematic can be found below (Schematic 4: PCSWMM Proposed Conditions Model Schematic) and Table 12 outlines the impervious values used for each land use.

Refer to Appendix C for PCSWMM model parameters and Appendix E for



Schematic 4: PCSWMM Proposed Conditions Model Schematic

Table 12: Post-Development Impervious Values

Land Use	Imperviousness
Right-of-Ways	80%
Natural Heritage Area	10%
Grassed Areas	15%
Single Lot Residential	55%
Townhouse Residential	65%
Medium Density	80%
Commercial	90%

3.2.2 Results

Based on the model set-up and input parameters described in Section 3.2.1 the post-development model was run for the Regional and all 2- through 100-year storm events. Table 13 summarizes the resultant peak flow rates for each storm event at Outlets 1, 2, 3, and 4.

Table 13: Peak Flow Rates from Proposed Conditions PCSWMM Model

	Outlet 1 Peak Flow (m^3/s)	Outlet 2 Peak Flow (m^3/s)*	Outlet 3 Peak Flow (m^3/s)	Outlet 4 Peak Flow (m^3/s)
2-Year	0.1	1.04	0.14	0.56
5-Year	0.13	1.4	0.19	0.76
10-Year	0.16	1.75	0.23	0.95
25-Year	0.19	1.99	0.27	1.16
50-Year	0.21	2.29	0.32	1.37
100-Year	0.23	2.37	0.34	1.49
Hazel	0.14	1.36	0.15	0.62

*Values include peak flows from the Commercial Block and Catchment 202

Table 9 in Section 3.1.4 summarizes the resultant peak flow rates from the existing conditions VO model for Outlets 1, 2, 3, and 4. The PCSWMM modelling results show that peak flow rates generated on site increase under post-development conditions. This result was anticipated as the overall sites imperviousness increased under proposed conditions.

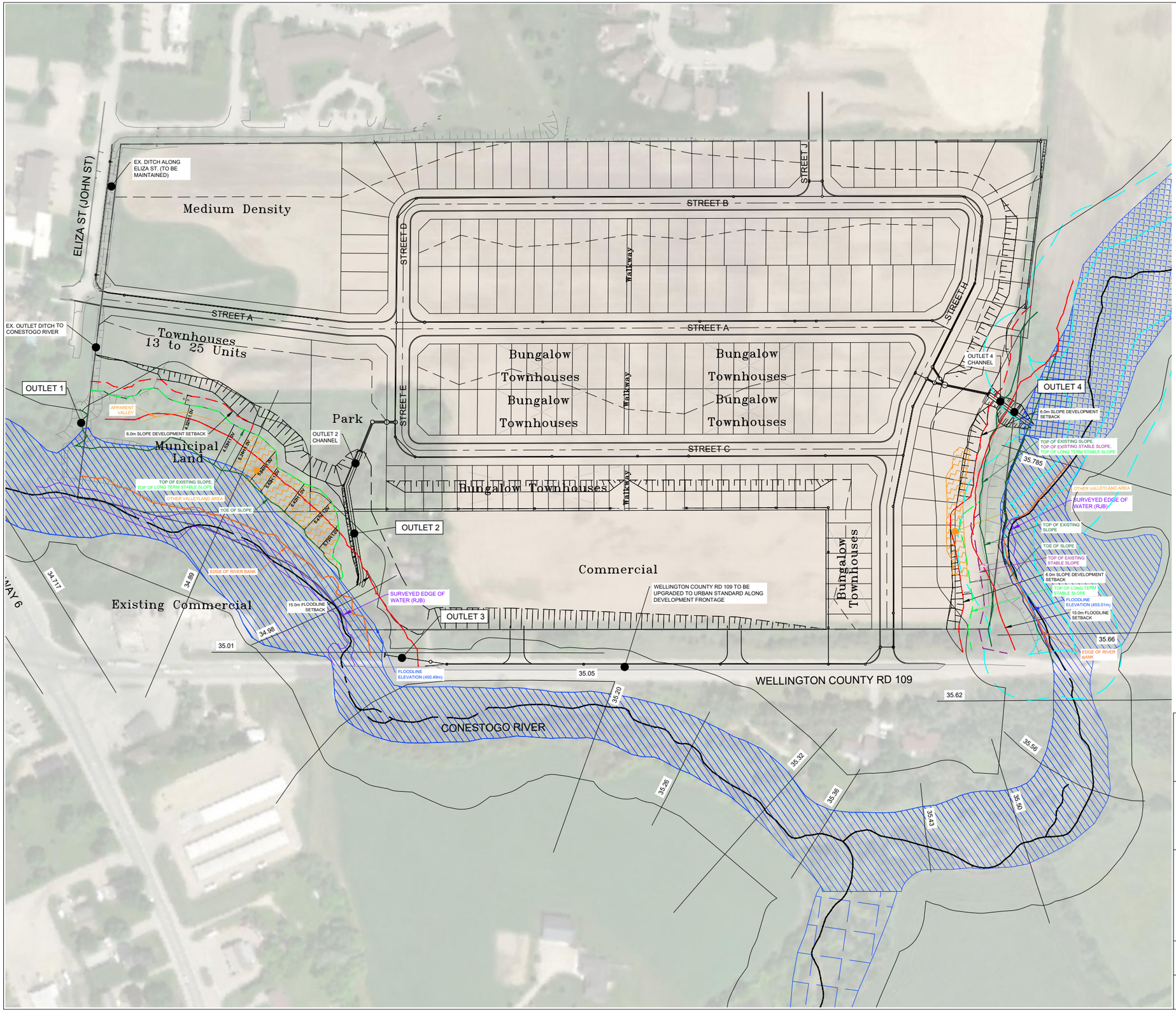
Resultant hydrographs produced at each outlet, along with a separate hydrograph produced from the commercial block were exported from PCWMM and brought into the proposed VO model discussed in Section22.

3.3 HEC-RAS Hydraulic Model

3.3.1 Methodology

The HEC-RAS (Version 6.4.1) hydraulic modelling software was used to demonstrate that the risk of flooding of the Conestogo River will not be increased at the time the uncontrolled site-runoff from the site reaches the watercourse.

A steady state HEC-RAS model was provided by the GRCA for the Upper Conestogo River which included approved existing hydrology (flows) and the Engineered Regulatory Floodplain Elevations (RFE)s for the subject Site. Using this steady state model an unsteady state HEC-RAS model was created. Both models are discussed in further detail in the following sections. See Figure 11 for RFEs and HEC-RAS Cross-Section locations relative to the subject site.



LEGEND

- SITE PROPERTY LINE
- EDGE OF RIVERBANK (CMT)
- TOP/TOE OF EXISTING SLOPE (CMT)
- TOP OF EXISTING STABLE SLOPE (CMT)
- TOP OF LONG TERM STABLE SLOPE (CMT)
- 6.0 m SLOPE DEVELOPMENT SETBACK (CMT)
- FLOOD LINE LIMIT (GRCA)
- 15.0 m FLOOD LINE SETBACK (RJB)
- PROPOSED CATCHMENT BOUNDARY LINE
- WETLAND (NRSI)
- WETLAND BUFFER (NRSI)
- WATERCOURSE (GRCA)
- SURVEYED EDGE OF WATER (RJB)
- GRCA REGULATION LIMIT (GRCA)
- 35.01 HEC-RAS CROSS-SECTION LOCATION AND ID
- ENGINEERED REGULATED FLOODPLAIN (GRCA)
- ESTIMATED REGULATED FLOODPLAIN (GRCA)
- OTHER VALLEYLAND (CMT)

N

0 50 100 150 200

Metres

BURNSIDE

Client

SARAH PROPERTIES LIMITED

Figure Title

211 ELIZA DEVELOPMENT
TOWNSHIP OF WELLINGTON NORTH
(ARTHUR, ONTARIO)

HEC-RAS MODEL CROSS-SECTIONS

Drawn	Checked	Date	Figure No.
A.T.	S.R.	MONTH 2024	11
Scale		Project No.	
1:2500		042585	

File: U:\042585\2000\03-PRDF\FIGS\WM FIGS\042585 - FIG 11 - HEC-RAS MODEL FIGURE.dwg Date Plotted: December 18, 2024 - 4:12 PM

3.3.2 Original Model Review

The Upper Conestogo River HEC-RAS model was obtained from the GRCA on April 28th, 2023. The model was reviewed and cross-sections within the subject site were identified. Each cross-section of interest's RFEs and Regional Peak Flow Rates are summarized in Table 14.

Table 14: Original Steady State HEC-RAS Model Cross-Section Summary (Regional Storm)

Cross-Section ID	RFE (CGVD 2013) (m)	Peak Flow Rate (m^3/s)
35.785	454.65	143.00
35.66	454.29	143.00
35.36	452.93	235.10
35.01	450.41	235.10
34.98	450.39	235.10
34.89	450.13	235.10
34.717	449.83	235.10

The survey of the subject site taken on September 25th, 2024, by Van Harten Surveying Inc. noted the approximate water level of the Conestogo River on the east side of the property at 451.63 m and 447.25 m on the west side of the property. These elevations are significantly lower than the 2-year water surface elevations provided in the original HEC-RAS Model. Although the proximity to a storm event to the time at which the water surface elevation was surveyed is unknown, this large difference suggests the HEC-RAS model flow is conservative, then there is no need to check VO models with higher curve number and higher flow as alternative option.

See Table 15 for a summary of the water surface elevations surveyed and the corresponding cross-section 2-year water surface elevations.

Table 15: Surveyed and HEC-RAS Model Water Surface Elevation Comparison

Location of Surveyed Elevation (HEC-RAS Cross-Section ID)	Surveyed Water Surface Elevation (m)	2-year Storm Event Water Surface Elevation from HEC-RAS (m)
East Side of Property (35.66)	451.63	452.06
West Side of Property (34.89)	447.25	448.12

Table 16 presents water level elevations both upstream and downstream of the site in selected sections. Appendix F provides the water levels for all sections in the existing HEC RAS Model.

Table 16: Existing HEC-RAS Model Water Surface Elevation Upstream and Downstream of the Developments

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
		(m^3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m^2)	(m)
35.785	Reg	143	451.4	455.01		455.19	0.0030	2.11	94.49	126.11
	100-yr	51.3		453.55		453.67	0.0037	1.67	39.86	31.34
	50-yr	46.9		453.46		453.58	0.0036	1.62	37.3	30.74
	20-yr	42.5		453.38		453.49	0.0036	1.57	34.66	30.1
	10-yr	34		453.2		453.29	0.0036	1.46	29.29	28.76
	5-yr	29.8		453.1		453.19	0.0036	1.4	26.52	28.05
	2-yr	20.4		452.85		452.92	0.0036	1.23	19.81	25.15
35.43	Reg	143	449.8	453.32		453.44	0.0014	1.58	100.67	41.07
	100-yr	51.3		451.71		451.79	0.0022	1.22	43.01	31.67
	50-yr	46.9		451.61		451.68	0.0024	1.2	39.86	31.15
	20-yr	42.5		451.51		451.58	0.0025	1.17	36.75	30.63
	10-yr	34		451.29		451.36	0.0030	1.13	30.28	29.52
	5-yr	29.8		451.18		451.24	0.0033	1.11	26.93	28.93
	2-yr	20.4		450.9		450.96	0.0048	1.07	19.01	27.33
35.36	Reg	235.1	448.8	452.93		453.25	0.0036	2.6	105.97	43.59
	100-yr	82.9		451.36		451.54	0.0046	1.89	45.78	31.61
	50-yr	75.5		451.26		451.43	0.0047	1.83	42.6	30.59
	20-yr	68.3		451.15		451.32	0.0048	1.78	39.45	29.55
	10-yr	54		450.92		451.07	0.0052	1.67	32.89	27.24
	5-yr	47.1		450.8		450.93	0.0053	1.62	29.56	25.99
	2-yr	31.6		450.48		450.59	0.0054	1.46	21.89	22.84
34.98	Reg	235.1	446.7	450.75		451.03	0.0038	2.5	124.52	71.91
	100-yr	82.9		449.33		449.52	0.0052	1.91	44.86	37.64
	50-yr	75.5		449.25		449.42	0.0052	1.84	41.82	35.22
	20-yr	68.3		449.16		449.32	0.0052	1.77	38.93	32.75
	10-yr	54		448.98		449.11	0.0053	1.62	33.27	27.71
	5-yr	47.1		448.87		448.99	0.0052	1.56	30.28	26.38
	2-yr	31.6		448.58		448.67	0.0047	1.36	23.2	22.94
34.89	Reg	235.1	446.4	450.49		450.72	0.0029	2.38	145.43	70.03
	100-yr	82.9		448.87		449.06	0.0049	2.00	48.83	44.67
	50-yr	75.5		448.78		448.96	0.0049	1.93	45.03	42.49
	20-yr	68.3		448.69		448.86	0.0049	1.86	41.47	40.34
	10-yr	54		448.5		448.65	0.0050	1.71	34.08	35.47
	5-yr	47.1		448.39		448.53	0.0051	1.63	30.41	32.78
	2-yr	31.6		448.12		448.22	0.0054	1.42	22.36	2-yr

3.3.3 Unsteady State Analysis

To assess the flooding risk associated with uncontrolled site runoff reaching the Conestogo River, the HEC-RAS model was modified and run in unsteady flow mode. Hydrographs from the external catchments (N and S) were incorporated into the model, along with hydrographs from the existing and proposed development areas, which were added as lateral inflows at each section. As this analysis compares pre- and post-development conditions, all parameters, including inflow hydrographs for external areas and downstream boundaries, were held constant. For the unsteady flow analysis, VO outflow hydrographs were utilized, with the flow from each outlet being routed through the proposed stormwater network (outflow from PCSWMM → inflow VO) and then added to the corresponding sections of the unsteady Hec Ras model.

The results from the VO model indicate that the peak flow in the river and at each outlet in the proposed developments occurs at different times, suggesting no concerns regarding water levels in any of the sections. It is also important to highlight that the flow in the steady-state models is substantial, meaning that the relatively small contributions from the proposed developments are not expected to cause any significant changes to the water levels.

Further model details and results are provided in Appendix F for reference.

4.0 Stormwater Management Plan

4.1 Catchment 201 & Medium Density Block

4.1.1 Quality Control for Catchment 201

80% TSS removal will be achieved for Catchment 201 for runoff produced from the 2- and 5-year storm events via a Jellyfish unit at the end of the storm sewer system, before the pipes connect into the existing 900 mm diameter storm sewer along Eliza Street.

4.1.2 Quantity & Quality Control for Medium Density Block

Specific block level quantity control will be provided for the Medium Density block. The post-development 2- through 100-year peak flow rates will be controlled back to their pre-development peak flow rates through a combination of Low Impact Development (LID) methods and underground storage. A preliminary analysis was completed in PCSWMM to determine the approximate storage volume required of ~600 m^3. See Table 17 for pre- and post-development estimated catchment parameters and 100-year peak flow rates, and Appendix E for PCSWMM Model Results. The specific method of storage will be determined at detailed design.

Table 17: Pre- and Post-Development Flows for Medium Density Block

Design Storm	Pre-Development Conditions	Post-Development Conditions
Area (ha)	1.54	1.54
Flow Length (m)	88.50	88.50
Slope (%)	2.15	2.15
Impervious (%)	0.00	80
CN	74.50	77
100-Year Peak Flow without Storage	0.06	0.65
100-Year Peak Flow with Storage	N/A	0.056
Storage Volume Required (m^3)		~600

The medium density block will provide enhanced protection (80% S.S. removal) quality treatment for all stormwater generated within the block. A treatment train approach including an OGS unit, LID measures, and CB shields is a possible approach, however the specific forms of quality treatment will be determined at detailed design.

4.1.3 Outlet 1 Configuration

The major flows generated in Catchment 201 (and Medium Density Block) will outlet to the existing ditch along Eliza St and the minor flows will outlet to the existing 900mm diameter storm sewer along Eliza St. Detailed information about the 900mm storm sewer and drainage area to

the existing ditch was unavailable at the time of this submission. A storm sewer capacity analysis and ditch capacity analysis will be completed at detail design. Under proposed conditions a culvert will be constructed under the proposed road connection to Eliza St. to hydraulically connect the existing ditches. Culvert details will be determined at detailed design. See Table 18 for pre- and post-development flows directed to the existing ditch and storm sewer calculated using the VO model discussed in Section 3.1.

Table 18: Peak Flow Rates to Eliza St. Ditch and 900mm Dia. Storm Sewer

Storm Event	Pre-Development Flow (Catchment 101) (m^3/s)	Post-Development Flow (Catchment 201) (m^3/s)
2-Year	0.05	0.10
5-Year	0.09	0.13
10-Year	0.11	0.16
25-Year	0.16	0.19
50-Year	0.19	0.21
100-Year	0.22	0.23
Regional	0.50	0.14

4.2 Catchment 202

4.2.1 Quality Control for Catchment 202

80% TSS removal will be achieved for Catchment 202 for runoff produced from the 2-and 5-year storm events via a Jellyfish unit near the end of the storm sewer system, before the minor and major system flows combine and outlet to the Outlet 2 channel (see Section 4.2.2 for further channel details). Additional LID features such as swales/backyard infiltration trenches will be explored and considered in the detailed design phase once details within each block are confirmed.

4.2.2 Outlet 2 Configuration

Under proposed conditions a 92m long, 3m flat bottom, and 0.3m deep channel (approx.) will be constructed to convey all major and minor flows generated from Catchment 202 to the Conestoga River in between Wellington County Rd 109 and Highway 6, south-west of the site. Major flows will join minor flows in a 1200mm diameter storm sewer pipe via two ditch inlet catch basins. The 1200mm diameter pipe will outlet via a headwall to the Outlet 2 channel. Refer to Appendix C for the ditch inlet grate calculation and storm sewer design sheet.

The channel has been sized to convey the peak flows generated from the 100-Year ($2.3m^3/s$) and Regional Storm Events ($1.36m^3/s$) for Catchment 202 and the Commercial Block, as the Commercial Block outlet will the channel (see Section 0 for more information about the Commercial Block). Capacity calculations were completed using Hydra Flow Express and results can be found in Appendix C. The channel has been configured to avoid the *Other*

Valleyland area outlined in the Geotechnical Investigation/Slope Stability Report Prepared by CMT Engineering and riprap will be implemented at the inlet and outlet of the channel before it discharges into the Conestoga River. Refer to Appendix H for preliminary riprap calculations. The Outlet 2 channel is proposed to incorporate a GEOWEB geocell system (by Presto Geosystems) for stabilization of the channel. See Appendix G “PR24706 ELIZA (WEST OUTLET) Channel Protection System” for details.

See Table 19 for pre- and post-development flows directed to this portion of the Conestogo River. Details pertaining to the VO model (Catchment 102) and PCSWMM Model (Catchment 202) that produced these results can be found in Section 11.

Table 19: Peak Flow Rates to Conestogo River for Catchments 102 and 202

Storm Event	Pre-Development Flow (Catchment 102) (m^3/s)	Post-Development Flow (Catchment 202) (m^3/s)*
2-Year	0.08	1.04
5-Year	0.14	1.4
10-Year	0.19	1.75
25-Year	0.26	1.99
50-Year	0.31	2.29
100-Year	0.37	2.37
Regional	0.67	1.36

*Values include peak flows from the Commercial Block and Catchment 202

4.3 Commercial Block

4.3.1 Quantity Control

Specific block level quantity control will be provided for the commercial block. The post-development 2- through 100-year peak flow rates will be controlled back to their pre-development peak flow rates through a combination of rooftop storage over building B and underground storage tanks (ADS or equivalent). A preliminary analysis was completed in PCSWMM to determine that an approximate storage volume of 800 m^3 is required for the combined rooftop and underground storage tank. See Table 20 for pre- and post-development flows and estimated catchment parameters. Refer to Appendix E for PCSWMM Model Results.

Table 20: Pre- and Post-Development Flows for Commercial Block

	Pre-Development Conditions	Post-Development Conditions
Area (ha)	2.23	2.23
Flow Length (m)	92.76	92.76
Slope (%)	8.98	2.00
Impervious (%)	2.66	90.00
CN	75.32	77.00
100-Year Peak Flow without Storage	0.14	1.04
100-Year Peak Flow with Storage	N/A	0.14
Storage Volume Required (m^3)		~800.00

4.3.2 Quality Control

The commercial block will provide enhanced protection (80% S.S. removal) quality treatment for all stormwater generated within the block. A treatment train approach including an OGS unit, Jellyfish, LID measures, and CB shields is a possible approach, however the specific forms of quality treatment will be determined at detailed design.

4.3.3 Outlet

All stormwater flows generated from the commercial block are proposed to outlet directly to the Outlet 1 channel discussed in Section 4.1.3. Details about this connection will be determined once the configuration of the commercial block is confirmed.

4.4 Catchment 203

4.4.1 Quality Control

80% TSS removal will be achieved for Catchment 203 for runoff produced from the 2-and 5-year storm events via a Jellyfish unit at the end of the storm sewer system, before the pipes outlet to the Conestogo River (see Section 4.4.2 for further details). Additional LID features such as swales/backyard infiltration trenches will be explored and considered in the detailed design phase once details within each block are confirmed.

4.4.2 Outlet 3 Configuration

Under proposed conditions both major and minor flows generated in Catchment 203 will outlet to a proposed west flowing storm sewer system within the future urban ROW on the north side of Wellington County Rd 109. Riprap protection will be implemented at the outlet point of the storms sewer before flows enter the Conestogo River to prevent erosion. Details pertaining to the storm sewer system within the future ROW will be determined at detailed design.

See Table 21 for pre- and post-development flows directed to this portion of the Conestogo River. Details pertaining to the VO model (Catchment 103) and PCSWMM Model (Catchment 203) that produced these results can be found in Section 11.

Table 21: Peak Flow Rates to Conestogo River for Catchments 103 and 203

Storm Event	Pre-Development Flow (Catchment 103) (m^3/s)	Post-Development Flow (Catchment 203) (m^3/s)
2-Year	0.05	0.14
5-Year	0.09	0.19
10-Year	0.13	0.23
25-Year	0.18	0.27
50-Year	0.22	0.32
100-Year	0.26	0.34
Regional	0.46	0.15

4.5 Catchment 204

4.5.1 Quality Control

80% TSS removal will be achieved for Catchment 202 for runoff produced from the 2-and 5-year storm events via a Jellyfish unit at the end of the storm sewer system, before the pipes outlet to Outlet channel 4 (see Section 4.5.2 for further channel details). Additional LID features such as swales/backyard infiltration trenches will be explored and considered in the detailed design phase once details within each block are confirmed.

4.5.2 Outlet 4 Configuration

Under proposed conditions a 64 m long, 3m flat bottom, and 0.3m deep channel (approx.) will be constructed to convey all major and minor flows generated from Catchment 204 to the Conestogo River (east of the subject site). Major flows will join minor flows in a 1050mm diameter storm sewer pipe via two ditch inlet catch basins. The 1050mm diameter pipe will outlet via a headwall to the Outlet 4 channel. Refer to Appendix C for the ditch inlet grate calculation and storm sewer design sheet.

The channel has been sized to convey the peak flows generated from the 100-Year ($1.49m^3/s$) and Regional Storm Events ($0.62m^3/s$) for Catchment 204. Capacity calculations were completed using Hydra Flow Express and results can be found in Appendix C. Riprap protection will be placed at Catchment 204's minor system headwall outlet (start of Outlet 4 channel) and at the end of the Outlet 4 channel before flows exit to the Conestogo River. Refer to Appendix H for preliminary riprap calculations. The Outlet 4 channel is proposed to incorporate a GEOWEB geocell system (by Presto Geosystems) for stabilization of the channel. See Appendix G "PR24706 ELIZA (EAST OUTLET) Channel Protection System" for details.

See Table 22 for pre- and post-development flows directed to this portion of the Conestogo River. Details pertaining to the VO model (Catchment 104) and PCSWMM Model (Catchment 204) that produced these results can be found in Section 11.

Table 22: Peak Flow Rates to Conestogo River for Catchments 104 and 204

Storm Event	Pre-Development Flow (Catchment 104) (m^3/s)	Post-Development Flow (Catchment 204) (m^3/s)
2-Year	0.06	0.56
5-Year	0.11	0.76
10-Year	0.15	0.95
25-Year	0.20	1.16
50-Year	0.25	1.37
100-Year	0.29	1.49
Regional	0.54	0.62

5.0 Water Balance

A preliminary water balance analysis has been completed for the site and details will be provided at detailed design. The proposed development will be connected to municipal water and wastewater services, eliminating any impact on local groundwater or surface water conditions, as there will be no need for onsite groundwater pumping or septic effluent disposal. To minimize potential effects on the water balance, Low Impact Development (LID) measures for stormwater management will be implemented. Techniques such as directing roof runoff to lawns, side and rear yard swales, and other permeable areas will help increase infiltration volume across the development. These LID methods promote natural water absorption by ensuring additional water from roof runoff is directed to permeable areas, enhancing infiltration. Refer to the Hydrogeological Assessment report by R.J. Burnside & Associates under separate cover for further information.

6.0 Conclusions

Modeling results demonstrate that while peak flows at the site increase, the overall peak flow at the downstream node stays unchanged under both pre- and post-development conditions and thus the use of the “beat the peak” strategize in leu of traditional quantity control will not affect the flow in the receiving watercourse. Varies hydraulic and hydrologic models were utilized to demonstrate the “beat the peak” strategizes compliance with the GRCA’s concerns outlined in email correspondence (dated June 27, 2024) and through their letter (dated October 31, 2023).

In addition to analyzing peak flow, the study evaluated the impact of proposed flows on the main river. Given the substantial flow in the main river, the addition of small flows from each outlet did not result in significant changes to water levels. This observation was further confirmed using the HEC-RAS model in an unsteady state.

For quality control, approved treatment devices, such as the Jellyfish system or equivalent alternatives, were considered for each outlet.

Erosion control, a primary focus for this subdivision in the absence of a centralized SWM facility, involves several proposed measures. With multiple outlets, flow rates in the proposed development are managed to remain at lower levels. In areas with steep slopes, specifically outlets 2 and 4, materials such as Geoweb or equivalent solutions are recommended to improve soil stabilization and effectively reduce site erosion.

Additional tools, including on-site storage and Low Impact Development (LID) techniques, are employed to maintain the site’s water balance. These measures also aid in mitigating erosion by further reducing the proposed flow rates.

BURNSIDE

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Appendix A

GRCA Correspondence

From:	Jessica Conroy <jconroy@grandriver.ca>
Sent:	Thursday, June 27, 2024 1:12 PM
To:	Brandon Flewwelling
Cc:	wbroos@broos.ca; sarahb@broos.ca; Tiffany Broos; Frank Goulding
Subject:	RE: 211 Eliza, Arthur - Stormwater Management Criteria
Attachments:	SWM Pre-consultation - 211 Eliza Street - GRCA Comments.pdf

Good afternoon,

GRCA staff have now had the opportunity to have internal discussions regarding the proposed stormwater management strategy for 211 Eliza Street, Arthur.

GRCA is willing to accept the beat the peak strategy for this application, subject to our previous comments/concerns being addressed to our satisfaction, as outlined in our October 31, 2023 letter (attached for reference). GRCA's requirements are outlined below for reference:

Water Quantity

- Existing drainage patterns must be maintained.
- Must demonstrate that the risk of flooding of the Conestogo River will not be increased at the time the uncontrolled site-runoff reaches the watercourse and that there will be no impacts to upstream and downstream properties. Flood elevations within the Conestogo River must not be increased during any design storm event (2-year, 5-year, 10-year, 25-year, 50-year, and 100-year) as well as the Regional Storm event.
- Must demonstrate that the risk of erosion to the Conestogo River will not be increased at the time the uncontrolled site-runoff reaches the watercourse. An erosion threshold study will be required. Guidance for erosion threshold studies can be found in Section 2.4 of LSRCA's Technical Guidelines for Stormwater Management Submissions (2016).
- GRCA comments provided with respect to the submitted Beat the Peak Analysis (provided in the October 31, 2023 letter) must be addressed. A comment-response should be provided.
    - The Beat the Peak Analysis should also consider the extent to which routing through the proposed storm sewer system would impact the time at which the post-development site peak flows reach the watercourse.
- A SWM report including outlet details and engineering design drawings, stamped and signed by a professional engineer will be required.

Erosion Control

- Ensure that there is adequate erosion protection at the site outlet(s) to protect against erosion to the watercourse.
- Erosion and Sediment Control plans for construction works, stamped and signed by a qualified Professional Engineer will be required.

Water Balance

- Ensure existing infiltration / recharge rates are maintained or enhanced.
- An annual site water balance will be required.

Flooding Hazard

- The regulatory floodplain elevation must be delineated on all drawings according to site specific elevations. The floodplain must be delineated by a licenced Ontario Land Surveyor. GRCA can provide the Engineered regulatory floodplain elevations for the subject property.

Erosion Hazard

- A slope stability study will be required to determine appropriate setbacks from riverine erosion hazards, and the setbacks must be clearly delineated on the engineering drawings.

Thank you,
Jessica

Jessica Conroy, MES Pl.
Resource Planner
Grand River Conservation Authority

400 Clyde Road, PO Box 729
Cambridge, ON N1R 5W6
Office: 519-621-2763 ext. 2230
Toll-free: 1-866-900-4722
Email: jconroy@grandriver.ca
www.grandriver.ca | Connect with us on social media

From: Brandon Flewwelling <brandonf@gspgroup.ca>
Sent: Monday, June 3, 2024 11:58 AM
To: Jessica Conroy <jconroy@grandriver.ca>
Cc: Walter Broos <wbroos@broos.ca>; Sarah Broos <sarahb@broos.ca>; Tiffany Broos <tiffany@broos.ca>; Frank Goulding <Frank.Goulding@rjburnside.com>
Subject: RE: 211 Eliza, Arthur - Stormwater Management Criteria

Hi Jessica,
Following up on our call from a couple of weeks ago. We had discussed the change in approach provided by the GRCA which is in contrast to the initial direction we were provided (beat the peak).

We concluded our meeting with the understanding that you would review this matter internally and report back to us.

Have you been able to review? Can you please send us a follow up on our inquiry and course of direction.

Thanks,
Brandon

Brandon Flewwelling
MCIP, RPP
Development Planning Manager

office: 519.569.8883
direct: 226.243.6521
mobile: 226.220.5463
email: brandonf@gspgroup.ca

GSP group
72 Victoria Street South
Suite 201
Kitchener, ON N2G 4Y9

www.gspgroup.ca

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Administration Centre: 400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

Phone: 519-621-2761 Toll free: 1-866-900-4722 Fax: 519-621-4844 www.grandriver.ca

October 31, 2023 via email

GRCA File: Pre-Consultation – 211 Eliza Street, Arthur

Frank Goulding
Project Manager
R.J. Burnside & Associates Limited
35 Perry Street
Woodstock, ON N4S 3C4

Dear Frank Goulding,

Re: Subdivision Pre-consultation – 'Beat the Peak' Strategy Review
211 Eliza Street, Township of Wellington North
Sarah Properties Limited

Documents Reviewed by Staff

GRCA staff have now had the opportunity to review the Hydrological Technical Memorandum (Prepared by R.J. Burnside & Associates Limited, dated August 2, 2023) and associated HEC-RAS modelling files. The purpose of the memo was to present a hydrology analysis completed on the Conestogo River upstream of the subject property and demonstrate that the subject property could be developed without quantity control measures (often called a 'beat the peak' stormwater management strategy).

GRCA Comments

Overall, GRCA is not currently supportive of the proposed stormwater management strategy and has numerous concerns to be addressed. We understand that stormwater is proposed to outlet to a municipal ditch before the regulated watercourse, so this stormwater management strategy will first depend on municipal acceptance. GRCA advises against the discharge of uncontrolled runoff to the proposed municipal ditch. If the strategy to outlet to the municipal ditch is accepted, GRCA has additional comments to be addressed regarding the 'beat the peak' analysis. In addition, GRCA is concerned with potential flooding and erosion impacts to the watercourse caused by uncontrolled runoff from the proposed development. Please see detailed comments below.

Advisory comments to the municipality:

Please find below advisory comments for the municipality regarding the proposed stormwater management outlet and strategy:

- The submitted analysis does not mention the intended outlet is to the municipal ditch and instead assumes runoff will discharge directly to the watercourse. Through recent correspondence with the consultant, it was confirmed that the intended outlet point for the developed site is directly to the existing ditch north of Wellington Road 109, located south of the site and just upstream of an existing residential driveway crossing over the ditch. We would like to advise the municipality that existing drainage patterns are not being maintained in the proposed condition and the

entirety of the developed site is proposed to be sent to the municipal ditch without any quantity controls.

- Under existing conditions, the municipal ditch receives uncontrolled sheet flow from ~4.2 ha of the undeveloped site (agricultural field). The remaining site drains to the east and northwest (~11.8 ha). Under proposed conditions, the municipal ditch will receive uncontrolled, concentrated flow from the entire developed site (~16 ha, subdivision). The municipal ditch will be impacted by the proposed site. GRCA advises against the discharge of uncontrolled runoff to the proposed municipal ditch for the following reasons:
    - This would increase the risk of flooding along the road and downstream properties. The Municipality would have to size a large ditch to accommodate this development for all storm events up to the regional storm.
    - The adjacent residential property and associated driveway crossing will be impacted. The crossing will likely also require upgrading. Safe access over the existing driveway will be of concern.
    - Allowing uncontrolled discharge to the municipal ditch sets a precedent for future developments. Developers of nearby properties may also want to tie into the Municipality's infrastructure and release uncontrolled flows from their site. Will the Municipality's infrastructure then be sized to accommodate all properties that want to have this same approach? How would this impact future roadway upgrades and developments within the Municipality?
    - The potential cumulative impact of this and the precedent it sets for future developers and Municipal infrastructure upgrades is of concern.
- Additionally, analyses have not been completed to address the following outstanding concerns:
    - Any impacts to the receiving municipal ditch and adjacent residential property(ies) with respect to an increase in the risk of flooding.
    - Any impacts to the receiving municipal ditch with respect to an increase in the risk of erosion.
- Although the Conestogo River is not proposed to directly receive runoff from the developed site, the municipal ditch discharges into the Conestogo River just a short distance downstream of the intended outlet point for the site. GRCA is concerned with potential flooding and erosion impacts to the watercourse caused by uncontrolled runoff from the proposed development.

GRCA Comments on Hydrological Technical Memorandum

Based on our review of the Hydrological Technical Memorandum, GRCA has the following comments on the analysis:

- It was recently confirmed with R.J. Burnside that the proposed site outlet will be via a storm sewer that will convey both major and minor site flows directly to the municipal ditch along Wellington Road 109. It appears that the municipal ditch ultimately drains

into the Conestogo River a short distance from the site. Please note the intended outlet configuration in the report. Please also comment on how this configuration might impact the Beat the Peak analysis.

- In describing the purpose of the "Beat the Peak" analysis, Section 1.1 of the memo notes that, "…the analysis presented herein confirms that post-development peak flows to the receiving watercourse will not be increased from pre-development levels." It is understood that there will be an increase in peak flows discharging from the developed site in comparison to pre-development conditions, and the outlet will be receiving an increase in peak flows as there are no SWM controls proposed. Is this meant to suggest that the purpose of the analysis is to demonstrate that uncontrolled site flows will reach the Conestogo River faster than the river itself reaches its peak during a given storm? Please clarify and edit wording as necessary.
- The Bransby-Williams Method for calculating time of concentration, and subsequently time to peak, should be utilized when the runoff coefficient for the catchment is greater than 0.4. The Airport Method should be utilized when the runoff coefficient for the catchment is less than 0.4. Please confirm the runoff coefficient for the catchments.
- The Regional Storm event (Hurricane Hazel) must be included in the analysis.

Comments to address if the municipality accepts proposed outlet to municipal ditch:
In addition to the comments noted above, the following comments must be addressed if the Township and County accept the proposed outlet to the ditch (municipal infrastructure):

- While the submitted analysis currently concludes that the peak flows from the developed site reach the river faster than the time the Conestogo River reaches its peak, it does not assess how the proposed SWM strategy might impact the risk of flooding and erosion in the receiving system. The following must also be demonstrated with respect to the proposed works:
    - Must demonstrate that the risk of flooding of the Conestogo River will not be increased at the time the uncontrolled runoff reaches the watercourse and that there will be no impacts to downstream properties. Flood elevations within the Conestogo River must not be increased during any design storm event (2-year, 5-year, 10-year, 25-year, 50-year, and 100-year) as well as the Regional Storm event.
    - Must demonstrate that the risk of erosion to the Conestogo River will not be increased at the time the uncontrolled runoff reaches the watercourse. An erosion threshold study will be required. Guidance for erosion threshold studies can be found in Section 2.4 of LSRCA's Technical Guidelines for Stormwater Management Submissions (2016).

As noted above, GRCA has numerous concerns regarding the proposed stormwater management strategy. The strategy is dependent on the municipality's acceptance of the outlet to the municipal ditch, and GRCA has also provided advisory comments and concerns for the municipality regarding this proposed outlet. Given the many concerns

identified, the preferred stormwater management approach would be for on-site quantity controls.

Documents required for future planning application submissions:
In addition to the above comments, GRCA wishes to note that we request the following studies and documents toward a future complete planning application for our review:

- Preliminary Stormwater Management Report including outlet details;
- Environmental Impact Study; and
- Slope Stability Study.
- Please note that if the proposed outlet to the municipal ditch is accepted, we would also require an updated Hydrological Analysis addressing our comments, as well as an Erosion Threshold Study demonstrating that the risk of erosion to the Conestogo River will not be increased at the time the uncontrolled runoff reaches the watercourse.

Should you have any questions, please contact me at jconroy@grandriver.ca or 519-621-2763 extension 2230.

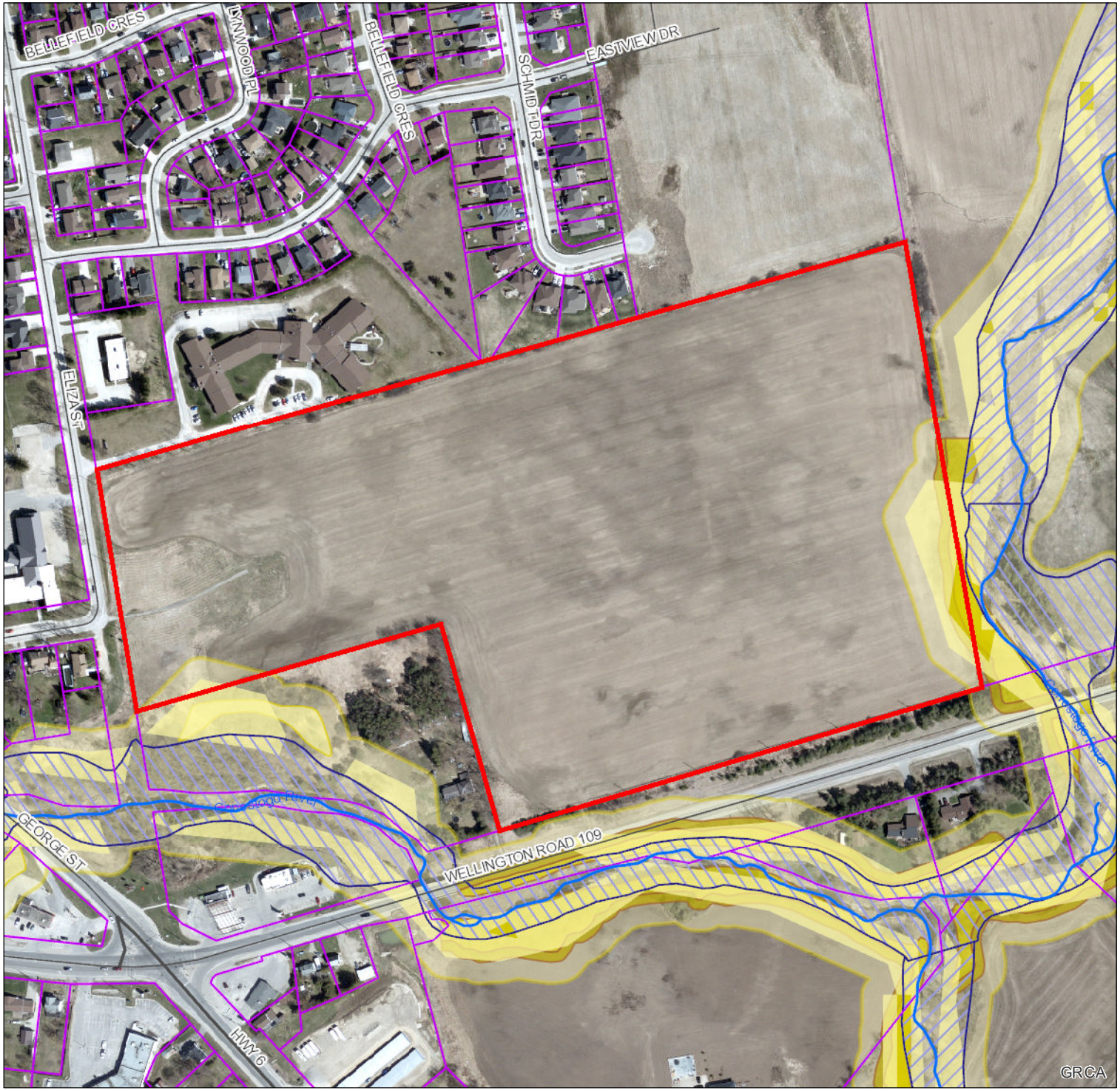
Sincerely,

Jessica Conroy

Jessica Conroy, MES Pl.
Resource Planner
Grand River Conservation Authority

Enclosed: GRCA Map of Subject Property

Copy: Tammy Pringle, Township of Wellington North (via email)
Darren Jones, Township of Wellington North (via email)
Ray Kirtz, Triton Engineering Services (via email)
Curtis Marshall, Wellington County (via email)



Grand River Conservation Authority

Date: Oct 25, 2023

Author: JC

211 Eliza Street, Wellington North

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
  - Special Policy Area
- Slope Valley (GRCA)
  - Steep
  - Oversteep
  - Steep
- Slope Erosion (GRCA)
  - Oversteep
  - Toe
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)

This legend is static and may not fully reflect the layers shown on the map. The text of Ontario Regulation 150/06 supercedes the mapping as represented by these layers.

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Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to: https://maps.grandriver.ca/Sources-and-Citations.pdf

0 20 40 80 120 Metres

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Map Centre (UTM NAD83 z17): 537,988.80 4,853,147.18

This map is not to be used for navigation | 2020 Ortho (ON)

NAD 1983 UTM Zone 17N

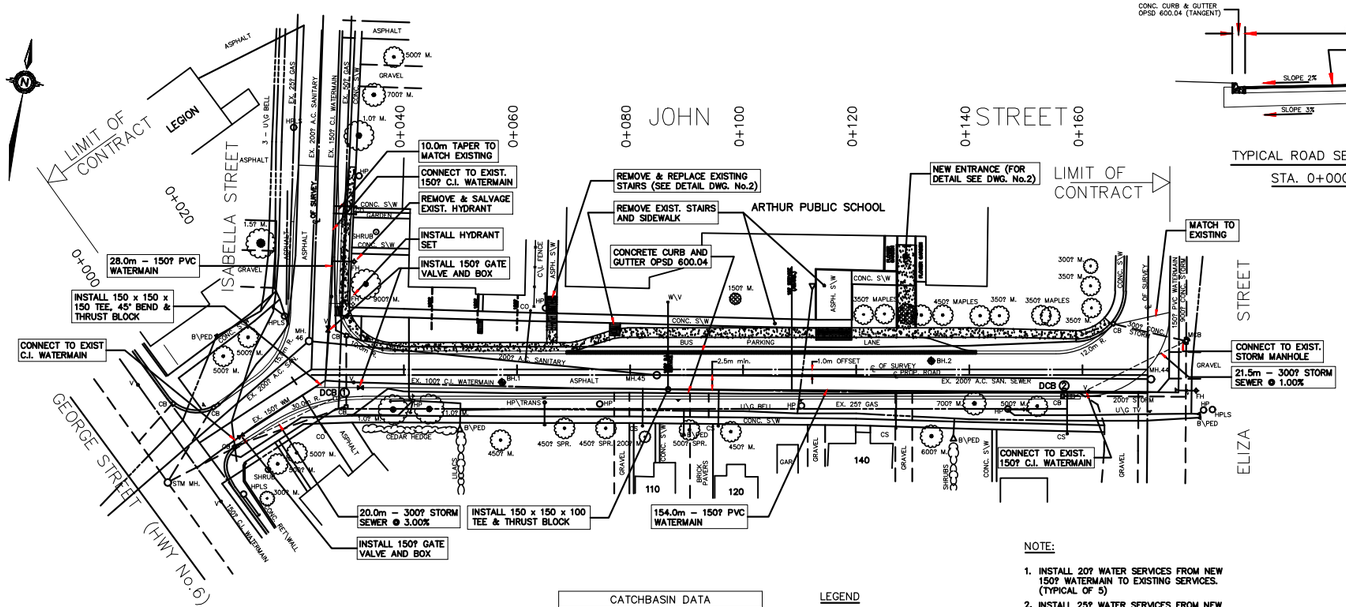
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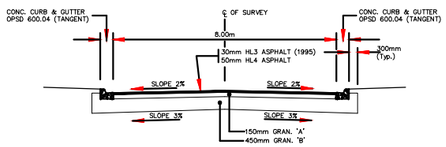
BURNSIDE

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Appendix B

Historic Plans and Profiles

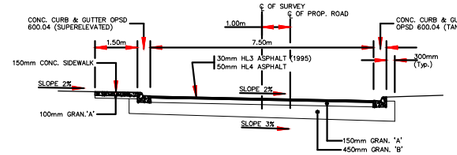




TYPICAL ROAD SECTION – JOHN STREET

STA. 0+000 TO STA. 0+020

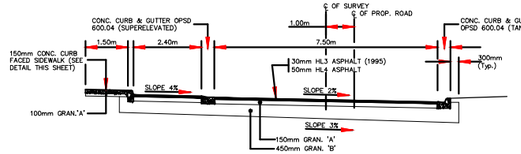
N.T.S.



TYPICAL ROAD SECTION – JOHN STREET

STA. 0+040 TO STA. 0+070

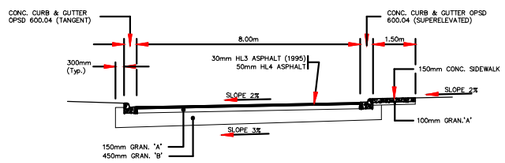
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TYPICAL ROAD SECTION – JOHN STREET

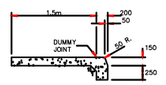
STA. 0+070 TO STA. 0+140

N.T.S.



TYPICAL ROAD SECTION – ISABELLA ST.

N.T.S.



DETAIL – CONCRETE CURB FACED SIDEWALK

CATCHBASIN DATA				
No.	OUTLET	TOP OF GRATE	TYPE
DCB 1	456.400	457.923	OPSD 705.01
DCB 2	456.400	457.971	OPSD 705.01

LEGEND

CLEAR AND GRUB

NOTE:

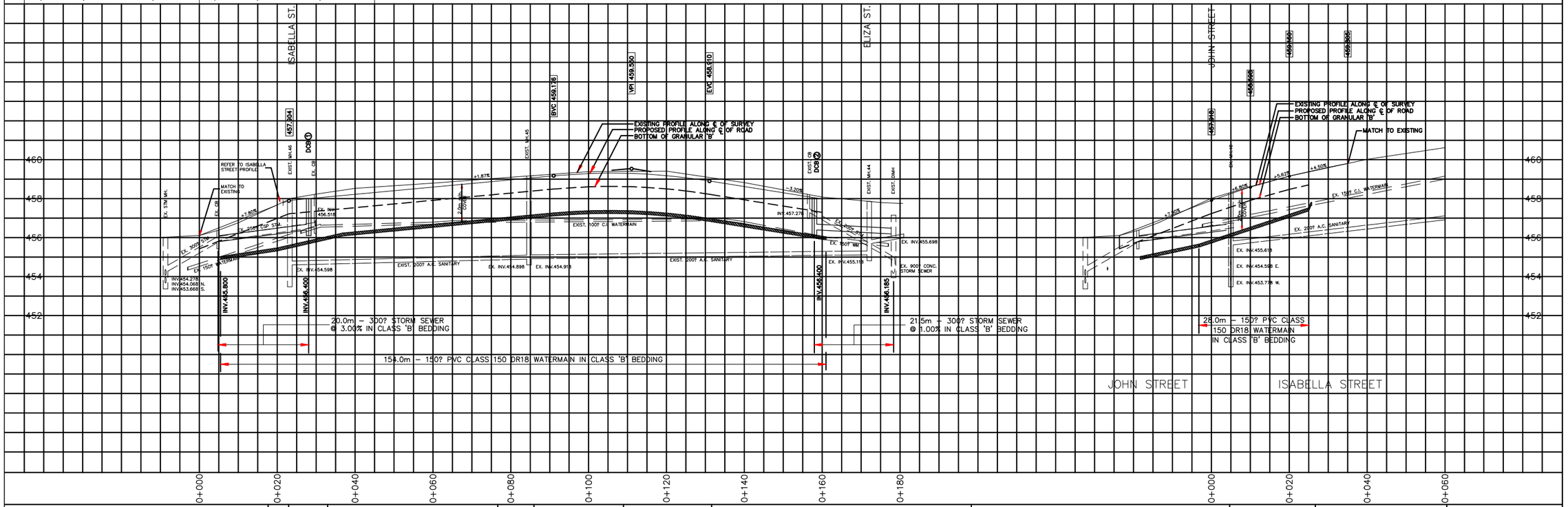
1. INSTALL 20? WATER SERVICES FROM NEW 150? WATERMAIN TO EXISTING SERVICES. (TYPICAL OF 5)
2. INSTALL 25? WATER SERVICES FROM NEW 150? WATERMAIN TO EXISTING SERVICES. (TYPICAL OF 2)
3. REMOVE & SALVAGE EXIST. GATE VALVES.
4. REMOVE & SALVAGE EXIST. CATCHBASINS.
5. REMOVE EXISTING WATERMAIN

B.M. 92–3638–1 Elev. 458.032

TOP OF CONCRETE WALL @ NORTH–EAST CORNER OF GEORGE STREET & JOHN STREET. STA. 0+113 O/S 2.2m Rt. (GEORGE ST. CHAINAGE)

B.M. 92–3638–2 Elev. 458.312

TOP OF OPERATING NUT ON HYDRANT @ CORNER OF JOHN STREET & ELIZA STREET. STA. 0+096.3 O/S 8.6m Rt. (ELIZA ST. CHAINAGE)



1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY AND SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION AGAINST DAMAGE.

REGISTERED PROFESSIONAL ENGINEER C.M. FURLONG PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER D.B. MURRAY PROVINCE OF ONTARIO

RECONSTRUCTION OF

JOHN STREET

VILLAGE OF ARTHUR
BOX 490
149 ST. GEORGE ST., ARTHUR ONTARIO, NOG 1A0

PLAN & PROFILE – GEORGE STREET (HWY No.6) TO ELIZA STREET

M3638

g.m. Drawn

D.A.H.

D.B.M.

JUNE, 1994

Fergus, Ontario

NTS

1

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Appendix C

Stormwater Management Calculations

SOIL MAP OF WELLINGTON COUNTY ONTARIO

NORTH SHEET

SOIL SURVEY REPORT No. 35

Scale 1 inch to 1 mile or 1:63360

Miles 1 ½ 0 1 2 3 4 Miles

Contour Interval 25 Feet

All Elevations in Feet above Mean Sea Level

LEGEND

MAP SYMBOL	SOIL TYPE	ACREAGE	GREAT SOIL GROUP	SOIL MATERIALS	DRAINAGE
Bf	Burford loam	28,200	Grey-Brown Podzolic	Gravel	Good
Bl	Brisbane loam	3,500	Grey-Brown Podzolic	Gravel	Imperfect
Bnl	Brookston loam	9,800	Dark Grey Gleysolic	Clay loam till	Poor
Bns	Brookston silt loam	4,300	Dark Grey Gleysolic	Clay loam till	Poor
Bs	Brady sandy loam	2,200	Grey-Brown Podzolic	Medium sand	Imperfect
Btf	Brant fine sandy loam	1,900	Grey-Brown Podzolic	Fine sand and silt loam	Good
Cg	Caledon fine sandy loam	13,000	Grey-Brown Podzolic	Fine sand over gravel	Good
Cof	Colwood fine sandy loam	1,200	Dark Grey Gleysolic	Fine sand and silt loam	Poor
Cos	Colwood silt loam	900	Dark Grey Gleysolic	Fine sand and silt loam	Poor
Db	Donnybrook sandy loam	8,800	Grey-Brown Podzolic	Gravel	Good
Df	Dumfries	42,700	Grey-Brown Podzolic	Stony, sandy loam till	Good
Fl	Farmington loam	1,500	Brown Forest	Less than 12" loam till over bedrock	Good
Fs	Fox sandy loam	6,800	Grey-Brown Podzolic	Medium sand	Good
Gl	Gilford loam	4,800	Dark Grey Gleysolic	Gravel	Poor
Grs	Granby sandy loam	3,200	Dark Grey Gleysolic	Medium sand	Poor
Gl	Guelph loam	64,000	Grey-Brown Podzolic	Loam till	Good
Gsl	Guelph sandy loam	400	Grey-Brown Podzolic	Loam till	Good
Hlf	Hillsburg fine sandy loam	35,000	Grey-Brown Podzolic	Fine to medium sand	Good
Hls	Hillsburg sandy loam	2,400	Grey-Brown Podzolic	Fine to medium sand	Good
Hl	Huriston loam	45,400	Grey-Brown Podzolic	Loam till	Good
Hs	Harriston silt loam	13,100	Grey-Brown Podzolic	Loam till	Good
Hul	Huron loam	74,600	Grey-Brown Podzolic	Clay loam till	Good
Hus	Huron silt loam	6,600	Grey-Brown Podzolic	Clay loam till	Good
Kl	Kilean loam	3,500	Grey-Brown Podzolic	Stony, sandy loam till	Imperfect
Ll	Listowel loam	9,000	Grey-Brown Podzolic	Loam till	Imperfect
Lls	Listowel silt loam	39,600	Grey-Brown Podzolic	Loam till	Imperfect
Ll	London loam	26,300	Grey-Brown Podzolic	Loam till	Imperfect
Lyl	Lily loam	600	Dark Grey Gleysolic	Stony, sandy loam till	Poor
M	Muck	32,200	Organic		Very poor
P	Peat	6,400	Organic		Very poor
Pal	Parkhill loam	10,400	Dark Grey Gleysolic	Loam till	Poor
Pas	Parkhill silt loam	3,300	Dark Grey Gleysolic	Loam till	Poor
Pl	Perth Loam	93,000	Grey-Brown Podzolic	Clay loam till	Imperfect
Ps	Perth silt loam	12,000	Grey-Brown Podzolic	Clay loam till	Imperfect
Tc	Toledo clay loam	2,400	Dark Grey Gleysolic	Clay loam	Poor
Tes	Teeswater silt loam	4,500	Grey-Brown Podzolic	Silt loam over gravel	Good
Tus	Tuscola silt loam	200	Dark Grey Gleysolic	Silt loam	Imperfect
	SOIL COMPLEXES				
Btf-Hs	Brant — Harriston	3,600			
Db-Tes	Donnybrook-Teeswater	1,000			
Df-Hf	Dumfries-Hillsburgh	9,000			
	MISCELLANEOUS				
	Stream Courses	1,200			
B.L.	Bottom Land	6,300			

REFERENCE

Road: paved
secondary
other roads
Church
Post office
Telephone exchange

KEY MAP



Soils (see notes)

- Hydro Soil Class A
- Hydro Soil Class C
- Hydro Soil Class D

Landuse (see notes)

- Impervious
- Pasture
- Row Crops
- Wetland
- Woodland

Notes on the Hydro Soil Class:

Ontario Ministry of Agriculture, Food, and Rural Affairs and Agriculture and Agri-Food Canada, in cooperation with the Ministry of Natural Resources, have compiled a geo-spatial soils database for Southern Ontario. The database consolidated the existing digital soil data mapped on a county basis into a digitally stitched and standardized procuct.

The soil survey data was mapped by a number of soil surveyors from the 1920s to the 1990s. The Soil Ontario product incorporates soil information from a variety of map scales. The project has brought the individual county or regional municipality surveys together in a digitally stitched database which reveals inconsistencies in soil data across county boundaries.

Hydrologic Soil Groups are used to estimate runoff from precipitation. Classification of soils by their reference to intake rate of infiltration of water, which is influenced by texture, organic matter content, stability of the soil aggregates and soil horizon development. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly saturated.

A Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

B Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

C Soils having a slow infiltration rate when thorcughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

D Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Notes on Landcover Classifications:

Landcover classifications were derived from Agriculture and Agri-Food Canada Crop Type Mapping, 2021.

In 2021, the Earth Observation Team of the Science and Technology Branch (STB) at AgriCulture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada. In support of a national crop inventory, A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2), and radar (RCM) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, and Quebec; point observations from the PEI Department of Environment, Water and Climate Change; Ontario Ministry of Agriculture, Food and Rural Affairs; University of Guelph - Ridgetown campus; British Columbia Ministry of Agriculture; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Fredericton, Guelph and Summerland.

Sources:

1. Ministry of Natural Resources and Forestry (Ontario)
2. Agriculture and Agri-Food Canada (AAFC)

Disclaimer:

R.J. Burnside & Associates Limited and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: 0°	Scale Factor: 0.99960

N
Grid North

0 500 1,000 1,500 2,000
Metres

BURNSIDE

Client
SARAH PROPERTIES LIMITED

Map Title
211 ELIZA DEVELOPMENT
211 Eliza Street, Arthur, ON
SOILS AND LAND USE MAP

Drawn	Checked	Date	Figure No.
PS	MP	2023/07/24	11
Scale		Project No.	
H 1:25,000		300042585	

File Path: \\amnotshared work areas\302586 Arch\efs\302586 Arch\mxds\11 - SOILS AND LAND USE MAP.mxd Print Date: 2023/07/24 Time: 10:30 AM

CHART H2 - 6A (Cont'd)

CHART H2-6A - continued

Soils Series	Soil Texture	Hyd. Soil Grp.	Soils Series	Soil Texture	Hyd. Soil Grp.	Soils Series	Soil Texture	Hyd. Soil Grp.
Darlington	s	B	"	c l	C	Heidelburg	f s l	B
"	l	C	Ferndale	si l	BC	Hendrie	s /g	AB
Dawson	s l	A	"	c l	C	Henwood	s /g	A
"	l	B	Flamboro	s	B	Hespeler	s l	B
Deloro	l	B	"	s l	B	Hillier	c &c l	C
Devlin	si c / c l	C	Floradale	l	B	Hillsburgh	s l	A
			Fonthill	g	A	Himsworth	si l	BC
Dinorwic	c	BC	"	l	B	Hinchinbr.	s l	B
Dobie	c /l	BC	Font	g s l	A	"	l	BC
Doe	s l	B	Forbes	c	D	"	si l	BC
"	si l	BC	Fox	s	A	Honeywood	s l	AB
Donald	l	B	"	s l	AB	"	si l	BC
Donnybrook	s g	A	"	gr l	AB	"	s	A
"	s l	AB	Foxboro	s	A	Howland	s l	B
"	l	B	Franktown	l	B	"	l	BC
Dorion	c /l	C	Freeport	s l	B	Huron	s l	B
Dorking	si c l	BC	Galesburg	s l	A	"	l	BC
Dumfries	s l	A	"	l	AB	"	si l	BC
"	l	AB	Gameland	s /g	AB	"	c l	CorD
Dunmer	s l	A	Gananoque	c	C	"	c	D
"	l	B	Gerow	c l	C	Innisville	s l	B
Dundonald	s l	AB	Gilford	s l	B	Jeddo	l	BC
Dunedin	c	D	"	l	B	"	c l	C
Dymond	s l	AB	Gordon	si c	C	"	c	D
"	l	B	Granby	s	B	Kagawong	si l	BC
Eagle Lake	s /g	AB	"	s l	B	Kars	s /g	A
Eamer	l	BC	Grand	l	B	"	s l	B
Earlton	si l	B	Grenville	s l	A	Kemble	si l	BC
"	c l	C	"	l	BC	"	si c l	C
Eastport	s	A	Grimsby	s l	A	"	si c	C
Edenvale	s	AB	Guelph	s l	A	"	c l	D
"	s l	B	"	l	BC	Kenabeek	s	B
Eganville	l	B	"	si l	BC	"	s l	B
Elderslie	si l	BC	Guerin	s l	AB	Killean	l /s l	AB
"	si c l	C	"	l	B	King	si l	BC
"	c l	C	Gwillimb.	g	AB	"	c l	C
Eldorado	s l	A	Haileybury	si c l	C	Kirkland	s l	A
"	l	B	"	si c	C	Kossuth	s l	B
Elk Pit	s g	A	"	c	CD	L'Achigan	s	AB
Ellwood	c l	C	Haldimand	si l	BC	Lambton	l	BC
Elmbrook	si l	BC	"	si c l	C	"	si l	BC
"	c l	C	"	c	CorD	Lanark	c	C
"	c	C	"	c l	C	Lansdowne	c /si l	C
Elmira	l	B	Hanbury	si c l	C	Leech	si c l	C
Elmsley	s l	B	"	si c	C	"	c l	D
Embro	s l	BC	"	c	D	Leitrim	g	B
"	si l	C	Harkaway	l	B	Leith	si l	BC
Emily	l	B	"	si l	BC	Lily	l /s l	B
Emo	c & p	C	Harriston	l	BC	Lincoln	si c	C
Englehart	s l	B	"	si l	BC	"	c	C
Evanturel	si l	BC	Harrow	s	A	Lindsay	c l	C
"	si c l	C	"	s l	AB	"	c	C
Falardeau	si l	BC	"	l	B	Lisbon	s l	A
"	si c l	C	Havelock	s /g	A	Listowel	l	B/BC
Farmington	s l	A	Hawkesvi.	l	B	"	si l	BC
"	l	B	Haysville	s l	AB	Little Cur.	c	C

HURON LOAM TILL - C OR D

Table 9–1 Runoff curve numbers for agricultural lands 1/ — Continued

Cover description			CN for hydrologic soil group			
cover type	treatment 2/	hydrologic condition 3/	A	B	C	D
Pasture, grassland, or range-continuous forage for grazing 4/	HURON LOAM C OR D FARM LAND IS CURRENTLY HAY	Poor	68	79	86	89
		Fair	49	69	79	84
		Good	39	61	74	80
Meadow-continuous grass, protected from grazing and generally mowed for hay	AVERAGE = CN 74.5	Good	30	58	71	78
Brush-brush-forbs-grass mixture with brush the major element 5/		Poor	48	67	77	83
		Fair	35	56	70	77
		Good	30 6/	48	65	73
Woods-grass combination (orchard or tree farm) 7/		Poor	57	73	82	86
		Fair	43	65	76	82
		Good	32	58	72	79
Woods 8/	AVERAGE = CN 76	Poor	45	66	77	83
		Fair	36	60	73	79
		Good	30	55	70	77
Farmstead–buildings, lanes, driveways, and surrounding lots		---	59	74	82	86
Roads (including right-of-way):						
Dirt		---	72	82	87	89
Gravel		---	76	85	89	91

1/ Average runoff condition, and I_a=0.2s.

2/ Crop residue cover applies only if residue is on at least 5 percent of the surface throughout the year.

3/ Hydrologic condition is based on combinations of factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥20%), and (e) degree of surface toughness.
Poor: Factors impair infiltration and tend to increase runoff.
Good: Factors encourage average and better then average infiltration and tend to decrease runoff.
For conservation tillage poor hydrologic condition, 5 to 20 percent of the surface is covered with residue (less than 750 pounds per acre for row crops or 300 pounds per acre for small grain).
For conservation tillage good hydrologic condition, more than 20 percent of the surface is covered with residue (greater than 750 pounds per acre for row crops or 300 pounds per acre for small grain).

4/ Poor: < 50% ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

5/ Poor: < 50% ground cover.
Fair: 50 to 75% ground cover.
Good: > 75% ground cover.

6/ If actual curve number is less than 30, use CN = 30 for runoff computation.

7/ CNs shown were computed for areas with 50 percent woods and 50 percent grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture.

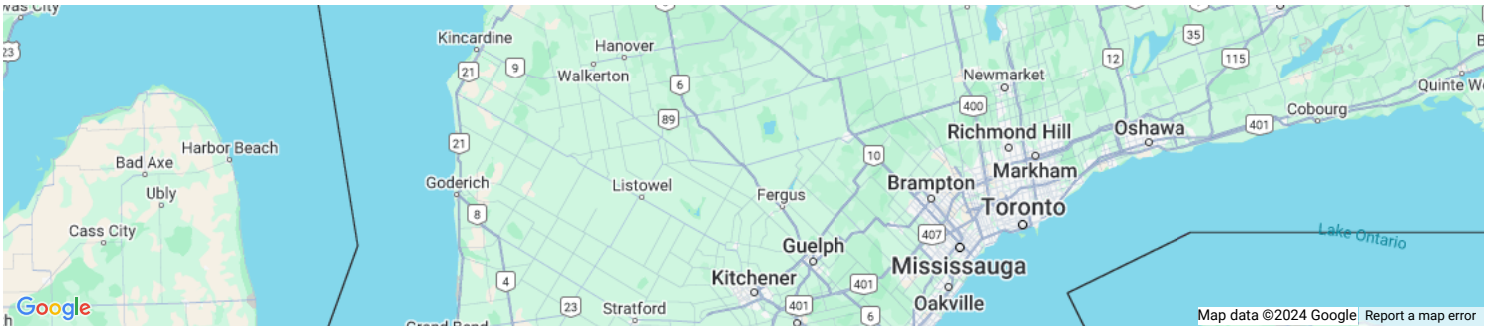
8/ Poor: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed, but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Ontario IDF CURVE LOOKUP

Active coordinate

43° 49' 45" N, 80° 31' 45" W (43.829167,-80.529167)

Retrieved: Thu, 14 Nov 2024 17:56:06 GMT



Location summary

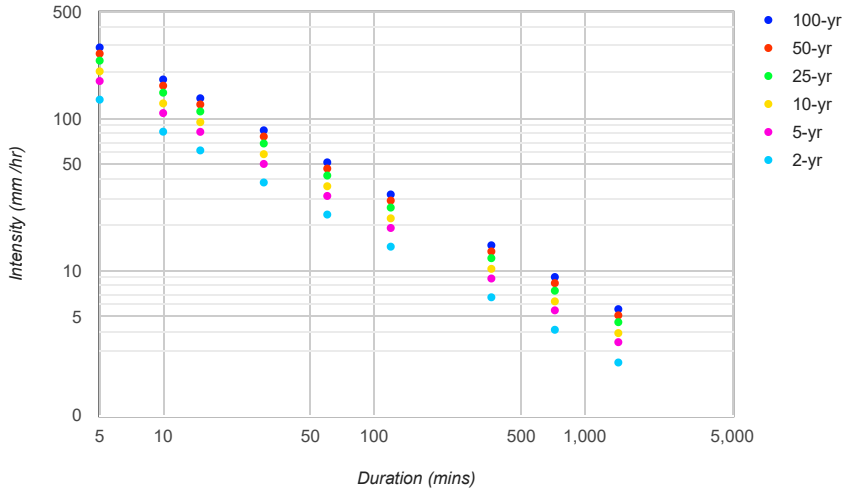
These are the locations in the selection.

IDF Curve: 43° 49' 45" N, 80° 31' 45" W (43.829167,-80.529167)

Results

An IDF curve was found.

Coordinate: 43.829167, -80.529167
IDF curve year: 2010



Coefficient summary

IDF Curve: 43° 49' 45" N, 80° 31' 45" W (43.829167,-80.529167)

Retrieved: Thu, 14 Nov 2024 17:56:06 GMT

Data year: 2010
IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	23.4	31.0	35.9	42.2	46.9	51.5
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr^{-1})

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	132.9	81.9	61.7	38.0	23.4	14.4	6.7	4.1	2.5
5-yr	176.1	108.5	81.7	50.3	31.0	19.1	8.9	5.5	3.4
10-yr	203.9	125.6	94.6	58.3	35.9	22.1	10.3	6.3	3.9
25-yr	239.7	147.7	111.2	68.5	42.2	26.0	12.1	7.4	4.6
50-yr	266.4	164.1	123.6	76.1	46.9	28.9	13.4	8.3	5.1
100-yr	292.5	180.2	135.7	83.6	51.5	31.7	14.7	9.1	5.6

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	11.1	13.6	15.4	19.0	23.4	28.8	40.1	49.4	60.9
5-yr	14.7	18.1	20.4	25.2	31.0	38.2	53.2	65.5	80.7
10-yr	17.0	20.9	23.7	29.1	35.9	44.2	61.6	75.8	93.4
25-yr	20.0	24.6	27.8	34.3	42.2	52.0	72.4	89.2	109.8
50-yr	22.2	27.3	30.9	38.1	46.9	57.8	80.4	99.1	122.1
100-yr	24.4	30.0	33.9	41.8	51.5	63.4	88.3	108.8	134.0

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Last Modified: September 2016

Project:	211 Eliza Street Arthur
Project #:	300042585.1
Designed By:	A. Trenholm
Checked By:	S. Rastgou
Date:	9-Dec-2024

Catchment D, S and N Parameters

*Note: Columns "Statistics Class", "%Area", & "Area HA" are from ArcHydro/ArcGIS

Catchment	CN number
D2	84.98
D	85.42
COMBINED (D&D2)	85.20
S	83.42
N	84.35

Catchment ID	Statistics Class	% Area		Area HA	CN (From TR-55 Table 2-2a,b,c)	Covertype (From TR-55 Table 2-2a,b,c)
D2	Woods, Soil Hydro Class C	20.942	0.209	4	73	fair
D2	Row Crops, Soil Hydro Class C	36.649	0.366	7	85	good
D2	1/4 Residential, Soil Hydro Class C	12.042	0.120	2.3	83	
D2	Commerical, Soil Hydro Class C	30.366	0.304	5.8	94	
D	Paved: Open Ditches, Soil Hydro Class C	35.5	0.355	7.3	92	streets and roads, paved, open ditches
D	Pasture, Soil Hydro Class C	33.4	0.334	6.8	79	fair
D	Row Crops, Soil Hydro Class C	30	0.3	6.2	85	good
D	Woods, Soil Hydro Class C	1.2	0.012	0.2	73	fair
S	Paved: Open Ditches,, Soil Hydro Class C	2.7	0.027	77.9	92	streets and roads, paved, open ditches
S	Paved: Open Ditches,, Soil Hydro Class D	0.5	0.005	15.9	93	streets and roads, paved, open ditches
S	Pasture, Soil Hydro Class C	15.4	0.154	450.8	79	fair
S	Pasture, Soil Hydro Class D	4.6	0.046	133.4	84	fair
S	Row Crops, Soil Hydro Class C	54.8	0.548	1604	85	good
S	Row Crops, Soil Hydro Class D	7.7	0.077	224.3	89	good
S	Wetland, Soil Hydro Class C	0.8	0.008	22.6	98	
S	Wetland, Soil Hydro Class D	2.1	0.021	61.6	98	
S	Woods, Soil Hydro Class A	1.6	0.016	46.9	36	fair
S	Woods, Soil Hydro Class C	3.8	0.038	110.3	73	fair
S	Woods, Soil Hydro Class D	6.1	0.061	177.4	79	fair
N	Paved: Open Ditches,, Soil Hydro Class C	2.2	0.022	63.4	82	farmsteads
N	Paved: Open Ditches,, Soil Hydro Class D	0.7	0.007	21.3	86	farmsteads
N	Pasture, Soil Hydro Class C	17.6	0.176	506.8	79	fair
N	Pasture, Soil Hydro Class D	7.5	0.075	216	84	fair
N	Row Crops, Soil Hydro Class C	52.8	0.528	1520.8	85	good
N	Row Crops, Soil Hydro Class D	14.7	0.147	422.9	89	good
N	Wetland, Soil Hydro Class C	0.4	0.004	10.3	98	
N	Wetland, Soil Hydro Class D	1.3	0.013	38.5	98	
N	Woods, Soil Hydro Class C	1.7	0.017	47.6	73	fair
N	Woods, Soil Hydro Class D	1.1	0.011	32.9	79	fair

Project:	211 Eliza Street Arthur
Project #:	300042585
Designed By:	A. Trenholm
Checked By:	S. Rastgou
Date:	9-Dec-2024

Airport Method for Time to Peak Calculations - VISUALL OTTHYMO ANALYSIS

Existing Conditions

WS	Area (ha)	Length (m)	C	Slope (%)	Time of Concentration (min)	Time of Concentration (hrs)	Time to Peak (hrs)
N	2873.93	10420.0	0.35	1.16	237.65	3.96	2.65
S	2922.70	10158.0	0.35	1.19	232.68	3.88	2.60
D	25.69	687.5	0.40	1.65	51.04	0.85	0.57
101	4.53	496.0	0.35	2.03	43.11	0.72	0.48
102	5.55	350.5	0.35	5.43	26.19	0.44	0.29
103	3.83	253.4	0.35	5.28	22.48	0.37	0.25
104	4.47	258.1	0.35	4.24	24.38	0.41	0.27

NOTE: Time to Peak = 0.67Tc

NOTE: Airport method was selected to calculate the watershed time of concentration as per the MOE Drainage Management Manual (for RC less than 0.4) - see below

Airport Formula

For watersheds where the runoff coefficient, C, is less than 0.40, the Airport formula gives a better estimate of t_c. This method was developed for airfields and is expressed as follows:

$$t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S_w^{0.33}} \qquad (8.16)$$

where:

t_c = time of concentration, min
C = runoff coefficient
S_w = watershed slope, %
L = watershed length, m

When a watershed length is made up of widely differing surfaces (e.g. grass and concrete), t_c, can be calculated for each surface, and the individual values summed to give the overall value.

Project:	211 Eliza Street
Project #:	300042585.1
Designed By:	A. Trenholm
Checked By:	S. Rastgou
Date:	16-Dec-2024

VISUAL OTTHYMO CATCHMENT PARAMETERS

Existing Conditions

Catchment	Area (ha)	Tp (hr)	CN	CN (Modified)
N (-Site East)	2873.93	2.65	84.35	78.50
S	2922.70	2.60	83.42	63.00
D	20.50	N/A	85.42	N/A
D2	19.10		84.98	
COMBINED D (-101,102,103)	25.62	0.57	85.20	
101	4.53	0.48	74.50	
102	5.62	0.29	75.24	
103	3.83	0.25	74.50	
104	4.47	0.27	74.50	

Proposed Conditions

Catchment	Area (ha)	Tp (hr)	CN
N	2873.93	2.65	84.35
S	2922.70	2.60	83.42
D	25.69	0.57	85.20

Project:	211 Eliza Street Arthur
Project #:	300042585.1
Designed By:	A. Trenholm
Checked By:	S. Rastgou
Date:	16-Dec-2024

PCSWMM CATCHMENT PARAMETERS

Existing Conditions

Catchment	Area (ha)	Flow Length (m)	Slope (%)	Imp (%)	CN
Medium Density (Area for Future Medium Density Use)	1.54	88.50	2.15	0.00	74.50
Commercial (Area for Future Commerical Use)	2.23	92.76	8.98	2.66	75.32

Proposed Conditions

Catchment	Area (ha)*	Imp*	CN
Commercial	**2.23**	**0.90**	77.00
Medium Density	1.54	0.80	77.00
ROW	0.31	0.80	
Townhouse Block	0.11	0.65	
201	**1.96**	**0.79**	
ROW	1.80	0.80	77.00
NHS	2.27	0.10	
Single Lot Residential	3.35	0.55	
Townhouse Residential	0.79	0.65	
Townhouse Block	0.38	0.65	
202	**8.59**	**0.50**	
ROW	0.13	0.80	77.00
NHS	0.00	0.10	
Single Lot Residential	0.70	0.55	
Townhouse Residential	0.24	0.65	
203	**1.06**	**0.60**	
ROW	1.59	0.80	77.00
NHS	1.33	0.10	
Single Lot Residential	1.35	0.55	
Townhouse Residential	0.30	0.65	
204	**4.57**	**0.51**	

*Note these areas and Imp values are shown in Figure 5 (Post-development Drainage Plan)

STORM SEWER DESIGN SHEET: (5 Year Storm)

211 Eliza St

BURNSIDE

Project #: 300042585.0
Date: 18-Dec-24
Designed: AT
Checked: SR

Min. Diameter = 250 mm
Mannings 'n'= 0.013
Starting Tc = 10 min
Factor of Safety = 10 %

Rainfall Intensity = $\frac{A}{(Tc+B)^{c}}$ *where Tc is in hours*

A = 31
B = 0
C = 0.699
(5 Yr)

NOMINAL PIPE SIZE USED

DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
Leg to Outlet 4	MH174	MH176	0.06	0.68	0.04	0.04	108.5	0.013			0.013	8.5	1.00	250	0.059	1.21	10.00	0.12	10.12	21%
	MH176	MH6	0.06	0.57	0.03	0.08	107.6	0.023			0.023	10.0	3.60	250	0.113	2.30	10.12	0.07	10.19	20%
	MH6	MH22	0.42	0.57	0.24	0.31	107.1	0.093			0.093	93.7	2.00	300	0.137	1.93	10.19	0.81	11.00	68%
	MH22	MH23	0.10	0.57	0.06	0.37	101.5	0.104			0.104	17.1	2.00	300	0.137	1.93	11.00	0.15	11.14	76%
*PRELIMINARY STORM	MH23	MH24	0.16	0.57	0.09	0.46	100.6	0.128			0.128	44.3	2.00	**375**	0.248	2.25	11.14	0.33	11.47	52%
DESIGN ONLY. STORM	MH24	MH25	0.13	0.57	0.08	0.53	98.5	0.146			0.146	34.5	2.00	375	0.248	2.25	11.47	0.26	11.73	59%
DESIGN WILL BE FINALIZED	MH26	MH27	0.74	0.57	0.42	0.42	108.5	0.126			0.126	76.4	0.60	450	0.221	1.39	10.00	0.92	10.92	57%
DURING DETAILED DESIGN.*	MH27	MH25				0.42	102.0	0.118			0.118	14.0	0.60	450	0.221	1.39	10.92	0.17	11.09	54%
	MH25	OGS4B	0.13	0.68	0.09	1.04	97.0	0.280			0.280	27.1	1.10	**525**	0.451	2.08	11.73	0.22	11.95	62%
	OGS4B	MH33				1.04	95.8	0.277			0.277	8.1	**3.35**	**525**	0.787	3.64	11.95	0.04	11.98	35%
	MH16	MH28	0.99	0.57	0.56	0.56	108.5	0.168			0.168	90.0	0.60	450	0.221	1.39	10.00	1.08	11.08	76%
	MH28	MH29	0.37	0.57	0.21	0.77	101.0	0.215			0.215	51.2	0.60	525	0.333	1.54	11.08	0.55	11.63	65%
	MH29	MH30	0.11	0.68	0.07	0.84	97.6	0.227			0.227	32.8	0.69	525	0.357	1.65	11.63	0.33	11.97	64%
	MH30	OGS4A				0.84	95.7	0.223			0.223	20.3	0.73	525	0.367	1.70	11.97	0.20	12.16	61%
	OGS4A	MH33				0.84	94.6	0.220			0.220	6.4	3.24	525	0.774	3.58	12.16	0.03	12.19	28%
	MH33	HW				1.88	94.4	0.492			0.492	35.6	0.50	825	1.015	1.90	12.19	0.31	12.51	49%
Leg to Outlet 2	MH7	MH8	0.99	0.57	0.56	0.56	108.5	0.169			0.169	90.0	1.56	375	0.219	1.98	10.00	0.76	10.76	77%
	MH8	MH9	0.58	0.57	0.33	0.89	103.1	0.253			0.253	90.3	1.56	450	0.356	2.24	10.76	0.67	11.43	71%
	MH9	MH10	0.20	0.57	0.11	1.00	98.8	0.274			0.274	17.3	1.56	525	0.537	2.48	11.43	0.12	11.54	51%
	MH10	MH11	0.36	0.57	0.20	1.20	98.1	0.327			0.327	69.5	1.70	525	0.561	2.59	11.54	0.45	11.99	58%
	MH13	MH14	1.33	0.57	0.75	0.75	108.5	0.226			0.226	90.0	1.00	525	0.430	1.99	10.00	0.76	10.76	53%
	MH14	MH11	0.70	0.57	0.40	1.15	103.1	0.328			0.328	96.3	1.40	525	0.509	2.35	10.76	0.68	11.44	64%
	MH11	MH21	0.20	0.57	0.11	2.46	95.5	0.653			0.653	65.6	0.90	675	0.797	2.23	11.99	0.49	12.48	82%
	MH18	MH19	1.11	0.57	0.63	0.63	108.5	0.189			0.189	90.0	1.23	450	0.316	1.99	10.00	0.75	10.75	60%
	MH19	MH20	0.07	0.68	0.04	0.67	103.1	0.192			0.192	18.5	1.23	450	0.316	1.99	10.75	0.16	10.91	61%
	MH20	MH21				0.67	102.1	0.190			0.190	9.7	1.23	450	0.316	1.99	10.91	0.08	10.99	60%
	MH21	OGS2				3.13	92.9	0.808			0.808	4.1	2.00	750	1.574	3.56	12.48	0.02	12.50	51%
	OGS2	MH43				3.13	92.8	0.807			0.807	9.4	2.00	750	1.574	3.56	12.50	0.04	12.55	51%
	MH43	HW				3.13	92.6	0.805			0.805	20.6	2.95	750	1.912	4.33	12.55	0.08	12.63	42%
Leg to Outlet 1	MH1	OGS1	0.41	0.68	0.28	0.28	108.5	0.084			0.084	90.1	3.50	300	0.181	2.56	10.00	0.59	10.59	46%
	OGS1	MH3				0.28	104.2	0.081			0.081	16.9	7.48	300	0.264	3.74	10.59	0.08	10.66	31%

STORM SEWER DESIGN SHEET: (100 Year Storm)

211 Eliza St

BURNSIDE

Project #: 300042585.0
Date: 18-Dec-24
Designed: AT
Checked: SR

Min. Diameter = 250 mm
Mannings 'n'= 0.013
Starting Tc = 10 min
Factor of Safety = 10 %

Rainfall Intensity = $\frac{A}{(Tc+B)^{c}}$ *where Tc is in hours*

A = 51
B = 0
C = 0.699
(100 Yr)

NOMINAL PIPE SIZE USED

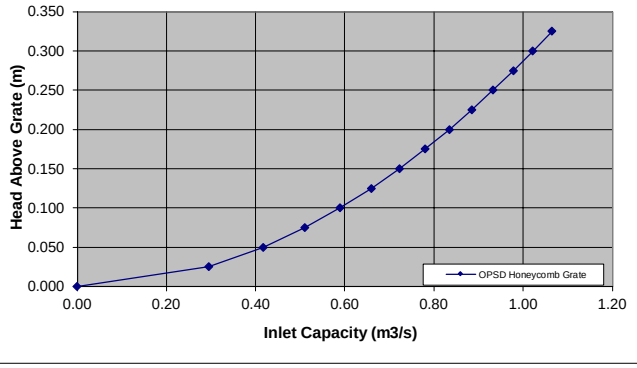
DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
Leg to Outlet 3	Outlet of Catchment 203 Pipe Network	Outlet 3	1.06	0.62	0.66	0.66	178.4	0.326			0.326	47.7	0.50	600	0.434	1.54	10.00	0.52	10.52	75%
Major strm Capacity Pipe	Outlet 2 CB	Outlet 2 Channel	8.70	0.56	4.85	4.85	178.4	2.402			2.402	40.0	0.50	1200	2.757	2.44	10.00	0.27	10.27	87%
Major strm Capacity Pipe	Outlet 4 CB	Outlet 4 Channel	4.59	0.66	3.01	3.01	178.4	1.490			1.490	30.0	0.50	**1050**	1.931	2.23	10.00	0.22	10.22	77%

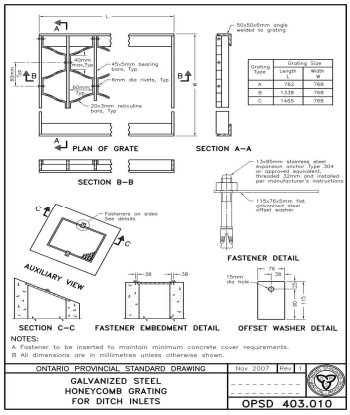
Project Name:	211 Eliza Street Arthur
Job Number:	300042585.1
Designer:	A. Trenholm
Date:	2024/12/12

DICB2 Grate Capacity Calculation
OPSD 403.010 Honey Comb Grate Configuration - 6:1 Grate Slope

Depth above Grate Increment	0.025	m
Orifice Coefficient =	0.6	
Number of Super CB's	2	

OPSD 403.010 Honey Comb Grate Configuration Details			Average Depth Above Grate (m)	Q1 (m3/s)	V1 (m/s)	Qeff (m3/s)	Qtot (m3/s)	
Grate Length =	1.465	m	0.000	0.00	0.00	0.00	0.00	
Grate Width =	0.768	m	0.025	0.00	0.42	0.15	0.29	
Length =	1.32	m	0.050	0.00	0.59	0.21	0.42	
Width =	0.62	m	0.075	0.00	0.73	0.26	0.51	
Area =	0.82	m^2	0.100	0.00	0.84	0.29	0.59	
Length of Structural Support (if any) =		m	0.125	0.00	0.94	0.33	0.66	
Width of Structural Support (if any) =		m	0.150	0.00	1.03	0.36	0.72	
Lost Area to Structural Support =	0.0000	m^2	0.175	0.00	1.11	0.39	0.78	<Outlet 4 100yr(-5yr) Flow
Area Lost to Grating/Opening =	0.0006	m^2	0.200	0.00	1.19	0.42	0.83	
Orifice Opening Area =	0.0036	m^2	0.225	0.00	1.26	0.44	0.88	
Effective number of Openings =	195.00		0.250	0.00	1.33	0.47	0.93	
Grating Open Area =	0.70	m^2	0.275	0.01	1.39	0.49	0.98	<Outlet 2 100yr(-5yr) Flow
Assumed Blockage =	**50.00**	%	0.300	0.01	1.46	0.51	1.02	
Effective Grating Open Area =	0.35	m^2	0.325	0.01	1.52	0.53	1.06	





Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Dec 10 2024

Outlet 2 Channel Capacity Analysis (100yr Flow)

Trapezoidal

Bottom Width (m)	= 3.0000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.3000
Invert Elev (m)	= 458.2500
Slope (%)	= 2.0000
N-Value	= 0.025

Calculations

Compute by:	Known Q
Known Q (cms)	= 2.3700

Highlighted

Depth (m)	= 0.2896
Q (cms)	= 2.3700
Area (sqm)	= 1.1202
Velocity (m/s)	= 2.1157
Wetted Perim (m)	= 4.8313
Crit Depth, Yc (m)	= 0.3000
Top Width (m)	= 4.7374
EGL (m)	= 0.5179

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Dec 10 2024

Outlet 4 Channel Capacity Analysis (100yr Flow)

Trapezoidal

Bottom Width (m)	= 3.0000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.3000
Invert Elev (m)	= 458.2500
Slope (%)	= 2.0000
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cms)	= 1.5000

Highlighted

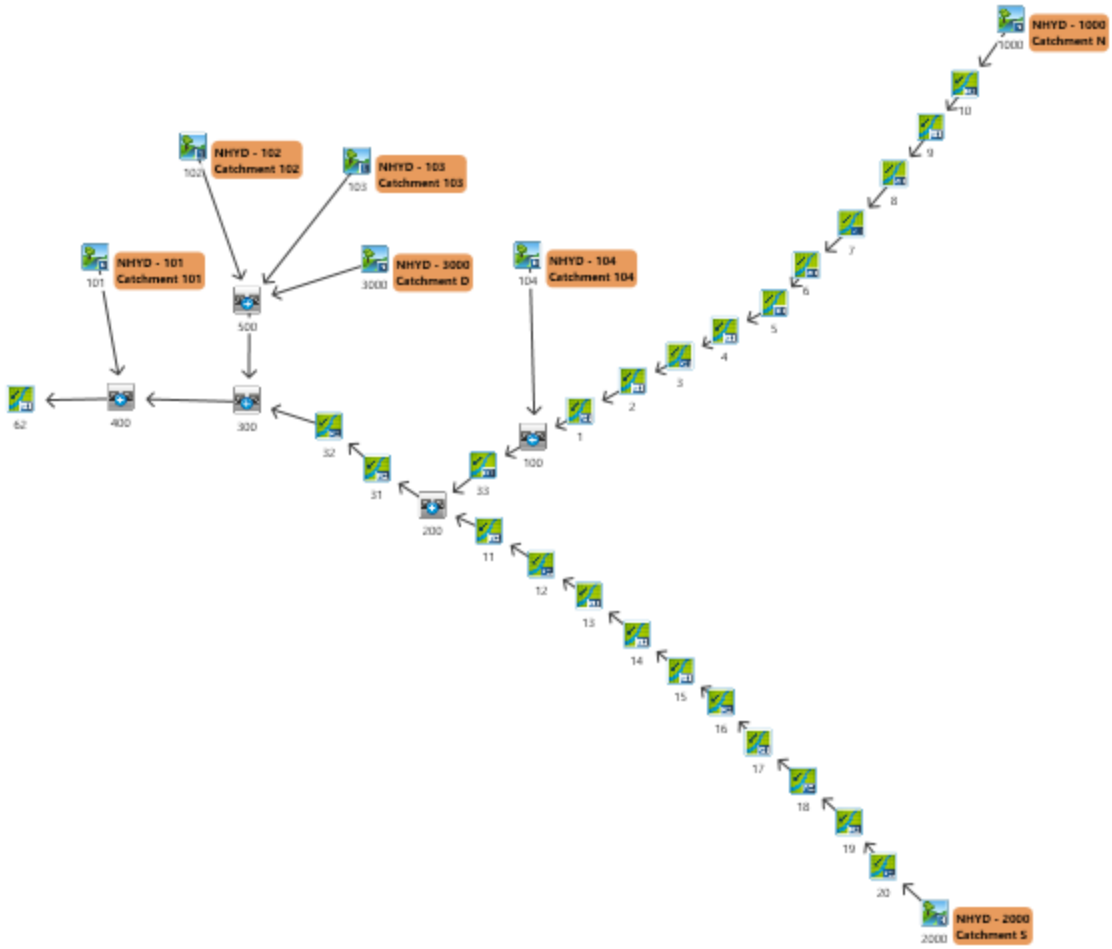
Depth (m)	= 0.1554
Q (cms)	= 1.5000
Area (sqm)	= 0.5388
Velocity (m/s)	= 2.7838
Wetted Perim (m)	= 3.9831
Crit Depth, Yc (m)	= 0.2682
Top Width (m)	= 3.9327
EGL (m)	= 0.5507

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix D
Visual Otthymo Model Results

Pre-Development VO Model Schematic



```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

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***** 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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\a5dbdf25-
Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\a5dbdf25-

DATE: 12/09/2024 TIME: 12:18:14

USER:

COMMENTS: _____

** SIMULATION : 211 Eliza - Rain 06 - 100yr **

| CHICAGO STORM | Ptotal= 71.64 mm |

IDF curve parameters: A= 901.021
B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	8.38	0.83	180.19	1.67	12.99	2.50	8.08
0.17	9.86	1.00	38.16	1.83	11.47	2.67	7.57
0.33	12.22	1.17	24.06	2.00	10.33	2.83	7.13
0.50	16.72	1.33	18.35	2.17	9.42		
0.67	31.09	1.50	15.11	2.33	8.69		

CALIB NASHYD (0104) ID= 1 DT=15.0 min	Area (ha)= 4.47 Curve Number (CN)= 74.5 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.27

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 0.632

PEAK FLOW (cms)= 0.290 (i)
TIME TO PEAK (hrs)= 1.250
RUNOFF VOLUME (mm)= 27.822
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.388

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

```
--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              68f8b37b-e980-4249-af6d-aaba4695c6ac\816d8916
| Ptotal= 88.50 mm |    Comments: 100-Year 12-Hour SCS II Design Storm
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.21	3.00	3.54	6.00	15.93	9.00	3.10
0.25	2.21	3.25	3.54	6.25	15.93	9.25	3.10
0.50	2.21	3.50	3.54	6.50	7.08	9.50	3.10
0.75	2.21	3.75	3.54	6.75	7.08	9.75	3.10
1.00	2.21	4.00	5.31	7.00	5.31	10.00	1.77
1.25	2.21	4.25	5.31	7.25	5.31	10.25	1.77
1.50	2.21	4.50	7.08	7.50	5.31	10.50	1.77
1.75	2.21	4.75	7.08	7.75	5.31	10.75	1.77
2.00	2.65	5.00	10.62	8.00	3.10	11.00	1.77
2.25	2.65	5.25	10.62	8.25	3.10	11.25	1.77
2.50	2.65	5.50	42.48	8.50	3.10	11.50	1.77
2.75	2.65	5.75	116.82	8.75	3.10	11.75	1.77

```
--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 84.3
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)=  69.011 (i)
     TIME TO PEAK    (hrs)=   8.750
     RUNOFF VOLUME    (mm)=  53.375
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.603

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

--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  88.23         474.75        0.0500
                  89.82         474.75    0.0500 /0.0300
                  94.62         473.25        0.0300      Main Channel
                  96.33         473.25        0.0300      Main Channel
                 101.14         474.50    0.0300 /0.0500  Main Channel
                 108.03         474.46        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)       (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22      107.71
       0.13   473.38    .391E+03       0.1          0.33       72.28
       0.19   473.44    .647E+03       0.2          0.41       58.08
       0.25   473.50    .944E+03       0.3          0.47       50.05
       0.32   473.57    .128E+04       0.5          0.53       44.73
       0.38   473.63    .166E+04       0.7          0.58       40.85
       0.45   473.70    .208E+04       0.9          0.63       37.86
       0.51   473.76    .254E+04       1.2          0.67       35.46
       0.57   473.82    .304E+04       1.5          0.71       33.46
       0.64   473.89    .358E+04       1.9          0.75       31.76
       0.70   473.95    .416E+04       2.3          0.78       30.29
       0.76   474.01    .478E+04       2.7          0.82       29.01
       0.83   474.08    .544E+04       3.3          0.85       27.86
       0.89   474.14    .615E+04       3.8          0.88       26.84
       0.96   474.21    .689E+04       4.4          0.91       25.91
       1.02   474.27    .767E+04       5.1          0.94       25.07
       1.08   474.33    .850E+04       5.8          0.97       24.29
       1.15   474.40    .936E+04       6.6          1.00       23.58
       1.21   474.46    .103E+05       7.5          1.03       22.92

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    69.01    8.75  53.38      1.19       1.03
```

```
   OUTFLOW: ID= 1 (  0010) 2873.93    67.33    9.25  53.38      1.21      1.03


--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  59.79        473.44        0.0500
                  67.47        472.75        0.0500
                  90.84        472.50    0.0500 /0.0300  Main Channel
                  93.81        472.25        0.0300      Main Channel
                  95.43        472.25        0.0300      Main Channel
                 115.15        472.50    0.0300 /0.0500  Main Channel
                 119.95        472.50        0.0500
                 143.58        472.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   472.28    .689E+02       0.0          0.07     232.76
        0.05   472.30    .194E+03       0.0          0.11     158.29
        0.08   472.33    .377E+03       0.1          0.13     125.54
        0.10   472.35    .616E+03       0.1          0.16     106.06
        0.13   472.38    .912E+03       0.2          0.18      92.83
        0.15   472.40    .126E+04       0.3          0.20      83.13
        0.18   472.43    .167E+04       0.4          0.22      75.64
        0.20   472.45    .214E+04       0.5          0.24      69.65
        0.23   472.48    .266E+04       0.7          0.26      64.73
        0.25   472.50    .324E+04       0.9          0.28      60.59
        0.28   472.53    .412E+04       1.2          0.30      55.76
        0.31   472.56    .515E+04       1.6          0.32      52.56
        0.33   472.58    .632E+04       2.1          0.33      50.26
        0.36   472.61    .764E+04       2.6          0.34      48.49
        0.39   472.64    .910E+04       3.2          0.35      47.04
        0.42   472.67    .107E+05       3.9          0.36      45.81
        0.44   472.69    .125E+05       4.6          0.37      44.73
        0.47   472.72    .144E+05       5.5          0.38      43.76
        0.50   472.75    .164E+05       6.4          0.39      42.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0010) 2873.93    67.33    9.25  53.38      0.50      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    63.40   10.25  53.37      0.50      0.39


--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.04   471.29    .712E+01       0.0          0.09     186.75
        0.08   471.33    .285E+02       0.0          0.14     117.64
        0.12   471.37    .641E+02       0.0          0.19      89.78
        0.16   471.41    .114E+03       0.0          0.22      74.11
        0.20   471.45    .178E+03       0.0          0.26      63.87
        0.24   471.49    .256E+03       0.1          0.29      56.56
        0.28   471.53    .349E+03       0.1          0.33      51.03
        0.32   471.57    .456E+03       0.2          0.36      46.69
        0.36   471.61    .577E+03       0.2          0.39      43.16
        0.39   471.64    .712E+03       0.3          0.41      40.23
        0.43   471.68    .862E+03       0.4          0.44      37.76
        0.47   471.72    .103E+04       0.5          0.47      35.63
        0.51   471.76    .120E+04       0.6          0.49      33.78
        0.55   471.80    .140E+04       0.7          0.52      32.15
        0.59   471.84    .160E+04       0.9          0.54      30.70
        0.63   471.88    .182E+04       1.0          0.57      29.41
```

0.67	471.92	.206E+04	1.2	0.59	28.25
0.71	471.96	.231E+04	1.4	0.61	27.19
0.75	472.00	.257E+04	1.6	0.64	26.23

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0009)	2873.93	63.40	10.25	53.37	0.74	0.63
OUTFLOW: ID= 1 (| 0008)	2873.93	61.82	10.75	53.37	0.75	0.64

ROUTE CHN(0007)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
9.36	470.00	0.0500	
13.30	470.05	0.0500 /0.0300	
18.94	469.00	0.0300	Main Channel
22.08	469.00	0.0300	Main Channel
26.35	470.00	0.0300 /0.0500	Main Channel
28.73	470.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	469.06	.188E+03	0.0	0.21	79.24
0.11	469.11	.406E+03	0.1	0.32	52.24
0.17	469.17	.653E+03	0.3	0.40	41.50
0.22	469.22	.929E+03	0.4	0.47	35.50
0.28	469.28	.124E+04	0.7	0.53	31.57
0.33	469.33	.157E+04	0.9	0.58	28.77
0.39	469.39	.194E+04	1.2	0.63	26.63
0.44	469.44	.233E+04	1.6	0.67	24.93
0.50	469.50	.275E+04	1.9	0.71	23.54
0.55	469.55	.321E+04	2.4	0.75	22.37
0.61	469.61	.369E+04	2.9	0.78	21.37
0.66	469.66	.420E+04	3.4	0.81	20.49
0.72	469.72	.474E+04	4.0	0.85	19.72
0.77	469.77	.531E+04	4.7	0.88	19.03
0.83	469.83	.591E+04	5.4	0.91	18.41
0.88	469.88	.654E+04	6.1	0.93	17.85
0.94	469.94	.720E+04	6.9	0.96	17.33
0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0008)	2873.93	61.82	10.75	53.37	1.03	1.00
OUTFLOW: ID= 1 (| 0007)	2873.93	61.34	11.25	53.37	1.05	1.01

ROUTE CHN(0006)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98

0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0007)	2873.93	61.34	11.25	53.37	1.06	1.05
OUTFLOW: ID= 1 (| 0006)	2873.93	61.01	11.50	53.37	1.07	1.05

ROUTE CHN(0005)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47
0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0006)	2873.93	61.01	11.50	53.37	1.22	0.85
OUTFLOW: ID= 1 (| 0005)	2873.93	60.48	11.75	53.37	1.25	0.86

ROUTE CHN(0004)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)

0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0005)	2873.93	60.48	11.75	53.37	1.99	1.35
OUTFLOW: ID= 1 (0004)	2873.93	60.32	12.00	53.37	1.99	1.35

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<-------- DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97
0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0004)	2873.93	60.32	12.00	53.37	2.35	1.56
OUTFLOW: ID= 1 (0003)	2873.93	60.20	12.25	53.37	2.35	1.56

ROUTE CHN(0002)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<-------- DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
10.00	460.25	0.0500
19.50	459.19	0.0500

```
                25.29        457.44    0.0500 /0.0300  Main Channel
                27.28        457.26        0.0300      Main Channel
                35.31        457.75    0.0300 /0.0500  Main Channel
                44.00        458.00        0.0500
                54.00        459.00        0.0500
                58.00        459.00        0.0500
                60.00        459.25        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.09   457.35    .111E+03       0.0          0.21      77.66
       0.18   457.44    .444E+03       0.2          0.34      48.93
       0.29   457.55    .108E+04       0.5          0.49      33.88
       0.39   457.65    .194E+04       1.2          0.61      27.50
       0.50   457.76    .303E+04       2.2          0.71      23.47
       0.61   457.87    .446E+04       3.7          0.83      20.04
       0.71   457.97    .632E+04       5.7          0.90      18.42
       0.82   458.08    .854E+04       8.3          0.97      17.20
       0.93   458.19    .109E+05      11.3          1.04      16.05
       1.03   458.29    .134E+05      14.9          1.11      15.06
       1.14   458.40    .161E+05      18.9          1.17      14.22
       1.24   458.50    .189E+05      23.4          1.23      13.51
       1.35   458.61    .219E+05      28.3          1.29      12.89
       1.46   458.72    .251E+05      33.8          1.35      12.36
       1.56   458.82    .283E+05      39.7          1.40      11.89
       1.67   458.93    .318E+05      46.2          1.45      11.47
       1.78   459.04    .355E+05      51.7          1.46      11.45
       1.88   459.14    .397E+05      59.6          1.50      11.09
       1.99   459.25    .439E+05      68.2          1.55      10.74

                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0003) 2873.93    60.20   12.25  53.37      1.89      1.51
   OUTFLOW: ID= 1 (  0002) 2873.93    60.08   12.25  53.37      1.88      1.50



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| ROUTE CHN(  0001)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77      14.66
       0.42   455.17    .205E+04       3.5          1.14       9.86
       0.62   455.37    .349E+04       7.4          1.43       7.88
       0.83   455.58    .522E+04      12.9          1.68       6.72
       1.04   455.79    .722E+04      20.2          1.90       5.95
       1.25   456.00    .950E+04      29.4          2.10       5.38
       1.46   456.21    .124E+05      42.5          2.33       4.85
       1.67   456.42    .163E+05      58.3          2.42       4.67
       1.88   456.63    .220E+05      78.1          2.40       4.69
       2.10   456.85    .292E+05     103.3          2.39       4.72
       2.31   457.06    .372E+05     134.3          2.45       4.61
       2.52   457.27    .456E+05     170.3          2.53       4.46
       2.73   457.48    .545E+05     211.2          2.62       4.30
       2.94   457.69    .638E+05     258.3          2.74       4.12
       3.15   457.90    .733E+05     310.2          2.86       3.94
       3.37   458.12    .832E+05     367.0          2.99       3.78
       3.58   458.33    .932E+05     428.5          3.11       3.63
       3.79   458.54    .104E+06     495.8          3.24       3.48
       4.00   458.75    .115E+06     573.1          3.38       3.34

                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    60.08   12.25  53.37      1.69      2.42
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   OUTFLOW: ID= 1 (  0001) 2873.93    60.07   12.50  53.37      1.69      2.42


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| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):  2873.93  60.067    12.50    53.37
     + ID2= 2 (  0104):     4.47   0.290     1.25    27.82
       ================================================
       ID = 3 (  0100):  2878.40  60.067    12.50    53.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.21   454.96    .442E+03       1.0          0.77       7.33
        0.42   455.17    .102E+04       3.5          1.14       4.93
        0.62   455.37    .175E+04       7.4          1.43       3.94
        0.83   455.58    .261E+04      12.9          1.68       3.36
        1.04   455.79    .361E+04      20.2          1.90       2.97
        1.25   456.00    .475E+04      29.4          2.10       2.69
        1.46   456.21    .618E+04      42.5          2.33       2.42
        1.67   456.42    .816E+04      58.3          2.42       2.33
        1.88   456.63    .110E+05      78.1          2.40       2.35
        2.10   456.85    .146E+05     103.3          2.39       2.36
        2.31   457.06    .186E+05     134.3          2.45       2.31
        2.52   457.27    .228E+05     170.3          2.53       2.23
        2.73   457.48    .273E+05     211.2          2.62       2.15
        2.94   457.69    .319E+05     258.3          2.74       2.06
        3.15   457.90    .367E+05     310.2          2.86       1.97
        3.37   458.12    .416E+05     367.0          2.99       1.89
        3.58   458.33    .466E+05     428.5          3.11       1.81
        3.79   458.54    .518E+05     495.8          3.24       1.74
        4.00   458.75    .573E+05     573.1          3.38       1.67

                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0100) 2878.40    60.07   12.50  53.33      1.69      2.42
   OUTFLOW: ID= 1 (  0033) 2878.40    60.08   12.50  53.33      1.69      2.42


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| CALIB            |
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 83.4
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.60

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)=  69.385 (i)
     TIME TO PEAK    (hrs)=   8.750
     RUNOFF VOLUME    (mm)=  52.038
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.588

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

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| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87         0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25         0.0300      Main Channel
                  24.23        470.25         0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00         0.0500
                  40.00        471.16         0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV       VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)      (cu.m.)       (cms)         (m/s)      (min)
        0.03   470.28     .106E+03        0.0           0.18      109.47
        0.07   470.32     .229E+03        0.1           0.27       72.36
        0.10   470.35     .371E+03        0.1           0.34       57.58
        0.13   470.38     .531E+03        0.2           0.39       49.31
        0.16   470.41     .708E+03        0.3           0.44       43.90
        0.20   470.45     .904E+03        0.4           0.48       40.01
        0.23   470.48     .112E+04        0.5           0.52       37.05
        0.26   470.51     .135E+04        0.6           0.56       34.69
        0.29   470.54     .160E+04        0.8           0.59       32.75
        0.33   470.58     .186E+04        1.0           0.62       31.11
        0.36   470.61     .215E+04        1.2           0.65       29.71
        0.39   470.64     .245E+04        1.4           0.68       28.49
        0.42   470.67     .277E+04        1.7           0.70       27.40
        0.46   470.71     .311E+04        2.0           0.73       26.44
        0.49   470.74     .347E+04        2.3           0.75       25.56
        0.52   470.77     .386E+04        2.6           0.79       24.42
        0.55   470.80     .432E+04        3.1           0.82       23.53
        0.59   470.84     .485E+04        3.5           0.84       22.95
        0.62   470.87     .545E+04        4.0           0.86       22.57

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2000) 2922.70    69.38    8.75  52.04      0.59      0.84
   OUTFLOW: ID= 1 (  0020) 2922.70    67.90    9.25  52.04      0.62      0.86



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--------------------
| ROUTE CHN(  0019)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  60.00        467.50         0.0500
                  68.78        467.50    0.0500 /0.0300
                  75.63        467.28         0.0300      Main Channel
                  75.99        467.25         0.0300      Main Channel
                  80.23        467.25         0.0300      Main Channel
                  82.81        467.75    0.0300 /0.0500  Main Channel
                  87.19        467.93         0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV       VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)      (cu.m.)       (cms)         (m/s)      (min)
        0.01   467.26     .433E+02        0.0           0.05      328.94
        0.02   467.27     .883E+02        0.0           0.08      209.84
        0.03   467.28     .135E+03        0.0           0.10      162.03
        0.04   467.29     .204E+03        0.0           0.13      127.07
        0.06   467.31     .280E+03        0.0           0.15      108.18
        0.07   467.32     .362E+03        0.1           0.17       96.07
        0.09   467.34     .452E+03        0.1           0.19       87.54
        0.10   467.35     .548E+03        0.1           0.21       81.15
        0.11   467.36     .652E+03        0.1           0.22       76.14
        0.13   467.38     .762E+03        0.2           0.23       72.09
        0.14   467.39     .879E+03        0.2           0.24       68.72
        0.15   467.40     .100E+04        0.3           0.25       65.86
        0.17   467.42     .113E+04        0.3           0.26       63.40
        0.18   467.43     .127E+04        0.3           0.27       61.25
        0.20   467.45     .142E+04        0.4           0.28       59.34
        0.21   467.46     .157E+04        0.5           0.29       57.64
        0.22   467.47     .173E+04        0.5           0.30       56.10
        0.24   467.49     .189E+04        0.6           0.30       54.71
        0.25   467.50     .207E+04        0.6           0.31       53.49

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
```

		<---- hydrograph ---->		<pipe / channel->
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0020)	2922.70	67.90	9.25	52.04	0.25	0.31
OUTFLOW: ID= 1 (0019)	2922.70	61.00	10.50	52.04	0.25	0.31

ROUTE CHN(0018)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17
0.47	466.61	.198E+04	1.6	0.81	20.60
0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->		<pipe / channel->
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0019)	2922.70	61.00	10.50	52.04	1.10	1.11
OUTFLOW: ID= 1 (0018)	2922.70	60.70	10.75	52.04	1.11	1.11

ROUTE CHN(0017)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89

0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0018)	2922.70	60.70	10.75	52.04	0.75	1.21
OUTFLOW: ID= 1 (0017)	2922.70	60.42	11.00	52.04	0.77	1.23

ROUTE CHN(0016)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel
30.53	460.25	0.0300 /0.0500	Main Channel
60.87	460.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	458.81	.262E+03	0.1	0.20	82.51
0.13	458.88	.554E+03	0.2	0.31	53.72
0.19	458.94	.875E+03	0.3	0.40	42.17
0.25	459.00	.123E+04	0.6	0.47	35.68
0.31	459.06	.160E+04	0.9	0.53	31.42
0.38	459.13	.201E+04	1.2	0.59	28.36
0.44	459.19	.245E+04	1.6	0.64	26.03
0.50	459.25	.292E+04	2.0	0.69	24.18
0.56	459.31	.342E+04	2.5	0.74	22.66
0.63	459.38	.394E+04	3.1	0.78	21.39
0.69	459.44	.450E+04	3.7	0.82	20.31
0.75	459.50	.509E+04	4.4	0.86	19.36
0.81	459.56	.570E+04	5.1	0.90	18.53
0.88	459.63	.634E+04	5.9	0.94	17.80
0.94	459.69	.702E+04	6.8	0.97	17.14
1.00	459.75	.772E+04	7.8	1.01	16.54
1.08	459.83	.879E+04	9.3	1.06	15.68
1.17	459.92	.101E+05	11.1	1.10	15.19
1.25	460.00	.116E+05	13.0	1.12	14.91

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0017)	2922.70	60.42	11.00	52.04	1.24	1.11
OUTFLOW: ID= 1 (0016)	2922.70	60.10	11.25	52.04	1.25	1.12

ROUTE CHN(0015)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
131.87	458.25	0.0500	
140.91	458.66	0.0500 /0.0300	
147.80	457.48	0.0300	Main Channel
149.90	457.48	0.0300	Main Channel
153.04	458.50	0.0300 /0.0500	Main Channel
156.08	458.60	0.0500	
157.70	458.75	0.0500	
160.00	458.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	457.52	.924E+02	0.0	0.12	134.80
0.08	457.56	.199E+03	0.0	0.19	89.01
0.12	457.60	.321E+03	0.1	0.24	70.81
0.16	457.64	.457E+03	0.1	0.27	60.67
0.20	457.68	.608E+03	0.2	0.31	54.05
0.24	457.72	.774E+03	0.3	0.34	49.33
0.28	457.76	.954E+03	0.3	0.36	45.73
0.32	457.80	.115E+04	0.4	0.39	42.89
0.36	457.84	.136E+04	0.6	0.41	40.55
0.41	457.89	.158E+04	0.7	0.43	38.59
0.45	457.93	.182E+04	0.8	0.45	36.91
0.49	457.97	.208E+04	1.0	0.47	35.45
0.53	458.01	.234E+04	1.1	0.49	34.15
0.57	458.05	.263E+04	1.3	0.51	33.00
0.61	458.09	.292E+04	1.5	0.52	31.96
0.65	458.13	.324E+04	1.7	0.54	31.02
0.69	458.17	.356E+04	2.0	0.55	30.15
0.73	458.21	.390E+04	2.2	0.57	29.36
0.77	458.25	.426E+04	2.5	0.58	28.62

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0016)	2922.70	60.10	11.25	52.04	0.75	0.57
OUTFLOW:	ID= 1 (0015)	2922.70	58.63	12.00	52.04	0.77	0.58

ROUTE CHN(0014)
IN= 2---> OUT= 1

Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
150.00	456.75	0.0500	
155.75	456.75	0.0500 /0.0300	
160.05	456.00	0.0300	Main Channel
165.32	456.00	0.0300	Main Channel
170.87	457.50	0.0300 /0.0500	Main Channel
172.96	457.75	0.0500	
175.82	457.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	456.04	.215E+03	0.0	0.09	180.09
0.08	456.08	.445E+03	0.1	0.14	115.91
0.12	456.12	.690E+03	0.1	0.18	90.27
0.16	456.16	.950E+03	0.2	0.22	75.96
0.20	456.20	.122E+04	0.3	0.25	66.67
0.24	456.24	.151E+04	0.4	0.28	60.07
0.28	456.28	.182E+04	0.5	0.30	55.11
0.32	456.32	.213E+04	0.7	0.33	51.21
0.36	456.36	.247E+04	0.9	0.35	48.06
0.39	456.39	.282E+04	1.0	0.37	45.44
0.43	456.43	.318E+04	1.2	0.39	43.23
0.47	456.47	.356E+04	1.4	0.40	41.33
0.51	456.51	.395E+04	1.7	0.42	39.67
0.55	456.55	.435E+04	1.9	0.44	38.22
0.59	456.59	.477E+04	2.2	0.45	36.92
0.63	456.63	.521E+04	2.4	0.47	35.76
0.67	456.67	.566E+04	2.7	0.48	34.70
0.71	456.71	.613E+04	3.0	0.49	33.75
0.75	456.75	.661E+04	3.3	0.51	32.87

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0015)	2922.70	58.63	12.00	52.04	0.73	0.50
OUTFLOW:	ID= 1 (0014)	2922.70	56.99	12.50	52.04	0.75	0.51

ROUTE CHN(0013)
IN= 2---> OUT= 1

Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

```
            Distance      Elevation       Manning
              155.00        456.25        0.0500
              161.70        456.25    0.0500 /0.0300
              169.49        455.25        0.0300      Main Channel
              170.18        455.25        0.0300      Main Channel
              176.86        456.75    0.0300 /0.0500  Main Channel
              181.81        456.75        0.0500
              188.74        456.25        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.08   455.33    .926E+02        0.0          0.18       90.89
       0.16   455.41    .262E+03        0.1          0.25       65.50
       0.24   455.49    .507E+03        0.2          0.31       53.95
       0.32   455.57    .828E+03        0.3          0.36       46.77
       0.39   455.64    .123E+04        0.5          0.40       41.69
       0.47   455.72    .170E+04        0.7          0.44       37.85
       0.55   455.80    .225E+04        1.1          0.48       34.80
       0.63   455.88    .288E+04        1.5          0.52       32.31
       0.71   455.96    .358E+04        2.0          0.55       30.23
       0.79   456.04    .436E+04        2.6          0.59       28.46
       0.87   456.12    .522E+04        3.2          0.62       26.93
       0.95   456.20    .615E+04        4.0          0.65       25.59
       1.03   456.28    .734E+04        4.9          0.67       24.78
       1.11   456.36    .898E+04        6.2          0.68       24.34
       1.18   456.43    .107E+05        7.6          0.71       23.62
       1.26   456.51    .126E+05        9.2          0.73       22.81
       1.34   456.59    .146E+05       11.1          0.76       22.00
       1.42   456.67    .167E+05       13.1          0.79       21.22
       1.50   456.75    .189E+05       15.2          0.81       20.70

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  0014) 2922.70    56.99   12.50  52.04      1.49       0.80
   OUTFLOW: ID= 1 (  0013) 2922.70    56.58   13.00  52.04      1.50       0.81



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| ROUTE CHN(  0012)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.10        455.50        0.0500
                 144.47        455.50        0.0500
                 148.86        455.75        0.0500
                 150.17        455.75        0.0500
                 151.79        455.50    0.0500 /0.0300  Main Channel
                 155.72        454.00        0.0300      Main Channel
                 158.28        453.76        0.0300      Main Channel
                 161.63        454.00        0.0300      Main Channel
                 165.55        455.50    0.0300 /0.0500  Main Channel
                 169.69        455.50        0.0500
                 175.87        455.25        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.10   453.86    .129E+03        0.0          0.08      209.88
       0.20   453.96    .516E+03        0.1          0.13      132.21
       0.31   454.07    .112E+04        0.2          0.18       91.49
       0.41   454.17    .179E+04        0.4          0.23       70.94
       0.51   454.27    .251E+04        0.7          0.28       59.65
       0.61   454.37    .329E+04        1.0          0.32       52.34
       0.72   454.48    .412E+04        1.5          0.35       47.15
       0.82   454.58    .501E+04        1.9          0.39       43.22
       0.92   454.68    .595E+04        2.5          0.42       40.11
       1.02   454.78    .695E+04        3.1          0.44       37.58
       1.13   454.89    .800E+04        3.8          0.47       35.47
       1.23   454.99    .911E+04        4.5          0.50       33.66
       1.33   455.09    .103E+05        5.3          0.52       32.10
       1.43   455.19    .115E+05        6.2          0.54       30.73
       1.54   455.30    .128E+05        7.2          0.56       29.57
       1.64   455.40    .144E+05        8.3          0.58       28.91
       1.74   455.50    .162E+05        9.4          0.58       28.67
       1.87   455.63    .220E+05       11.7          0.53       31.39
       1.99   455.75    .281E+05       14.4          0.51       32.45

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
```

```
                                   <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0013) 2922.70    56.58   13.00  52.04      1.97      0.52
   OUTFLOW: ID= 1 (  0012) 2922.70    56.01   13.50  52.04      1.96      0.52


     **** WARNING:  COMPUTATIONS FAILED TO CONVERGE.

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| ROUTE CHN(  0011)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.00        455.75        0.0500
                 137.92        455.00    0.0500 /0.0300
                 144.47        453.45        0.0300      Main Channel
                 146.45        453.43        0.0300      Main Channel
                 148.74        453.48        0.0300      Main Channel
                 151.36        453.75        0.0300      Main Channel
                 154.10        453.93        0.0300      Main Channel
                 155.00        454.00        0.0300      Main Channel
                 161.50        455.18    0.0300 /0.0500  Main Channel
                 168.74        455.67        0.0500
                 170.19        455.67        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.02   453.45    .290E+02       0.0          0.10     164.18
        0.14   453.57    .573E+03       0.3          0.48      35.05
        0.25   453.68    .132E+04       0.9          0.69      24.05
        0.37   453.80    .227E+04       1.9          0.84      19.87
        0.49   453.92    .347E+04       3.3          0.95      17.58
        0.60   454.03    .492E+04       5.3          1.08      15.43
        0.72   454.15    .653E+04       8.0          1.23      13.54
        0.84   454.27    .827E+04      11.3          1.37      12.21
        0.95   454.38    .101E+05      15.1          1.49      11.21
        1.07   454.50    .121E+05      19.4          1.60      10.43
        1.19   454.62    .143E+05      24.3          1.70       9.79
        1.31   454.74    .166E+05      29.8          1.80       9.26
        1.42   454.85    .190E+05      35.9          1.89       8.81
        1.54   454.97    .215E+05      42.5          1.98       8.42
        1.66   455.09    .242E+05      50.0          2.07       8.07
        1.77   455.20    .273E+05      58.6          2.15       7.76
        1.89   455.32    .307E+05      69.0          2.25       7.42
        2.01   455.44    .346E+05      80.3          2.32       7.19
        2.12   455.55    .390E+05      92.7          2.38       7.01

                                   <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0012) 2922.70    56.01   13.50  52.04      1.74      2.12
   OUTFLOW: ID= 1 (  0011) 2922.70    56.04   13.50  52.04      1.74      2.12



--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0011):  2922.70  56.037    13.50    52.04
      + ID2= 2 (  0033):  2878.40  60.081    12.50    53.33
        ================================================
        ID = 3 (  0200):  5801.10 114.247    13.00    52.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0031)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  23.66        457.50        0.0500
                  47.14        455.00        0.0500
                  62.60        454.50        0.0500
                  62.72        454.25        0.0500
                  73.90        453.50    0.0500 /0.0300  Main Channel
                  83.00        450.25        0.0300      Main Channel
```

```
                85.93        450.00        0.0300      Main Channel
                93.20        449.75        0.0300      Main Channel
               101.08        449.00        0.0300      Main Channel
               107.87        449.00        0.0300      Main Channel
               114.70        453.40    0.0300 /0.0500  Main Channel
               117.36        454.00        0.0500
               123.95        454.11        0.0500
               180.00        458.52        0.0500
               200.00        459.04        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.44   449.44    .143E+04         4.5          1.09        5.26
       0.88   449.88    .371E+04        16.0          1.48        3.87
       1.32   450.32    .740E+04        41.0          1.90        3.01
       1.76   450.76    .116E+05        82.9          2.44        2.34
       2.20   451.20    .162E+05       136.9          2.91        1.97
       2.64   451.64    .210E+05       202.6          3.31        1.73
       3.08   452.08    .261E+05       279.7          3.68        1.55
       3.52   452.52    .315E+05       368.3          4.01        1.42
       3.96   452.96    .372E+05       468.4          4.32        1.32
       4.40   453.40    .431E+05       580.3          4.62        1.24
       4.86   453.86    .500E+05       727.3          4.99        1.15
       5.31   454.31    .588E+05       895.2          5.22        1.09
       5.77   454.77    .696E+05      1084.5          5.35        1.07
       6.22   455.22    .831E+05      1302.7          5.37        1.06
       6.68   455.68    .985E+05      1553.5          5.41        1.06
       7.13   456.13    .115E+06      1834.9          5.46        1.05
       7.59   456.59    .134E+06      2148.3          5.51        1.04
       8.04   457.04    .154E+06      2494.8          5.56        1.03
       8.50   457.50    .175E+06      2875.7          5.62        1.02

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA     QPEAK    TPEAK    R.V.    MAX DEPTH  MAX VEL
                              (ha)     (cms)    (hrs)    (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0200) 5801.10    114.25    13.00   52.68      2.02      2.69
   OUTFLOW: ID= 1 (  0031) 5801.10    114.27    13.00   52.68      2.01      2.69



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0032)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   4.69        451.07        0.0500
                  13.38        451.10        0.0500
                  23.86        450.00    0.0500 /0.0300  Main Channel
                  32.76        447.75        0.0300      Main Channel
                  35.26        447.50        0.0300      Main Channel
                  46.15        447.50        0.0300      Main Channel
                  49.16        447.75        0.0300      Main Channel
                  56.34        451.00    0.0300 /0.0500  Main Channel
                  67.16        452.61        0.0500
                  73.93        452.92        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.18   447.68    .165E+03         1.8          0.77        1.55
       0.36   447.86    .375E+03         6.3          1.21        0.99
       0.54   448.04    .601E+03        13.3          1.59        0.75
       0.71   448.21    .842E+03        22.4          1.91        0.63
       0.89   448.39    .110E+04        33.5          2.20        0.55
       1.07   448.57    .137E+04        46.5          2.45        0.49
       1.25   448.75    .165E+04        61.5          2.68        0.45
       1.43   448.93    .195E+04        78.4          2.90        0.41
       1.61   449.11    .226E+04        97.3          3.10        0.39
       1.79   449.29    .258E+04       118.2          3.30        0.36
       1.96   449.46    .292E+04       141.1          3.48        0.35
       2.14   449.64    .328E+04       166.1          3.65        0.33
       2.32   449.82    .364E+04       193.2          3.82        0.31
       2.50   450.00    .403E+04       222.4          3.98        0.30
       2.68   450.18    .443E+04       257.2          4.18        0.29
       2.89   450.39    .495E+04       302.1          4.40        0.27
       3.11   450.61    .550E+04       350.5          4.59        0.26
       3.32   450.82    .610E+04       402.6          4.75        0.25
       3.53   451.03    .673E+04       459.2          4.91        0.24

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA     QPEAK    TPEAK    R.V.    MAX DEPTH  MAX VEL
```

	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0031)	5801.10	114.27	13.00	52.68	1.75	3.26
OUTFLOW: ID= 1 (0032)	5801.10	114.27	13.00	52.68	1.75	3.25

CALIB NASHYD (3000) ID= 1 DT=15.0 min			
	Area (ha)=	25.69	Curve Number (CN)= 85.2
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.57	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 1.660 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 39.998
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.558

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

CALIB NASHYD (0103) ID= 1 DT=15.0 min			
	Area (ha)=	3.83	Curve Number (CN)= 74.5
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.25	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 0.585

PEAK FLOW (cms)= 0.264 (i)
TIME TO PEAK (hrs)= 1.000
RUNOFF VOLUME (mm)= 27.488
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.384

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

CALIB NASHYD (0102) ID= 1 DT=15.0 min			
	Area (ha)=	5.55	Curve Number (CN)= 75.2
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.29	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 0.731

PEAK FLOW (cms)= 0.367 (i)
TIME TO PEAK (hrs)= 1.250
RUNOFF VOLUME (mm)= 28.692
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.401

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

ADD HYD (0500)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0102):	5.55	0.367	1.25	28.69
	+ ID2= 2 (0103):	3.83	0.264	1.00	27.49
	ID = 3 (0500):	9.38	0.614	1.25	28.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0500)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0500):	9.38	0.614	1.25	28.20
	+ ID2= 2 (3000):	25.69	1.660	1.50	40.00
	ID = 1 (0500):	35.07	2.103	1.50	36.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0300)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0032):	5801.10	114.274	13.00	52.68
	+ ID2= 2 (0500):	35.07	2.103	1.50	36.84
	ID = 3 (0300):	5836.17	114.274	13.00	52.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0101)	ID= 1 DT=15.0 min

Area (ha)= 4.53 Curve Number (CN)= 74.5
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.48

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 0.360

PEAK FLOW (cms)= 0.224 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 28.783
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.402

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

ADD HYD (0400)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0101):	4.53	0.224	1.50	28.78
	+ ID2= 2 (0300):	5836.17	114.274	13.00	52.58
	ID = 3 (0400):	5840.70	114.274	13.00	52.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN (0062)	IN= 2---> OUT= 1

Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
0.00	457.07	0.0500	
20.00	455.31	0.0500	
40.00	452.41	0.0500 /0.0300	Main Channel
60.00	449.56	0.0300	Main Channel
80.00	447.17	0.0300	Main Channel
100.00	447.13	0.0300	Main Channel
120.00	448.92	0.0300	Main Channel
140.00	454.00	0.0300 /0.0500	Main Channel
160.00	454.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0400)	5840.70	114.27	13.00	52.57	1.26	2.78
OUTFLOW:	ID= 1 (0062)	5840.70	114.29	13.00	52.57	1.26	2.78

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

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***** 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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\1bada552-
Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\1bada552-

DATE: 12/09/2024 TIME: 12:19:31

USER:

COMMENTS: _____

** SIMULATION : 211 Eliza - Rain 06 - 100yr **

| CHICAGO STORM | Ptotal= 71.64 mm |

IDF curve parameters: A= 901.021
B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	8.38	0.83	180.19	1.67	12.99	2.50	8.08
0.17	9.86	1.00	38.16	1.83	11.47	2.67	7.57
0.33	12.22	1.17	24.06	2.00	10.33	2.83	7.13
0.50	16.72	1.33	18.35	2.17	9.42		
0.67	31.09	1.50	15.11	2.33	8.69		

CALIB NASHYD (0104) ID= 1 DT=15.0 min	Area (ha)= 4.47	Curve Number (CN)= 74.5
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.27	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 0.632

PEAK FLOW (cms)= 0.290 (i)
TIME TO PEAK (hrs)= 1.250
RUNOFF VOLUME (mm)= 27.822
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.388

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

```
--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              a4496c22-e4c8-4d74-ac93-ad230b4d8d62\816d8916
| Ptotal= 88.50 mm |    Comments: 100-Year 12-Hour SCS II Design Storm
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.21	3.00	3.54	6.00	15.93	9.00	3.10
0.25	2.21	3.25	3.54	6.25	15.93	9.25	3.10
0.50	2.21	3.50	3.54	6.50	7.08	9.50	3.10
0.75	2.21	3.75	3.54	6.75	7.08	9.75	3.10
1.00	2.21	4.00	5.31	7.00	5.31	10.00	1.77
1.25	2.21	4.25	5.31	7.25	5.31	10.25	1.77
1.50	2.21	4.50	7.08	7.50	5.31	10.50	1.77
1.75	2.21	4.75	7.08	7.75	5.31	10.75	1.77
2.00	2.65	5.00	10.62	8.00	3.10	11.00	1.77
2.25	2.65	5.25	10.62	8.25	3.10	11.25	1.77
2.50	2.65	5.50	42.48	8.50	3.10	11.50	1.77
2.75	2.65	5.75	116.82	8.75	3.10	11.75	1.77

```
--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)=  58.300 (i)
     TIME TO PEAK    (hrs)=   8.750
     RUNOFF VOLUME    (mm)=  45.550
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.515

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

--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  88.23         474.75        0.0500
                  89.82         474.75    0.0500 /0.0300
                  94.62         473.25        0.0300      Main Channel
                  96.33         473.25        0.0300      Main Channel
                 101.14         474.50    0.0300 /0.0500  Main Channel
                 108.03         474.46        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.06   473.31    .175E+03       0.0          0.22     107.71
        0.13   473.38    .391E+03       0.1          0.33      72.28
        0.19   473.44    .647E+03       0.2          0.41      58.08
        0.25   473.50    .944E+03       0.3          0.47      50.05
        0.32   473.57    .128E+04       0.5          0.53      44.73
        0.38   473.63    .166E+04       0.7          0.58      40.85
        0.45   473.70    .208E+04       0.9          0.63      37.86
        0.51   473.76    .254E+04       1.2          0.67      35.46
        0.57   473.82    .304E+04       1.5          0.71      33.46
        0.64   473.89    .358E+04       1.9          0.75      31.76
        0.70   473.95    .416E+04       2.3          0.78      30.29
        0.76   474.01    .478E+04       2.7          0.82      29.01
        0.83   474.08    .544E+04       3.3          0.85      27.86
        0.89   474.14    .615E+04       3.8          0.88      26.84
        0.96   474.21    .689E+04       4.4          0.91      25.91
        1.02   474.27    .767E+04       5.1          0.94      25.07
        1.08   474.33    .850E+04       5.8          0.97      24.29
        1.15   474.40    .936E+04       6.6          1.00      23.58
        1.21   474.46    .103E+05       7.5          1.03      22.92

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    58.30    8.75  45.55      1.19      1.03
```

```
   OUTFLOW: ID= 1 (  0010) 2873.93    57.07    9.25  45.55      1.21      1.03


--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  59.79        473.44        0.0500
                  67.47        472.75        0.0500
                  90.84        472.50    0.0500 /0.0300  Main Channel
                  93.81        472.25        0.0300      Main Channel
                  95.43        472.25        0.0300      Main Channel
                 115.15        472.50    0.0300 /0.0500  Main Channel
                 119.95        472.50        0.0500
                 143.58        472.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   472.28    .689E+02       0.0          0.07     232.76
        0.05   472.30    .194E+03       0.0          0.11     158.29
        0.08   472.33    .377E+03       0.1          0.13     125.54
        0.10   472.35    .616E+03       0.1          0.16     106.06
        0.13   472.38    .912E+03       0.2          0.18      92.83
        0.15   472.40    .126E+04       0.3          0.20      83.13
        0.18   472.43    .167E+04       0.4          0.22      75.64
        0.20   472.45    .214E+04       0.5          0.24      69.65
        0.23   472.48    .266E+04       0.7          0.26      64.73
        0.25   472.50    .324E+04       0.9          0.28      60.59
        0.28   472.53    .412E+04       1.2          0.30      55.76
        0.31   472.56    .515E+04       1.6          0.32      52.56
        0.33   472.58    .632E+04       2.1          0.33      50.26
        0.36   472.61    .764E+04       2.6          0.34      48.49
        0.39   472.64    .910E+04       3.2          0.35      47.04
        0.42   472.67    .107E+05       3.9          0.36      45.81
        0.44   472.69    .125E+05       4.6          0.37      44.73
        0.47   472.72    .144E+05       5.5          0.38      43.76
        0.50   472.75    .164E+05       6.4          0.39      42.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0010) 2873.93    57.07    9.25  45.55      0.50      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    54.06   10.25  45.55      0.50      0.39


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--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.04   471.29    .712E+01       0.0          0.09     186.75
        0.08   471.33    .285E+02       0.0          0.14     117.64
        0.12   471.37    .641E+02       0.0          0.19      89.78
        0.16   471.41    .114E+03       0.0          0.22      74.11
        0.20   471.45    .178E+03       0.0          0.26      63.87
        0.24   471.49    .256E+03       0.1          0.29      56.56
        0.28   471.53    .349E+03       0.1          0.33      51.03
        0.32   471.57    .456E+03       0.2          0.36      46.69
        0.36   471.61    .577E+03       0.2          0.39      43.16
        0.39   471.64    .712E+03       0.3          0.41      40.23
        0.43   471.68    .862E+03       0.4          0.44      37.76
        0.47   471.72    .103E+04       0.5          0.47      35.63
        0.51   471.76    .120E+04       0.6          0.49      33.78
        0.55   471.80    .140E+04       0.7          0.52      32.15
        0.59   471.84    .160E+04       0.9          0.54      30.70
        0.63   471.88    .182E+04       1.0          0.57      29.41
```

0.67	471.92	.206E+04	1.2	0.59	28.25
0.71	471.96	.231E+04	1.4	0.61	27.19
0.75	472.00	.257E+04	1.6	0.64	26.23

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0009)	2873.93	54.06	10.25	45.55	0.75	0.63
OUTFLOW: ID= 1 (0008)	2873.93	52.79	10.75	45.55	0.75	0.64

ROUTE CHN(0007) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
9.36	470.00	0.0500	
13.30	470.05	0.0500 /0.0300	
18.94	469.00	0.0300	Main Channel
22.08	469.00	0.0300	Main Channel
26.35	470.00	0.0300 /0.0500	Main Channel
28.73	470.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	469.06	.188E+03	0.0	0.21	79.24
0.11	469.11	.406E+03	0.1	0.32	52.24
0.17	469.17	.653E+03	0.3	0.40	41.50
0.22	469.22	.929E+03	0.4	0.47	35.50
0.28	469.28	.124E+04	0.7	0.53	31.57
0.33	469.33	.157E+04	0.9	0.58	28.77
0.39	469.39	.194E+04	1.2	0.63	26.63
0.44	469.44	.233E+04	1.6	0.67	24.93
0.50	469.50	.275E+04	1.9	0.71	23.54
0.55	469.55	.321E+04	2.4	0.75	22.37
0.61	469.61	.369E+04	2.9	0.78	21.37
0.66	469.66	.420E+04	3.4	0.81	20.49
0.72	469.72	.474E+04	4.0	0.85	19.72
0.77	469.77	.531E+04	4.7	0.88	19.03
0.83	469.83	.591E+04	5.4	0.91	18.41
0.88	469.88	.654E+04	6.1	0.93	17.85
0.94	469.94	.720E+04	6.9	0.96	17.33
0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0008)	2873.93	52.79	10.75	45.55	1.00	0.99
OUTFLOW: ID= 1 (0007)	2873.93	52.39	11.25	45.55	1.05	1.01

ROUTE CHN(0006) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98

0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0007)	2873.93	52.39	11.25	45.55	1.02	1.06
OUTFLOW: ID= 1 (| 0006)	2873.93	52.11	11.50	45.55	1.07	1.05

ROUTE CHN(0005)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47
0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0006)	2873.93	52.11	11.50	45.55	1.24	0.86
OUTFLOW: ID= 1 (| 0005)	2873.93	51.65	11.75	45.55	1.25	0.86

ROUTE CHN(0004)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)

0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0005)	2873.93	51.65	11.75	45.55	1.98	1.35
OUTFLOW: ID= 1 (0004)	2873.93	51.49	12.00	45.55	1.99	1.35

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<-------- DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97
0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0004)	2873.93	51.49	12.00	45.55	2.21	1.52
OUTFLOW: ID= 1 (0003)	2873.93	51.37	12.25	45.55	2.20	1.52

ROUTE CHN(0002)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<-------- DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
10.00	460.25	0.0500
19.50	459.19	0.0500

```
                25.29        457.44    0.0500 /0.0300  Main Channel
                27.28        457.26        0.0300      Main Channel
                35.31        457.75    0.0300 /0.0500  Main Channel
                44.00        458.00        0.0500
                54.00        459.00        0.0500
                58.00        459.00        0.0500
                60.00        459.25        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.09   457.35    .111E+03       0.0          0.21      77.66
       0.18   457.44    .444E+03       0.2          0.34      48.93
       0.29   457.55    .108E+04       0.5          0.49      33.88
       0.39   457.65    .194E+04       1.2          0.61      27.50
       0.50   457.76    .303E+04       2.2          0.71      23.47
       0.61   457.87    .446E+04       3.7          0.83      20.04
       0.71   457.97    .632E+04       5.7          0.90      18.42
       0.82   458.08    .854E+04       8.3          0.97      17.20
       0.93   458.19    .109E+05      11.3          1.04      16.05
       1.03   458.29    .134E+05      14.9          1.11      15.06
       1.14   458.40    .161E+05      18.9          1.17      14.22
       1.24   458.50    .189E+05      23.4          1.23      13.51
       1.35   458.61    .219E+05      28.3          1.29      12.89
       1.46   458.72    .251E+05      33.8          1.35      12.36
       1.56   458.82    .283E+05      39.7          1.40      11.89
       1.67   458.93    .318E+05      46.2          1.45      11.47
       1.78   459.04    .355E+05      51.7          1.46      11.45
       1.88   459.14    .397E+05      59.6          1.50      11.09
       1.99   459.25    .439E+05      68.2          1.55      10.74

                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0003) 2873.93    51.37   12.25  45.55      1.77      1.46
   OUTFLOW: ID= 1 (  0002) 2873.93    51.19   12.25  45.55      1.76      1.46



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--------------------
| ROUTE CHN(  0001)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77      14.66
       0.42   455.17    .205E+04       3.5          1.14       9.86
       0.62   455.37    .349E+04       7.4          1.43       7.88
       0.83   455.58    .522E+04      12.9          1.68       6.72
       1.04   455.79    .722E+04      20.2          1.90       5.95
       1.25   456.00    .950E+04      29.4          2.10       5.38
       1.46   456.21    .124E+05      42.5          2.33       4.85
       1.67   456.42    .163E+05      58.3          2.42       4.67
       1.88   456.63    .220E+05      78.1          2.40       4.69
       2.10   456.85    .292E+05     103.3          2.39       4.72
       2.31   457.06    .372E+05     134.3          2.45       4.61
       2.52   457.27    .456E+05     170.3          2.53       4.46
       2.73   457.48    .545E+05     211.2          2.62       4.30
       2.94   457.69    .638E+05     258.3          2.74       4.12
       3.15   457.90    .733E+05     310.2          2.86       3.94
       3.37   458.12    .832E+05     367.0          2.99       3.78
       3.58   458.33    .932E+05     428.5          3.11       3.63
       3.79   458.54    .104E+06     495.8          3.24       3.48
       4.00   458.75    .115E+06     573.1          3.38       3.34

                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    51.19   12.25  45.55      1.58      2.38
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   OUTFLOW: ID= 1 (  0001) 2873.93    51.22   12.50  45.55      1.58      2.38


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--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):  2873.93  51.224    12.50    45.55
     + ID2= 2 (  0104):     4.47   0.290     1.25    27.82
       ================================================
       ID = 3 (  0100):  2878.40  51.224    12.50    45.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.21   454.96    .442E+03       1.0          0.77       7.33
        0.42   455.17    .102E+04       3.5          1.14       4.93
        0.62   455.37    .175E+04       7.4          1.43       3.94
        0.83   455.58    .261E+04      12.9          1.68       3.36
        1.04   455.79    .361E+04      20.2          1.90       2.97
        1.25   456.00    .475E+04      29.4          2.10       2.69
        1.46   456.21    .618E+04      42.5          2.33       2.42
        1.67   456.42    .816E+04      58.3          2.42       2.33
        1.88   456.63    .110E+05      78.1          2.40       2.35
        2.10   456.85    .146E+05     103.3          2.39       2.36
        2.31   457.06    .186E+05     134.3          2.45       2.31
        2.52   457.27    .228E+05     170.3          2.53       2.23
        2.73   457.48    .273E+05     211.2          2.62       2.15
        2.94   457.69    .319E+05     258.3          2.74       2.06
        3.15   457.90    .367E+05     310.2          2.86       1.97
        3.37   458.12    .416E+05     367.0          2.99       1.89
        3.58   458.33    .466E+05     428.5          3.11       1.81
        3.79   458.54    .518E+05     495.8          3.24       1.74
        4.00   458.75    .573E+05     573.1          3.38       1.67

                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0100) 2878.40    51.22   12.50  45.52      1.58      2.38
   OUTFLOW: ID= 1 (  0033) 2878.40    51.23   12.50  45.52      1.58      2.37


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--------------------
| CALIB            |
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.60

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)=  38.810 (i)
     TIME TO PEAK    (hrs)=   8.750
     RUNOFF VOLUME    (mm)=  29.965
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.339

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

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| ROUTE CHN(0020)|
| IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
12.14	470.87	0.0500	
17.70	470.75	0.0500 /0.0300	
21.67	470.25	0.0300	Main Channel
24.23	470.25	0.0300	Main Channel
27.54	470.75	0.0300 /0.0500	Main Channel
30.81	471.00	0.0500	
40.00	471.16	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.03	470.28	.106E+03	0.0	0.18	109.47
0.07	470.32	.229E+03	0.1	0.27	72.36
0.10	470.35	.371E+03	0.1	0.34	57.58
0.13	470.38	.531E+03	0.2	0.39	49.31
0.16	470.41	.708E+03	0.3	0.44	43.90
0.20	470.45	.904E+03	0.4	0.48	40.01
0.23	470.48	.112E+04	0.5	0.52	37.05
0.26	470.51	.135E+04	0.6	0.56	34.69
0.29	470.54	.160E+04	0.8	0.59	32.75
0.33	470.58	.186E+04	1.0	0.62	31.11
0.36	470.61	.215E+04	1.2	0.65	29.71
0.39	470.64	.245E+04	1.4	0.68	28.49
0.42	470.67	.277E+04	1.7	0.70	27.40
0.46	470.71	.311E+04	2.0	0.73	26.44
0.49	470.74	.347E+04	2.3	0.75	25.56
0.52	470.77	.386E+04	2.6	0.79	24.42
0.55	470.80	.432E+04	3.1	0.82	23.53
0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->				<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (2000)	2922.70	38.81	8.75	29.97	0.61	0.85
OUTFLOW:	ID= 1 (0020)	2922.70	38.02	9.25	29.97	0.62	0.86

| ROUTE CHN(0019)|
| IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

```
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0020) 2922.70    38.02    9.25  29.97      0.25      0.31
   OUTFLOW: ID= 1 (  0019) 2922.70    34.84   10.50  29.96      0.25      0.31



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--------------------
| ROUTE CHN(  0018)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   6.54        467.25        0.0500
                  19.67        466.75    0.0500 /0.0300
                  22.61        466.14        0.0300      Main Channel
                  25.22        466.22        0.0300      Main Channel
                  28.78        467.00    0.0300 /0.0500  Main Channel
                  47.66        467.67        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.06   466.20    .639E+02       0.0          0.18       94.08
        0.12   466.26    .237E+03       0.1          0.32       51.84
        0.18   466.32    .448E+03       0.2          0.44       37.57
        0.23   466.37    .691E+03       0.4          0.54       30.91
        0.29   466.43    .966E+03       0.6          0.62       26.91
        0.35   466.49    .127E+04       0.9          0.69       24.18
        0.41   466.55    .161E+04       1.2          0.75       22.17
        0.47   466.61    .198E+04       1.6          0.81       20.60
        0.53   466.67    .239E+04       2.1          0.86       19.33
        0.58   466.72    .282E+04       2.6          0.91       18.28
        0.64   466.78    .330E+04       3.2          0.96       17.34
        0.70   466.84    .388E+04       3.9          1.00       16.72
        0.76   466.90    .456E+04       4.7          1.02       16.32
        0.82   466.96    .535E+04       5.6          1.04       16.04
        0.88   467.02    .624E+04       6.6          1.06       15.73
        0.93   467.07    .730E+04       7.9          1.08       15.38
        0.99   467.13    .855E+04       9.4          1.10       15.19
        1.05   467.19    .998E+04      11.0          1.10       15.08
        1.11   467.25    .116E+05      12.9          1.11       15.01

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0019) 2922.70    34.84   10.50  29.96      1.09      1.11
   OUTFLOW: ID= 1 (  0018) 2922.70    34.67   10.75  29.96      1.11      1.11



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--------------------
| ROUTE CHN(  0017)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  27.82        463.25        0.0500
                  39.01        463.50        0.0500
                  41.03        463.50        0.0500
                  44.22        463.25    0.0500 /0.0300  Main Channel
                  47.11        462.50        0.0300      Main Channel
                  48.44        462.44        0.0300      Main Channel
                  49.79        462.50        0.0300      Main Channel
                  52.47        463.25    0.0300 /0.0500  Main Channel
                  56.68        463.50        0.0500
                  64.37        463.50        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.04   462.48    .367E+02       0.0          0.15      110.68
        0.08   462.52    .138E+03       0.0          0.27       61.69
        0.12   462.56    .259E+03       0.1          0.38       43.49
        0.16   462.60    .392E+03       0.2          0.47       35.13
        0.20   462.64    .538E+03       0.3          0.55       30.16
        0.24   462.68    .695E+03       0.4          0.62       26.79
        0.28   462.72    .865E+03       0.6          0.69       24.32
        0.32   462.76    .105E+04       0.8          0.74       22.42
        0.36   462.80    .124E+04       1.0          0.80       20.89
```

0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0018)	2922.70	34.67	10.75	29.96	0.74	1.20
OUTFLOW: ID= 1 (0017)	2922.70	34.47	11.00	29.96	0.77	1.23

ROUTE CHN(0016) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel
30.53	460.25	0.0300 /0.0500	Main Channel
60.87	460.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	458.81	.262E+03	0.1	0.20	82.51
0.13	458.88	.554E+03	0.2	0.31	53.72
0.19	458.94	.875E+03	0.3	0.40	42.17
0.25	459.00	.123E+04	0.6	0.47	35.68
0.31	459.06	.160E+04	0.9	0.53	31.42
0.38	459.13	.201E+04	1.2	0.59	28.36
0.44	459.19	.245E+04	1.6	0.64	26.03
0.50	459.25	.292E+04	2.0	0.69	24.18
0.56	459.31	.342E+04	2.5	0.74	22.66
0.63	459.38	.394E+04	3.1	0.78	21.39
0.69	459.44	.450E+04	3.7	0.82	20.31
0.75	459.50	.509E+04	4.4	0.86	19.36
0.81	459.56	.570E+04	5.1	0.90	18.53
0.88	459.63	.634E+04	5.9	0.94	17.80
0.94	459.69	.702E+04	6.8	0.97	17.14
1.00	459.75	.772E+04	7.8	1.01	16.54
1.08	459.83	.879E+04	9.3	1.06	15.68
1.17	459.92	.101E+05	11.1	1.10	15.19
1.25	460.00	.116E+05	13.0	1.12	14.91

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0017)	2922.70	34.47	11.00	29.96	1.22	1.11
OUTFLOW: ID= 1 (0016)	2922.70	34.29	11.25	29.96	1.25	1.12

ROUTE CHN(0015) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
131.87	458.25	0.0500	
140.91	458.66	0.0500 /0.0300	
147.80	457.48	0.0300	Main Channel
149.90	457.48	0.0300	Main Channel
153.04	458.50	0.0300 /0.0500	Main Channel
156.08	458.60	0.0500	
157.70	458.75	0.0500	
160.00	458.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	457.52	.924E+02	0.0	0.12	134.80
0.08	457.56	.199E+03	0.0	0.19	89.01
0.12	457.60	.321E+03	0.1	0.24	70.81
0.16	457.64	.457E+03	0.1	0.27	60.67
0.20	457.68	.608E+03	0.2	0.31	54.05
0.24	457.72	.774E+03	0.3	0.34	49.33
0.28	457.76	.954E+03	0.3	0.36	45.73
0.32	457.80	.115E+04	0.4	0.39	42.89
0.36	457.84	.136E+04	0.6	0.41	40.55
0.41	457.89	.158E+04	0.7	0.43	38.59
0.45	457.93	.182E+04	0.8	0.45	36.91
0.49	457.97	.208E+04	1.0	0.47	35.45
0.53	458.01	.234E+04	1.1	0.49	34.15
0.57	458.05	.263E+04	1.3	0.51	33.00
0.61	458.09	.292E+04	1.5	0.52	31.96
0.65	458.13	.324E+04	1.7	0.54	31.02
0.69	458.17	.356E+04	2.0	0.55	30.15
0.73	458.21	.390E+04	2.2	0.57	29.36
0.77	458.25	.426E+04	2.5	0.58	28.62

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0016)	2922.70	34.29	11.25	29.96	0.75	0.57
OUTFLOW:	ID= 1 (0015)	2922.70	33.60	12.00	29.96	0.77	0.58

ROUTE CHN(0014) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
150.00	456.75	0.0500	
155.75	456.75	0.0500 /0.0300	
160.05	456.00	0.0300	Main Channel
165.32	456.00	0.0300	Main Channel
170.87	457.50	0.0300 /0.0500	Main Channel
172.96	457.75	0.0500	
175.82	457.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	456.04	.215E+03	0.0	0.09	180.09
0.08	456.08	.445E+03	0.1	0.14	115.91
0.12	456.12	.690E+03	0.1	0.18	90.27
0.16	456.16	.950E+03	0.2	0.22	75.96
0.20	456.20	.122E+04	0.3	0.25	66.67
0.24	456.24	.151E+04	0.4	0.28	60.07
0.28	456.28	.182E+04	0.5	0.30	55.11
0.32	456.32	.213E+04	0.7	0.33	51.21
0.36	456.36	.247E+04	0.9	0.35	48.06
0.39	456.39	.282E+04	1.0	0.37	45.44
0.43	456.43	.318E+04	1.2	0.39	43.23
0.47	456.47	.356E+04	1.4	0.40	41.33
0.51	456.51	.395E+04	1.7	0.42	39.67
0.55	456.55	.435E+04	1.9	0.44	38.22
0.59	456.59	.477E+04	2.2	0.45	36.92
0.63	456.63	.521E+04	2.4	0.47	35.76
0.67	456.67	.566E+04	2.7	0.48	34.70
0.71	456.71	.613E+04	3.0	0.49	33.75
0.75	456.75	.661E+04	3.3	0.51	32.87

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0015)	2922.70	33.60	12.00	29.96	0.70	0.49
OUTFLOW:	ID= 1 (0014)	2922.70	32.81	12.50	29.96	0.75	0.51

ROUTE CHN(0013) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

```
              Distance      Elevation       Manning
                155.00        456.25        0.0500
                161.70        456.25    0.0500 /0.0300
                169.49        455.25        0.0300      Main Channel
                170.18        455.25        0.0300      Main Channel
                176.86        456.75    0.0300 /0.0500  Main Channel
                181.81        456.75        0.0500
                188.74        456.25        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.08   455.33    .926E+02        0.0          0.18       90.89
       0.16   455.41    .262E+03        0.1          0.25       65.50
       0.24   455.49    .507E+03        0.2          0.31       53.95
       0.32   455.57    .828E+03        0.3          0.36       46.77
       0.39   455.64    .123E+04        0.5          0.40       41.69
       0.47   455.72    .170E+04        0.7          0.44       37.85
       0.55   455.80    .225E+04        1.1          0.48       34.80
       0.63   455.88    .288E+04        1.5          0.52       32.31
       0.71   455.96    .358E+04        2.0          0.55       30.23
       0.79   456.04    .436E+04        2.6          0.59       28.46
       0.87   456.12    .522E+04        3.2          0.62       26.93
       0.95   456.20    .615E+04        4.0          0.65       25.59
       1.03   456.28    .734E+04        4.9          0.67       24.78
       1.11   456.36    .898E+04        6.2          0.68       24.34
       1.18   456.43    .107E+05        7.6          0.71       23.62
       1.26   456.51    .126E+05        9.2          0.73       22.81
       1.34   456.59    .146E+05       11.1          0.76       22.00
       1.42   456.67    .167E+05       13.1          0.79       21.22
       1.50   456.75    .189E+05       15.2          0.81       20.70

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  0014) 2922.70    32.81   12.50  29.96      1.47       0.80
   OUTFLOW: ID= 1 (  0013) 2922.70    32.56   13.00  29.96      1.50       0.81



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0012)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                124.10        455.50        0.0500
                144.47        455.50        0.0500
                148.86        455.75        0.0500
                150.17        455.75        0.0500
                151.79        455.50    0.0500 /0.0300  Main Channel
                155.72        454.00        0.0300      Main Channel
                158.28        453.76        0.0300      Main Channel
                161.63        454.00        0.0300      Main Channel
                165.55        455.50    0.0300 /0.0500  Main Channel
                169.69        455.50        0.0500
                175.87        455.25        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.10   453.86    .129E+03        0.0          0.08      209.88
       0.20   453.96    .516E+03        0.1          0.13      132.21
       0.31   454.07    .112E+04        0.2          0.18       91.49
       0.41   454.17    .179E+04        0.4          0.23       70.94
       0.51   454.27    .251E+04        0.7          0.28       59.65
       0.61   454.37    .329E+04        1.0          0.32       52.34
       0.72   454.48    .412E+04        1.5          0.35       47.15
       0.82   454.58    .501E+04        1.9          0.39       43.22
       0.92   454.68    .595E+04        2.5          0.42       40.11
       1.02   454.78    .695E+04        3.1          0.44       37.58
       1.13   454.89    .800E+04        3.8          0.47       35.47
       1.23   454.99    .911E+04        4.5          0.50       33.66
       1.33   455.09    .103E+05        5.3          0.52       32.10
       1.43   455.19    .115E+05        6.2          0.54       30.73
       1.54   455.30    .128E+05        7.2          0.56       29.57
       1.64   455.40    .144E+05        8.3          0.58       28.91
       1.74   455.50    .162E+05        9.4          0.58       28.67
       1.87   455.63    .220E+05       11.7          0.53       31.39
       1.99   455.75    .281E+05       14.4          0.51       32.45

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
```

```
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0013) 2922.70    32.56   13.00  29.96      1.95      0.52
   OUTFLOW: ID= 1 (  0012) 2922.70    32.23   13.50  29.96      1.95      0.52



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| ROUTE CHN(  0011)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.00        455.75        0.0500
                 137.92        455.00    0.0500 /0.0300
                 144.47        453.45        0.0300      Main Channel
                 146.45        453.43        0.0300      Main Channel
                 148.74        453.48        0.0300      Main Channel
                 151.36        453.75        0.0300      Main Channel
                 154.10        453.93        0.0300      Main Channel
                 155.00        454.00        0.0300      Main Channel
                 161.50        455.18    0.0300 /0.0500  Main Channel
                 168.74        455.67        0.0500
                 170.19        455.67        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.02   453.45    .290E+02       0.0          0.10     164.18
       0.14   453.57    .573E+03       0.3          0.48      35.05
       0.25   453.68    .132E+04       0.9          0.69      24.05
       0.37   453.80    .227E+04       1.9          0.84      19.87
       0.49   453.92    .347E+04       3.3          0.95      17.58
       0.60   454.03    .492E+04       5.3          1.08      15.43
       0.72   454.15    .653E+04       8.0          1.23      13.54
       0.84   454.27    .827E+04      11.3          1.37      12.21
       0.95   454.38    .101E+05      15.1          1.49      11.21
       1.07   454.50    .121E+05      19.4          1.60      10.43
       1.19   454.62    .143E+05      24.3          1.70       9.79
       1.31   454.74    .166E+05      29.8          1.80       9.26
       1.42   454.85    .190E+05      35.9          1.89       8.81
       1.54   454.97    .215E+05      42.5          1.98       8.42
       1.66   455.09    .242E+05      50.0          2.07       8.07
       1.77   455.20    .273E+05      58.6          2.15       7.76
       1.89   455.32    .307E+05      69.0          2.25       7.42
       2.01   455.44    .346E+05      80.3          2.32       7.19
       2.12   455.55    .390E+05      92.7          2.38       7.01

                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0012) 2922.70    32.23   13.50  29.96      1.35      1.84
   OUTFLOW: ID= 1 (  0011) 2922.70    32.24   13.50  29.96      1.35      1.83



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--------------------
| ADD HYD  (  0200)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0011):  2922.70  32.240    13.50    29.96
      + ID2= 2 (  0033):  2878.40  51.234    12.50    45.52
        ================================================
        ID = 3 (  0200):  5801.10  82.081    12.75    37.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ROUTE CHN(  0031)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  23.66        457.50        0.0500
                  47.14        455.00        0.0500
                  62.60        454.50        0.0500
                  62.72        454.25        0.0500
                  73.90        453.50    0.0500 /0.0300  Main Channel
                  83.00        450.25        0.0300      Main Channel
                  85.93        450.00        0.0300      Main Channel
```

93.20	449.75	0.0300		Main Channel
101.08	449.00	0.0300		Main Channel
107.87	449.00	0.0300		Main Channel
114.70	453.40	0.0300 /0.0500		Main Channel
117.36	454.00	0.0500		
123.95	454.11	0.0500		
180.00	458.52	0.0500		
200.00	459.04	0.0500		

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0200)	5801.10	82.08	12.75	37.68	1.75	2.43
OUTFLOW: ID= 1 (0031)	5801.10	82.11	13.00	37.68	1.74	2.42

ROUTE CHN(0032)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning		
4.69	451.07	0.0500		
13.38	451.10	0.0500		
23.86	450.00	0.0500 /0.0300		Main Channel
32.76	447.75	0.0300		Main Channel
35.26	447.50	0.0300		Main Channel
46.15	447.50	0.0300		Main Channel
49.16	447.75	0.0300		Main Channel
56.34	451.00	0.0300 /0.0500		Main Channel
67.16	452.61	0.0500		
73.93	452.92	0.0500		

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.18	447.68	.165E+03	1.8	0.77	1.55
0.36	447.86	.375E+03	6.3	1.21	0.99
0.54	448.04	.601E+03	13.3	1.59	0.75
0.71	448.21	.842E+03	22.4	1.91	0.63
0.89	448.39	.110E+04	33.5	2.20	0.55
1.07	448.57	.137E+04	46.5	2.45	0.49
1.25	448.75	.165E+04	61.5	2.68	0.45
1.43	448.93	.195E+04	78.4	2.90	0.41
1.61	449.11	.226E+04	97.3	3.10	0.39
1.79	449.29	.258E+04	118.2	3.30	0.36
1.96	449.46	.292E+04	141.1	3.48	0.35
2.14	449.64	.328E+04	166.1	3.65	0.33
2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)

```
   INFLOW : ID= 2 (  0031) 5801.10    82.11   13.00  37.68      1.46      2.94
   OUTFLOW: ID= 1 (  0032) 5801.10    82.13   13.00  37.68      1.46      2.93



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--------------------
| CALIB            |
| NASHYD   (  3000)|   Area    (ha)=  25.69   Curve Number   (CN)= 85.2
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.57

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
              0.250    8.87 | 1.000  130.49 | 1.750   14.41 |  2.50    8.93
              0.500   11.43 | 1.250   33.46 | 2.000   11.98 |  2.75    7.91
              0.750   21.51 | 1.500   20.25 | 2.250   10.02 |  3.00    7.27

     Unit Hyd Qpeak  (cms)=   1.721

     PEAK FLOW       (cms)=   1.660 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  39.998
     TOTAL RAINFALL   (mm)=  71.636
     RUNOFF COEFFICIENT   =   0.558

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0103)|   Area    (ha)=   3.83   Curve Number   (CN)= 74.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
              0.250    8.87 | 1.000  130.49 | 1.750   14.41 |  2.50    8.93
              0.500   11.43 | 1.250   33.46 | 2.000   11.98 |  2.75    7.91
              0.750   21.51 | 1.500   20.25 | 2.250   10.02 |  3.00    7.27

     Unit Hyd Qpeak  (cms)=   0.585

     PEAK FLOW       (cms)=   0.264 (i)
     TIME TO PEAK    (hrs)=   1.000
     RUNOFF VOLUME    (mm)=  27.488
     TOTAL RAINFALL   (mm)=  71.636
     RUNOFF COEFFICIENT   =   0.384

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   5.55   Curve Number   (CN)= 75.2
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.29

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
              0.250    8.87 | 1.000  130.49 | 1.750   14.41 |  2.50    8.93
              0.500   11.43 | 1.250   33.46 | 2.000   11.98 |  2.75    7.91
              0.750   21.51 | 1.500   20.25 | 2.250   10.02 |  3.00    7.27

     Unit Hyd Qpeak  (cms)=   0.731

     PEAK FLOW       (cms)=   0.367 (i)
     TIME TO PEAK    (hrs)=   1.250
     RUNOFF VOLUME    (mm)=  28.692
     TOTAL RAINFALL   (mm)=  71.636
     RUNOFF COEFFICIENT   =   0.401
```

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

ADD HYD (0500)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0102):	5.55	0.367	1.25	28.69
	+ ID2= 2 (0103):	3.83	0.264	1.00	27.49
	ID = 3 (0500):	9.38	0.614	1.25	28.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0500)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0500):	9.38	0.614	1.25	28.20
	+ ID2= 2 (3000):	25.69	1.660	1.50	40.00
	ID = 1 (0500):	35.07	2.103	1.50	36.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0300)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0032):	5801.10	82.125	13.00	37.68
	+ ID2= 2 (0500):	35.07	2.103	1.50	36.84
	ID = 3 (0300):	5836.17	82.125	13.00	37.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0101) ID= 1 DT=15.0 min			
	Area (ha)=	4.53	Curve Number (CN)= 74.5
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.48	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 0.360

PEAK FLOW (cms)= 0.224 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 28.783
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.402

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

ADD HYD (0400)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0101):	4.53	0.224	1.50	28.78
	+ ID2= 2 (0300):	5836.17	82.125	13.00	37.68
	ID = 3 (0400):	5840.70	82.125	13.00	37.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN (0062) IN= 2---> OUT= 1		
	Routing time step (min)'=	15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning

0.00	457.07	0.0500	
20.00	455.31	0.0500	
40.00	452.41	0.0500 /0.0300	Main Channel
60.00	449.56	0.0300	Main Channel
80.00	447.17	0.0300	Main Channel
100.00	447.13	0.0300	Main Channel
120.00	448.92	0.0300	Main Channel
140.00	454.00	0.0300 /0.0500	Main Channel
160.00	454.00	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0400)	5840.70	82.13	13.00	37.67	1.07	2.56
OUTFLOW: ID= 1 (0062)	5840.70	82.13	13.00	37.67	1.07	2.56

Pre-Development - Regional Storm Hazel

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\5e507381-
  Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\5e507381-


DATE: 12/09/2024                          TIME: 12:20:25

USER:


COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Hazel                         **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              5e547945-44cb-4ab6-932c-65fada264dc4\9b431259
| 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

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--------------------
| CALIB            |
| NASHYD   (  0104)|   Area    (ha)=   4.47   Curve Number   (CN)= 74.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
               0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
               0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
               0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
               1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
               1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
               1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
               1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
               2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
               2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
               2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
               2.750    6.00 | 5.750   13.00 | 8.750   13.00 | 11.75   13.00
               3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

     Unit Hyd Qpeak  (cms)=   0.632

     PEAK FLOW       (cms)=   0.536 (i)
     TIME TO PEAK    (hrs)=  10.000
     RUNOFF VOLUME    (mm)= 140.272
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     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.662

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

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--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              5e547945-44cb-4ab6-932c-65fada264dc4\83013d31
| Ptotal=210.33 mm |    Comments: Hazel992
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    5.95 |  3.00   12.90 |  6.00   22.82 |  9.00   52.58
                1.00    3.97 |  4.00   16.86 |  7.00   12.90 | 10.00   37.70
                2.00    5.95 |  5.00   12.90 |  8.00   12.90 | 11.00   12.90

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--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
               0.250    5.95 | 3.250   12.90 | 6.250   22.82 |  9.25   52.58
               0.500    5.95 | 3.500   12.90 | 6.500   22.82 |  9.50   52.58
               0.750    5.95 | 3.750   12.90 | 6.750   22.82 |  9.75   52.58
               1.000    5.95 | 4.000   12.90 | 7.000   22.82 | 10.00   52.58
               1.250    3.97 | 4.250   16.86 | 7.250   12.90 | 10.25   37.70
               1.500    3.97 | 4.500   16.86 | 7.500   12.90 | 10.50   37.70
               1.750    3.97 | 4.750   16.86 | 7.750   12.90 | 10.75   37.70
               2.000    3.97 | 5.000   16.86 | 8.000   12.90 | 11.00   37.70
               2.250    5.95 | 5.250   12.90 | 8.250   12.90 | 11.25   12.90
               2.500    5.95 | 5.500   12.90 | 8.500   12.90 | 11.50   12.90
               2.750    5.95 | 5.750   12.90 | 8.750   12.90 | 11.75   12.90
               3.000    5.95 | 6.000   12.90 | 9.000   12.90 | 12.00   12.90

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)= 176.823 (i)
     TIME TO PEAK    (hrs)=  12.500
     RUNOFF VOLUME    (mm)= 153.367
     TOTAL RAINFALL   (mm)= 210.330
     RUNOFF COEFFICIENT   =   0.729

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

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--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  88.23        474.75        0.0500
                  89.82        474.75    0.0500 /0.0300
                  94.62        473.25        0.0300      Main Channel
                  96.33        473.25        0.0300      Main Channel
                 101.14        474.50    0.0300 /0.0500  Main Channel
                 108.03        474.46        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.06  473.31    .175E+03       0.0          0.22     107.71
        0.13  473.38    .391E+03       0.1          0.33      72.28
        0.19  473.44    .647E+03       0.2          0.41      58.08
        0.25  473.50    .944E+03       0.3          0.47      50.05
        0.32  473.57    .128E+04       0.5          0.53      44.73
        0.38  473.63    .166E+04       0.7          0.58      40.85
        0.45  473.70    .208E+04       0.9          0.63      37.86
        0.51  473.76    .254E+04       1.2          0.67      35.46
        0.57  473.82    .304E+04       1.5          0.71      33.46
        0.64  473.89    .358E+04       1.9          0.75      31.76
        0.70  473.95    .416E+04       2.3          0.78      30.29
```

0.76	474.01	.478E+04	2.7	0.82	29.01
0.83	474.08	.544E+04	3.3	0.85	27.86
0.89	474.14	.615E+04	3.8	0.88	26.84
0.96	474.21	.689E+04	4.4	0.91	25.91
1.02	474.27	.767E+04	5.1	0.94	25.07
1.08	474.33	.850E+04	5.8	0.97	24.29
1.15	474.40	.936E+04	6.6	1.00	23.58
1.21	474.46	.103E+05	7.5	1.03	22.92

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->			<-pipe / channel->	
INFLOW : ID= 2 (1000)	2873.93	176.82	12.50	153.37	1.18	1.02
OUTFLOW: ID= 1 (0010)	2873.93	173.57	13.00	153.37	1.21	1.03

ROUTE CHN(0009)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
59.79	473.44	0.0500	
67.47	472.75	0.0500	
90.84	472.50	0.0500 /0.0300	Main Channel
93.81	472.25	0.0300	Main Channel
95.43	472.25	0.0300	Main Channel
115.15	472.50	0.0300 /0.0500	Main Channel
119.95	472.50	0.0500	
143.58	472.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.03	472.28	.689E+02	0.0	0.07	232.76
0.05	472.30	.194E+03	0.0	0.11	158.29
0.08	472.33	.377E+03	0.1	0.13	125.54
0.10	472.35	.616E+03	0.1	0.16	106.06
0.13	472.38	.912E+03	0.2	0.18	92.83
0.15	472.40	.126E+04	0.3	0.20	83.13
0.18	472.43	.167E+04	0.4	0.22	75.64
0.20	472.45	.214E+04	0.5	0.24	69.65
0.23	472.48	.266E+04	0.7	0.26	64.73
0.25	472.50	.324E+04	0.9	0.28	60.59
0.28	472.53	.412E+04	1.2	0.30	55.76
0.31	472.56	.515E+04	1.6	0.32	52.56
0.33	472.58	.632E+04	2.1	0.33	50.26
0.36	472.61	.764E+04	2.6	0.34	48.49
0.39	472.64	.910E+04	3.2	0.35	47.04
0.42	472.67	.107E+05	3.9	0.36	45.81
0.44	472.69	.125E+05	4.6	0.37	44.73
0.47	472.72	.144E+05	5.5	0.38	43.76
0.50	472.75	.164E+05	6.4	0.39	42.87

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->			<-pipe / channel->	
INFLOW : ID= 2 (0010)	2873.93	173.57	13.00	153.37	0.50	0.39
OUTFLOW: ID= 1 (0009)	2873.93	165.39	13.50	153.37	0.50	0.39

ROUTE CHN(0008)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
16.22	472.00	0.0500	
17.77	472.00	0.0500 /0.0300	
21.59	471.25	0.0300	Main Channel
25.64	472.25	0.0300 /0.0500	Main Channel
28.55	472.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	471.29	.712E+01	0.0	0.09	186.75
0.08	471.33	.285E+02	0.0	0.14	117.64

0.12	471.37	.641E+02	0.0	0.19	89.78
0.16	471.41	.114E+03	0.0	0.22	74.11
0.20	471.45	.178E+03	0.0	0.26	63.87
0.24	471.49	.256E+03	0.1	0.29	56.56
0.28	471.53	.349E+03	0.1	0.33	51.03
0.32	471.57	.456E+03	0.2	0.36	46.69
0.36	471.61	.577E+03	0.2	0.39	43.16
0.39	471.64	.712E+03	0.3	0.41	40.23
0.43	471.68	.862E+03	0.4	0.44	37.76
0.47	471.72	.103E+04	0.5	0.47	35.63
0.51	471.76	.120E+04	0.6	0.49	33.78
0.55	471.80	.140E+04	0.7	0.52	32.15
0.59	471.84	.160E+04	0.9	0.54	30.70
0.63	471.88	.182E+04	1.0	0.57	29.41
0.67	471.92	.206E+04	1.2	0.59	28.25
0.71	471.96	.231E+04	1.4	0.61	27.19
0.75	472.00	.257E+04	1.6	0.64	26.23

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2	(0009)	2873.93	165.39	13.50	153.37	0.74	0.63
OUTFLOW: ID= 1	(0008)	2873.93	162.16	14.00	153.37	0.75	0.64

ROUTE CHN(0007)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
9.36	470.00	0.0500	
13.30	470.05	0.0500 /0.0300	
18.94	469.00	0.0300	Main Channel
22.08	469.00	0.0300	Main Channel
26.35	470.00	0.0300 /0.0500	Main Channel
28.73	470.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	469.06	.188E+03	0.0	0.21	79.24
0.11	469.11	.406E+03	0.1	0.32	52.24
0.17	469.17	.653E+03	0.3	0.40	41.50
0.22	469.22	.929E+03	0.4	0.47	35.50
0.28	469.28	.124E+04	0.7	0.53	31.57
0.33	469.33	.157E+04	0.9	0.58	28.77
0.39	469.39	.194E+04	1.2	0.63	26.63
0.44	469.44	.233E+04	1.6	0.67	24.93
0.50	469.50	.275E+04	1.9	0.71	23.54
0.55	469.55	.321E+04	2.4	0.75	22.37
0.61	469.61	.369E+04	2.9	0.78	21.37
0.66	469.66	.420E+04	3.4	0.81	20.49
0.72	469.72	.474E+04	4.0	0.85	19.72
0.77	469.77	.531E+04	4.7	0.88	19.03
0.83	469.83	.591E+04	5.4	0.91	18.41
0.88	469.88	.654E+04	6.1	0.93	17.85
0.94	469.94	.720E+04	6.9	0.96	17.33
0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2	(0008)	2873.93	162.16	14.00	153.37	1.03	1.00
OUTFLOW: ID= 1	(0007)	2873.93	161.06	14.50	153.37	1.05	1.01

ROUTE CHN(0006)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel

```
                24.14        467.99        0.0500
                28.55        467.96        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.06   466.98    .447E+02       0.0          0.17      95.69
        0.11   467.03    .179E+03       0.0          0.28      60.28
        0.17   467.09    .382E+03       0.2          0.41      40.36
        0.23   467.15    .619E+03       0.3          0.52      32.04
        0.28   467.20    .891E+03       0.5          0.61      27.51
        0.34   467.26    .120E+04       0.8          0.68      24.60
        0.39   467.31    .154E+04       1.1          0.74      22.54
        0.45   467.37    .191E+04       1.5          0.79      20.98
        0.51   467.43    .232E+04       2.0          0.84      19.75
        0.56   467.48    .277E+04       2.5          0.89      18.74
        0.62   467.54    .358E+04       3.1          0.86      19.30
        0.68   467.60    .455E+04       3.9          0.86      19.43
        0.73   467.65    .554E+04       4.9          0.88      19.02
        0.79   467.71    .654E+04       5.9          0.91      18.38
        0.84   467.76    .757E+04       7.1          0.94      17.67
        0.90   467.82    .862E+04       8.5          0.98      16.97
        0.96   467.88    .968E+04       9.9          1.02      16.29
        1.01   467.93    .108E+05      11.5          1.06      15.66
        1.07   467.99    .119E+05      12.6          1.05      15.84

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0007) 2873.93   161.06   14.50 153.37      1.06      1.06
    OUTFLOW: ID= 1 (  0006) 2873.93   160.22   14.75 153.37      1.07      1.05



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0005)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   5.00        464.50        0.0500
                  15.50        464.26    0.0500 /0.0500
                  19.30        463.25        0.0500
                  23.50        463.25        0.0300      Main Channel
                  29.00        463.75    0.0300 /0.0500  Main Channel
                  34.65        465.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.07   463.32    .308E+03       0.0          0.12     137.56
        0.13   463.38    .680E+03       0.1          0.19      87.12
        0.20   463.45    .112E+04       0.3          0.25      66.78
        0.26   463.51    .162E+04       0.5          0.30      55.34
        0.33   463.58    .218E+04       0.8          0.35      47.84
        0.39   463.64    .281E+04       1.1          0.39      42.48
        0.46   463.71    .350E+04       1.5          0.43      38.43
        0.53   463.78    .425E+04       2.0          0.48      34.80
        0.59   463.84    .505E+04       2.7          0.53      31.47
        0.66   463.91    .588E+04       3.4          0.58      28.89
        0.72   463.97    .674E+04       4.2          0.62      26.84
        0.79   464.04    .764E+04       5.1          0.66      25.15
        0.86   464.11    .858E+04       6.0          0.70      23.75
        0.92   464.17    .955E+04       7.1          0.74      22.56
        0.99   464.24    .106E+05       8.2          0.77      21.53
        1.05   464.30    .116E+05       9.4          0.81      20.64
        1.12   464.37    .129E+05      10.7          0.83      20.05
        1.18   464.43    .144E+05      12.2          0.85      19.67
        1.25   464.50    .161E+05      13.8          0.86      19.43

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0006) 2873.93   160.22   14.75 153.37      1.19      0.85
    OUTFLOW: ID= 1 (  0005) 2873.93   159.03   15.00 153.37      1.25      0.86



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--------------------
| ROUTE CHN(  0004)|
```

| IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0005)	2873.93	159.03	15.00	153.37	1.95	1.33
OUTFLOW: ID= 1 (0004)	2873.93	158.47	15.25	153.37	1.99	1.35

| ROUTE CHN(0003)|
| IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97
0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	<---- hydrograph ---->				<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL

		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0004)		2873.93	158.47	15.25	153.37	2.75	1.68
OUTFLOW: ID= 1 (0003)		2873.93	158.02	15.25	153.37	2.75	1.69

ROUTE CHN(0002) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0003)	2873.93	158.02	15.25	153.37	1.98	1.55
OUTFLOW: ID= 1 (0002)	2873.93	157.77	15.50	153.37	1.99	1.55

ROUTE CHN(0001) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
39.74	459.25	0.0500	
41.86	459.00	0.0500	
49.51	457.47	0.0500	
58.73	456.75	0.0500	
85.31	456.25	0.0500	
91.00	456.00	0.0500 /0.0300	Main Channel
98.50	454.75	0.0300	Main Channel
103.78	454.75	0.0300	Main Channel
116.96	458.50	0.0300 /0.0500	Main Channel
125.11	458.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.21	454.96	.885E+03	1.0	0.77	14.66
0.42	455.17	.205E+04	3.5	1.14	9.86
0.62	455.37	.349E+04	7.4	1.43	7.88
0.83	455.58	.522E+04	12.9	1.68	6.72
1.04	455.79	.722E+04	20.2	1.90	5.95
1.25	456.00	.950E+04	29.4	2.10	5.38
1.46	456.21	.124E+05	42.5	2.33	4.85
1.67	456.42	.163E+05	58.3	2.42	4.67

1.88	456.63	.220E+05	78.1	2.40	4.69
2.10	456.85	.292E+05	103.3	2.39	4.72
2.31	457.06	.372E+05	134.3	2.45	4.61
2.52	457.27	.456E+05	170.3	2.53	4.46
2.73	457.48	.545E+05	211.2	2.62	4.30
2.94	457.69	.638E+05	258.3	2.74	4.12
3.15	457.90	.733E+05	310.2	2.86	3.94
3.37	458.12	.832E+05	367.0	2.99	3.78
3.58	458.33	.932E+05	428.5	3.11	3.63
3.79	458.54	.104E+06	495.8	3.24	3.48
4.00	458.75	.115E+06	573.1	3.38	3.34

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0002)		2873.93	157.77	15.50	153.37	2.45	2.50
OUTFLOW: ID= 1 (0001)		2873.93	157.62	15.50	153.37	2.44	2.50

ADD HYD (0100)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):	2873.93	157.625	15.50	153.37
+ ID2= 2 (0104):	4.47	0.536	10.00	140.27
ID = 3 (0100):	2878.40	157.625	15.50	153.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0033)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
39.74	459.25	0.0500	
41.86	459.00	0.0500	
49.51	457.47	0.0500	
58.73	456.75	0.0500	
85.31	456.25	0.0500	
91.00	456.00	0.0500 /0.0300	Main Channel
98.50	454.75	0.0300	Main Channel
103.78	454.75	0.0300	Main Channel
116.96	458.50	0.0300 /0.0500	Main Channel
125.11	458.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.21	454.96	.442E+03	1.0	0.77	7.33
0.42	455.17	.102E+04	3.5	1.14	4.93
0.62	455.37	.175E+04	7.4	1.43	3.94
0.83	455.58	.261E+04	12.9	1.68	3.36
1.04	455.79	.361E+04	20.2	1.90	2.97
1.25	456.00	.475E+04	29.4	2.10	2.69
1.46	456.21	.618E+04	42.5	2.33	2.42
1.67	456.42	.816E+04	58.3	2.42	2.33
1.88	456.63	.110E+05	78.1	2.40	2.35
2.10	456.85	.146E+05	103.3	2.39	2.36
2.31	457.06	.186E+05	134.3	2.45	2.31
2.52	457.27	.228E+05	170.3	2.53	2.23
2.73	457.48	.273E+05	211.2	2.62	2.15
2.94	457.69	.319E+05	258.3	2.74	2.06
3.15	457.90	.367E+05	310.2	2.86	1.97
3.37	458.12	.416E+05	367.0	2.99	1.89
3.58	458.33	.466E+05	428.5	3.11	1.81
3.79	458.54	.518E+05	495.8	3.24	1.74
4.00	458.75	.573E+05	573.1	3.38	1.67

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0100)		2878.40	157.62	15.50	153.35	2.44	2.50
OUTFLOW: ID= 1 (0033)		2878.40	157.66	15.75	153.35	2.44	2.50

CALIB

```
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   2.60

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
               0.250    5.95 | 3.250   12.90 | 6.250   22.82 |  9.25   52.58
               0.500    5.95 | 3.500   12.90 | 6.500   22.82 |  9.50   52.58
               0.750    5.95 | 3.750   12.90 | 6.750   22.82 |  9.75   52.58
               1.000    5.95 | 4.000   12.90 | 7.000   22.82 | 10.00   52.58
               1.250    3.97 | 4.250   16.86 | 7.250   12.90 | 10.25   37.70
               1.500    3.97 | 4.500   16.86 | 7.500   12.90 | 10.50   37.70
               1.750    3.97 | 4.750   16.86 | 7.750   12.90 | 10.75   37.70
               2.000    3.97 | 5.000   16.86 | 8.000   12.90 | 11.00   37.70
               2.250    5.95 | 5.250   12.90 | 8.250   12.90 | 11.25   12.90
               2.500    5.95 | 5.500   12.90 | 8.500   12.90 | 11.50   12.90
               2.750    5.95 | 5.750   12.90 | 8.750   12.90 | 11.75   12.90
               3.000    5.95 | 6.000   12.90 | 9.000   12.90 | 12.00   12.90

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)= 147.021 (i)
     TIME TO PEAK    (hrs)=  12.500
     RUNOFF VOLUME    (mm)= 118.927
     TOTAL RAINFALL   (mm)= 210.330
     RUNOFF COEFFICIENT   =   0.565

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

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--------------------
| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87        0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25        0.0300      Main Channel
                  24.23        470.25        0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00        0.0500
                  40.00        471.16        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   470.28    .106E+03       0.0          0.18     109.47
        0.07   470.32    .229E+03       0.1          0.27      72.36
        0.10   470.35    .371E+03       0.1          0.34      57.58
        0.13   470.38    .531E+03       0.2          0.39      49.31
        0.16   470.41    .708E+03       0.3          0.44      43.90
        0.20   470.45    .904E+03       0.4          0.48      40.01
        0.23   470.48    .112E+04       0.5          0.52      37.05
        0.26   470.51    .135E+04       0.6          0.56      34.69
        0.29   470.54    .160E+04       0.8          0.59      32.75
        0.33   470.58    .186E+04       1.0          0.62      31.11
        0.36   470.61    .215E+04       1.2          0.65      29.71
        0.39   470.64    .245E+04       1.4          0.68      28.49
        0.42   470.67    .277E+04       1.7          0.70      27.40
        0.46   470.71    .311E+04       2.0          0.73      26.44
        0.49   470.74    .347E+04       2.3          0.75      25.56
        0.52   470.77    .386E+04       2.6          0.79      24.42
        0.55   470.80    .432E+04       3.1          0.82      23.53
        0.59   470.84    .485E+04       3.5          0.84      22.95
        0.62   470.87    .545E+04       4.0          0.86      22.57

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  2000) 2922.70   147.02   12.50 118.93      0.62      0.85
    OUTFLOW: ID= 1 (  0020) 2922.70   144.36   13.00 118.93      0.62      0.86



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| ROUTE CHN(  0019)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
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               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  60.00        467.50        0.0500
                  68.78        467.50    0.0500 /0.0300
                  75.63        467.28        0.0300      Main Channel
                  75.99        467.25        0.0300      Main Channel
                  80.23        467.25        0.0300      Main Channel
                  82.81        467.75    0.0300 /0.0500  Main Channel
                  87.19        467.93        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.01   467.26    .433E+02        0.0           0.05       328.94
       0.02   467.27    .883E+02        0.0           0.08       209.84
       0.03   467.28    .135E+03        0.0           0.10       162.03
       0.04   467.29    .204E+03        0.0           0.13       127.07
       0.06   467.31    .280E+03        0.0           0.15       108.18
       0.07   467.32    .362E+03        0.1           0.17        96.07
       0.09   467.34    .452E+03        0.1           0.19        87.54
       0.10   467.35    .548E+03        0.1           0.21        81.15
       0.11   467.36    .652E+03        0.1           0.22        76.14
       0.13   467.38    .762E+03        0.2           0.23        72.09
       0.14   467.39    .879E+03        0.2           0.24        68.72
       0.15   467.40    .100E+04        0.3           0.25        65.86
       0.17   467.42    .113E+04        0.3           0.26        63.40
       0.18   467.43    .127E+04        0.3           0.27        61.25
       0.20   467.45    .142E+04        0.4           0.28        59.34
       0.21   467.46    .157E+04        0.5           0.29        57.64
       0.22   467.47    .173E+04        0.5           0.30        56.10
       0.24   467.49    .189E+04        0.6           0.30        54.71
       0.25   467.50    .207E+04        0.6           0.31        53.49

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0020) 2922.70   144.36   13.00 118.93      0.24      0.31
    OUTFLOW: ID= 1 (  0019) 2922.70   131.56   14.00 118.93      0.25      0.31



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--------------------
| ROUTE CHN(  0018)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   6.54        467.25        0.0500
                  19.67        466.75    0.0500 /0.0300
                  22.61        466.14        0.0300      Main Channel
                  25.22        466.22        0.0300      Main Channel
                  28.78        467.00    0.0300 /0.0500  Main Channel
                  47.66        467.67        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.06   466.20    .639E+02        0.0           0.18        94.08
       0.12   466.26    .237E+03        0.1           0.32        51.84
       0.18   466.32    .448E+03        0.2           0.44        37.57
       0.23   466.37    .691E+03        0.4           0.54        30.91
       0.29   466.43    .966E+03        0.6           0.62        26.91
       0.35   466.49    .127E+04        0.9           0.69        24.18
       0.41   466.55    .161E+04        1.2           0.75        22.17
       0.47   466.61    .198E+04        1.6           0.81        20.60
       0.53   466.67    .239E+04        2.1           0.86        19.33
       0.58   466.72    .282E+04        2.6           0.91        18.28
       0.64   466.78    .330E+04        3.2           0.96        17.34
       0.70   466.84    .388E+04        3.9           1.00        16.72
       0.76   466.90    .456E+04        4.7           1.02        16.32
       0.82   466.96    .535E+04        5.6           1.04        16.04
       0.88   467.02    .624E+04        6.6           1.06        15.73
       0.93   467.07    .730E+04        7.9           1.08        15.38
       0.99   467.13    .855E+04        9.4           1.10        15.19
       1.05   467.19    .998E+04       11.0           1.10        15.08
       1.11   467.25    .116E+05       12.9           1.11        15.01

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0019) 2922.70   131.56   14.00 118.93      1.10      1.11
   OUTFLOW: ID= 1 (  0018) 2922.70   130.90   14.25 118.93      1.11      1.11



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0017)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  27.82        463.25        0.0500
                  39.01        463.50        0.0500
                  41.03        463.50        0.0500
                  44.22        463.25    0.0500 /0.0300  Main Channel
                  47.11        462.50        0.0300      Main Channel
                  48.44        462.44        0.0300      Main Channel
                  49.79        462.50        0.0300      Main Channel
                  52.47        463.25    0.0300 /0.0500  Main Channel
                  56.68        463.50        0.0500
                  64.37        463.50        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.04   462.48    .367E+02        0.0           0.15      110.68
       0.08   462.52    .138E+03        0.0           0.27       61.69
       0.12   462.56    .259E+03        0.1           0.38       43.49
       0.16   462.60    .392E+03        0.2           0.47       35.13
       0.20   462.64    .538E+03        0.3           0.55       30.16
       0.24   462.68    .695E+03        0.4           0.62       26.79
       0.28   462.72    .865E+03        0.6           0.69       24.32
       0.32   462.76    .105E+04        0.8           0.74       22.42
       0.36   462.80    .124E+04        1.0           0.80       20.89
       0.40   462.84    .145E+04        1.2           0.85       19.62
       0.45   462.89    .166E+04        1.5           0.90       18.56
       0.49   462.93    .189E+04        1.8           0.94       17.64
       0.53   462.97    .214E+04        2.1           0.99       16.84
       0.57   463.01    .239E+04        2.5           1.03       16.14
       0.61   463.05    .266E+04        2.9           1.07       15.51
       0.65   463.09    .294E+04        3.3           1.12       14.94
       0.69   463.13    .323E+04        3.7           1.15       14.43
       0.73   463.17    .353E+04        4.2           1.19       13.97
       0.77   463.21    .385E+04        4.7           1.23       13.54

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0018) 2922.70   130.90   14.25 118.93      0.75      1.21
   OUTFLOW: ID= 1 (  0017) 2922.70   130.24   14.50 118.93      0.77      1.23



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--------------------
| ROUTE CHN(  0016)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   5.63        460.00        0.0500
                  10.00        460.00        0.0500
                  17.60        459.75    0.0500 /0.0300  Main Channel
                  22.22        458.75        0.0300      Main Channel
                  26.18        458.75        0.0300      Main Channel
                  30.53        460.25    0.0300 /0.0500  Main Channel
                  60.87        460.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.06   458.81    .262E+03        0.1           0.20       82.51
       0.13   458.88    .554E+03        0.2           0.31       53.72
       0.19   458.94    .875E+03        0.3           0.40       42.17
       0.25   459.00    .123E+04        0.6           0.47       35.68
       0.31   459.06    .160E+04        0.9           0.53       31.42
       0.38   459.13    .201E+04        1.2           0.59       28.36
       0.44   459.19    .245E+04        1.6           0.64       26.03
       0.50   459.25    .292E+04        2.0           0.69       24.18
       0.56   459.31    .342E+04        2.5           0.74       22.66
       0.63   459.38    .394E+04        3.1           0.78       21.39
       0.69   459.44    .450E+04        3.7           0.82       20.31
```

0.75	459.50	.509E+04	4.4	0.86	19.36
0.81	459.56	.570E+04	5.1	0.90	18.53
0.88	459.63	.634E+04	5.9	0.94	17.80
0.94	459.69	.702E+04	6.8	0.97	17.14
1.00	459.75	.772E+04	7.8	1.01	16.54
1.08	459.83	.879E+04	9.3	1.06	15.68
1.17	459.92	.101E+05	11.1	1.10	15.19
1.25	460.00	.116E+05	13.0	1.12	14.91

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0017)	2922.70	130.24	14.50	118.93	1.24	1.12
OUTFLOW: ID= 1 (0016)	2922.70	129.62	14.75	118.93	1.25	1.12

ROUTE CHN(0015) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
131.87	458.25	0.0500	
140.91	458.66	0.0500 /0.0300	
147.80	457.48	0.0300	Main Channel
149.90	457.48	0.0300	Main Channel
153.04	458.50	0.0300 /0.0500	Main Channel
156.08	458.60	0.0500	
157.70	458.75	0.0500	
160.00	458.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	457.52	.924E+02	0.0	0.12	134.80
0.08	457.56	.199E+03	0.0	0.19	89.01
0.12	457.60	.321E+03	0.1	0.24	70.81
0.16	457.64	.457E+03	0.1	0.27	60.67
0.20	457.68	.608E+03	0.2	0.31	54.05
0.24	457.72	.774E+03	0.3	0.34	49.33
0.28	457.76	.954E+03	0.3	0.36	45.73
0.32	457.80	.115E+04	0.4	0.39	42.89
0.36	457.84	.136E+04	0.6	0.41	40.55
0.41	457.89	.158E+04	0.7	0.43	38.59
0.45	457.93	.182E+04	0.8	0.45	36.91
0.49	457.97	.208E+04	1.0	0.47	35.45
0.53	458.01	.234E+04	1.1	0.49	34.15
0.57	458.05	.263E+04	1.3	0.51	33.00
0.61	458.09	.292E+04	1.5	0.52	31.96
0.65	458.13	.324E+04	1.7	0.54	31.02
0.69	458.17	.356E+04	2.0	0.55	30.15
0.73	458.21	.390E+04	2.2	0.57	29.36
0.77	458.25	.426E+04	2.5	0.58	28.62

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0016)	2922.70	129.62	14.75	118.93	0.73	0.57
OUTFLOW: ID= 1 (0015)	2922.70	127.10	15.25	118.93	0.77	0.58

ROUTE CHN(0014) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
150.00	456.75	0.0500	
155.75	456.75	0.0500 /0.0300	
160.05	456.00	0.0300	Main Channel
165.32	456.00	0.0300	Main Channel
170.87	457.50	0.0300 /0.0500	Main Channel
172.96	457.75	0.0500	
175.82	457.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)

0.04	456.04	.215E+03	0.0	0.09	180.09
0.08	456.08	.445E+03	0.1	0.14	115.91
0.12	456.12	.690E+03	0.1	0.18	90.27
0.16	456.16	.950E+03	0.2	0.22	75.96
0.20	456.20	.122E+04	0.3	0.25	66.67
0.24	456.24	.151E+04	0.4	0.28	60.07
0.28	456.28	.182E+04	0.5	0.30	55.11
0.32	456.32	.213E+04	0.7	0.33	51.21
0.36	456.36	.247E+04	0.9	0.35	48.06
0.39	456.39	.282E+04	1.0	0.37	45.44
0.43	456.43	.318E+04	1.2	0.39	43.23
0.47	456.47	.356E+04	1.4	0.40	41.33
0.51	456.51	.395E+04	1.7	0.42	39.67
0.55	456.55	.435E+04	1.9	0.44	38.22
0.59	456.59	.477E+04	2.2	0.45	36.92
0.63	456.63	.521E+04	2.4	0.47	35.76
0.67	456.67	.566E+04	2.7	0.48	34.70
0.71	456.71	.613E+04	3.0	0.49	33.75
0.75	456.75	.661E+04	3.3	0.51	32.87

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0015)	2922.70	127.10	15.25	118.93	0.74	0.50
OUTFLOW: ID= 1 (| 0014)	2922.70	124.54	15.75	118.93	0.75	0.51

ROUTE CHN(0013)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
155.00	456.25	0.0500	
161.70	456.25	0.0500 /0.0300	
169.49	455.25	0.0300	Main Channel
170.18	455.25	0.0300	Main Channel
176.86	456.75	0.0300 /0.0500	Main Channel
181.81	456.75	0.0500	
188.74	456.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	455.33	.926E+02	0.0	0.18	90.89
0.16	455.41	.262E+03	0.1	0.25	65.50
0.24	455.49	.507E+03	0.2	0.31	53.95
0.32	455.57	.828E+03	0.3	0.36	46.77
0.39	455.64	.123E+04	0.5	0.40	41.69
0.47	455.72	.170E+04	0.7	0.44	37.85
0.55	455.80	.225E+04	1.1	0.48	34.80
0.63	455.88	.288E+04	1.5	0.52	32.31
0.71	455.96	.358E+04	2.0	0.55	30.23
0.79	456.04	.436E+04	2.6	0.59	28.46
0.87	456.12	.522E+04	3.2	0.62	26.93
0.95	456.20	.615E+04	4.0	0.65	25.59
1.03	456.28	.734E+04	4.9	0.67	24.78
1.11	456.36	.898E+04	6.2	0.68	24.34
1.18	456.43	.107E+05	7.6	0.71	23.62
1.26	456.51	.126E+05	9.2	0.73	22.81
1.34	456.59	.146E+05	11.1	0.76	22.00
1.42	456.67	.167E+05	13.1	0.79	21.22
1.50	456.75	.189E+05	15.2	0.81	20.70

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0014)	2922.70	124.54	15.75	118.93	1.47	0.80
OUTFLOW: ID= 1 (| 0013)	2922.70	123.41	16.00	118.93	1.50	0.81

ROUTE CHN(0012)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
124.10	455.50	0.0500

```
                144.47        455.50        0.0500
                148.86        455.75        0.0500
                150.17        455.75        0.0500
                151.79        455.50    0.0500 /0.0300  Main Channel
                155.72        454.00        0.0300      Main Channel
                158.28        453.76        0.0300      Main Channel
                161.63        454.00        0.0300      Main Channel
                165.55        455.50    0.0300 /0.0500  Main Channel
                169.69        455.50        0.0500
                175.87        455.25        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.10   453.86    .129E+03        0.0          0.08      209.88
       0.20   453.96    .516E+03        0.1          0.13      132.21
       0.31   454.07    .112E+04        0.2          0.18       91.49
       0.41   454.17    .179E+04        0.4          0.23       70.94
       0.51   454.27    .251E+04        0.7          0.28       59.65
       0.61   454.37    .329E+04        1.0          0.32       52.34
       0.72   454.48    .412E+04        1.5          0.35       47.15
       0.82   454.58    .501E+04        1.9          0.39       43.22
       0.92   454.68    .595E+04        2.5          0.42       40.11
       1.02   454.78    .695E+04        3.1          0.44       37.58
       1.13   454.89    .800E+04        3.8          0.47       35.47
       1.23   454.99    .911E+04        4.5          0.50       33.66
       1.33   455.09    .103E+05        5.3          0.52       32.10
       1.43   455.19    .115E+05        6.2          0.54       30.73
       1.54   455.30    .128E+05        7.2          0.56       29.57
       1.64   455.40    .144E+05        8.3          0.58       28.91
       1.74   455.50    .162E+05        9.4          0.58       28.67
       1.87   455.63    .220E+05       11.7          0.53       31.39
       1.99   455.75    .281E+05       14.4          0.51       32.45

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
    INFLOW : ID= 2 (  0013) 2922.70   123.41   16.00 118.93      1.94       0.52
    OUTFLOW: ID= 1 (  0012) 2922.70   122.11   16.50 118.92      1.99       0.51


     **** WARNING:  COMPUTATIONS FAILED TO CONVERGE.

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0011)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.00        455.75        0.0500
                 137.92        455.00    0.0500 /0.0300
                 144.47        453.45        0.0300      Main Channel
                 146.45        453.43        0.0300      Main Channel
                 148.74        453.48        0.0300      Main Channel
                 151.36        453.75        0.0300      Main Channel
                 154.10        453.93        0.0300      Main Channel
                 155.00        454.00        0.0300      Main Channel
                 161.50        455.18    0.0300 /0.0500  Main Channel
                 168.74        455.67        0.0500
                 170.19        455.67        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.02   453.45    .290E+02        0.0          0.10      164.18
       0.14   453.57    .573E+03        0.3          0.48       35.05
       0.25   453.68    .132E+04        0.9          0.69       24.05
       0.37   453.80    .227E+04        1.9          0.84       19.87
       0.49   453.92    .347E+04        3.3          0.95       17.58
       0.60   454.03    .492E+04        5.3          1.08       15.43
       0.72   454.15    .653E+04        8.0          1.23       13.54
       0.84   454.27    .827E+04       11.3          1.37       12.21
       0.95   454.38    .101E+05       15.1          1.49       11.21
       1.07   454.50    .121E+05       19.4          1.60       10.43
       1.19   454.62    .143E+05       24.3          1.70        9.79
       1.31   454.74    .166E+05       29.8          1.80        9.26
       1.42   454.85    .190E+05       35.9          1.89        8.81
       1.54   454.97    .215E+05       42.5          1.98        8.42
       1.66   455.09    .242E+05       50.0          2.07        8.07
       1.77   455.20    .273E+05       58.6          2.15        7.76
       1.89   455.32    .307E+05       69.0          2.25        7.42
       2.01   455.44    .346E+05       80.3          2.32        7.19
```

2.12	455.55	.390E+05	92.7	2.38	7.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0012)	2922.70	122.11	16.50	118.92	2.12	2.37
OUTFLOW: ID= 1 (0011)	2922.70	121.89	16.75	118.92	2.12	2.38

ADD HYD (0200)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0011):	2922.70	121.890	16.75	118.92
+ ID2= 2 (0033):	2878.40	157.657	15.75	153.35
ID = 3 (0200):	5801.10	275.205	16.00	136.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0200)	5801.10	275.20	16.00	136.00	3.05	3.65
OUTFLOW: ID= 1 (0031)	5801.10	275.26	16.00	136.00	3.04	3.65

ROUTE CHN(0032)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning

4.69	451.07	0.0500		
13.38	451.10	0.0500		
23.86	450.00	0.0500 /0.0300	Main Channel	
32.76	447.75	0.0300	Main Channel	
35.26	447.50	0.0300	Main Channel	
46.15	447.50	0.0300	Main Channel	
49.16	447.75	0.0300	Main Channel	
56.34	451.00	0.0300 /0.0500	Main Channel	
67.16	452.61	0.0500		
73.93	452.92	0.0500		

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.18	447.68	.165E+03	1.8	0.77	1.55
0.36	447.86	.375E+03	6.3	1.21	0.99
0.54	448.04	.601E+03	13.3	1.59	0.75
0.71	448.21	.842E+03	22.4	1.91	0.63
0.89	448.39	.110E+04	33.5	2.20	0.55
1.07	448.57	.137E+04	46.5	2.45	0.49
1.25	448.75	.165E+04	61.5	2.68	0.45
1.43	448.93	.195E+04	78.4	2.90	0.41
1.61	449.11	.226E+04	97.3	3.10	0.39
1.79	449.29	.258E+04	118.2	3.30	0.36
1.96	449.46	.292E+04	141.1	3.48	0.35
2.14	449.64	.328E+04	166.1	3.65	0.33
2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (	0031)	5801.10	275.26	16.00	136.00	2.76	4.27
OUTFLOW: ID= 1 (	0032)	5801.10	275.30	16.00	136.00	2.76	4.26

CALIB NASHYD (3000) ID= 1 DT=15.0 min	Area (ha)=	25.69	Curve Number (CN)= 85.2
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.57	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 3.027 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.234
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

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

CALIB NASHYD (0103) ID= 1 DT=15.0 min	Area (ha)=	3.83	Curve Number (CN)= 74.5
	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.25	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.585

PEAK FLOW (cms)= 0.456 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 138.591
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.654

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

CALIB NASHYD (0102) ID= 1 DT=15.0 min	Area (ha)= 5.55	Curve Number (CN)= 75.2
	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.29	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.731

PEAK FLOW (cms)= 0.672 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 143.132
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.675

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

ADD HYD (0500) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0102):	5.55	0.672	10.00	143.13
+ ID2= 2 (0103):	3.83	0.456	10.00	138.59
ID = 3 (0500):	9.38	1.128	10.00	141.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0500) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
       ID1= 3 (  0500):     9.38   1.128    10.00   141.28
     + ID2= 2 (  3000):    25.69   3.027    10.25   170.23
       ================================================
       ID = 1 (  0500):    35.07   4.013    10.25   162.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0032):  5801.10 275.303    16.00   136.00
     + ID2= 2 (  0500):    35.07   4.013    10.25   162.49
       ================================================
       ID = 3 (  0300):  5836.17 275.303    16.00   136.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=   4.53   Curve Number   (CN)= 74.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.48

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
              0.250    6.00 | 3.250   13.00 | 6.250   23.00 |  9.25   53.00
              0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50   53.00
              0.750    6.00 | 3.750   13.00 | 6.750   23.00 |  9.75   53.00
              1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00   53.00
              1.250    4.00 | 4.250   17.00 | 7.250   13.00 | 10.25   38.00
              1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50   38.00
              1.750    4.00 | 4.750   17.00 | 7.750   13.00 | 10.75   38.00
              2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00   38.00
              2.250    6.00 | 5.250   13.00 | 8.250   13.00 | 11.25   13.00
              2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50   13.00
              2.750    6.00 | 5.750   13.00 | 8.750   13.00 | 11.75   13.00
              3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

     Unit Hyd Qpeak  (cms)=   0.360

     PEAK FLOW       (cms)=   0.501 (i)
     TIME TO PEAK    (hrs)=  10.250
     RUNOFF VOLUME    (mm)= 145.118
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.685

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

------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0101):     4.53   0.501    10.25   145.12
     + ID2= 2 (  0300):  5836.17 275.303    16.00   136.16
       ================================================
       ID = 3 (  0400):  5840.70 275.303    16.00   136.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
```

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

			<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0400)	5840.70	275.30	16.00	136.17	1.95	3.62
OUTFLOW:	ID= 1 (0062)	5840.70	275.28	16.00	136.17	1.94	3.61

FINISH

==========

Post-Development - 2-Year Storm Event

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\a1266773-
  Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\a1266773-


DATE: 12/09/2024                          TIME: 12:22:36

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : 211 Eliza - Rain 01 - 2yr     **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              b896fc62-c93b-4398-a605-f237b8e152c6\7e29bc78
| Ptotal= 42.00 mm |    Comments: 2-Year 12-Hour SCS II Design Storm
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'    hrs    mm/hr |    hrs    mm/hr
                0.00     1.05 |  3.00     1.68 |  6.00     7.56 |  9.00     1.47
                0.25     1.05 |  3.25     1.68 |  6.25     7.56 |  9.25     1.47
                0.50     1.05 |  3.50     1.68 |  6.50     3.36 |  9.50     1.47
                0.75     1.05 |  3.75     1.68 |  6.75     3.36 |  9.75     1.47
                1.00     1.05 |  4.00     2.52 |  7.00     2.52 | 10.00     0.84
                1.25     1.05 |  4.25     2.52 |  7.25     2.52 | 10.25     0.84
                1.50     1.05 |  4.50     3.36 |  7.50     2.52 | 10.50     0.84
                1.75     1.05 |  4.75     3.36 |  7.75     2.52 | 10.75     0.84
                2.00     1.26 |  5.00     5.04 |  8.00     1.47 | 11.00     0.84
                2.25     1.26 |  5.25     5.04 |  8.25     1.47 | 11.25     0.84
                2.50     1.26 |  5.50    20.16 |  8.50     1.47 | 11.50     0.84
                2.75     1.26 |  5.75    55.44 |  8.75     1.47 | 11.75     0.84

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)=  16.030 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  12.846
     TOTAL RAINFALL   (mm)=  42.000
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
```

```
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 88.23        474.75        0.0500
                 89.82        474.75    0.0500 /0.0300
                 94.62        473.25        0.0300      Main Channel
                 96.33        473.25        0.0300      Main Channel
                101.14        474.50    0.0300 /0.0500  Main Channel
                108.03        474.46        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22     107.71
       0.13   473.38    .391E+03       0.1          0.33      72.28
       0.19   473.44    .647E+03       0.2          0.41      58.08
       0.25   473.50    .944E+03       0.3          0.47      50.05
       0.32   473.57    .128E+04       0.5          0.53      44.73
       0.38   473.63    .166E+04       0.7          0.58      40.85
       0.45   473.70    .208E+04       0.9          0.63      37.86
       0.51   473.76    .254E+04       1.2          0.67      35.46
       0.57   473.82    .304E+04       1.5          0.71      33.46
       0.64   473.89    .358E+04       1.9          0.75      31.76
       0.70   473.95    .416E+04       2.3          0.78      30.29
       0.76   474.01    .478E+04       2.7          0.82      29.01
       0.83   474.08    .544E+04       3.3          0.85      27.86
       0.89   474.14    .615E+04       3.8          0.88      26.84
       0.96   474.21    .689E+04       4.4          0.91      25.91
       1.02   474.27    .767E+04       5.1          0.94      25.07
       1.08   474.33    .850E+04       5.8          0.97      24.29
       1.15   474.40    .936E+04       6.6          1.00      23.58
       1.21   474.46    .103E+05       7.5          1.03      22.92

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    16.03    9.00  12.85      1.17      1.01
   OUTFLOW: ID= 1 (  0010) 2873.93    15.74    9.50  12.85      1.21      1.03



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--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 59.79        473.44        0.0500
                 67.47        472.75        0.0500
                 90.84        472.50    0.0500 /0.0300  Main Channel
                 93.81        472.25        0.0300      Main Channel
                 95.43        472.25        0.0300      Main Channel
                115.15        472.50    0.0300 /0.0500  Main Channel
                119.95        472.50        0.0500
                143.58        472.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.03   472.28    .689E+02       0.0          0.07     232.76
       0.05   472.30    .194E+03       0.0          0.11     158.29
       0.08   472.33    .377E+03       0.1          0.13     125.54
       0.10   472.35    .616E+03       0.1          0.16     106.06
       0.13   472.38    .912E+03       0.2          0.18      92.83
       0.15   472.40    .126E+04       0.3          0.20      83.13
       0.18   472.43    .167E+04       0.4          0.22      75.64
       0.20   472.45    .214E+04       0.5          0.24      69.65
       0.23   472.48    .266E+04       0.7          0.26      64.73
       0.25   472.50    .324E+04       0.9          0.28      60.59
       0.28   472.53    .412E+04       1.2          0.30      55.76
       0.31   472.56    .515E+04       1.6          0.32      52.56
       0.33   472.58    .632E+04       2.1          0.33      50.26
       0.36   472.61    .764E+04       2.6          0.34      48.49
       0.39   472.64    .910E+04       3.2          0.35      47.04
       0.42   472.67    .107E+05       3.9          0.36      45.81
       0.44   472.69    .125E+05       4.6          0.37      44.73
       0.47   472.72    .144E+05       5.5          0.38      43.76
       0.50   472.75    .164E+05       6.4          0.39      42.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0010) 2873.93    15.74    9.50  12.85      0.49      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    14.94   10.50  12.85      0.50      0.39



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.04   471.29    .712E+01        0.0          0.09      186.75
       0.08   471.33    .285E+02        0.0          0.14      117.64
       0.12   471.37    .641E+02        0.0          0.19       89.78
       0.16   471.41    .114E+03        0.0          0.22       74.11
       0.20   471.45    .178E+03        0.0          0.26       63.87
       0.24   471.49    .256E+03        0.1          0.29       56.56
       0.28   471.53    .349E+03        0.1          0.33       51.03
       0.32   471.57    .456E+03        0.2          0.36       46.69
       0.36   471.61    .577E+03        0.2          0.39       43.16
       0.39   471.64    .712E+03        0.3          0.41       40.23
       0.43   471.68    .862E+03        0.4          0.44       37.76
       0.47   471.72    .103E+04        0.5          0.47       35.63
       0.51   471.76    .120E+04        0.6          0.49       33.78
       0.55   471.80    .140E+04        0.7          0.52       32.15
       0.59   471.84    .160E+04        0.9          0.54       30.70
       0.63   471.88    .182E+04        1.0          0.57       29.41
       0.67   471.92    .206E+04        1.2          0.59       28.25
       0.71   471.96    .231E+04        1.4          0.61       27.19
       0.75   472.00    .257E+04        1.6          0.64       26.23

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0009) 2873.93    14.94   10.50  12.85      0.75      0.63
   OUTFLOW: ID= 1 (  0008) 2873.93    14.47   11.00  12.85      0.75      0.64



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--------------------
| ROUTE CHN(  0007)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   9.36        470.00        0.0500
                  13.30        470.05    0.0500 /0.0300
                  18.94        469.00        0.0300      Main Channel
                  22.08        469.00        0.0300      Main Channel
                  26.35        470.00    0.0300 /0.0500  Main Channel
                  28.73        470.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.06   469.06    .188E+03        0.0          0.21       79.24
       0.11   469.11    .406E+03        0.1          0.32       52.24
       0.17   469.17    .653E+03        0.3          0.40       41.50
       0.22   469.22    .929E+03        0.4          0.47       35.50
       0.28   469.28    .124E+04        0.7          0.53       31.57
       0.33   469.33    .157E+04        0.9          0.58       28.77
       0.39   469.39    .194E+04        1.2          0.63       26.63
       0.44   469.44    .233E+04        1.6          0.67       24.93
       0.50   469.50    .275E+04        1.9          0.71       23.54
       0.55   469.55    .321E+04        2.4          0.75       22.37
       0.61   469.61    .369E+04        2.9          0.78       21.37
       0.66   469.66    .420E+04        3.4          0.81       20.49
       0.72   469.72    .474E+04        4.0          0.85       19.72
       0.77   469.77    .531E+04        4.7          0.88       19.03
       0.83   469.83    .591E+04        5.4          0.91       18.41
       0.88   469.88    .654E+04        6.1          0.93       17.85
       0.94   469.94    .720E+04        6.9          0.96       17.33
```

0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0008)	2873.93	14.47	11.00	12.85	1.03	1.00
OUTFLOW: ID= 1 (0007)	2873.93	14.40	11.50	12.85	1.05	1.01

ROUTE CHN(0006)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0007)	2873.93	14.40	11.50	12.85	1.05	1.06
OUTFLOW: ID= 1 (0006)	2873.93	14.33	11.75	12.85	1.07	1.05

ROUTE CHN(0005)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47

0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0006)	2873.93	14.33	11.75	12.85	1.25	0.86
OUTFLOW: ID= 1 (0005)	2873.93	14.24	12.00	12.84	1.25	0.86

ROUTE CHN(0004)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0005)	2873.93	14.24	12.00	12.84	1.29	1.02
OUTFLOW: ID= 1 (0004)	2873.93	14.19	12.25	12.84	1.29	1.01

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97

0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0004)	2873.93	14.19	12.25	12.84	1.21	1.09
OUTFLOW: ID= 1 (| 0003)	2873.93	14.15	12.50	12.84	1.21	1.08

ROUTE CHN(0002)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0003)	2873.93	14.15	12.50	12.84	1.01	1.09
OUTFLOW: ID= 1 (| 0002)	2873.93	14.11	12.50	12.84	1.01	1.09

ROUTE CHN(0001)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
39.74	459.25	0.0500
41.86	459.00	0.0500

```
                49.51        457.47        0.0500
                58.73        456.75        0.0500
                85.31        456.25        0.0500
                91.00        456.00    0.0500 /0.0300  Main Channel
                98.50        454.75        0.0300      Main Channel
               103.78        454.75        0.0300      Main Channel
               116.96        458.50    0.0300 /0.0500  Main Channel
               125.11        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77       14.66
       0.42   455.17    .205E+04       3.5          1.14        9.86
       0.62   455.37    .349E+04       7.4          1.43        7.88
       0.83   455.58    .522E+04      12.9          1.68        6.72
       1.04   455.79    .722E+04      20.2          1.90        5.95
       1.25   456.00    .950E+04      29.4          2.10        5.38
       1.46   456.21    .124E+05      42.5          2.33        4.85
       1.67   456.42    .163E+05      58.3          2.42        4.67
       1.88   456.63    .220E+05      78.1          2.40        4.69
       2.10   456.85    .292E+05     103.3          2.39        4.72
       2.31   457.06    .372E+05     134.3          2.45        4.61
       2.52   457.27    .456E+05     170.3          2.53        4.46
       2.73   457.48    .545E+05     211.2          2.62        4.30
       2.94   457.69    .638E+05     258.3          2.74        4.12
       3.15   457.90    .733E+05     310.2          2.86        3.94
       3.37   458.12    .832E+05     367.0          2.99        3.78
       3.58   458.33    .932E+05     428.5          3.11        3.63
       3.79   458.54    .104E+06     495.8          3.24        3.48
       4.00   458.75    .115E+06     573.1          3.38        3.34

                                   <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    14.11   12.50  12.84      0.87      1.71
   OUTFLOW: ID= 1 (  0001) 2873.93    14.11   12.75  12.84      0.87      1.71



--------------------------------------------------------------------------------
--------------------
| READ HYD (  0004)|   AREA       (ha)=   4.59
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  19.21
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 2Yr, Outlet4

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'    hrs     cms |   hrs     cms
  0.00   0.000 |  1.25   0.435 |  2.50   0.040 |  3.75   0.002 |
  0.25   0.004 |  1.50   0.120 |  2.75   0.036 |  4.00   0.001 |
  0.50   0.025 |  1.75   0.070 |  3.00   0.033 |  4.25   0.001 |
  0.75   0.040 |  2.00   0.055 |  3.25   0.008 |  4.50   0.000 |
  1.00   0.061 |  2.25   0.046 |  3.50   0.003 |  4.75   0.000 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     4.59   0.435     1.25     19.21
     + ID2= 2 (  0001):  2873.93  14.111    12.75     12.84
       ================================================
       ID = 3 (  0100):  2878.52  14.111    12.75     12.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.21	454.96	.442E+03	1.0	0.77	7.33
0.42	455.17	.102E+04	3.5	1.14	4.93
0.62	455.37	.175E+04	7.4	1.43	3.94
0.83	455.58	.261E+04	12.9	1.68	3.36
1.04	455.79	.361E+04	20.2	1.90	2.97
1.25	456.00	.475E+04	29.4	2.10	2.69
1.46	456.21	.618E+04	42.5	2.33	2.42
1.67	456.42	.816E+04	58.3	2.42	2.33
1.88	456.63	.110E+05	78.1	2.40	2.35
2.10	456.85	.146E+05	103.3	2.39	2.36
2.31	457.06	.186E+05	134.3	2.45	2.31
2.52	457.27	.228E+05	170.3	2.53	2.23
2.73	457.48	.273E+05	211.2	2.62	2.15
2.94	457.69	.319E+05	258.3	2.74	2.06
3.15	457.90	.367E+05	310.2	2.86	1.97
3.37	458.12	.416E+05	367.0	2.99	1.89
3.58	458.33	.466E+05	428.5	3.11	1.81
3.79	458.54	.518E+05	495.8	3.24	1.74
4.00	458.75	.573E+05	573.1	3.38	1.67

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0100)	2878.52	14.11	12.75	12.85	0.87	1.71
OUTFLOW: ID= 1 (0033)	2878.52	14.11	12.75	12.85	0.87	1.71

CALIB NASHYD (2000) ID= 1 DT=15.0 min	Area (ha)=2922.70 Curve Number (CN)= 63.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 2.60

Unit Hyd Qpeak (cms)= 42.936

PEAK FLOW (cms)= 9.309 (i)
TIME TO PEAK (hrs)= 9.000
RUNOFF VOLUME (mm)= 7.353
TOTAL RAINFALL (mm)= 42.000
RUNOFF COEFFICIENT = 0.175

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

ROUTE CHN(0020) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
12.14	470.87	0.0500	
17.70	470.75	0.0500 /0.0300	
21.67	470.25	0.0300	Main Channel
24.23	470.25	0.0300	Main Channel
27.54	470.75	0.0300 /0.0500	Main Channel
30.81	471.00	0.0500	
40.00	471.16	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.03	470.28	.106E+03	0.0	0.18	109.47
0.07	470.32	.229E+03	0.1	0.27	72.36
0.10	470.35	.371E+03	0.1	0.34	57.58
0.13	470.38	.531E+03	0.2	0.39	49.31
0.16	470.41	.708E+03	0.3	0.44	43.90
0.20	470.45	.904E+03	0.4	0.48	40.01
0.23	470.48	.112E+04	0.5	0.52	37.05
0.26	470.51	.135E+04	0.6	0.56	34.69
0.29	470.54	.160E+04	0.8	0.59	32.75
0.33	470.58	.186E+04	1.0	0.62	31.11
0.36	470.61	.215E+04	1.2	0.65	29.71
0.39	470.64	.245E+04	1.4	0.68	28.49
0.42	470.67	.277E+04	1.7	0.70	27.40
0.46	470.71	.311E+04	2.0	0.73	26.44
0.49	470.74	.347E+04	2.3	0.75	25.56
0.52	470.77	.386E+04	2.6	0.79	24.42
0.55	470.80	.432E+04	3.1	0.82	23.53

0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2000)	2922.70	9.31	9.00	7.35	0.60	0.85
OUTFLOW: ID= 1 (0020)	2922.70	9.15	9.50	7.35	0.62	0.86

ROUTE CHN(0019)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0020)	2922.70	9.15	9.50	7.35	0.24	0.31
OUTFLOW: ID= 1 (0019)	2922.70	7.63	11.25	7.35	0.25	0.31

ROUTE CHN(0018)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17
0.47	466.61	.198E+04	1.6	0.81	20.60

0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0019)		2922.70	7.63	11.25	7.35	0.92	1.08
OUTFLOW: ID= 1 (0018)		2922.70	7.61	11.50	7.35	0.92	1.08

ROUTE CHN(0017)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0018)		2922.70	7.61	11.50	7.35	0.76	1.22
OUTFLOW: ID= 1 (0017)		2922.70	7.59	11.75	7.35	0.77	1.23

ROUTE CHN(0016)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel
30.53	460.25	0.0300 /0.0500	Main Channel
60.87	460.75	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	458.81	.262E+03	0.1	0.20	82.51
0.13	458.88	.554E+03	0.2	0.31	53.72
0.19	458.94	.875E+03	0.3	0.40	42.17
0.25	459.00	.123E+04	0.6	0.47	35.68
0.31	459.06	.160E+04	0.9	0.53	31.42
0.38	459.13	.201E+04	1.2	0.59	28.36
0.44	459.19	.245E+04	1.6	0.64	26.03
0.50	459.25	.292E+04	2.0	0.69	24.18
0.56	459.31	.342E+04	2.5	0.74	22.66
0.63	459.38	.394E+04	3.1	0.78	21.39
0.69	459.44	.450E+04	3.7	0.82	20.31
0.75	459.50	.509E+04	4.4	0.86	19.36
0.81	459.56	.570E+04	5.1	0.90	18.53
0.88	459.63	.634E+04	5.9	0.94	17.80
0.94	459.69	.702E+04	6.8	0.97	17.14
1.00	459.75	.772E+04	7.8	1.01	16.54
1.08	459.83	.879E+04	9.3	1.06	15.68
1.17	459.92	.101E+05	11.1	1.10	15.19
1.25	460.00	.116E+05	13.0	1.12	14.91

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0017)	2922.70	7.59	11.75	7.35	0.99	1.00
OUTFLOW: ID= 1 (0016)	2922.70	7.57	12.00	7.35	0.98	1.00

ROUTE CHN(0015) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
131.87	458.25	0.0500	
140.91	458.66	0.0500 /0.0300	
147.80	457.48	0.0300	Main Channel
149.90	457.48	0.0300	Main Channel
153.04	458.50	0.0300 /0.0500	Main Channel
156.08	458.60	0.0500	
157.70	458.75	0.0500	
160.00	458.75	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	457.52	.924E+02	0.0	0.12	134.80
0.08	457.56	.199E+03	0.0	0.19	89.01
0.12	457.60	.321E+03	0.1	0.24	70.81
0.16	457.64	.457E+03	0.1	0.27	60.67
0.20	457.68	.608E+03	0.2	0.31	54.05
0.24	457.72	.774E+03	0.3	0.34	49.33
0.28	457.76	.954E+03	0.3	0.36	45.73
0.32	457.80	.115E+04	0.4	0.39	42.89
0.36	457.84	.136E+04	0.6	0.41	40.55
0.41	457.89	.158E+04	0.7	0.43	38.59
0.45	457.93	.182E+04	0.8	0.45	36.91
0.49	457.97	.208E+04	1.0	0.47	35.45
0.53	458.01	.234E+04	1.1	0.49	34.15
0.57	458.05	.263E+04	1.3	0.51	33.00
0.61	458.09	.292E+04	1.5	0.52	31.96
0.65	458.13	.324E+04	1.7	0.54	31.02
0.69	458.17	.356E+04	2.0	0.55	30.15
0.73	458.21	.390E+04	2.2	0.57	29.36
0.77	458.25	.426E+04	2.5	0.58	28.62

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0016)	2922.70	7.57	12.00	7.35	0.76	0.58
OUTFLOW: ID= 1 (0015)	2922.70	7.45	12.50	7.35	0.77	0.58

ROUTE CHN(0014) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

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--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 150.00        456.75        0.0500
                 155.75        456.75    0.0500 /0.0300
                 160.05        456.00        0.0300      Main Channel
                 165.32        456.00        0.0300      Main Channel
                 170.87        457.50    0.0300 /0.0500  Main Channel
                 172.96        457.75        0.0500
                 175.82        457.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
        0.04   456.04    .215E+03        0.0          0.09      180.09
        0.08   456.08    .445E+03        0.1          0.14      115.91
        0.12   456.12    .690E+03        0.1          0.18       90.27
        0.16   456.16    .950E+03        0.2          0.22       75.96
        0.20   456.20    .122E+04        0.3          0.25       66.67
        0.24   456.24    .151E+04        0.4          0.28       60.07
        0.28   456.28    .182E+04        0.5          0.30       55.11
        0.32   456.32    .213E+04        0.7          0.33       51.21
        0.36   456.36    .247E+04        0.9          0.35       48.06
        0.39   456.39    .282E+04        1.0          0.37       45.44
        0.43   456.43    .318E+04        1.2          0.39       43.23
        0.47   456.47    .356E+04        1.4          0.40       41.33
        0.51   456.51    .395E+04        1.7          0.42       39.67
        0.55   456.55    .435E+04        1.9          0.44       38.22
        0.59   456.59    .477E+04        2.2          0.45       36.92
        0.63   456.63    .521E+04        2.4          0.47       35.76
        0.67   456.67    .566E+04        2.7          0.48       34.70
        0.71   456.71    .613E+04        3.0          0.49       33.75
        0.75   456.75    .661E+04        3.3          0.51       32.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0015) 2922.70     7.45   12.50   7.35      0.75      0.51
    OUTFLOW: ID= 1 (  0014) 2922.70     7.33   13.25   7.35      0.75      0.51



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0013)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 155.00        456.25        0.0500
                 161.70        456.25    0.0500 /0.0300
                 169.49        455.25        0.0300      Main Channel
                 170.18        455.25        0.0300      Main Channel
                 176.86        456.75    0.0300 /0.0500  Main Channel
                 181.81        456.75        0.0500
                 188.74        456.25        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
        0.08   455.33    .926E+02        0.0          0.18       90.89
        0.16   455.41    .262E+03        0.1          0.25       65.50
        0.24   455.49    .507E+03        0.2          0.31       53.95
        0.32   455.57    .828E+03        0.3          0.36       46.77
        0.39   455.64    .123E+04        0.5          0.40       41.69
        0.47   455.72    .170E+04        0.7          0.44       37.85
        0.55   455.80    .225E+04        1.1          0.48       34.80
        0.63   455.88    .288E+04        1.5          0.52       32.31
        0.71   455.96    .358E+04        2.0          0.55       30.23
        0.79   456.04    .436E+04        2.6          0.59       28.46
        0.87   456.12    .522E+04        3.2          0.62       26.93
        0.95   456.20    .615E+04        4.0          0.65       25.59
        1.03   456.28    .734E+04        4.9          0.67       24.78
        1.11   456.36    .898E+04        6.2          0.68       24.34
        1.18   456.43    .107E+05        7.6          0.71       23.62
        1.26   456.51    .126E+05        9.2          0.73       22.81
        1.34   456.59    .146E+05       11.1          0.76       22.00
        1.42   456.67    .167E+05       13.1          0.79       21.22
        1.50   456.75    .189E+05       15.2          0.81       20.70

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0014) 2922.70     7.33   13.25   7.35      1.17      0.70
   OUTFLOW: ID= 1 (  0013) 2922.70     7.27   13.50   7.35      1.17      0.70



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0012)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.10        455.50        0.0500
                 144.47        455.50        0.0500
                 148.86        455.75        0.0500
                 150.17        455.75        0.0500
                 151.79        455.50    0.0500 /0.0300  Main Channel
                 155.72        454.00        0.0300      Main Channel
                 158.28        453.76        0.0300      Main Channel
                 161.63        454.00        0.0300      Main Channel
                 165.55        455.50    0.0300 /0.0500  Main Channel
                 169.69        455.50        0.0500
                 175.87        455.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
        0.10   453.86    .129E+03        0.0          0.08      209.88
        0.20   453.96    .516E+03        0.1          0.13      132.21
        0.31   454.07    .112E+04        0.2          0.18       91.49
        0.41   454.17    .179E+04        0.4          0.23       70.94
        0.51   454.27    .251E+04        0.7          0.28       59.65
        0.61   454.37    .329E+04        1.0          0.32       52.34
        0.72   454.48    .412E+04        1.5          0.35       47.15
        0.82   454.58    .501E+04        1.9          0.39       43.22
        0.92   454.68    .595E+04        2.5          0.42       40.11
        1.02   454.78    .695E+04        3.1          0.44       37.58
        1.13   454.89    .800E+04        3.8          0.47       35.47
        1.23   454.99    .911E+04        4.5          0.50       33.66
        1.33   455.09    .103E+05        5.3          0.52       32.10
        1.43   455.19    .115E+05        6.2          0.54       30.73
        1.54   455.30    .128E+05        7.2          0.56       29.57
        1.64   455.40    .144E+05        8.3          0.58       28.91
        1.74   455.50    .162E+05        9.4          0.58       28.67
        1.87   455.63    .220E+05       11.7          0.53       31.39
        1.99   455.75    .281E+05       14.4          0.51       32.45

                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA     QPEAK    TPEAK    R.V.    MAX DEPTH  MAX VEL
                               (ha)     (cms)    (hrs)    (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0013) 2922.70     7.27   13.50   7.35      1.54      0.56
   OUTFLOW: ID= 1 (  0012) 2922.70     7.10   14.00   7.35      1.52      0.56



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0011)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.00        455.75        0.0500
                 137.92        455.00    0.0500 /0.0300
                 144.47        453.45        0.0300      Main Channel
                 146.45        453.43        0.0300      Main Channel
                 148.74        453.48        0.0300      Main Channel
                 151.36        453.75        0.0300      Main Channel
                 154.10        453.93        0.0300      Main Channel
                 155.00        454.00        0.0300      Main Channel
                 161.50        455.18    0.0300 /0.0500  Main Channel
                 168.74        455.67        0.0500
                 170.19        455.67        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
        0.02   453.45    .290E+02        0.0          0.10      164.18
        0.14   453.57    .573E+03        0.3          0.48       35.05
        0.25   453.68    .132E+04        0.9          0.69       24.05
        0.37   453.80    .227E+04        1.9          0.84       19.87
        0.49   453.92    .347E+04        3.3          0.95       17.58
        0.60   454.03    .492E+04        5.3          1.08       15.43
        0.72   454.15    .653E+04        8.0          1.23       13.54
```

0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0012)	2922.70	7.10	14.00	7.35	0.68	1.17
OUTFLOW: ID= 1 (0011)	2922.70	7.08	14.25	7.35	0.68	1.17

ADD HYD (0200)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0011):		2922.70	7.079	14.25	7.35
+ ID2= 2 (0033):		2878.52	14.113	12.75	12.85
ID = 3 (0200):		5801.22	20.717	13.25	10.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0200)	5801.22	20.72	13.25	10.08	0.96	1.54
OUTFLOW: ID= 1 (0031)	5801.22	20.72	13.25	10.08	0.96	1.54

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--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0032)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   4.69        451.07        0.0500
                  13.38        451.10        0.0500
                  23.86        450.00    0.0500 /0.0300  Main Channel
                  32.76        447.75        0.0300      Main Channel
                  35.26        447.50        0.0300      Main Channel
                  46.15        447.50        0.0300      Main Channel
                  49.16        447.75        0.0300      Main Channel
                  56.34        451.00    0.0300 /0.0500  Main Channel
                  67.16        452.61        0.0500
                  73.93        452.92        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.18   447.68    .165E+03       1.8          0.77       1.55
        0.36   447.86    .375E+03       6.3          1.21       0.99
        0.54   448.04    .601E+03      13.3          1.59       0.75
        0.71   448.21    .842E+03      22.4          1.91       0.63
        0.89   448.39    .110E+04      33.5          2.20       0.55
        1.07   448.57    .137E+04      46.5          2.45       0.49
        1.25   448.75    .165E+04      61.5          2.68       0.45
        1.43   448.93    .195E+04      78.4          2.90       0.41
        1.61   449.11    .226E+04      97.3          3.10       0.39
        1.79   449.29    .258E+04     118.2          3.30       0.36
        1.96   449.46    .292E+04     141.1          3.48       0.35
        2.14   449.64    .328E+04     166.1          3.65       0.33
        2.32   449.82    .364E+04     193.2          3.82       0.31
        2.50   450.00    .403E+04     222.4          3.98       0.30
        2.68   450.18    .443E+04     257.2          4.18       0.29
        2.89   450.39    .495E+04     302.1          4.40       0.27
        3.11   450.61    .550E+04     350.5          4.59       0.26
        3.32   450.82    .610E+04     402.6          4.75       0.25
        3.53   451.03    .673E+04     459.2          4.91       0.24

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0031) 5801.22    20.72   13.25  10.08      0.68      1.85
   OUTFLOW: ID= 1 (  0032) 5801.22    20.73   13.25  10.08      0.68      1.84



--------------------------------------------------------------------------------
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 409.396
| Ptotal= 32.55 mm |                          B=   0.000
--------------------                          C=   0.699
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.00    3.81 |  0.83   81.87 |  1.67    5.90 |  2.50    3.67
                 0.17    4.48 |  1.00   17.34 |  1.83    5.21 |  2.67    3.44
                 0.33    5.55 |  1.17   10.93 |  2.00    4.69 |  2.83    3.24
                 0.50    7.60 |  1.33    8.34 |  2.17    4.28 |
                 0.67   14.13 |  1.50    6.87 |  2.33    3.95 |


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--------------------
| CALIB            |
| NASHYD   (  3000)|   Area    (ha)=  25.69   Curve Number   (CN)= 85.2
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.57

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
              0.250    4.03 | 1.000   59.29 | 1.750    6.55 |  2.50    4.06
              0.500    5.20 | 1.250   15.20 | 2.000    5.44 |  2.75    3.59
              0.750    9.77 | 1.500    9.20 | 2.250    4.55 |  3.00    3.31

     Unit Hyd Qpeak  (cms)=   1.721

     PEAK FLOW       (cms)=   0.394 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=  10.565
     TOTAL RAINFALL   (mm)=  32.549
     RUNOFF COEFFICIENT   =   0.325

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

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--------------------
| READ HYD (  0002)|   AREA       (ha)=   8.70
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  17.91
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 2Yr, Outlet2

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'   hrs     cms |   hrs     cms
  0.00   0.000 |  1.00   0.104 |  2.00   0.100 |  3.00   0.063 |  4.00   0.001
  0.25   0.008 |  1.25   0.762 |  2.25   0.086 |  3.25   0.018 |  4.25   0.000
  0.50   0.043 |  1.50   0.203 |  2.50   0.076 |  3.50   0.006 |
  0.75   0.068 |  1.75   0.122 |  2.75   0.069 |  3.75   0.003 |
-------------------------------------------------------------------------------
--------------------
| READ HYD (  0022)|   AREA       (ha)=   2.23
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  25.59
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 2Yr, Commercial

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'   hrs     cms |   hrs     cms
  0.00   0.000 |  1.25   0.155 |  2.50   0.031 |  3.75   0.007 |  5.00   0.002
  0.25   0.001 |  1.50   0.104 |  2.75   0.027 |  4.00   0.005 |  5.25   0.001
  0.50   0.006 |  1.75   0.068 |  3.00   0.020 |  4.25   0.004 |  5.50   0.001
  0.75   0.016 |  2.00   0.049 |  3.25   0.013 |  4.50   0.003 |  5.75   0.001
  1.00   0.070 |  2.25   0.038 |  3.50   0.009 |  4.75   0.002 |
-------------------------------------------------------------------------------
--------------------
| READ HYD (  0003)|   AREA       (ha)=   1.06
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  20.06
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 2Yr, Outlet3

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'   hrs     cms |   hrs     cms
  0.00   0.000 |  1.00   0.015 |  2.00   0.015 |  3.00   0.009 |  4.00   0.000
  0.25   0.001 |  1.25   0.087 |  2.25   0.012 |  3.25   0.003 |
  0.50   0.005 |  1.50   0.040 |  2.50   0.011 |  3.50   0.001 |
  0.75   0.009 |  1.75   0.019 |  2.75   0.010 |  3.75   0.000 |
-------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):     8.70   0.762     1.25    17.91
     + ID2= 2 (  0022):     2.23   0.155     1.25    25.59
       ================================================
       ID = 3 (  0500):    10.93   0.917     1.25    19.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0500)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0500):    10.93   0.917     1.25    19.47
     + ID2= 2 (  0003):     1.06   0.087     1.25    20.06
       ================================================
       ID = 1 (  0500):    11.99   1.003     1.25    19.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0500):    11.99   1.003     1.25    19.53
     + ID2= 2 (  3000):    25.69   0.394     1.75    10.56
       ================================================
       ID = 3 (  0500):    37.68   1.316     1.25    13.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0032):  5801.22  20.729    13.25    10.08
     + ID2= 2 (  0500):    37.68   1.316     1.25    13.42
       ================================================
       ID = 3 (  0300):  5838.90  20.729    13.25    10.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  23.51
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 2Yr, Outlet1

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'   hrs      cms |   hrs      cms
  0.00    0.000 |  1.50    0.092 |  3.00    0.023 |  4.50    0.004 |  6.00    0.001
  0.25    0.001 |  1.75    0.066 |  3.25    0.015 |  4.75    0.003 |
  0.50    0.004 |  2.00    0.049 |  3.50    0.011 |  5.00    0.002 |
  0.75    0.008 |  2.25    0.038 |  3.75    0.008 |  5.25    0.002 |
  1.00    0.015 |  2.50    0.031 |  4.00    0.006 |  5.50    0.002 |
  1.25    0.097 |  2.75    0.026 |  4.25    0.004 |  5.75    0.001 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     1.95   0.097     1.25    23.51
     + ID2= 2 (  0300):  5838.90  20.729    13.25    10.10
       ================================================
       ID = 3 (  0400):  5840.85  20.729    13.25    10.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
        0.35   447.48    .169E+04       10.3           1.33       2.74
        0.70   447.83    .399E+04       36.9           2.02       1.80
        1.06   448.19    .682E+04       79.6           2.54       1.43
        1.41   448.54    .102E+05      139.5           2.99       1.21
        1.76   448.89    .141E+05      218.4           3.39       1.07
        2.11   449.24    .184E+05      323.6           3.84       0.95
        2.46   449.59    .230E+05      449.8           4.25       0.85
        2.82   449.95    .280E+05      598.4           4.66       0.78
        3.17   450.30    .333E+05      767.8           5.03       0.72
        3.52   450.65    .389E+05      958.5           5.38       0.68
        3.87   451.00    .447E+05     1170.8           5.71       0.64
        4.22   451.35    .509E+05     1405.4           6.02       0.60
        4.58   451.71    .573E+05     1662.8           6.32       0.57
        4.93   452.06    .641E+05     1943.5           6.61       0.55
```

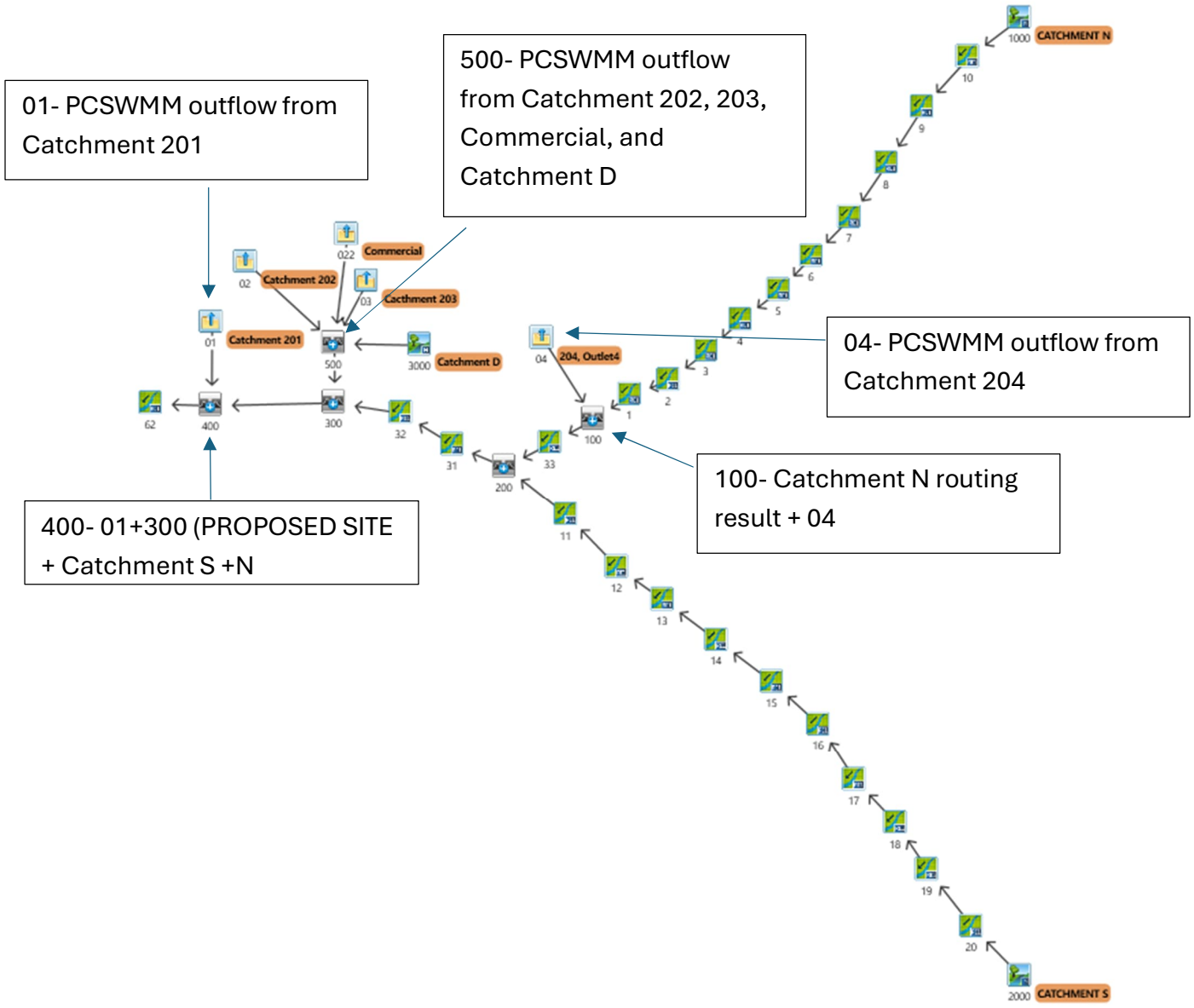
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0400)	5840.85	20.73	13.25	10.11	0.49	1.53
OUTFLOW: ID= 1 (0062)	5840.85	20.73	13.25	10.11	0.49	1.53

FINISH

==========

Post-Development VO Model Schematic



Post-Development - 5-Year Storm Event

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

***** 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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\459db878-
Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\459db878-

DATE: 12/09/2024 TIME: 12:23:29

USER:

COMMENTS: _____

****
** SIMULATION : 211 Eliza - Rain 02 - 5yr **
****

| READ STORM | Ptotal= 54.40 mm | Filename: C:\Users\atrenholm\AppData\Local\Temp\8aca5b86-3a4e-4127-aebe-701c5b285a8f\9638eb10 Comments: 5-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.36	3.00	2.18	6.00	9.79	9.00	1.90
0.25	1.36	3.25	2.18	6.25	9.79	9.25	1.90
0.50	1.36	3.50	2.18	6.50	4.35	9.50	1.90
0.75	1.36	3.75	2.18	6.75	4.35	9.75	1.90
1.00	1.36	4.00	3.26	7.00	3.26	10.00	1.09
1.25	1.36	4.25	3.26	7.25	3.26	10.25	1.09
1.50	1.36	4.50	4.35	7.50	3.26	10.50	1.09
1.75	1.36	4.75	4.35	7.75	3.26	10.75	1.09
2.00	1.63	5.00	6.53	8.00	1.90	11.00	1.09
2.25	1.63	5.25	6.53	8.25	1.90	11.25	1.09
2.50	1.63	5.50	26.11	8.50	1.90	11.50	1.09
2.75	1.63	5.75	71.81	8.75	1.90	11.75	1.09

CALIB	NASHYD (1000)	ID= 1 DT=15.0 min

Area (ha)=2873.93 Curve Number (CN)= 78.5
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 2.65

Unit Hyd Qpeak (cms)= 41.423

PEAK FLOW (cms)= 25.872 (i)
TIME TO PEAK (hrs)= 9.000
RUNOFF VOLUME (mm)= 20.513
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.377

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

| ROUTE CHN(0010) | IN= 2---> OUT= 1 |

Routing time step (min)'= 15.00

```
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 88.23        474.75        0.0500
                 89.82        474.75    0.0500 /0.0300
                 94.62        473.25        0.0300      Main Channel
                 96.33        473.25        0.0300      Main Channel
                101.14        474.50    0.0300 /0.0500  Main Channel
                108.03        474.46        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22     107.71
       0.13   473.38    .391E+03       0.1          0.33      72.28
       0.19   473.44    .647E+03       0.2          0.41      58.08
       0.25   473.50    .944E+03       0.3          0.47      50.05
       0.32   473.57    .128E+04       0.5          0.53      44.73
       0.38   473.63    .166E+04       0.7          0.58      40.85
       0.45   473.70    .208E+04       0.9          0.63      37.86
       0.51   473.76    .254E+04       1.2          0.67      35.46
       0.57   473.82    .304E+04       1.5          0.71      33.46
       0.64   473.89    .358E+04       1.9          0.75      31.76
       0.70   473.95    .416E+04       2.3          0.78      30.29
       0.76   474.01    .478E+04       2.7          0.82      29.01
       0.83   474.08    .544E+04       3.3          0.85      27.86
       0.89   474.14    .615E+04       3.8          0.88      26.84
       0.96   474.21    .689E+04       4.4          0.91      25.91
       1.02   474.27    .767E+04       5.1          0.94      25.07
       1.08   474.33    .850E+04       5.8          0.97      24.29
       1.15   474.40    .936E+04       6.6          1.00      23.58
       1.21   474.46    .103E+05       7.5          1.03      22.92

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    25.87    9.00  20.51      1.16      1.01
   OUTFLOW: ID= 1 (  0010) 2873.93    25.20    9.50  20.51      1.21      1.03



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 59.79        473.44        0.0500
                 67.47        472.75        0.0500
                 90.84        472.50    0.0500 /0.0300  Main Channel
                 93.81        472.25        0.0300      Main Channel
                 95.43        472.25        0.0300      Main Channel
                115.15        472.50    0.0300 /0.0500  Main Channel
                119.95        472.50        0.0500
                143.58        472.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.03   472.28    .689E+02       0.0          0.07     232.76
       0.05   472.30    .194E+03       0.0          0.11     158.29
       0.08   472.33    .377E+03       0.1          0.13     125.54
       0.10   472.35    .616E+03       0.1          0.16     106.06
       0.13   472.38    .912E+03       0.2          0.18      92.83
       0.15   472.40    .126E+04       0.3          0.20      83.13
       0.18   472.43    .167E+04       0.4          0.22      75.64
       0.20   472.45    .214E+04       0.5          0.24      69.65
       0.23   472.48    .266E+04       0.7          0.26      64.73
       0.25   472.50    .324E+04       0.9          0.28      60.59
       0.28   472.53    .412E+04       1.2          0.30      55.76
       0.31   472.56    .515E+04       1.6          0.32      52.56
       0.33   472.58    .632E+04       2.1          0.33      50.26
       0.36   472.61    .764E+04       2.6          0.34      48.49
       0.39   472.64    .910E+04       3.2          0.35      47.04
       0.42   472.67    .107E+05       3.9          0.36      45.81
       0.44   472.69    .125E+05       4.6          0.37      44.73
       0.47   472.72    .144E+05       5.5          0.38      43.76
       0.50   472.75    .164E+05       6.4          0.39      42.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0010) 2873.93    25.20    9.50  20.51      0.49      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    23.90   10.50  20.51      0.50      0.39



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.04   471.29    .712E+01        0.0          0.09      186.75
       0.08   471.33    .285E+02        0.0          0.14      117.64
       0.12   471.37    .641E+02        0.0          0.19       89.78
       0.16   471.41    .114E+03        0.0          0.22       74.11
       0.20   471.45    .178E+03        0.0          0.26       63.87
       0.24   471.49    .256E+03        0.1          0.29       56.56
       0.28   471.53    .349E+03        0.1          0.33       51.03
       0.32   471.57    .456E+03        0.2          0.36       46.69
       0.36   471.61    .577E+03        0.2          0.39       43.16
       0.39   471.64    .712E+03        0.3          0.41       40.23
       0.43   471.68    .862E+03        0.4          0.44       37.76
       0.47   471.72    .103E+04        0.5          0.47       35.63
       0.51   471.76    .120E+04        0.6          0.49       33.78
       0.55   471.80    .140E+04        0.7          0.52       32.15
       0.59   471.84    .160E+04        0.9          0.54       30.70
       0.63   471.88    .182E+04        1.0          0.57       29.41
       0.67   471.92    .206E+04        1.2          0.59       28.25
       0.71   471.96    .231E+04        1.4          0.61       27.19
       0.75   472.00    .257E+04        1.6          0.64       26.23

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0009) 2873.93    23.90   10.50  20.51      0.73      0.62
   OUTFLOW: ID= 1 (  0008) 2873.93    23.15   11.25  20.51      0.75      0.64



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0007)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   9.36        470.00        0.0500
                  13.30        470.05    0.0500 /0.0300
                  18.94        469.00        0.0300      Main Channel
                  22.08        469.00        0.0300      Main Channel
                  26.35        470.00    0.0300 /0.0500  Main Channel
                  28.73        470.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.06   469.06    .188E+03        0.0          0.21       79.24
       0.11   469.11    .406E+03        0.1          0.32       52.24
       0.17   469.17    .653E+03        0.3          0.40       41.50
       0.22   469.22    .929E+03        0.4          0.47       35.50
       0.28   469.28    .124E+04        0.7          0.53       31.57
       0.33   469.33    .157E+04        0.9          0.58       28.77
       0.39   469.39    .194E+04        1.2          0.63       26.63
       0.44   469.44    .233E+04        1.6          0.67       24.93
       0.50   469.50    .275E+04        1.9          0.71       23.54
       0.55   469.55    .321E+04        2.4          0.75       22.37
       0.61   469.61    .369E+04        2.9          0.78       21.37
       0.66   469.66    .420E+04        3.4          0.81       20.49
       0.72   469.72    .474E+04        4.0          0.85       19.72
       0.77   469.77    .531E+04        4.7          0.88       19.03
       0.83   469.83    .591E+04        5.4          0.91       18.41
       0.88   469.88    .654E+04        6.1          0.93       17.85
       0.94   469.94    .720E+04        6.9          0.96       17.33
```

0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0008)	2873.93	23.15	11.25	20.51	1.04	1.00
OUTFLOW: ID= 1 (0007)	2873.93	23.02	11.50	20.51	1.05	1.01

ROUTE CHN(0006)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0007)	2873.93	23.02	11.50	20.51	1.04	1.06
OUTFLOW: ID= 1 (0006)	2873.93	22.90	11.75	20.51	1.07	1.05

ROUTE CHN(0005)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47

0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0006)	2873.93	22.90	11.75	20.51	1.24	0.86
OUTFLOW: ID= 1 (0005)	2873.93	22.72	12.00	20.51	1.25	0.86

ROUTE CHN(0004)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0005)	2873.93	22.72	12.00	20.51	1.54	1.14
OUTFLOW: ID= 1 (0004)	2873.93	22.66	12.25	20.51	1.53	1.14

ROUTE CHN(0003)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97

0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0004)	2873.93	22.66	12.25	20.51	1.53	1.25
OUTFLOW: ID= 1 (| 0003)	2873.93	22.61	12.50	20.51	1.52	1.25

ROUTE CHN(0002) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0003)	2873.93	22.61	12.50	20.51	1.23	1.22
OUTFLOW: ID= 1 (| 0002)	2873.93	22.55	12.75	20.51	1.22	1.22

ROUTE CHN(0001) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
39.74	459.25	0.0500
41.86	459.00	0.0500

```
                49.51        457.47        0.0500
                58.73        456.75        0.0500
                85.31        456.25        0.0500
                91.00        456.00    0.0500 /0.0300  Main Channel
                98.50        454.75        0.0300      Main Channel
               103.78        454.75        0.0300      Main Channel
               116.96        458.50    0.0300 /0.0500  Main Channel
               125.11        458.75        0.0500

     <--------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77       14.66
       0.42   455.17    .205E+04       3.5          1.14        9.86
       0.62   455.37    .349E+04       7.4          1.43        7.88
       0.83   455.58    .522E+04      12.9          1.68        6.72
       1.04   455.79    .722E+04      20.2          1.90        5.95
       1.25   456.00    .950E+04      29.4          2.10        5.38
       1.46   456.21    .124E+05      42.5          2.33        4.85
       1.67   456.42    .163E+05      58.3          2.42        4.67
       1.88   456.63    .220E+05      78.1          2.40        4.69
       2.10   456.85    .292E+05     103.3          2.39        4.72
       2.31   457.06    .372E+05     134.3          2.45        4.61
       2.52   457.27    .456E+05     170.3          2.53        4.46
       2.73   457.48    .545E+05     211.2          2.62        4.30
       2.94   457.69    .638E+05     258.3          2.74        4.12
       3.15   457.90    .733E+05     310.2          2.86        3.94
       3.37   458.12    .832E+05     367.0          2.99        3.78
       3.58   458.33    .932E+05     428.5          3.11        3.63
       3.79   458.54    .104E+06     495.8          3.24        3.48
       4.00   458.75    .115E+06     573.1          3.38        3.34

                                   <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    22.55   12.75  20.51      1.09      1.94
   OUTFLOW: ID= 1 (  0001) 2873.93    22.56   12.75  20.51      1.09      1.94



--------------------------------------------------------------------------------
--------------------
| READ HYD (  0004)|   AREA       (ha)=   4.59
| DT=15.0 min      |   TPEAK     (hrs)=   1.00
--------------------   VOLUME     (mm)=  30.76
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 5Yr, Outlet4

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'    hrs     cms |   hrs     cms
  0.00   0.000 |  1.25   0.149 |  2.50   0.054 |  3.75   0.003 |  5.00   0.001
  0.25   0.013 |  1.50   0.103 |  2.75   0.049 |  4.00   0.002 |  5.25   0.000
  0.50   0.048 |  1.75   0.081 |  3.00   0.046 |  4.25   0.002 |  5.50   0.000
  0.75   0.103 |  2.00   0.069 |  3.25   0.013 |  4.50   0.001 |
  1.00   0.765 |  2.25   0.060 |  3.50   0.006 |  4.75   0.001 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0004):      4.59    0.765     1.00     30.76
     + ID2= 2 (  0001):   2873.93   22.560    12.75     20.51
       ================================================
       ID = 3 (  0100):   2878.52   22.560    12.75     20.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.21	454.96	.442E+03	1.0	0.77	7.33
0.42	455.17	.102E+04	3.5	1.14	4.93
0.62	455.37	.175E+04	7.4	1.43	3.94
0.83	455.58	.261E+04	12.9	1.68	3.36
1.04	455.79	.361E+04	20.2	1.90	2.97
1.25	456.00	.475E+04	29.4	2.10	2.69
1.46	456.21	.618E+04	42.5	2.33	2.42
1.67	456.42	.816E+04	58.3	2.42	2.33
1.88	456.63	.110E+05	78.1	2.40	2.35
2.10	456.85	.146E+05	103.3	2.39	2.36
2.31	457.06	.186E+05	134.3	2.45	2.31
2.52	457.27	.228E+05	170.3	2.53	2.23
2.73	457.48	.273E+05	211.2	2.62	2.15
2.94	457.69	.319E+05	258.3	2.74	2.06
3.15	457.90	.367E+05	310.2	2.86	1.97
3.37	458.12	.416E+05	367.0	2.99	1.89
3.58	458.33	.466E+05	428.5	3.11	1.81
3.79	458.54	.518E+05	495.8	3.24	1.74
4.00	458.75	.573E+05	573.1	3.38	1.67

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0100)	2878.52	22.56	12.75	20.53	1.09	1.94
OUTFLOW: ID= 1 (0033)	2878.52	22.57	12.75	20.53	1.09	1.94

CALIB NASHYD (2000) ID= 1 DT=15.0 min	Area (ha)=2922.70 Curve Number (CN)= 63.0 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 2.60

Unit Hyd Qpeak (cms)= 42.936

PEAK FLOW (cms)= 15.705 (i)
TIME TO PEAK (hrs)= 9.000
RUNOFF VOLUME (mm)= 12.289
TOTAL RAINFALL (mm)= 54.400
RUNOFF COEFFICIENT = 0.226

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

ROUTE CHN(0020) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
12.14	470.87	0.0500	
17.70	470.75	0.0500 /0.0300	
21.67	470.25	0.0300	Main Channel
24.23	470.25	0.0300	Main Channel
27.54	470.75	0.0300 /0.0500	Main Channel
30.81	471.00	0.0500	
40.00	471.16	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.03	470.28	.106E+03	0.0	0.18	109.47
0.07	470.32	.229E+03	0.1	0.27	72.36
0.10	470.35	.371E+03	0.1	0.34	57.58
0.13	470.38	.531E+03	0.2	0.39	49.31
0.16	470.41	.708E+03	0.3	0.44	43.90
0.20	470.45	.904E+03	0.4	0.48	40.01
0.23	470.48	.112E+04	0.5	0.52	37.05
0.26	470.51	.135E+04	0.6	0.56	34.69
0.29	470.54	.160E+04	0.8	0.59	32.75
0.33	470.58	.186E+04	1.0	0.62	31.11
0.36	470.61	.215E+04	1.2	0.65	29.71
0.39	470.64	.245E+04	1.4	0.68	28.49
0.42	470.67	.277E+04	1.7	0.70	27.40
0.46	470.71	.311E+04	2.0	0.73	26.44
0.49	470.74	.347E+04	2.3	0.75	25.56
0.52	470.77	.386E+04	2.6	0.79	24.42
0.55	470.80	.432E+04	3.1	0.82	23.53

0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (2000)	2922.70	15.71	9.00	12.29	0.60	0.85
OUTFLOW: ID= 1 (0020)	2922.70	15.30	9.50	12.29	0.62	0.86

ROUTE CHN(0019)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0020)	2922.70	15.30	9.50	12.29	0.24	0.31
OUTFLOW: ID= 1 (0019)	2922.70	13.20	11.25	12.29	0.25	0.31

ROUTE CHN(0018)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17
0.47	466.61	.198E+04	1.6	0.81	20.60

0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0019)		2922.70	13.20	11.25	12.29	1.11	1.11
OUTFLOW: ID= 1 (0018)		2922.70	13.15	11.50	12.29	1.11	1.11

ROUTE CHN(0017) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0018)		2922.70	13.15	11.50	12.29	0.75	1.21
OUTFLOW: ID= 1 (0017)		2922.70	13.11	11.75	12.29	0.77	1.23

ROUTE CHN(0016) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel
30.53	460.25	0.0300 /0.0500	Main Channel

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                60.87        460.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.06   458.81    .262E+03       0.1          0.20      82.51
        0.13   458.88    .554E+03       0.2          0.31      53.72
        0.19   458.94    .875E+03       0.3          0.40      42.17
        0.25   459.00    .123E+04       0.6          0.47      35.68
        0.31   459.06    .160E+04       0.9          0.53      31.42
        0.38   459.13    .201E+04       1.2          0.59      28.36
        0.44   459.19    .245E+04       1.6          0.64      26.03
        0.50   459.25    .292E+04       2.0          0.69      24.18
        0.56   459.31    .342E+04       2.5          0.74      22.66
        0.63   459.38    .394E+04       3.1          0.78      21.39
        0.69   459.44    .450E+04       3.7          0.82      20.31
        0.75   459.50    .509E+04       4.4          0.86      19.36
        0.81   459.56    .570E+04       5.1          0.90      18.53
        0.88   459.63    .634E+04       5.9          0.94      17.80
        0.94   459.69    .702E+04       6.8          0.97      17.14
        1.00   459.75    .772E+04       7.8          1.01      16.54
        1.08   459.83    .879E+04       9.3          1.06      15.68
        1.17   459.92    .101E+05      11.1          1.10      15.19
        1.25   460.00    .116E+05      13.0          1.12      14.91

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0017) 2922.70    13.11   11.75  12.29      1.25      1.12
    OUTFLOW: ID= 1 (  0016) 2922.70    13.06   12.00  12.29      1.25      1.12



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| ROUTE CHN(  0015)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
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               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 131.87        458.25        0.0500
                 140.91        458.66    0.0500 /0.0300
                 147.80        457.48        0.0300      Main Channel
                 149.90        457.48        0.0300      Main Channel
                 153.04        458.50    0.0300 /0.0500  Main Channel
                 156.08        458.60        0.0500
                 157.70        458.75        0.0500
                 160.00        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.04   457.52    .924E+02       0.0          0.12     134.80
        0.08   457.56    .199E+03       0.0          0.19      89.01
        0.12   457.60    .321E+03       0.1          0.24      70.81
        0.16   457.64    .457E+03       0.1          0.27      60.67
        0.20   457.68    .608E+03       0.2          0.31      54.05
        0.24   457.72    .774E+03       0.3          0.34      49.33
        0.28   457.76    .954E+03       0.3          0.36      45.73
        0.32   457.80    .115E+04       0.4          0.39      42.89
        0.36   457.84    .136E+04       0.6          0.41      40.55
        0.41   457.89    .158E+04       0.7          0.43      38.59
        0.45   457.93    .182E+04       0.8          0.45      36.91
        0.49   457.97    .208E+04       1.0          0.47      35.45
        0.53   458.01    .234E+04       1.1          0.49      34.15
        0.57   458.05    .263E+04       1.3          0.51      33.00
        0.61   458.09    .292E+04       1.5          0.52      31.96
        0.65   458.13    .324E+04       1.7          0.54      31.02
        0.69   458.17    .356E+04       2.0          0.55      30.15
        0.73   458.21    .390E+04       2.2          0.57      29.36
        0.77   458.25    .426E+04       2.5          0.58      28.62

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0016) 2922.70    13.06   12.00  12.29      0.77      0.58
    OUTFLOW: ID= 1 (  0015) 2922.70    12.84   12.50  12.29      0.77      0.58



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| ROUTE CHN(0014)|
| IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
150.00	456.75	0.0500	
155.75	456.75	0.0500 /0.0300	
160.05	456.00	0.0300	Main Channel
165.32	456.00	0.0300	Main Channel
170.87	457.50	0.0300 /0.0500	Main Channel
172.96	457.75	0.0500	
175.82	457.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	456.04	.215E+03	0.0	0.09	180.09
0.08	456.08	.445E+03	0.1	0.14	115.91
0.12	456.12	.690E+03	0.1	0.18	90.27
0.16	456.16	.950E+03	0.2	0.22	75.96
0.20	456.20	.122E+04	0.3	0.25	66.67
0.24	456.24	.151E+04	0.4	0.28	60.07
0.28	456.28	.182E+04	0.5	0.30	55.11
0.32	456.32	.213E+04	0.7	0.33	51.21
0.36	456.36	.247E+04	0.9	0.35	48.06
0.39	456.39	.282E+04	1.0	0.37	45.44
0.43	456.43	.318E+04	1.2	0.39	43.23
0.47	456.47	.356E+04	1.4	0.40	41.33
0.51	456.51	.395E+04	1.7	0.42	39.67
0.55	456.55	.435E+04	1.9	0.44	38.22
0.59	456.59	.477E+04	2.2	0.45	36.92
0.63	456.63	.521E+04	2.4	0.47	35.76
0.67	456.67	.566E+04	2.7	0.48	34.70
0.71	456.71	.613E+04	3.0	0.49	33.75
0.75	456.75	.661E+04	3.3	0.51	32.87

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<---- hydrograph ----> MAX DEPTH (m)	<-pipe / channel-> MAX VEL (m/s)
INFLOW : ID= 2	(0015)	2922.70	12.84	12.50	12.29	0.73	0.50
OUTFLOW: ID= 1	(0014)	2922.70	12.62	13.00	12.29	0.75	0.51

| ROUTE CHN(0013)|
| IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
155.00	456.25	0.0500	
161.70	456.25	0.0500 /0.0300	
169.49	455.25	0.0300	Main Channel
170.18	455.25	0.0300	Main Channel
176.86	456.75	0.0300 /0.0500	Main Channel
181.81	456.75	0.0500	
188.74	456.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.08	455.33	.926E+02	0.0	0.18	90.89
0.16	455.41	.262E+03	0.1	0.25	65.50
0.24	455.49	.507E+03	0.2	0.31	53.95
0.32	455.57	.828E+03	0.3	0.36	46.77
0.39	455.64	.123E+04	0.5	0.40	41.69
0.47	455.72	.170E+04	0.7	0.44	37.85
0.55	455.80	.225E+04	1.1	0.48	34.80
0.63	455.88	.288E+04	1.5	0.52	32.31
0.71	455.96	.358E+04	2.0	0.55	30.23
0.79	456.04	.436E+04	2.6	0.59	28.46
0.87	456.12	.522E+04	3.2	0.62	26.93
0.95	456.20	.615E+04	4.0	0.65	25.59
1.03	456.28	.734E+04	4.9	0.67	24.78
1.11	456.36	.898E+04	6.2	0.68	24.34
1.18	456.43	.107E+05	7.6	0.71	23.62
1.26	456.51	.126E+05	9.2	0.73	22.81
1.34	456.59	.146E+05	11.1	0.76	22.00
1.42	456.67	.167E+05	13.1	0.79	21.22
1.50	456.75	.189E+05	15.2	0.81	20.70

<---- hydrograph ----> <-pipe / channel->

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0014)	2922.70	12.62	13.00	12.29	1.40	0.78
OUTFLOW: ID= 1 (0013)	2922.70	12.54	13.25	12.29	1.40	0.78

ROUTE CHN(0012) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.10	455.50	0.0500	
144.47	455.50	0.0500	
148.86	455.75	0.0500	
150.17	455.75	0.0500	
151.79	455.50	0.0500 /0.0300	Main Channel
155.72	454.00	0.0300	Main Channel
158.28	453.76	0.0300	Main Channel
161.63	454.00	0.0300	Main Channel
165.55	455.50	0.0300 /0.0500	Main Channel
169.69	455.50	0.0500	
175.87	455.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	453.86	.129E+03	0.0	0.08	209.88
0.20	453.96	.516E+03	0.1	0.13	132.21
0.31	454.07	.112E+04	0.2	0.18	91.49
0.41	454.17	.179E+04	0.4	0.23	70.94
0.51	454.27	.251E+04	0.7	0.28	59.65
0.61	454.37	.329E+04	1.0	0.32	52.34
0.72	454.48	.412E+04	1.5	0.35	47.15
0.82	454.58	.501E+04	1.9	0.39	43.22
0.92	454.68	.595E+04	2.5	0.42	40.11
1.02	454.78	.695E+04	3.1	0.44	37.58
1.13	454.89	.800E+04	3.8	0.47	35.47
1.23	454.99	.911E+04	4.5	0.50	33.66
1.33	455.09	.103E+05	5.3	0.52	32.10
1.43	455.19	.115E+05	6.2	0.54	30.73
1.54	455.30	.128E+05	7.2	0.56	29.57
1.64	455.40	.144E+05	8.3	0.58	28.91
1.74	455.50	.162E+05	9.4	0.58	28.67
1.87	455.63	.220E+05	11.7	0.53	31.39
1.99	455.75	.281E+05	14.4	0.51	32.45

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0013)	2922.70	12.54	13.25	12.29	1.90	0.53
OUTFLOW: ID= 1 (0012)	2922.70	12.04	14.00	12.29	1.88	0.53

ROUTE CHN(0011) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.00	455.75	0.0500	
137.92	455.00	0.0500 /0.0300	
144.47	453.45	0.0300	Main Channel
146.45	453.43	0.0300	Main Channel
148.74	453.48	0.0300	Main Channel
151.36	453.75	0.0300	Main Channel
154.10	453.93	0.0300	Main Channel
155.00	454.00	0.0300	Main Channel
161.50	455.18	0.0300 /0.0500	Main Channel
168.74	455.67	0.0500	
170.19	455.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.02	453.45	.290E+02	0.0	0.10	164.18
0.14	453.57	.573E+03	0.3	0.48	35.05
0.25	453.68	.132E+04	0.9	0.69	24.05
0.37	453.80	.227E+04	1.9	0.84	19.87
0.49	453.92	.347E+04	3.3	0.95	17.58

0.60	454.03	.492E+04	5.3	1.08	15.43
0.72	454.15	.653E+04	8.0	1.23	13.54
0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0012)	2922.70	12.04	14.00	12.29	0.86	1.39
OUTFLOW: ID= 1 (0011)	2922.70	12.03	14.00	12.29	0.86	1.38

ADD HYD (0200)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0011):		2922.70	12.028	14.00	12.29
+ ID2= 2 (0033):		2878.52	22.565	12.75	20.53
ID = 3 (0200):		5801.22	33.778	13.00	16.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

	<---- hydrograph ---->			<-pipe / channel->	
AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)

```
   INFLOW : ID= 2 (  0200) 5801.22    33.78   13.00  16.38      1.19      1.76
   OUTFLOW: ID= 1 (  0031) 5801.22    33.80   13.25  16.38      1.19      1.75



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0032)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   4.69        451.07        0.0500
                  13.38        451.10        0.0500
                  23.86        450.00    0.0500 /0.0300  Main Channel
                  32.76        447.75        0.0300      Main Channel
                  35.26        447.50        0.0300      Main Channel
                  46.15        447.50        0.0300      Main Channel
                  49.16        447.75        0.0300      Main Channel
                  56.34        451.00    0.0300 /0.0500  Main Channel
                  67.16        452.61        0.0500
                  73.93        452.92        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.18   447.68    .165E+03       1.8          0.77       1.55
        0.36   447.86    .375E+03       6.3          1.21       0.99
        0.54   448.04    .601E+03      13.3          1.59       0.75
        0.71   448.21    .842E+03      22.4          1.91       0.63
        0.89   448.39    .110E+04      33.5          2.20       0.55
        1.07   448.57    .137E+04      46.5          2.45       0.49
        1.25   448.75    .165E+04      61.5          2.68       0.45
        1.43   448.93    .195E+04      78.4          2.90       0.41
        1.61   449.11    .226E+04      97.3          3.10       0.39
        1.79   449.29    .258E+04     118.2          3.30       0.36
        1.96   449.46    .292E+04     141.1          3.48       0.35
        2.14   449.64    .328E+04     166.1          3.65       0.33
        2.32   449.82    .364E+04     193.2          3.82       0.31
        2.50   450.00    .403E+04     222.4          3.98       0.30
        2.68   450.18    .443E+04     257.2          4.18       0.29
        2.89   450.39    .495E+04     302.1          4.40       0.27
        3.11   450.61    .550E+04     350.5          4.59       0.26
        3.32   450.82    .610E+04     402.6          4.75       0.25
        3.53   451.03    .673E+04     459.2          4.91       0.24

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA     QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)     (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0031) 5801.22     33.80   13.25  16.38      0.90      2.20
   OUTFLOW: ID= 1 (  0032) 5801.22     33.80   13.25  16.38      0.90      2.20



--------------------------------------------------------------------------------
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 542.362
| Ptotal= 43.12 mm |                          B=   0.000
--------------------                          C=   0.699
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                  TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                   hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
                  0.00     5.04 |  0.83   108.46 |  1.67     7.82 |  2.50     4.87
                  0.17     5.94 |  1.00    22.97 |  1.83     6.91 |  2.67     4.56
                  0.33     7.36 |  1.17    14.48 |  2.00     6.22 |  2.83     4.29
                  0.50    10.06 |  1.33    11.04 |  2.17     5.67 |
                  0.67    18.72 |  1.50     9.10 |  2.33     5.23 |



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  3000)|   Area    (ha)=  25.69   Curve Number   (CN)= 85.2
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.57

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
0.250	5.34	1.000	78.55	1.750	8.67	2.50	5.38
0.500	6.88	1.250	20.14	2.000	7.21	2.75	4.76
0.750	12.95	1.500	12.19	2.250	6.03	3.00	4.38

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 0.688 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 17.629
TOTAL RAINFALL (mm)= 43.121
RUNOFF COEFFICIENT = 0.409

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

READ HYD (0002)
DT=15.0 min

AREA (ha)= 8.70
TPEAK (hrs)= 1.00
VOLUME (mm)= 28.74

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 5Yr, Outlet2

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.25	0.267	2.50	0.105	3.75	0.005	5.00	0.000
0.25	0.021	1.50	0.193	2.75	0.095	4.00	0.003		
0.50	0.082	1.75	0.155	3.00	0.088	4.25	0.001		
0.75	0.177	2.00	0.133	3.25	0.026	4.50	0.000		
1.00	1.298	2.25	0.117	3.50	0.011	4.75	0.000		

READ HYD (0022)
DT=15.0 min

AREA (ha)= 2.23
TPEAK (hrs)= 1.25
VOLUME (mm)= 36.82

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 5Yr, Commercial

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	2.25	0.050	4.50	0.004	6.75	0.001	9.00	0.000
0.25	0.000	2.50	0.042	4.75	0.003	7.00	0.001	9.25	0.000
0.50	0.005	2.75	0.036	5.00	0.002	7.25	0.000	9.50	0.000
0.75	0.020	3.00	0.031	5.25	0.002	7.50	0.000	9.75	0.000
1.00	0.172	3.25	0.023	5.50	0.002	7.75	0.000	10.00	0.000
1.25	0.182	3.50	0.015	5.75	0.001	8.00	0.000	10.25	0.000
1.50	0.138	3.75	0.010	6.00	0.001	8.25	0.000	10.50	0.000
1.75	0.089	4.00	0.007	6.25	0.001	8.50	0.000	10.75	0.000
2.00	0.065	4.25	0.005	6.50	0.001	8.75	0.000		

READ HYD (0003)
DT=15.0 min

AREA (ha)= 1.06
TPEAK (hrs)= 1.00
VOLUME (mm)= 33.11

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 5Yr, Outlet3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.00	0.184	2.00	0.018	3.00	0.011	4.00	0.000
0.25	0.002	1.25	0.043	2.25	0.016	3.25	0.004		
0.50	0.011	1.50	0.028	2.50	0.014	3.50	0.001		
0.75	0.023	1.75	0.022	2.75	0.012	3.75	0.000		

ADD HYD (0500)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	8.70	1.298	1.00	28.74
+ ID2= 2 (0022):	2.23	0.182	1.25	36.82
ID = 3 (0500):	10.93	1.470	1.00	30.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0500)
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0500):	10.93	1.470	1.00	30.39

```
      + ID2= 2 (  0003):     1.06   0.184     1.00    33.11
        ================================================
        ID = 1 (  0500):    11.99   1.654     1.00    30.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0500):    11.99   1.654     1.00    30.63
      + ID2= 2 (  3000):    25.69   0.688     1.50    17.63
        ================================================
        ID = 3 (  0500):    37.68   1.925     1.00    21.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0032):  5801.22  33.805    13.25    16.38
      + ID2= 2 (  0500):    37.68   1.925     1.00    21.77
        ================================================
        ID = 3 (  0300):  5838.90  33.805    13.25    16.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=   1.00
--------------------   VOLUME     (mm)=  34.48
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 5Yr, Outlet1

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'   hrs      cms |   hrs      cms
  0.00    0.000 |  2.50    0.036 |  5.00    0.002 |  7.50    0.000 | 10.00    0.000
  0.25    0.003 |  2.75    0.031 |  5.25    0.002 |  7.75    0.000 | 10.25    0.000
  0.50    0.009 |  3.00    0.027 |  5.50    0.002 |  8.00    0.000 | 10.50    0.000
  0.75    0.024 |  3.25    0.018 |  5.75    0.001 |  8.25    0.000 | 10.75    0.000
  1.00    0.183 |  3.50    0.013 |  6.00    0.001 |  8.50    0.000 | 11.00    0.000
  1.25    0.110 |  3.75    0.009 |  6.25    0.001 |  8.75    0.000 | 11.25    0.000
  1.50    0.089 |  4.00    0.007 |  6.50    0.001 |  9.00    0.000 | 11.50    0.000
  1.75    0.066 |  4.25    0.005 |  6.75    0.001 |  9.25    0.000 |
  2.00    0.052 |  4.50    0.004 |  7.00    0.001 |  9.50    0.000 |
  2.25    0.042 |  4.75    0.003 |  7.25    0.001 |  9.75    0.000 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     1.95   0.183     1.00    34.48
      + ID2= 2 (  0300):  5838.90  33.805    13.25    16.41
        ================================================
        ID = 3 (  0400):  5840.85  33.805    13.25    16.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <--------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.35   447.48    .169E+04       10.3          1.33       2.74
       0.70   447.83    .399E+04       36.9          2.02       1.80
       1.06   448.19    .682E+04       79.6          2.54       1.43
```

1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0400)	5840.85	33.80	13.25	16.42	0.66	1.90
OUTFLOW: ID= 1 (0062)	5840.85	33.82	13.25	16.42	0.66	1.90

FINISH

==========

Post-Development - 10-Year Storm Event

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\630dc1fd-
  Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\630dc1fd-


DATE: 12/09/2024                          TIME: 12:24:08

USER:


COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : 211 Eliza - Rain 03 - 10yr    **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              4bce8d31-38dc-41c2-8393-f5f71332ded8\1bf444ed
| Ptotal= 62.70 mm |    Comments: 10-Year 12-Hour SCS II Design Storm
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'    hrs    mm/hr |    hrs    mm/hr
                0.00     1.57 |  3.00     2.51 |  6.00   11.29 |  9.00     2.19
                0.25     1.57 |  3.25     2.51 |  6.25   11.29 |  9.25     2.19
                0.50     1.57 |  3.50     2.51 |  6.50    5.02 |  9.50     2.19
                0.75     1.57 |  3.75     2.51 |  6.75    5.02 |  9.75     2.19
                1.00     1.57 |  4.00     3.76 |  7.00    3.76 | 10.00     1.25
                1.25     1.57 |  4.25     3.76 |  7.25    3.76 | 10.25     1.25
                1.50     1.57 |  4.50     5.02 |  7.50    3.76 | 10.50     1.25
                1.75     1.57 |  4.75     5.02 |  7.75    3.76 | 10.75     1.25
                2.00     1.88 |  5.00     7.52 |  8.00    2.19 | 11.00     1.25
                2.25     1.88 |  5.25     7.52 |  8.25    2.19 | 11.25     1.25
                2.50     1.88 |  5.50    30.10 |  8.50    2.19 | 11.50     1.25
                2.75     1.88 |  5.75    82.76 |  8.75    2.19 | 11.75     1.25

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)=  33.149 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  26.160
     TOTAL RAINFALL   (mm)=  62.700
     RUNOFF COEFFICIENT   =   0.417

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
```

```
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
               88.23        474.75        0.0500
               89.82        474.75    0.0500 /0.0300
               94.62        473.25        0.0300      Main Channel
               96.33        473.25        0.0300      Main Channel
              101.14        474.50    0.0300 /0.0500  Main Channel
              108.03        474.46        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22     107.71
       0.13   473.38    .391E+03       0.1          0.33      72.28
       0.19   473.44    .647E+03       0.2          0.41      58.08
       0.25   473.50    .944E+03       0.3          0.47      50.05
       0.32   473.57    .128E+04       0.5          0.53      44.73
       0.38   473.63    .166E+04       0.7          0.58      40.85
       0.45   473.70    .208E+04       0.9          0.63      37.86
       0.51   473.76    .254E+04       1.2          0.67      35.46
       0.57   473.82    .304E+04       1.5          0.71      33.46
       0.64   473.89    .358E+04       1.9          0.75      31.76
       0.70   473.95    .416E+04       2.3          0.78      30.29
       0.76   474.01    .478E+04       2.7          0.82      29.01
       0.83   474.08    .544E+04       3.3          0.85      27.86
       0.89   474.14    .615E+04       3.8          0.88      26.84
       0.96   474.21    .689E+04       4.4          0.91      25.91
       1.02   474.27    .767E+04       5.1          0.94      25.07
       1.08   474.33    .850E+04       5.8          0.97      24.29
       1.15   474.40    .936E+04       6.6          1.00      23.58
       1.21   474.46    .103E+05       7.5          1.03      22.92

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    33.15    9.00  26.16      1.17      1.01
   OUTFLOW: ID= 1 (  0010) 2873.93    32.44    9.50  26.16      1.21      1.03



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
               59.79        473.44        0.0500
               67.47        472.75        0.0500
               90.84        472.50    0.0500 /0.0300  Main Channel
               93.81        472.25        0.0300      Main Channel
               95.43        472.25        0.0300      Main Channel
              115.15        472.50    0.0300 /0.0500  Main Channel
              119.95        472.50        0.0500
              143.58        472.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.03   472.28    .689E+02       0.0          0.07     232.76
       0.05   472.30    .194E+03       0.0          0.11     158.29
       0.08   472.33    .377E+03       0.1          0.13     125.54
       0.10   472.35    .616E+03       0.1          0.16     106.06
       0.13   472.38    .912E+03       0.2          0.18      92.83
       0.15   472.40    .126E+04       0.3          0.20      83.13
       0.18   472.43    .167E+04       0.4          0.22      75.64
       0.20   472.45    .214E+04       0.5          0.24      69.65
       0.23   472.48    .266E+04       0.7          0.26      64.73
       0.25   472.50    .324E+04       0.9          0.28      60.59
       0.28   472.53    .412E+04       1.2          0.30      55.76
       0.31   472.56    .515E+04       1.6          0.32      52.56
       0.33   472.58    .632E+04       2.1          0.33      50.26
       0.36   472.61    .764E+04       2.6          0.34      48.49
       0.39   472.64    .910E+04       3.2          0.35      47.04
       0.42   472.67    .107E+05       3.9          0.36      45.81
       0.44   472.69    .125E+05       4.6          0.37      44.73
       0.47   472.72    .144E+05       5.5          0.38      43.76
       0.50   472.75    .164E+05       6.4          0.39      42.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0010) 2873.93    32.44    9.50  26.16      0.49      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    30.56   10.25  26.16      0.50      0.39



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.04   471.29    .712E+01        0.0           0.09      186.75
       0.08   471.33    .285E+02        0.0           0.14      117.64
       0.12   471.37    .641E+02        0.0           0.19       89.78
       0.16   471.41    .114E+03        0.0           0.22       74.11
       0.20   471.45    .178E+03        0.0           0.26       63.87
       0.24   471.49    .256E+03        0.1           0.29       56.56
       0.28   471.53    .349E+03        0.1           0.33       51.03
       0.32   471.57    .456E+03        0.2           0.36       46.69
       0.36   471.61    .577E+03        0.2           0.39       43.16
       0.39   471.64    .712E+03        0.3           0.41       40.23
       0.43   471.68    .862E+03        0.4           0.44       37.76
       0.47   471.72    .103E+04        0.5           0.47       35.63
       0.51   471.76    .120E+04        0.6           0.49       33.78
       0.55   471.80    .140E+04        0.7           0.52       32.15
       0.59   471.84    .160E+04        0.9           0.54       30.70
       0.63   471.88    .182E+04        1.0           0.57       29.41
       0.67   471.92    .206E+04        1.2           0.59       28.25
       0.71   471.96    .231E+04        1.4           0.61       27.19
       0.75   472.00    .257E+04        1.6           0.64       26.23

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0009) 2873.93    30.56   10.25  26.16      0.72      0.62
   OUTFLOW: ID= 1 (  0008) 2873.93    29.46   11.25  26.16      0.75      0.64



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0007)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   9.36        470.00        0.0500
                  13.30        470.05    0.0500 /0.0300
                  18.94        469.00        0.0300      Main Channel
                  22.08        469.00        0.0300      Main Channel
                  26.35        470.00    0.0300 /0.0500  Main Channel
                  28.73        470.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.06   469.06    .188E+03        0.0           0.21       79.24
       0.11   469.11    .406E+03        0.1           0.32       52.24
       0.17   469.17    .653E+03        0.3           0.40       41.50
       0.22   469.22    .929E+03        0.4           0.47       35.50
       0.28   469.28    .124E+04        0.7           0.53       31.57
       0.33   469.33    .157E+04        0.9           0.58       28.77
       0.39   469.39    .194E+04        1.2           0.63       26.63
       0.44   469.44    .233E+04        1.6           0.67       24.93
       0.50   469.50    .275E+04        1.9           0.71       23.54
       0.55   469.55    .321E+04        2.4           0.75       22.37
       0.61   469.61    .369E+04        2.9           0.78       21.37
       0.66   469.66    .420E+04        3.4           0.81       20.49
       0.72   469.72    .474E+04        4.0           0.85       19.72
       0.77   469.77    .531E+04        4.7           0.88       19.03
       0.83   469.83    .591E+04        5.4           0.91       18.41
       0.88   469.88    .654E+04        6.1           0.93       17.85
       0.94   469.94    .720E+04        6.9           0.96       17.33
```

0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0008)	2873.93	29.46	11.25	26.16	1.02	1.00
OUTFLOW: ID= 1 (0007)	2873.93	29.30	11.50	26.16	1.05	1.01

ROUTE CHN(0006)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0007)	2873.93	29.30	11.50	26.16	1.05	1.06
OUTFLOW: ID= 1 (0006)	2873.93	29.15	11.75	26.16	1.07	1.05

ROUTE CHN(0005)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47

0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0006)	2873.93	29.15	11.75	26.16	1.24	0.86
OUTFLOW: ID= 1 (0005)	2873.93	28.92	12.00	26.16	1.25	0.86

ROUTE CHN(0004)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0005)	2873.93	28.92	12.00	26.16	1.68	1.21
OUTFLOW: ID= 1 (0004)	2873.93	28.86	12.25	26.16	1.68	1.21

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97

0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0004)	2873.93	28.86	12.25	26.16	1.72	1.35
OUTFLOW: ID= 1 (0003)	2873.93	28.81	12.50	26.16	1.72	1.35

ROUTE CHN(0002)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0003)	2873.93	28.81	12.50	26.16	1.36	1.30
OUTFLOW: ID= 1 (0002)	2873.93	28.75	12.50	26.16	1.36	1.29

ROUTE CHN(0001)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
39.74	459.25	0.0500
41.86	459.00	0.0500

```
                49.51        457.47        0.0500
                58.73        456.75        0.0500
                85.31        456.25        0.0500
                91.00        456.00    0.0500 /0.0300  Main Channel
                98.50        454.75        0.0300      Main Channel
               103.78        454.75        0.0300      Main Channel
               116.96        458.50    0.0300 /0.0500  Main Channel
               125.11        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77       14.66
       0.42   455.17    .205E+04       3.5          1.14        9.86
       0.62   455.37    .349E+04       7.4          1.43        7.88
       0.83   455.58    .522E+04      12.9          1.68        6.72
       1.04   455.79    .722E+04      20.2          1.90        5.95
       1.25   456.00    .950E+04      29.4          2.10        5.38
       1.46   456.21    .124E+05      42.5          2.33        4.85
       1.67   456.42    .163E+05      58.3          2.42        4.67
       1.88   456.63    .220E+05      78.1          2.40        4.69
       2.10   456.85    .292E+05     103.3          2.39        4.72
       2.31   457.06    .372E+05     134.3          2.45        4.61
       2.52   457.27    .456E+05     170.3          2.53        4.46
       2.73   457.48    .545E+05     211.2          2.62        4.30
       2.94   457.69    .638E+05     258.3          2.74        4.12
       3.15   457.90    .733E+05     310.2          2.86        3.94
       3.37   458.12    .832E+05     367.0          2.99        3.78
       3.58   458.33    .932E+05     428.5          3.11        3.63
       3.79   458.54    .104E+06     495.8          3.24        3.48
       4.00   458.75    .115E+06     573.1          3.38        3.34

                                   <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    28.75   12.50  26.16      1.23      2.08
   OUTFLOW: ID= 1 (  0001) 2873.93    28.75   12.75  26.16      1.23      2.08



--------------------------------------------------------------------------------
--------------------
| READ HYD (  0004)|   AREA       (ha)=   4.59
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  32.65
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 25Yr, Outlet4

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'   hrs     cms |   hrs     cms
  0.00   0.000 |  1.50   0.223 |  3.00   0.058 |  4.50   0.002 |  6.00   0.000
  0.25   0.014 |  1.75   0.130 |  3.25   0.016 |  4.75   0.001 |
  0.50   0.045 |  2.00   0.100 |  3.50   0.008 |  5.00   0.001 |
  0.75   0.062 |  2.25   0.083 |  3.75   0.005 |  5.25   0.001 |
  1.00   0.095 |  2.50   0.072 |  4.00   0.003 |  5.50   0.000 |
  1.25   0.679 |  2.75   0.064 |  4.25   0.002 |  5.75   0.000 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     4.59   0.679     1.25    32.65
     + ID2= 2 (  0001):  2873.93  28.746    12.75    26.16
       ================================================
       ID = 3 (  0100):  2878.52  28.746    12.75    26.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 39.74        459.25        0.0500
                 41.86        459.00        0.0500
                 49.51        457.47        0.0500
                 58.73        456.75        0.0500
                 85.31        456.25        0.0500
                 91.00        456.00    0.0500 /0.0300  Main Channel
                 98.50        454.75        0.0300      Main Channel
                103.78        454.75        0.0300      Main Channel
                116.96        458.50    0.0300 /0.0500  Main Channel
```

```
            125.11        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.21   454.96    .442E+03       1.0          0.77       7.33
        0.42   455.17    .102E+04       3.5          1.14       4.93
        0.62   455.37    .175E+04       7.4          1.43       3.94
        0.83   455.58    .261E+04      12.9          1.68       3.36
        1.04   455.79    .361E+04      20.2          1.90       2.97
        1.25   456.00    .475E+04      29.4          2.10       2.69
        1.46   456.21    .618E+04      42.5          2.33       2.42
        1.67   456.42    .816E+04      58.3          2.42       2.33
        1.88   456.63    .110E+05      78.1          2.40       2.35
        2.10   456.85    .146E+05     103.3          2.39       2.36
        2.31   457.06    .186E+05     134.3          2.45       2.31
        2.52   457.27    .228E+05     170.3          2.53       2.23
        2.73   457.48    .273E+05     211.2          2.62       2.15
        2.94   457.69    .319E+05     258.3          2.74       2.06
        3.15   457.90    .367E+05     310.2          2.86       1.97
        3.37   458.12    .416E+05     367.0          2.99       1.89
        3.58   458.33    .466E+05     428.5          3.11       1.81
        3.79   458.54    .518E+05     495.8          3.24       1.74
        4.00   458.75    .573E+05     573.1          3.38       1.67

                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0100) 2878.52    28.75   12.75  26.17      1.23      2.08
   OUTFLOW: ID= 1 (  0033) 2878.52    28.76   12.75  26.17      1.23      2.08



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.60

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)=  20.656 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  16.093
     TOTAL RAINFALL   (mm)=  62.700
     RUNOFF COEFFICIENT   =   0.257

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87        0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25        0.0300      Main Channel
                  24.23        470.25        0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00        0.0500
                  40.00        471.16        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   470.28    .106E+03       0.0          0.18     109.47
        0.07   470.32    .229E+03       0.1          0.27      72.36
        0.10   470.35    .371E+03       0.1          0.34      57.58
        0.13   470.38    .531E+03       0.2          0.39      49.31
        0.16   470.41    .708E+03       0.3          0.44      43.90
        0.20   470.45    .904E+03       0.4          0.48      40.01
        0.23   470.48    .112E+04       0.5          0.52      37.05
        0.26   470.51    .135E+04       0.6          0.56      34.69
        0.29   470.54    .160E+04       0.8          0.59      32.75
        0.33   470.58    .186E+04       1.0          0.62      31.11
        0.36   470.61    .215E+04       1.2          0.65      29.71
        0.39   470.64    .245E+04       1.4          0.68      28.49
        0.42   470.67    .277E+04       1.7          0.70      27.40
        0.46   470.71    .311E+04       2.0          0.73      26.44
        0.49   470.74    .347E+04       2.3          0.75      25.56
        0.52   470.77    .386E+04       2.6          0.79      24.42
```

0.55	470.80	.432E+04	3.1	0.82	23.53
0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (2000)	2922.70	20.66	9.00	16.09	0.61	0.85
OUTFLOW: ID= 1 (0020)	2922.70	20.22	9.50	16.09	0.62	0.86

ROUTE CHN(0019) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0020)	2922.70	20.22	9.50	16.09	0.23	0.30
OUTFLOW: ID= 1 (0019)	2922.70	17.46	11.00	16.09	0.25	0.31

ROUTE CHN(0018) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17

0.47	466.61	.198E+04	1.6	0.81	20.60
0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0019)	2922.70	17.46	11.00	16.09	1.10	1.11
OUTFLOW: ID= 1 (0018)	2922.70	17.40	11.25	16.09	1.11	1.11

ROUTE CHN(0017)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0018)	2922.70	17.40	11.25	16.09	0.77	1.23
OUTFLOW: ID= 1 (0017)	2922.70	17.33	11.50	16.09	0.77	1.23

ROUTE CHN(0016)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel

```
                30.53        460.25    0.0300 /0.0500  Main Channel
                60.87        460.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.06   458.81    .262E+03        0.1          0.20       82.51
       0.13   458.88    .554E+03        0.2          0.31       53.72
       0.19   458.94    .875E+03        0.3          0.40       42.17
       0.25   459.00    .123E+04        0.6          0.47       35.68
       0.31   459.06    .160E+04        0.9          0.53       31.42
       0.38   459.13    .201E+04        1.2          0.59       28.36
       0.44   459.19    .245E+04        1.6          0.64       26.03
       0.50   459.25    .292E+04        2.0          0.69       24.18
       0.56   459.31    .342E+04        2.5          0.74       22.66
       0.63   459.38    .394E+04        3.1          0.78       21.39
       0.69   459.44    .450E+04        3.7          0.82       20.31
       0.75   459.50    .509E+04        4.4          0.86       19.36
       0.81   459.56    .570E+04        5.1          0.90       18.53
       0.88   459.63    .634E+04        5.9          0.94       17.80
       0.94   459.69    .702E+04        6.8          0.97       17.14
       1.00   459.75    .772E+04        7.8          1.01       16.54
       1.08   459.83    .879E+04        9.3          1.06       15.68
       1.17   459.92    .101E+05       11.1          1.10       15.19
       1.25   460.00    .116E+05       13.0          1.12       14.91

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  0017) 2922.70    17.33   11.50  16.09      1.24       1.12
   OUTFLOW: ID= 1 (  0016) 2922.70    17.27   11.75  16.09      1.25       1.12



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--------------------
| ROUTE CHN(  0015)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                131.87        458.25        0.0500
                140.91        458.66    0.0500 /0.0300
                147.80        457.48        0.0300      Main Channel
                149.90        457.48        0.0300      Main Channel
                153.04        458.50    0.0300 /0.0500  Main Channel
                156.08        458.60        0.0500
                157.70        458.75        0.0500
                160.00        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.04   457.52    .924E+02        0.0          0.12      134.80
       0.08   457.56    .199E+03        0.0          0.19       89.01
       0.12   457.60    .321E+03        0.1          0.24       70.81
       0.16   457.64    .457E+03        0.1          0.27       60.67
       0.20   457.68    .608E+03        0.2          0.31       54.05
       0.24   457.72    .774E+03        0.3          0.34       49.33
       0.28   457.76    .954E+03        0.3          0.36       45.73
       0.32   457.80    .115E+04        0.4          0.39       42.89
       0.36   457.84    .136E+04        0.6          0.41       40.55
       0.41   457.89    .158E+04        0.7          0.43       38.59
       0.45   457.93    .182E+04        0.8          0.45       36.91
       0.49   457.97    .208E+04        1.0          0.47       35.45
       0.53   458.01    .234E+04        1.1          0.49       34.15
       0.57   458.05    .263E+04        1.3          0.51       33.00
       0.61   458.09    .292E+04        1.5          0.52       31.96
       0.65   458.13    .324E+04        1.7          0.54       31.02
       0.69   458.17    .356E+04        2.0          0.55       30.15
       0.73   458.21    .390E+04        2.2          0.57       29.36
       0.77   458.25    .426E+04        2.5          0.58       28.62

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  0016) 2922.70    17.27   11.75  16.09      0.74       0.57
   OUTFLOW: ID= 1 (  0015) 2922.70    16.94   12.50  16.09      0.77       0.58



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--------------------
| ROUTE CHN(  0014)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 150.00        456.75        0.0500
                 155.75        456.75    0.0500 /0.0300
                 160.05        456.00        0.0300      Main Channel
                 165.32        456.00        0.0300      Main Channel
                 170.87        457.50    0.0300 /0.0500  Main Channel
                 172.96        457.75        0.0500
                 175.82        457.75        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
        0.04   456.04    .215E+03        0.0          0.09     180.09
        0.08   456.08    .445E+03        0.1          0.14     115.91
        0.12   456.12    .690E+03        0.1          0.18      90.27
        0.16   456.16    .950E+03        0.2          0.22      75.96
        0.20   456.20    .122E+04        0.3          0.25      66.67
        0.24   456.24    .151E+04        0.4          0.28      60.07
        0.28   456.28    .182E+04        0.5          0.30      55.11
        0.32   456.32    .213E+04        0.7          0.33      51.21
        0.36   456.36    .247E+04        0.9          0.35      48.06
        0.39   456.39    .282E+04        1.0          0.37      45.44
        0.43   456.43    .318E+04        1.2          0.39      43.23
        0.47   456.47    .356E+04        1.4          0.40      41.33
        0.51   456.51    .395E+04        1.7          0.42      39.67
        0.55   456.55    .435E+04        1.9          0.44      38.22
        0.59   456.59    .477E+04        2.2          0.45      36.92
        0.63   456.63    .521E+04        2.4          0.47      35.76
        0.67   456.67    .566E+04        2.7          0.48      34.70
        0.71   456.71    .613E+04        3.0          0.49      33.75
        0.75   456.75    .661E+04        3.3          0.51      32.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
    INFLOW : ID= 2 (  0015) 2922.70    16.94   12.50  16.09       0.74       0.50
    OUTFLOW: ID= 1 (  0014) 2922.70    16.55   13.00  16.09       0.75       0.51



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--------------------
| ROUTE CHN(  0013)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 155.00        456.25        0.0500
                 161.70        456.25    0.0500 /0.0300
                 169.49        455.25        0.0300      Main Channel
                 170.18        455.25        0.0300      Main Channel
                 176.86        456.75    0.0300 /0.0500  Main Channel
                 181.81        456.75        0.0500
                 188.74        456.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
        0.08   455.33    .926E+02        0.0          0.18      90.89
        0.16   455.41    .262E+03        0.1          0.25      65.50
        0.24   455.49    .507E+03        0.2          0.31      53.95
        0.32   455.57    .828E+03        0.3          0.36      46.77
        0.39   455.64    .123E+04        0.5          0.40      41.69
        0.47   455.72    .170E+04        0.7          0.44      37.85
        0.55   455.80    .225E+04        1.1          0.48      34.80
        0.63   455.88    .288E+04        1.5          0.52      32.31
        0.71   455.96    .358E+04        2.0          0.55      30.23
        0.79   456.04    .436E+04        2.6          0.59      28.46
        0.87   456.12    .522E+04        3.2          0.62      26.93
        0.95   456.20    .615E+04        4.0          0.65      25.59
        1.03   456.28    .734E+04        4.9          0.67      24.78
        1.11   456.36    .898E+04        6.2          0.68      24.34
        1.18   456.43    .107E+05        7.6          0.71      23.62
        1.26   456.51    .126E+05        9.2          0.73      22.81
        1.34   456.59    .146E+05       11.1          0.76      22.00
        1.42   456.67    .167E+05       13.1          0.79      21.22
        1.50   456.75    .189E+05       15.2          0.81      20.70
```

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (	0014)	2922.70	16.55	13.00	16.09	1.50	0.81
OUTFLOW: ID= 1 (	0013)	2922.70	16.46	13.50	16.09	1.50	0.81

ROUTE CHN(0012) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.10	455.50	0.0500	
144.47	455.50	0.0500	
148.86	455.75	0.0500	
150.17	455.75	0.0500	
151.79	455.50	0.0500 /0.0300	Main Channel
155.72	454.00	0.0300	Main Channel
158.28	453.76	0.0300	Main Channel
161.63	454.00	0.0300	Main Channel
165.55	455.50	0.0300 /0.0500	Main Channel
169.69	455.50	0.0500	
175.87	455.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	453.86	.129E+03	0.0	0.08	209.88
0.20	453.96	.516E+03	0.1	0.13	132.21
0.31	454.07	.112E+04	0.2	0.18	91.49
0.41	454.17	.179E+04	0.4	0.23	70.94
0.51	454.27	.251E+04	0.7	0.28	59.65
0.61	454.37	.329E+04	1.0	0.32	52.34
0.72	454.48	.412E+04	1.5	0.35	47.15
0.82	454.58	.501E+04	1.9	0.39	43.22
0.92	454.68	.595E+04	2.5	0.42	40.11
1.02	454.78	.695E+04	3.1	0.44	37.58
1.13	454.89	.800E+04	3.8	0.47	35.47
1.23	454.99	.911E+04	4.5	0.50	33.66
1.33	455.09	.103E+05	5.3	0.52	32.10
1.43	455.19	.115E+05	6.2	0.54	30.73
1.54	455.30	.128E+05	7.2	0.56	29.57
1.64	455.40	.144E+05	8.3	0.58	28.91
1.74	455.50	.162E+05	9.4	0.58	28.67
1.87	455.63	.220E+05	11.7	0.53	31.39
1.99	455.75	.281E+05	14.4	0.51	32.45

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (	0013)	2922.70	16.46	13.50	16.09	1.98	0.51
OUTFLOW: ID= 1 (	0012)	2922.70	16.28	14.00	16.09	1.98	0.52

ROUTE CHN(0011) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.00	455.75	0.0500	
137.92	455.00	0.0500 /0.0300	
144.47	453.45	0.0300	Main Channel
146.45	453.43	0.0300	Main Channel
148.74	453.48	0.0300	Main Channel
151.36	453.75	0.0300	Main Channel
154.10	453.93	0.0300	Main Channel
155.00	454.00	0.0300	Main Channel
161.50	455.18	0.0300 /0.0500	Main Channel
168.74	455.67	0.0500	
170.19	455.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.02	453.45	.290E+02	0.0	0.10	164.18
0.14	453.57	.573E+03	0.3	0.48	35.05

0.25	453.68	.132E+04	0.9	0.69	24.05
0.37	453.80	.227E+04	1.9	0.84	19.87
0.49	453.92	.347E+04	3.3	0.95	17.58
0.60	454.03	.492E+04	5.3	1.08	15.43
0.72	454.15	.653E+04	8.0	1.23	13.54
0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0012)	2922.70	16.28	14.00	16.09	0.99	1.52
OUTFLOW: ID= 1 (0011)	2922.70	16.26	14.00	16.09	0.98	1.51

ADD HYD (0200)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0011):	2922.70	16.261	14.00	16.09
+ ID2= 2 (0033):	2878.52	28.758	12.75	26.17
ID = 3 (0200):	5801.22	43.901	13.25	21.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

		<---- hydrograph ---->		<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0200)	5801.22	43.90	13.25	21.09	1.35	1.93
OUTFLOW: ID= 1 (0031)	5801.22	43.92	13.25	21.09	1.35	1.93

ROUTE CHN(0032)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.69	451.07	0.0500	
13.38	451.10	0.0500	
23.86	450.00	0.0500 /0.0300	Main Channel
32.76	447.75	0.0300	Main Channel
35.26	447.50	0.0300	Main Channel
46.15	447.50	0.0300	Main Channel
49.16	447.75	0.0300	Main Channel
56.34	451.00	0.0300 /0.0500	Main Channel
67.16	452.61	0.0500	
73.93	452.92	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.18	447.68	.165E+03	1.8	0.77	1.55
0.36	447.86	.375E+03	6.3	1.21	0.99
0.54	448.04	.601E+03	13.3	1.59	0.75
0.71	448.21	.842E+03	22.4	1.91	0.63
0.89	448.39	.110E+04	33.5	2.20	0.55
1.07	448.57	.137E+04	46.5	2.45	0.49
1.25	448.75	.165E+04	61.5	2.68	0.45
1.43	448.93	.195E+04	78.4	2.90	0.41
1.61	449.11	.226E+04	97.3	3.10	0.39
1.79	449.29	.258E+04	118.2	3.30	0.36
1.96	449.46	.292E+04	141.1	3.48	0.35
2.14	449.64	.328E+04	166.1	3.65	0.33
2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

		<---- hydrograph ---->		<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0031)	5801.22	43.92	13.25	21.09	1.04	2.40
OUTFLOW: ID= 1 (0032)	5801.22	43.92	13.25	21.09	1.04	2.40

CHICAGO STORM	
Ptotal= 49.94 mm	IDF curve parameters: A= 628.090
	B= 0.000
	C= 0.699

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.84	0.83	125.61	1.67	9.06	2.50	5.63
0.17	6.88	1.00	26.60	1.83	8.00	2.67	5.28
0.33	8.52	1.17	16.77	2.00	7.20	2.83	4.97
0.50	11.65	1.33	12.79	2.17	6.57		
0.67	21.67	1.50	10.54	2.33	6.06		

CALIB	
NASHYD (3000)|ID= 1 DT=15.0 min	Area (ha)= 25.69 Curve Number (CN)= 85.2
	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.57

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	6.19	1.000	90.96	1.750	10.04	2.50	6.23
0.500	7.97	1.250	23.32	2.000	8.35	2.75	5.51
0.750	14.99	1.500	14.12	2.250	6.99	3.00	5.07

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 0.901 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 22.621
TOTAL RAINFALL (mm)= 49.937
RUNOFF COEFFICIENT = 0.453

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

READ HYD (0002)	AREA (ha)= 8.70
DT=15.0 min	TPEAK (hrs)= 1.25
	VOLUME (mm)= 31.20

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 10Yr, Outlet2

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.25	1.184	2.50	0.141	3.75	0.007	5.00	0.000
0.25	0.023	1.50	0.415	2.75	0.124	4.00	0.003		
0.50	0.076	1.75	0.254	3.00	0.111	4.25	0.002		
0.75	0.106	2.00	0.198	3.25	0.032	4.50	0.000		
1.00	0.162	2.25	0.163	3.50	0.014	4.75	0.000		

READ HYD (0022)	AREA (ha)= 2.23
DT=15.0 min	TPEAK (hrs)= 1.50
	VOLUME (mm)= 42.45

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 10Yr, Commercial

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	2.50	0.061	5.00	0.003	7.50	0.000	10.00	0.000
0.25	0.000	2.75	0.049	5.25	0.002	7.75	0.000	10.25	0.000
0.50	0.004	3.00	0.041	5.50	0.002	8.00	0.000	10.50	0.000
0.75	0.015	3.25	0.029	5.75	0.001	8.25	0.000	10.75	0.000
1.00	0.032	3.50	0.018	6.00	0.001	8.50	0.000	11.00	0.000
1.25	0.132	3.75	0.012	6.25	0.001	8.75	0.000		
1.50	0.224	4.00	0.008	6.50	0.001	9.00	0.000		
1.75	0.181	4.25	0.006	6.75	0.001	9.25	0.000		
2.00	0.131	4.50	0.004	7.00	0.001	9.50	0.000		
2.25	0.084	4.75	0.003	7.25	0.000	9.75	0.000		

READ HYD (0003)	AREA (ha)= 1.06
DT=15.0 min	TPEAK (hrs)= 1.25
	VOLUME (mm)= 34.11

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 10Yr, Outlet3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.00	0.023	2.00	0.027	3.00	0.014	4.00	0.000
0.25	0.002	1.25	0.142	2.25	0.021	3.25	0.004		
0.50	0.010	1.50	0.071	2.50	0.018	3.50	0.001		
0.75	0.015	1.75	0.037	2.75	0.016	3.75	0.000		

ADD HYD (0500)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	8.70	1.184	1.25	31.20
	+ ID2= 2 (0022):	2.23	0.224	1.50	42.45
	ID = 3 (0500):	10.93	1.316	1.25	33.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD  (  0500)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0500):    10.93   1.316     1.25    33.49
     + ID2= 2 (  0003):     1.06   0.142     1.25    34.11
       ================================================
       ID = 1 (  0500):    11.99   1.458     1.25    33.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0500):    11.99   1.458     1.25    33.55
     + ID2= 2 (  3000):    25.69   0.901     1.50    22.62
       ================================================
       ID = 3 (  0500):    37.68   2.207     1.25    26.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0032):  5801.22  43.919    13.25    21.09
     + ID2= 2 (  0500):    37.68   2.207     1.25    26.10
       ================================================
       ID = 3 (  0300):  5838.90  43.919    13.25    21.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
-------------------   VOLUME      (mm)=  39.34
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 10Yr, Outlet1

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'    hrs      cms |   hrs      cms
  0.00    0.000 |  2.50    0.053 |  5.00    0.003 |  7.50    0.001 | 10.00    0.000
  0.25    0.003 |  2.75    0.043 |  5.25    0.002 |  7.75    0.000 | 10.25    0.000
  0.50    0.008 |  3.00    0.036 |  5.50    0.002 |  8.00    0.000 | 10.50    0.000
  0.75    0.015 |  3.25    0.023 |  5.75    0.002 |  8.25    0.000 | 10.75    0.000
  1.00    0.027 |  3.50    0.016 |  6.00    0.001 |  8.50    0.000 | 11.00    0.000
  1.25    0.162 |  3.75    0.011 |  6.25    0.001 |  8.75    0.000 | 11.25    0.000
  1.50    0.140 |  4.00    0.008 |  6.50    0.001 |  9.00    0.000 | 11.50    0.000
  1.75    0.114 |  4.25    0.006 |  6.75    0.001 |  9.25    0.000 | 11.75    0.000
  2.00    0.093 |  4.50    0.005 |  7.00    0.001 |  9.50    0.000 |
  2.25    0.069 |  4.75    0.004 |  7.25    0.001 |  9.75    0.000 |
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     1.95   0.162     1.25    39.34
     + ID2= 2 (  0300):  5838.90  43.919    13.25    21.12
       ================================================
       ID = 3 (  0400):  5840.85  43.919    13.25    21.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
```

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0400)	5840.85	43.92	13.25	21.13	0.76	2.09
OUTFLOW: ID= 1 (0062)	5840.85	43.93	13.25	21.13	0.76	2.09

FINISH

==========

Post-Development - 25-Year Storm Event

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\6c1aebd6-
  Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\6c1aebd6-


DATE: 12/09/2024                          TIME: 12:24:47

USER:


COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : 211 Eliza - Rain 04 - 25yr    **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              0a239ba1-ea49-43e9-a481-9ed9fc65c744\a3a0d3f9
| Ptotal= 73.10 mm |    Comments: 25-Year 12-Hour SCS II Design Storm
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'    hrs    mm/hr |   hrs    mm/hr
                0.00     1.83 |  3.00     2.92 |  6.00   13.16 |  9.00     2.56
                0.25     1.83 |  3.25     2.92 |  6.25   13.16 |  9.25     2.56
                0.50     1.83 |  3.50     2.92 |  6.50    5.85 |  9.50     2.56
                0.75     1.83 |  3.75     2.92 |  6.75    5.85 |  9.75     2.56
                1.00     1.83 |  4.00     4.39 |  7.00    4.39 | 10.00     1.46
                1.25     1.83 |  4.25     4.39 |  7.25    4.39 | 10.25     1.46
                1.50     1.83 |  4.50     5.85 |  7.50    4.39 | 10.50     1.46
                1.75     1.83 |  4.75     5.85 |  7.75    4.39 | 10.75     1.46
                2.00     2.19 |  5.00     8.77 |  8.00    2.56 | 11.00     1.46
                2.25     2.19 |  5.25     8.77 |  8.25    2.56 | 11.25     1.46
                2.50     2.19 |  5.50    35.09 |  8.50    2.56 | 11.50     1.46
                2.75     2.19 |  5.75    96.49 |  8.75    2.56 | 11.75     1.46

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--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)=  42.871 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  33.687
     TOTAL RAINFALL   (mm)=  73.100
     RUNOFF COEFFICIENT   =   0.461

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
```

```
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 88.23        474.75        0.0500
                 89.82        474.75    0.0500 /0.0300
                 94.62        473.25        0.0300      Main Channel
                 96.33        473.25        0.0300      Main Channel
                101.14        474.50    0.0300 /0.0500  Main Channel
                108.03        474.46        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22     107.71
       0.13   473.38    .391E+03       0.1          0.33      72.28
       0.19   473.44    .647E+03       0.2          0.41      58.08
       0.25   473.50    .944E+03       0.3          0.47      50.05
       0.32   473.57    .128E+04       0.5          0.53      44.73
       0.38   473.63    .166E+04       0.7          0.58      40.85
       0.45   473.70    .208E+04       0.9          0.63      37.86
       0.51   473.76    .254E+04       1.2          0.67      35.46
       0.57   473.82    .304E+04       1.5          0.71      33.46
       0.64   473.89    .358E+04       1.9          0.75      31.76
       0.70   473.95    .416E+04       2.3          0.78      30.29
       0.76   474.01    .478E+04       2.7          0.82      29.01
       0.83   474.08    .544E+04       3.3          0.85      27.86
       0.89   474.14    .615E+04       3.8          0.88      26.84
       0.96   474.21    .689E+04       4.4          0.91      25.91
       1.02   474.27    .767E+04       5.1          0.94      25.07
       1.08   474.33    .850E+04       5.8          0.97      24.29
       1.15   474.40    .936E+04       6.6          1.00      23.58
       1.21   474.46    .103E+05       7.5          1.03      22.92

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    42.87    9.00  33.69      1.17      1.02
   OUTFLOW: ID= 1 (  0010) 2873.93    41.78    9.50  33.69      1.21      1.03



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 59.79        473.44        0.0500
                 67.47        472.75        0.0500
                 90.84        472.50    0.0500 /0.0300  Main Channel
                 93.81        472.25        0.0300      Main Channel
                 95.43        472.25        0.0300      Main Channel
                115.15        472.50    0.0300 /0.0500  Main Channel
                119.95        472.50        0.0500
                143.58        472.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.03   472.28    .689E+02       0.0          0.07     232.76
       0.05   472.30    .194E+03       0.0          0.11     158.29
       0.08   472.33    .377E+03       0.1          0.13     125.54
       0.10   472.35    .616E+03       0.1          0.16     106.06
       0.13   472.38    .912E+03       0.2          0.18      92.83
       0.15   472.40    .126E+04       0.3          0.20      83.13
       0.18   472.43    .167E+04       0.4          0.22      75.64
       0.20   472.45    .214E+04       0.5          0.24      69.65
       0.23   472.48    .266E+04       0.7          0.26      64.73
       0.25   472.50    .324E+04       0.9          0.28      60.59
       0.28   472.53    .412E+04       1.2          0.30      55.76
       0.31   472.56    .515E+04       1.6          0.32      52.56
       0.33   472.58    .632E+04       2.1          0.33      50.26
       0.36   472.61    .764E+04       2.6          0.34      48.49
       0.39   472.64    .910E+04       3.2          0.35      47.04
       0.42   472.67    .107E+05       3.9          0.36      45.81
       0.44   472.69    .125E+05       4.6          0.37      44.73
       0.47   472.72    .144E+05       5.5          0.38      43.76
       0.50   472.75    .164E+05       6.4          0.39      42.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0010) 2873.93    41.78    9.50  33.69      0.50      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    39.10   10.50  33.69      0.50      0.39



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.04   471.29    .712E+01        0.0          0.09      186.75
       0.08   471.33    .285E+02        0.0          0.14      117.64
       0.12   471.37    .641E+02        0.0          0.19       89.78
       0.16   471.41    .114E+03        0.0          0.22       74.11
       0.20   471.45    .178E+03        0.0          0.26       63.87
       0.24   471.49    .256E+03        0.1          0.29       56.56
       0.28   471.53    .349E+03        0.1          0.33       51.03
       0.32   471.57    .456E+03        0.2          0.36       46.69
       0.36   471.61    .577E+03        0.2          0.39       43.16
       0.39   471.64    .712E+03        0.3          0.41       40.23
       0.43   471.68    .862E+03        0.4          0.44       37.76
       0.47   471.72    .103E+04        0.5          0.47       35.63
       0.51   471.76    .120E+04        0.6          0.49       33.78
       0.55   471.80    .140E+04        0.7          0.52       32.15
       0.59   471.84    .160E+04        0.9          0.54       30.70
       0.63   471.88    .182E+04        1.0          0.57       29.41
       0.67   471.92    .206E+04        1.2          0.59       28.25
       0.71   471.96    .231E+04        1.4          0.61       27.19
       0.75   472.00    .257E+04        1.6          0.64       26.23

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0009) 2873.93    39.10   10.50  33.69      0.75      0.64
   OUTFLOW: ID= 1 (  0008) 2873.93    38.16   11.00  33.69      0.75      0.64



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0007)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   9.36        470.00        0.0500
                  13.30        470.05    0.0500 /0.0300
                  18.94        469.00        0.0300      Main Channel
                  22.08        469.00        0.0300      Main Channel
                  26.35        470.00    0.0300 /0.0500  Main Channel
                  28.73        470.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.06   469.06    .188E+03        0.0          0.21       79.24
       0.11   469.11    .406E+03        0.1          0.32       52.24
       0.17   469.17    .653E+03        0.3          0.40       41.50
       0.22   469.22    .929E+03        0.4          0.47       35.50
       0.28   469.28    .124E+04        0.7          0.53       31.57
       0.33   469.33    .157E+04        0.9          0.58       28.77
       0.39   469.39    .194E+04        1.2          0.63       26.63
       0.44   469.44    .233E+04        1.6          0.67       24.93
       0.50   469.50    .275E+04        1.9          0.71       23.54
       0.55   469.55    .321E+04        2.4          0.75       22.37
       0.61   469.61    .369E+04        2.9          0.78       21.37
       0.66   469.66    .420E+04        3.4          0.81       20.49
       0.72   469.72    .474E+04        4.0          0.85       19.72
       0.77   469.77    .531E+04        4.7          0.88       19.03
       0.83   469.83    .591E+04        5.4          0.91       18.41
       0.88   469.88    .654E+04        6.1          0.93       17.85
       0.94   469.94    .720E+04        6.9          0.96       17.33
```

0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0008)	2873.93	38.16	11.00	33.69	1.04	1.00
OUTFLOW: ID= 1 (| 0007)	2873.93	37.88	11.50	33.69	1.05	1.01

ROUTE CHN(0006)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0007)	2873.93	37.88	11.50	33.69	1.05	1.06
OUTFLOW: ID= 1 (| 0006)	2873.93	37.70	11.75	33.69	1.07	1.05

ROUTE CHN(0005)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47

0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0006)	2873.93	37.70	11.75	33.69	1.24	0.86
OUTFLOW: ID= 1 (0005)	2873.93	37.41	12.00	33.69	1.25	0.86

ROUTE CHN(0004)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0005)	2873.93	37.41	12.00	33.69	1.86	1.29
OUTFLOW: ID= 1 (0004)	2873.93	37.33	12.25	33.69	1.85	1.29

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97

0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0004)	2873.93	37.33	12.25	33.69	1.94	1.44
OUTFLOW: ID= 1 (0003)	2873.93	37.22	12.25	33.69	1.93	1.43

ROUTE CHN(0002) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0003)	2873.93	37.22	12.25	33.69	1.52	1.38
OUTFLOW: ID= 1 (0002)	2873.93	37.19	12.50	33.69	1.52	1.38

ROUTE CHN(0001) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
39.74	459.25	0.0500
41.86	459.00	0.0500

```
                49.51        457.47        0.0500
                58.73        456.75        0.0500
                85.31        456.25        0.0500
                91.00        456.00    0.0500 /0.0300  Main Channel
                98.50        454.75        0.0300      Main Channel
               103.78        454.75        0.0300      Main Channel
               116.96        458.50    0.0300 /0.0500  Main Channel
               125.11        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77       14.66
       0.42   455.17    .205E+04       3.5          1.14        9.86
       0.62   455.37    .349E+04       7.4          1.43        7.88
       0.83   455.58    .522E+04      12.9          1.68        6.72
       1.04   455.79    .722E+04      20.2          1.90        5.95
       1.25   456.00    .950E+04      29.4          2.10        5.38
       1.46   456.21    .124E+05      42.5          2.33        4.85
       1.67   456.42    .163E+05      58.3          2.42        4.67
       1.88   456.63    .220E+05      78.1          2.40        4.69
       2.10   456.85    .292E+05     103.3          2.39        4.72
       2.31   457.06    .372E+05     134.3          2.45        4.61
       2.52   457.27    .456E+05     170.3          2.53        4.46
       2.73   457.48    .545E+05     211.2          2.62        4.30
       2.94   457.69    .638E+05     258.3          2.74        4.12
       3.15   457.90    .733E+05     310.2          2.86        3.94
       3.37   458.12    .832E+05     367.0          2.99        3.78
       3.58   458.33    .932E+05     428.5          3.11        3.63
       3.79   458.54    .104E+06     495.8          3.24        3.48
       4.00   458.75    .115E+06     573.1          3.38        3.34

                                   <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    37.19   12.50  33.69      1.38      2.23
   OUTFLOW: ID= 1 (  0001) 2873.93    37.17   12.50  33.69      1.37      2.22



--------------------------------------------------------------------------------
--------------------
| READ HYD (  0004)|   AREA       (ha)=   4.59
| DT=15.0 min      |   TPEAK     (hrs)=   1.00
--------------------   VOLUME     (mm)=  45.40
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 25Yr, Outlet4

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'    hrs      cms |   hrs      cms
  0.00    0.000 |  1.50    0.156 |  3.00    0.067 |  4.50    0.002 |  6.00    0.000
  0.25    0.028 |  1.75    0.122 |  3.25    0.019 |  4.75    0.002 |  6.25    0.000
  0.50    0.068 |  2.00    0.103 |  3.50    0.010 |  5.00    0.001 |
  0.75    0.145 |  2.25    0.090 |  3.75    0.006 |  5.25    0.001 |
  1.00    1.105 |  2.50    0.081 |  4.00    0.004 |  5.50    0.001 |
  1.25    0.229 |  2.75    0.073 |  4.25    0.003 |  5.75    0.000 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
-------------------           (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0004):      4.59     1.105      1.00     45.40
     + ID2= 2 (  0001):   2873.93    37.171     12.50     33.69
       ================================================
       ID = 3 (  0100):   2878.52    37.171     12.50     33.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
```

```
            125.11        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.21   454.96    .442E+03       1.0          0.77       7.33
        0.42   455.17    .102E+04       3.5          1.14       4.93
        0.62   455.37    .175E+04       7.4          1.43       3.94
        0.83   455.58    .261E+04      12.9          1.68       3.36
        1.04   455.79    .361E+04      20.2          1.90       2.97
        1.25   456.00    .475E+04      29.4          2.10       2.69
        1.46   456.21    .618E+04      42.5          2.33       2.42
        1.67   456.42    .816E+04      58.3          2.42       2.33
        1.88   456.63    .110E+05      78.1          2.40       2.35
        2.10   456.85    .146E+05     103.3          2.39       2.36
        2.31   457.06    .186E+05     134.3          2.45       2.31
        2.52   457.27    .228E+05     170.3          2.53       2.23
        2.73   457.48    .273E+05     211.2          2.62       2.15
        2.94   457.69    .319E+05     258.3          2.74       2.06
        3.15   457.90    .367E+05     310.2          2.86       1.97
        3.37   458.12    .416E+05     367.0          2.99       1.89
        3.58   458.33    .466E+05     428.5          3.11       1.81
        3.79   458.54    .518E+05     495.8          3.24       1.74
        4.00   458.75    .573E+05     573.1          3.38       1.67

                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0100) 2878.52    37.17   12.50  33.70      1.38      2.23
   OUTFLOW: ID= 1 (  0033) 2878.52    37.16   12.50  33.70      1.37      2.22



--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.60

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)=  27.511 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  21.344
     TOTAL RAINFALL   (mm)=  73.100
     RUNOFF COEFFICIENT   =   0.292

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87        0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25        0.0300      Main Channel
                  24.23        470.25        0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00        0.0500
                  40.00        471.16        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   470.28    .106E+03       0.0          0.18     109.47
        0.07   470.32    .229E+03       0.1          0.27      72.36
        0.10   470.35    .371E+03       0.1          0.34      57.58
        0.13   470.38    .531E+03       0.2          0.39      49.31
        0.16   470.41    .708E+03       0.3          0.44      43.90
        0.20   470.45    .904E+03       0.4          0.48      40.01
        0.23   470.48    .112E+04       0.5          0.52      37.05
        0.26   470.51    .135E+04       0.6          0.56      34.69
        0.29   470.54    .160E+04       0.8          0.59      32.75
        0.33   470.58    .186E+04       1.0          0.62      31.11
        0.36   470.61    .215E+04       1.2          0.65      29.71
        0.39   470.64    .245E+04       1.4          0.68      28.49
        0.42   470.67    .277E+04       1.7          0.70      27.40
        0.46   470.71    .311E+04       2.0          0.73      26.44
        0.49   470.74    .347E+04       2.3          0.75      25.56
        0.52   470.77    .386E+04       2.6          0.79      24.42
```

0.55	470.80	.432E+04	3.1	0.82	23.53
0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (2000)	2922.70	27.51	9.00	21.34	0.59	0.84
OUTFLOW: ID= 1 (0020)	2922.70	26.82	9.50	21.34	0.62	0.86

ROUTE CHN(0019) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0020)	2922.70	26.82	9.50	21.34	0.25	0.31
OUTFLOW: ID= 1 (0019)	2922.70	24.28	10.75	21.34	0.25	0.31

ROUTE CHN(0018) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17

0.47	466.61	.198E+04	1.6	0.81	20.60
0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0019)	2922.70	24.28	10.75	21.34	1.11	1.11
OUTFLOW: ID= 1 (| 0018)	2922.70	24.18	11.00	21.34	1.11	1.11

ROUTE CHN(0017)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0018)	2922.70	24.18	11.00	21.34	0.74	1.20
OUTFLOW: ID= 1 (| 0017)	2922.70	24.05	11.25	21.34	0.77	1.23

ROUTE CHN(0016)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel

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                30.53        460.25    0.0300 /0.0500  Main Channel
                60.87        460.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.06   458.81    .262E+03        0.1          0.20       82.51
       0.13   458.88    .554E+03        0.2          0.31       53.72
       0.19   458.94    .875E+03        0.3          0.40       42.17
       0.25   459.00    .123E+04        0.6          0.47       35.68
       0.31   459.06    .160E+04        0.9          0.53       31.42
       0.38   459.13    .201E+04        1.2          0.59       28.36
       0.44   459.19    .245E+04        1.6          0.64       26.03
       0.50   459.25    .292E+04        2.0          0.69       24.18
       0.56   459.31    .342E+04        2.5          0.74       22.66
       0.63   459.38    .394E+04        3.1          0.78       21.39
       0.69   459.44    .450E+04        3.7          0.82       20.31
       0.75   459.50    .509E+04        4.4          0.86       19.36
       0.81   459.56    .570E+04        5.1          0.90       18.53
       0.88   459.63    .634E+04        5.9          0.94       17.80
       0.94   459.69    .702E+04        6.8          0.97       17.14
       1.00   459.75    .772E+04        7.8          1.01       16.54
       1.08   459.83    .879E+04        9.3          1.06       15.68
       1.17   459.92    .101E+05       11.1          1.10       15.19
       1.25   460.00    .116E+05       13.0          1.12       14.91

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
  INFLOW : ID= 2 (  0017) 2922.70    24.05   11.25  21.34      1.24       1.12
  OUTFLOW: ID= 1 (  0016) 2922.70    23.95   11.50  21.34      1.25       1.12



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--------------------
| ROUTE CHN(  0015)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 131.87        458.25        0.0500
                 140.91        458.66    0.0500 /0.0300
                 147.80        457.48        0.0300      Main Channel
                 149.90        457.48        0.0300      Main Channel
                 153.04        458.50    0.0300 /0.0500  Main Channel
                 156.08        458.60        0.0500
                 157.70        458.75        0.0500
                 160.00        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.04   457.52    .924E+02        0.0          0.12      134.80
       0.08   457.56    .199E+03        0.0          0.19       89.01
       0.12   457.60    .321E+03        0.1          0.24       70.81
       0.16   457.64    .457E+03        0.1          0.27       60.67
       0.20   457.68    .608E+03        0.2          0.31       54.05
       0.24   457.72    .774E+03        0.3          0.34       49.33
       0.28   457.76    .954E+03        0.3          0.36       45.73
       0.32   457.80    .115E+04        0.4          0.39       42.89
       0.36   457.84    .136E+04        0.6          0.41       40.55
       0.41   457.89    .158E+04        0.7          0.43       38.59
       0.45   457.93    .182E+04        0.8          0.45       36.91
       0.49   457.97    .208E+04        1.0          0.47       35.45
       0.53   458.01    .234E+04        1.1          0.49       34.15
       0.57   458.05    .263E+04        1.3          0.51       33.00
       0.61   458.09    .292E+04        1.5          0.52       31.96
       0.65   458.13    .324E+04        1.7          0.54       31.02
       0.69   458.17    .356E+04        2.0          0.55       30.15
       0.73   458.21    .390E+04        2.2          0.57       29.36
       0.77   458.25    .426E+04        2.5          0.58       28.62

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
  INFLOW : ID= 2 (  0016) 2922.70    23.95   11.50  21.34      0.75       0.58
  OUTFLOW: ID= 1 (  0015) 2922.70    23.44   12.25  21.34      0.77       0.58



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| ROUTE CHN(  0014)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 150.00        456.75        0.0500
                 155.75        456.75    0.0500 /0.0300
                 160.05        456.00        0.0300      Main Channel
                 165.32        456.00        0.0300      Main Channel
                 170.87        457.50    0.0300 /0.0500  Main Channel
                 172.96        457.75        0.0500
                 175.82        457.75        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.04   456.04    .215E+03        0.0           0.09     180.09
       0.08   456.08    .445E+03        0.1           0.14     115.91
       0.12   456.12    .690E+03        0.1           0.18      90.27
       0.16   456.16    .950E+03        0.2           0.22      75.96
       0.20   456.20    .122E+04        0.3           0.25      66.67
       0.24   456.24    .151E+04        0.4           0.28      60.07
       0.28   456.28    .182E+04        0.5           0.30      55.11
       0.32   456.32    .213E+04        0.7           0.33      51.21
       0.36   456.36    .247E+04        0.9           0.35      48.06
       0.39   456.39    .282E+04        1.0           0.37      45.44
       0.43   456.43    .318E+04        1.2           0.39      43.23
       0.47   456.47    .356E+04        1.4           0.40      41.33
       0.51   456.51    .395E+04        1.7           0.42      39.67
       0.55   456.55    .435E+04        1.9           0.44      38.22
       0.59   456.59    .477E+04        2.2           0.45      36.92
       0.63   456.63    .521E+04        2.4           0.47      35.76
       0.67   456.67    .566E+04        2.7           0.48      34.70
       0.71   456.71    .613E+04        3.0           0.49      33.75
       0.75   456.75    .661E+04        3.3           0.51      32.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
    INFLOW : ID= 2 (  0015) 2922.70    23.44   12.25  21.34       0.71       0.49
    OUTFLOW: ID= 1 (  0014) 2922.70    22.86   12.75  21.34       0.75       0.51



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| ROUTE CHN(  0013)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 155.00        456.25        0.0500
                 161.70        456.25    0.0500 /0.0300
                 169.49        455.25        0.0300      Main Channel
                 170.18        455.25        0.0300      Main Channel
                 176.86        456.75    0.0300 /0.0500  Main Channel
                 181.81        456.75        0.0500
                 188.74        456.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.08   455.33    .926E+02        0.0           0.18      90.89
       0.16   455.41    .262E+03        0.1           0.25      65.50
       0.24   455.49    .507E+03        0.2           0.31      53.95
       0.32   455.57    .828E+03        0.3           0.36      46.77
       0.39   455.64    .123E+04        0.5           0.40      41.69
       0.47   455.72    .170E+04        0.7           0.44      37.85
       0.55   455.80    .225E+04        1.1           0.48      34.80
       0.63   455.88    .288E+04        1.5           0.52      32.31
       0.71   455.96    .358E+04        2.0           0.55      30.23
       0.79   456.04    .436E+04        2.6           0.59      28.46
       0.87   456.12    .522E+04        3.2           0.62      26.93
       0.95   456.20    .615E+04        4.0           0.65      25.59
       1.03   456.28    .734E+04        4.9           0.67      24.78
       1.11   456.36    .898E+04        6.2           0.68      24.34
       1.18   456.43    .107E+05        7.6           0.71      23.62
       1.26   456.51    .126E+05        9.2           0.73      22.81
       1.34   456.59    .146E+05       11.1           0.76      22.00
       1.42   456.67    .167E+05       13.1           0.79      21.22
       1.50   456.75    .189E+05       15.2           0.81      20.70
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**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (	0014)	2922.70	22.86	12.75	21.34	1.49	0.80
OUTFLOW: ID= 1 (	0013)	2922.70	22.70	13.25	21.34	1.50	0.81

ROUTE CHN(0012)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.10	455.50	0.0500	
144.47	455.50	0.0500	
148.86	455.75	0.0500	
150.17	455.75	0.0500	
151.79	455.50	0.0500 /0.0300	Main Channel
155.72	454.00	0.0300	Main Channel
158.28	453.76	0.0300	Main Channel
161.63	454.00	0.0300	Main Channel
165.55	455.50	0.0300 /0.0500	Main Channel
169.69	455.50	0.0500	
175.87	455.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	453.86	.129E+03	0.0	0.08	209.88
0.20	453.96	.516E+03	0.1	0.13	132.21
0.31	454.07	.112E+04	0.2	0.18	91.49
0.41	454.17	.179E+04	0.4	0.23	70.94
0.51	454.27	.251E+04	0.7	0.28	59.65
0.61	454.37	.329E+04	1.0	0.32	52.34
0.72	454.48	.412E+04	1.5	0.35	47.15
0.82	454.58	.501E+04	1.9	0.39	43.22
0.92	454.68	.595E+04	2.5	0.42	40.11
1.02	454.78	.695E+04	3.1	0.44	37.58
1.13	454.89	.800E+04	3.8	0.47	35.47
1.23	454.99	.911E+04	4.5	0.50	33.66
1.33	455.09	.103E+05	5.3	0.52	32.10
1.43	455.19	.115E+05	6.2	0.54	30.73
1.54	455.30	.128E+05	7.2	0.56	29.57
1.64	455.40	.144E+05	8.3	0.58	28.91
1.74	455.50	.162E+05	9.4	0.58	28.67
1.87	455.63	.220E+05	11.7	0.53	31.39
1.99	455.75	.281E+05	14.4	0.51	32.45

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (	0013)	2922.70	22.70	13.25	21.34	1.99	0.51
OUTFLOW: ID= 1 (	0012)	2922.70	22.46	13.75	21.34	1.96	0.52

ROUTE CHN(0011)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.00	455.75	0.0500	
137.92	455.00	0.0500 /0.0300	
144.47	453.45	0.0300	Main Channel
146.45	453.43	0.0300	Main Channel
148.74	453.48	0.0300	Main Channel
151.36	453.75	0.0300	Main Channel
154.10	453.93	0.0300	Main Channel
155.00	454.00	0.0300	Main Channel
161.50	455.18	0.0300 /0.0500	Main Channel
168.74	455.67	0.0500	
170.19	455.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.02	453.45	.290E+02	0.0	0.10	164.18
0.14	453.57	.573E+03	0.3	0.48	35.05

0.25	453.68	.132E+04	0.9	0.69	24.05
0.37	453.80	.227E+04	1.9	0.84	19.87
0.49	453.92	.347E+04	3.3	0.95	17.58
0.60	454.03	.492E+04	5.3	1.08	15.43
0.72	454.15	.653E+04	8.0	1.23	13.54
0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0012)	2922.70	22.46	13.75	21.34	1.14	1.66
OUTFLOW: ID= 1 (0011)	2922.70	22.45	13.75	21.34	1.14	1.66

ADD HYD (0200)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0011):	2922.70	22.451	13.75	21.34
+ ID2= 2 (0033):	2878.52	37.161	12.50	33.70
ID = 3 (0200):	5801.22	58.499	13.00	27.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

		<---- hydrograph ---->		<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0200)	5801.22	58.50	13.00	27.48	1.50	2.09
OUTFLOW: ID= 1 (0031)	5801.22	58.49	13.00	27.48	1.50	2.09

ROUTE CHN(0032)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.69	451.07	0.0500	
13.38	451.10	0.0500	
23.86	450.00	0.0500 /0.0300	Main Channel
32.76	447.75	0.0300	Main Channel
35.26	447.50	0.0300	Main Channel
46.15	447.50	0.0300	Main Channel
49.16	447.75	0.0300	Main Channel
56.34	451.00	0.0300 /0.0500	Main Channel
67.16	452.61	0.0500	
73.93	452.92	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.18	447.68	.165E+03	1.8	0.77	1.55
0.36	447.86	.375E+03	6.3	1.21	0.99
0.54	448.04	.601E+03	13.3	1.59	0.75
0.71	448.21	.842E+03	22.4	1.91	0.63
0.89	448.39	.110E+04	33.5	2.20	0.55
1.07	448.57	.137E+04	46.5	2.45	0.49
1.25	448.75	.165E+04	61.5	2.68	0.45
1.43	448.93	.195E+04	78.4	2.90	0.41
1.61	449.11	.226E+04	97.3	3.10	0.39
1.79	449.29	.258E+04	118.2	3.30	0.36
1.96	449.46	.292E+04	141.1	3.48	0.35
2.14	449.64	.328E+04	166.1	3.65	0.33
2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

		<---- hydrograph ---->		<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0031)	5801.22	58.49	13.00	27.48	1.21	2.64
OUTFLOW: ID= 1 (0032)	5801.22	58.49	13.00	27.48	1.21	2.63

CHICAGO STORM	
Ptotal= 58.70 mm	IDF curve parameters: A= 738.312
	B= 0.000
	C= 0.699

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.87	0.83	147.65	1.67	10.64	2.50	6.62
0.17	8.08	1.00	31.27	1.83	9.40	2.67	6.20
0.33	10.01	1.17	19.71	2.00	8.46	2.83	5.84
0.50	13.70	1.33	15.03	2.17	7.72		
0.67	25.48	1.50	12.38	2.33	7.12		

CALIB	
NASHYD (3000)|	Area (ha)= 25.69 Curve Number (CN)= 85.2
ID= 1 DT=15.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.57

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	7.27	1.000	106.93	1.750	11.80	2.50	7.32
0.500	9.37	1.250	27.42	2.000	9.82	2.75	6.48
0.750	17.62	1.500	16.59	2.250	8.21	3.00	5.96

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 1.195 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 29.410
TOTAL RAINFALL (mm)= 58.700
RUNOFF COEFFICIENT = 0.501

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

READ HYD (0002)	AREA (ha)= 8.70
DT=15.0 min	TPEAK (hrs)= 1.00
	VOLUME (mm)= 42.65

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 25Yr, Outlet2

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.25	0.437	2.50	0.155	3.75	0.008	5.00	0.000
0.25	0.048	1.50	0.308	2.75	0.139	4.00	0.004		
0.50	0.115	1.75	0.240	3.00	0.127	4.25	0.002		
0.75	0.247	2.00	0.203	3.25	0.037	4.50	0.001		
1.00	1.861	2.25	0.175	3.50	0.016	4.75	0.000		

READ HYD (0022)	AREA (ha)= 2.23
DT=15.0 min	TPEAK (hrs)= 1.25
	VOLUME (mm)= 51.27

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 25Yr, Commercial

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	2.50	0.058	5.00	0.003	7.50	0.000	10.00	0.000
0.25	0.001	2.75	0.049	5.25	0.002	7.75	0.000	10.25	0.000
0.50	0.009	3.00	0.043	5.50	0.002	8.00	0.000	10.50	0.000
0.75	0.034	3.25	0.030	5.75	0.001	8.25	0.000	10.75	0.000
1.00	0.220	3.50	0.019	6.00	0.001	8.50	0.000	11.00	0.000
1.25	0.239	3.75	0.013	6.25	0.001	8.75	0.000		
1.50	0.196	4.00	0.009	6.50	0.001	9.00	0.000		
1.75	0.149	4.25	0.006	6.75	0.001	9.25	0.000		
2.00	0.100	4.50	0.005	7.00	0.001	9.50	0.000		
2.25	0.073	4.75	0.003	7.25	0.001	9.75	0.000		

READ HYD (0003)	AREA (ha)= 1.06
DT=15.0 min	TPEAK (hrs)= 1.00
	VOLUME (mm)= 48.18

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 25Yr, Outlet3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.00	0.265	2.00	0.026	3.00	0.016	4.00	0.000
0.25	0.005	1.25	0.067	2.25	0.022	3.25	0.005		
0.50	0.016	1.50	0.042	2.50	0.019	3.50	0.002		
0.75	0.032	1.75	0.032	2.75	0.017	3.75	0.001		

ADD HYD (0500)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	8.70	1.861	1.00	42.65
	+ ID2= 2 (0022):	2.23	0.239	1.25	51.27
	ID = 3 (0500):	10.93	2.081	1.00	44.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD  (  0500)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0500):    10.93   2.081     1.00    44.41
     + ID2= 2 (  0003):     1.06   0.265     1.00    48.18
       ================================================
       ID = 1 (  0500):    11.99   2.346     1.00    44.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0500):    11.99   2.346     1.00    44.74
     + ID2= 2 (  3000):    25.69   1.195     1.50    29.41
       ================================================
       ID = 3 (  0500):    37.68   2.847     1.00    34.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0032):  5801.22  58.492    13.00    27.48
     + ID2= 2 (  0500):    37.68   2.847     1.00    34.29
       ================================================
       ID = 3 (  0300):  5838.90  58.492    13.00    27.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=   1.00
-------------------   VOLUME      (mm)=  48.97
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 25Yr, Outlet1

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'    hrs     cms |   hrs     cms
  0.00   0.000 |  2.50   0.052 |  5.00   0.003 |  7.50   0.001 | 10.00   0.000
  0.25   0.006 |  2.75   0.044 |  5.25   0.002 |  7.75   0.000 | 10.25   0.000
  0.50   0.013 |  3.00   0.038 |  5.50   0.002 |  8.00   0.000 | 10.50   0.000
  0.75   0.036 |  3.25   0.024 |  5.75   0.002 |  8.25   0.000 | 10.75   0.000
  1.00   0.251 |  3.50   0.017 |  6.00   0.001 |  8.50   0.000 | 11.00   0.000
  1.25   0.148 |  3.75   0.012 |  6.25   0.001 |  8.75   0.000 | 11.25   0.000
  1.50   0.127 |  4.00   0.008 |  6.50   0.001 |  9.00   0.000 | 11.50   0.000
  1.75   0.105 |  4.25   0.006 |  6.75   0.001 |  9.25   0.000 | 11.75   0.000
  2.00   0.085 |  4.50   0.005 |  7.00   0.001 |  9.50   0.000 |
  2.25   0.064 |  4.75   0.004 |  7.25   0.001 |  9.75   0.000 |
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     1.95   0.251     1.00    48.97
     + ID2= 2 (  0300):  5838.90  58.492    13.00    27.52
       ================================================
       ID = 3 (  0400):  5840.85  58.492    13.00    27.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
```

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0400)	5840.85	58.49	13.00	27.53	0.88	2.25
OUTFLOW: ID= 1 (0062)	5840.85	58.49	13.00	27.53	0.88	2.25

FINISH

==========

Post-Development - 50-Year Storm Event

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\4c74ae6a-
  Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\4c74ae6a-


DATE: 12/09/2024                          TIME: 12:25:47

USER:


COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : 211 Eliza - Rain 05 - 50yr    **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              0ed8d176-ffc6-4b3c-a6d9-a21a6b549d4a\fd3dfa7c
| Ptotal= 80.80 mm |    Comments: 50-Year 12-Hour SCS II Design Storm
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'    hrs    mm/hr |    hrs    mm/hr
                0.00     2.02 |  3.00     3.23 |  6.00    14.54 |  9.00     2.83
                0.25     2.02 |  3.25     3.23 |  6.25    14.54 |  9.25     2.83
                0.50     2.02 |  3.50     3.23 |  6.50     6.46 |  9.50     2.83
                0.75     2.02 |  3.75     3.23 |  6.75     6.46 |  9.75     2.83
                1.00     2.02 |  4.00     4.85 |  7.00     4.85 | 10.00     1.62
                1.25     2.02 |  4.25     4.85 |  7.25     4.85 | 10.25     1.62
                1.50     2.02 |  4.50     6.46 |  7.50     4.85 | 10.50     1.62
                1.75     2.02 |  4.75     6.46 |  7.75     4.85 | 10.75     1.62
                2.00     2.42 |  5.00     9.70 |  8.00     2.83 | 11.00     1.62
                2.25     2.42 |  5.25     9.70 |  8.25     2.83 | 11.25     1.62
                2.50     2.42 |  5.50    38.78 |  8.50     2.83 | 11.50     1.62
                2.75     2.42 |  5.75   106.66 |  8.75     2.83 | 11.75     1.62

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

     Unit Hyd Qpeak  (cms)=  41.423

     PEAK FLOW       (cms)=  50.449 (i)
     TIME TO PEAK    (hrs)=   8.750
     RUNOFF VOLUME    (mm)=  39.525
     TOTAL RAINFALL   (mm)=  80.800
     RUNOFF COEFFICIENT   =   0.489

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
```

```
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
               88.23        474.75        0.0500
               89.82        474.75    0.0500 /0.0300
               94.62        473.25        0.0300      Main Channel
               96.33        473.25        0.0300      Main Channel
              101.14        474.50    0.0300 /0.0500  Main Channel
              108.03        474.46        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22     107.71
       0.13   473.38    .391E+03       0.1          0.33      72.28
       0.19   473.44    .647E+03       0.2          0.41      58.08
       0.25   473.50    .944E+03       0.3          0.47      50.05
       0.32   473.57    .128E+04       0.5          0.53      44.73
       0.38   473.63    .166E+04       0.7          0.58      40.85
       0.45   473.70    .208E+04       0.9          0.63      37.86
       0.51   473.76    .254E+04       1.2          0.67      35.46
       0.57   473.82    .304E+04       1.5          0.71      33.46
       0.64   473.89    .358E+04       1.9          0.75      31.76
       0.70   473.95    .416E+04       2.3          0.78      30.29
       0.76   474.01    .478E+04       2.7          0.82      29.01
       0.83   474.08    .544E+04       3.3          0.85      27.86
       0.89   474.14    .615E+04       3.8          0.88      26.84
       0.96   474.21    .689E+04       4.4          0.91      25.91
       1.02   474.27    .767E+04       5.1          0.94      25.07
       1.08   474.33    .850E+04       5.8          0.97      24.29
       1.15   474.40    .936E+04       6.6          1.00      23.58
       1.21   474.46    .103E+05       7.5          1.03      22.92

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    50.45    8.75  39.52      1.19      1.02
   OUTFLOW: ID= 1 (  0010) 2873.93    49.28    9.50  39.52      1.21      1.03



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
               59.79        473.44        0.0500
               67.47        472.75        0.0500
               90.84        472.50    0.0500 /0.0300  Main Channel
               93.81        472.25        0.0300      Main Channel
               95.43        472.25        0.0300      Main Channel
              115.15        472.50    0.0300 /0.0500  Main Channel
              119.95        472.50        0.0500
              143.58        472.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.03   472.28    .689E+02       0.0          0.07     232.76
       0.05   472.30    .194E+03       0.0          0.11     158.29
       0.08   472.33    .377E+03       0.1          0.13     125.54
       0.10   472.35    .616E+03       0.1          0.16     106.06
       0.13   472.38    .912E+03       0.2          0.18      92.83
       0.15   472.40    .126E+04       0.3          0.20      83.13
       0.18   472.43    .167E+04       0.4          0.22      75.64
       0.20   472.45    .214E+04       0.5          0.24      69.65
       0.23   472.48    .266E+04       0.7          0.26      64.73
       0.25   472.50    .324E+04       0.9          0.28      60.59
       0.28   472.53    .412E+04       1.2          0.30      55.76
       0.31   472.56    .515E+04       1.6          0.32      52.56
       0.33   472.58    .632E+04       2.1          0.33      50.26
       0.36   472.61    .764E+04       2.6          0.34      48.49
       0.39   472.64    .910E+04       3.2          0.35      47.04
       0.42   472.67    .107E+05       3.9          0.36      45.81
       0.44   472.69    .125E+05       4.6          0.37      44.73
       0.47   472.72    .144E+05       5.5          0.38      43.76
       0.50   472.75    .164E+05       6.4          0.39      42.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0010) 2873.93    49.28    9.50  39.52      0.50      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    46.45   10.25  39.52      0.50      0.39



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--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.04   471.29    .712E+01        0.0           0.09      186.75
       0.08   471.33    .285E+02        0.0           0.14      117.64
       0.12   471.37    .641E+02        0.0           0.19       89.78
       0.16   471.41    .114E+03        0.0           0.22       74.11
       0.20   471.45    .178E+03        0.0           0.26       63.87
       0.24   471.49    .256E+03        0.1           0.29       56.56
       0.28   471.53    .349E+03        0.1           0.33       51.03
       0.32   471.57    .456E+03        0.2           0.36       46.69
       0.36   471.61    .577E+03        0.2           0.39       43.16
       0.39   471.64    .712E+03        0.3           0.41       40.23
       0.43   471.68    .862E+03        0.4           0.44       37.76
       0.47   471.72    .103E+04        0.5           0.47       35.63
       0.51   471.76    .120E+04        0.6           0.49       33.78
       0.55   471.80    .140E+04        0.7           0.52       32.15
       0.59   471.84    .160E+04        0.9           0.54       30.70
       0.63   471.88    .182E+04        1.0           0.57       29.41
       0.67   471.92    .206E+04        1.2           0.59       28.25
       0.71   471.96    .231E+04        1.4           0.61       27.19
       0.75   472.00    .257E+04        1.6           0.64       26.23

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0009) 2873.93    46.45   10.25  39.52      0.75      0.64
   OUTFLOW: ID= 1 (  0008) 2873.93    45.16   11.00  39.52      0.75      0.64



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--------------------
| ROUTE CHN(  0007)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   9.36        470.00        0.0500
                  13.30        470.05    0.0500 /0.0300
                  18.94        469.00        0.0300      Main Channel
                  22.08        469.00        0.0300      Main Channel
                  26.35        470.00    0.0300 /0.0500  Main Channel
                  28.73        470.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
       0.06   469.06    .188E+03        0.0           0.21       79.24
       0.11   469.11    .406E+03        0.1           0.32       52.24
       0.17   469.17    .653E+03        0.3           0.40       41.50
       0.22   469.22    .929E+03        0.4           0.47       35.50
       0.28   469.28    .124E+04        0.7           0.53       31.57
       0.33   469.33    .157E+04        0.9           0.58       28.77
       0.39   469.39    .194E+04        1.2           0.63       26.63
       0.44   469.44    .233E+04        1.6           0.67       24.93
       0.50   469.50    .275E+04        1.9           0.71       23.54
       0.55   469.55    .321E+04        2.4           0.75       22.37
       0.61   469.61    .369E+04        2.9           0.78       21.37
       0.66   469.66    .420E+04        3.4           0.81       20.49
       0.72   469.72    .474E+04        4.0           0.85       19.72
       0.77   469.77    .531E+04        4.7           0.88       19.03
       0.83   469.83    .591E+04        5.4           0.91       18.41
       0.88   469.88    .654E+04        6.1           0.93       17.85
       0.94   469.94    .720E+04        6.9           0.96       17.33
```

0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0008)	2873.93	45.16	11.00	39.52	1.03	1.00
OUTFLOW: ID= 1 (0007)	2873.93	44.88	11.25	39.52	1.05	1.01

ROUTE CHN(0006)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0007)	2873.93	44.88	11.25	39.52	1.05	1.06
OUTFLOW: ID= 1 (0006)	2873.93	44.61	11.50	39.52	1.07	1.05

ROUTE CHN(0005)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47

0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0006)	2873.93	44.61	11.50	39.52	1.19	0.85
OUTFLOW: ID= 1 (0005)	2873.93	44.25	12.00	39.52	1.25	0.86

ROUTE CHN(0004)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

	<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0005)	2873.93	44.25	12.00	39.52	1.98	1.35
OUTFLOW: ID= 1 (0004)	2873.93	44.14	12.00	39.52	1.98	1.34

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.14	460.14	.107E+04	0.3	0.28	58.97

0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0004)	2873.93	44.14	12.00	39.52	2.08	1.48
OUTFLOW: ID= 1 (0003)	2873.93	44.09	12.25	39.52	2.07	1.47

ROUTE CHN(0002) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0003)	2873.93	44.09	12.25	39.52	1.64	1.44
OUTFLOW: ID= 1 (0002)	2873.93	43.99	12.50	39.52	1.63	1.43

ROUTE CHN(0001) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
39.74	459.25	0.0500
41.86	459.00	0.0500

```
                49.51        457.47        0.0500
                58.73        456.75        0.0500
                85.31        456.25        0.0500
                91.00        456.00    0.0500 /0.0300  Main Channel
                98.50        454.75        0.0300      Main Channel
               103.78        454.75        0.0300      Main Channel
               116.96        458.50    0.0300 /0.0500  Main Channel
               125.11        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .885E+03       1.0          0.77       14.66
       0.42   455.17    .205E+04       3.5          1.14        9.86
       0.62   455.37    .349E+04       7.4          1.43        7.88
       0.83   455.58    .522E+04      12.9          1.68        6.72
       1.04   455.79    .722E+04      20.2          1.90        5.95
       1.25   456.00    .950E+04      29.4          2.10        5.38
       1.46   456.21    .124E+05      42.5          2.33        4.85
       1.67   456.42    .163E+05      58.3          2.42        4.67
       1.88   456.63    .220E+05      78.1          2.40        4.69
       2.10   456.85    .292E+05     103.3          2.39        4.72
       2.31   457.06    .372E+05     134.3          2.45        4.61
       2.52   457.27    .456E+05     170.3          2.53        4.46
       2.73   457.48    .545E+05     211.2          2.62        4.30
       2.94   457.69    .638E+05     258.3          2.74        4.12
       3.15   457.90    .733E+05     310.2          2.86        3.94
       3.37   458.12    .832E+05     367.0          2.99        3.78
       3.58   458.33    .932E+05     428.5          3.11        3.63
       3.79   458.54    .104E+06     495.8          3.24        3.48
       4.00   458.75    .115E+06     573.1          3.38        3.34

                                   <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93    43.99   12.50  39.52      1.48      2.34
   OUTFLOW: ID= 1 (  0001) 2873.93    44.00   12.50  39.52      1.48      2.33



--------------------------------------------------------------------------------
--------------------
| READ HYD (  0004)|   AREA       (ha)=   4.59
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
--------------------   VOLUME     (mm)=  46.94
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 50Yr, Outlet4

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'    hrs     cms |   hrs     cms
  0.00   0.000 |  1.50   0.320 |  3.00   0.081 |  4.50   0.003 |  6.00   0.000
  0.25   0.027 |  1.75   0.185 |  3.25   0.023 |  4.75   0.002 |  6.25   0.000
  0.50   0.060 |  2.00   0.143 |  3.50   0.012 |  5.00   0.002 |  6.50   0.000
  0.75   0.082 |  2.25   0.117 |  3.75   0.008 |  5.25   0.001 |
  1.00   0.125 |  2.50   0.102 |  4.00   0.006 |  5.50   0.001 |
  1.25   0.999 |  2.75   0.090 |  4.25   0.004 |  5.75   0.001 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0004):     4.59   0.999     1.25    46.94
     + ID2= 2 (  0001):  2873.93  43.998    12.50    39.52
       ================================================
       ID = 3 (  0100):  2878.52  43.998    12.50    39.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                 39.74        459.25        0.0500
                 41.86        459.00        0.0500
                 49.51        457.47        0.0500
                 58.73        456.75        0.0500
                 85.31        456.25        0.0500
                 91.00        456.00    0.0500 /0.0300  Main Channel
                 98.50        454.75        0.0300      Main Channel
                103.78        454.75        0.0300      Main Channel
                116.96        458.50    0.0300 /0.0500  Main Channel
```

```
            125.11        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.21   454.96    .442E+03       1.0          0.77       7.33
        0.42   455.17    .102E+04       3.5          1.14       4.93
        0.62   455.37    .175E+04       7.4          1.43       3.94
        0.83   455.58    .261E+04      12.9          1.68       3.36
        1.04   455.79    .361E+04      20.2          1.90       2.97
        1.25   456.00    .475E+04      29.4          2.10       2.69
        1.46   456.21    .618E+04      42.5          2.33       2.42
        1.67   456.42    .816E+04      58.3          2.42       2.33
        1.88   456.63    .110E+05      78.1          2.40       2.35
        2.10   456.85    .146E+05     103.3          2.39       2.36
        2.31   457.06    .186E+05     134.3          2.45       2.31
        2.52   457.27    .228E+05     170.3          2.53       2.23
        2.73   457.48    .273E+05     211.2          2.62       2.15
        2.94   457.69    .319E+05     258.3          2.74       2.06
        3.15   457.90    .367E+05     310.2          2.86       1.97
        3.37   458.12    .416E+05     367.0          2.99       1.89
        3.58   458.33    .466E+05     428.5          3.11       1.81
        3.79   458.54    .518E+05     495.8          3.24       1.74
        4.00   458.75    .573E+05     573.1          3.38       1.67

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA     QPEAK    TPEAK    R.V.    MAX DEPTH  MAX VEL
                              (ha)     (cms)    (hrs)    (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0100) 2878.52     44.00    12.50   39.53      1.48      2.34
   OUTFLOW: ID= 1 (  0033) 2878.52     44.00    12.50   39.53      1.48      2.33



--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.60

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)=  33.000 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  25.539
     TOTAL RAINFALL   (mm)=  80.800
     RUNOFF COEFFICIENT   =   0.316

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87        0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25        0.0300      Main Channel
                  24.23        470.25        0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00        0.0500
                  40.00        471.16        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   470.28    .106E+03       0.0          0.18     109.47
        0.07   470.32    .229E+03       0.1          0.27      72.36
        0.10   470.35    .371E+03       0.1          0.34      57.58
        0.13   470.38    .531E+03       0.2          0.39      49.31
        0.16   470.41    .708E+03       0.3          0.44      43.90
        0.20   470.45    .904E+03       0.4          0.48      40.01
        0.23   470.48    .112E+04       0.5          0.52      37.05
        0.26   470.51    .135E+04       0.6          0.56      34.69
        0.29   470.54    .160E+04       0.8          0.59      32.75
        0.33   470.58    .186E+04       1.0          0.62      31.11
        0.36   470.61    .215E+04       1.2          0.65      29.71
        0.39   470.64    .245E+04       1.4          0.68      28.49
        0.42   470.67    .277E+04       1.7          0.70      27.40
        0.46   470.71    .311E+04       2.0          0.73      26.44
        0.49   470.74    .347E+04       2.3          0.75      25.56
        0.52   470.77    .386E+04       2.6          0.79      24.42
```

0.55	470.80	.432E+04	3.1	0.82	23.53
0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (2000)	2922.70	33.00	9.00	25.54	0.60	0.85
OUTFLOW: ID= 1 (0020)	2922.70	32.27	9.50	25.54	0.62	0.86

ROUTE CHN(0019) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0020)	2922.70	32.27	9.50	25.54	0.23	0.30
OUTFLOW: ID= 1 (0019)	2922.70	29.07	10.75	25.54	0.25	0.31

ROUTE CHN(0018) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17

0.47	466.61	.198E+04	1.6	0.81	20.60
0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0019)	2922.70	29.07	10.75	25.54	1.08	1.11
OUTFLOW: ID= 1 (| 0018)	2922.70	28.95	11.00	25.54	1.11	1.11

ROUTE CHN(0017)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0018)	2922.70	28.95	11.00	25.54	0.76	1.22
OUTFLOW: ID= 1 (| 0017)	2922.70	28.82	11.25	25.54	0.77	1.23

ROUTE CHN(0016)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel

```
                30.53        460.25    0.0300 /0.0500  Main Channel
                60.87        460.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.06   458.81    .262E+03        0.1          0.20       82.51
       0.13   458.88    .554E+03        0.2          0.31       53.72
       0.19   458.94    .875E+03        0.3          0.40       42.17
       0.25   459.00    .123E+04        0.6          0.47       35.68
       0.31   459.06    .160E+04        0.9          0.53       31.42
       0.38   459.13    .201E+04        1.2          0.59       28.36
       0.44   459.19    .245E+04        1.6          0.64       26.03
       0.50   459.25    .292E+04        2.0          0.69       24.18
       0.56   459.31    .342E+04        2.5          0.74       22.66
       0.63   459.38    .394E+04        3.1          0.78       21.39
       0.69   459.44    .450E+04        3.7          0.82       20.31
       0.75   459.50    .509E+04        4.4          0.86       19.36
       0.81   459.56    .570E+04        5.1          0.90       18.53
       0.88   459.63    .634E+04        5.9          0.94       17.80
       0.94   459.69    .702E+04        6.8          0.97       17.14
       1.00   459.75    .772E+04        7.8          1.01       16.54
       1.08   459.83    .879E+04        9.3          1.06       15.68
       1.17   459.92    .101E+05       11.1          1.10       15.19
       1.25   460.00    .116E+05       13.0          1.12       14.91

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
  INFLOW : ID= 2 (  0017) 2922.70    28.82   11.25  25.54      1.21       1.11
  OUTFLOW: ID= 1 (  0016) 2922.70    28.69   11.50  25.54      1.25       1.12



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0015)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 131.87        458.25        0.0500
                 140.91        458.66    0.0500 /0.0300
                 147.80        457.48        0.0300      Main Channel
                 149.90        457.48        0.0300      Main Channel
                 153.04        458.50    0.0300 /0.0500  Main Channel
                 156.08        458.60        0.0500
                 157.70        458.75        0.0500
                 160.00        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY    TRAV.TIME
        (m)      (m)     (cu.m.)       (cms)         (m/s)       (min)
       0.04   457.52    .924E+02        0.0          0.12      134.80
       0.08   457.56    .199E+03        0.0          0.19       89.01
       0.12   457.60    .321E+03        0.1          0.24       70.81
       0.16   457.64    .457E+03        0.1          0.27       60.67
       0.20   457.68    .608E+03        0.2          0.31       54.05
       0.24   457.72    .774E+03        0.3          0.34       49.33
       0.28   457.76    .954E+03        0.3          0.36       45.73
       0.32   457.80    .115E+04        0.4          0.39       42.89
       0.36   457.84    .136E+04        0.6          0.41       40.55
       0.41   457.89    .158E+04        0.7          0.43       38.59
       0.45   457.93    .182E+04        0.8          0.45       36.91
       0.49   457.97    .208E+04        1.0          0.47       35.45
       0.53   458.01    .234E+04        1.1          0.49       34.15
       0.57   458.05    .263E+04        1.3          0.51       33.00
       0.61   458.09    .292E+04        1.5          0.52       31.96
       0.65   458.13    .324E+04        1.7          0.54       31.02
       0.69   458.17    .356E+04        2.0          0.55       30.15
       0.73   458.21    .390E+04        2.2          0.57       29.36
       0.77   458.25    .426E+04        2.5          0.58       28.62

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
  INFLOW : ID= 2 (  0016) 2922.70    28.69   11.50  25.54      0.77       0.58
  OUTFLOW: ID= 1 (  0015) 2922.70    27.90   12.25  25.54      0.77       0.58



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--------------------
| ROUTE CHN(  0014)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 150.00        456.75        0.0500
                 155.75        456.75    0.0500 /0.0300
                 160.05        456.00        0.0300      Main Channel
                 165.32        456.00        0.0300      Main Channel
                 170.87        457.50    0.0300 /0.0500  Main Channel
                 172.96        457.75        0.0500
                 175.82        457.75        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.04   456.04    .215E+03        0.0          0.09     180.09
       0.08   456.08    .445E+03        0.1          0.14     115.91
       0.12   456.12    .690E+03        0.1          0.18      90.27
       0.16   456.16    .950E+03        0.2          0.22      75.96
       0.20   456.20    .122E+04        0.3          0.25      66.67
       0.24   456.24    .151E+04        0.4          0.28      60.07
       0.28   456.28    .182E+04        0.5          0.30      55.11
       0.32   456.32    .213E+04        0.7          0.33      51.21
       0.36   456.36    .247E+04        0.9          0.35      48.06
       0.39   456.39    .282E+04        1.0          0.37      45.44
       0.43   456.43    .318E+04        1.2          0.39      43.23
       0.47   456.47    .356E+04        1.4          0.40      41.33
       0.51   456.51    .395E+04        1.7          0.42      39.67
       0.55   456.55    .435E+04        1.9          0.44      38.22
       0.59   456.59    .477E+04        2.2          0.45      36.92
       0.63   456.63    .521E+04        2.4          0.47      35.76
       0.67   456.67    .566E+04        2.7          0.48      34.70
       0.71   456.71    .613E+04        3.0          0.49      33.75
       0.75   456.75    .661E+04        3.3          0.51      32.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                      <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)       (m/s)
    INFLOW : ID= 2 (  0015) 2922.70    27.90   12.25  25.54       0.72       0.50
    OUTFLOW: ID= 1 (  0014) 2922.70    27.32   12.75  25.54       0.75       0.51



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0013)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 155.00        456.25        0.0500
                 161.70        456.25    0.0500 /0.0300
                 169.49        455.25        0.0300      Main Channel
                 170.18        455.25        0.0300      Main Channel
                 176.86        456.75    0.0300 /0.0500  Main Channel
                 181.81        456.75        0.0500
                 188.74        456.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.08   455.33    .926E+02        0.0          0.18      90.89
       0.16   455.41    .262E+03        0.1          0.25      65.50
       0.24   455.49    .507E+03        0.2          0.31      53.95
       0.32   455.57    .828E+03        0.3          0.36      46.77
       0.39   455.64    .123E+04        0.5          0.40      41.69
       0.47   455.72    .170E+04        0.7          0.44      37.85
       0.55   455.80    .225E+04        1.1          0.48      34.80
       0.63   455.88    .288E+04        1.5          0.52      32.31
       0.71   455.96    .358E+04        2.0          0.55      30.23
       0.79   456.04    .436E+04        2.6          0.59      28.46
       0.87   456.12    .522E+04        3.2          0.62      26.93
       0.95   456.20    .615E+04        4.0          0.65      25.59
       1.03   456.28    .734E+04        4.9          0.67      24.78
       1.11   456.36    .898E+04        6.2          0.68      24.34
       1.18   456.43    .107E+05        7.6          0.71      23.62
       1.26   456.51    .126E+05        9.2          0.73      22.81
       1.34   456.59    .146E+05       11.1          0.76      22.00
       1.42   456.67    .167E+05       13.1          0.79      21.22
       1.50   456.75    .189E+05       15.2          0.81      20.70
```

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (	0014)	2922.70	27.32	12.75	25.54	1.50	0.80
OUTFLOW: ID= 1 (	0013)	2922.70	27.13	13.25	25.54	1.50	0.81

ROUTE CHN(0012) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.10	455.50	0.0500	
144.47	455.50	0.0500	
148.86	455.75	0.0500	
150.17	455.75	0.0500	
151.79	455.50	0.0500 /0.0300	Main Channel
155.72	454.00	0.0300	Main Channel
158.28	453.76	0.0300	Main Channel
161.63	454.00	0.0300	Main Channel
165.55	455.50	0.0300 /0.0500	Main Channel
169.69	455.50	0.0500	
175.87	455.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	453.86	.129E+03	0.0	0.08	209.88
0.20	453.96	.516E+03	0.1	0.13	132.21
0.31	454.07	.112E+04	0.2	0.18	91.49
0.41	454.17	.179E+04	0.4	0.23	70.94
0.51	454.27	.251E+04	0.7	0.28	59.65
0.61	454.37	.329E+04	1.0	0.32	52.34
0.72	454.48	.412E+04	1.5	0.35	47.15
0.82	454.58	.501E+04	1.9	0.39	43.22
0.92	454.68	.595E+04	2.5	0.42	40.11
1.02	454.78	.695E+04	3.1	0.44	37.58
1.13	454.89	.800E+04	3.8	0.47	35.47
1.23	454.99	.911E+04	4.5	0.50	33.66
1.33	455.09	.103E+05	5.3	0.52	32.10
1.43	455.19	.115E+05	6.2	0.54	30.73
1.54	455.30	.128E+05	7.2	0.56	29.57
1.64	455.40	.144E+05	8.3	0.58	28.91
1.74	455.50	.162E+05	9.4	0.58	28.67
1.87	455.63	.220E+05	11.7	0.53	31.39
1.99	455.75	.281E+05	14.4	0.51	32.45

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (	0013)	2922.70	27.13	13.25	25.54	1.99	0.51
OUTFLOW: ID= 1 (	0012)	2922.70	26.85	13.75	25.54	1.98	0.51

ROUTE CHN(0011) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.00	455.75	0.0500	
137.92	455.00	0.0500 /0.0300	
144.47	453.45	0.0300	Main Channel
146.45	453.43	0.0300	Main Channel
148.74	453.48	0.0300	Main Channel
151.36	453.75	0.0300	Main Channel
154.10	453.93	0.0300	Main Channel
155.00	454.00	0.0300	Main Channel
161.50	455.18	0.0300 /0.0500	Main Channel
168.74	455.67	0.0500	
170.19	455.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.02	453.45	.290E+02	0.0	0.10	164.18
0.14	453.57	.573E+03	0.3	0.48	35.05

0.25	453.68	.132E+04	0.9	0.69	24.05
0.37	453.80	.227E+04	1.9	0.84	19.87
0.49	453.92	.347E+04	3.3	0.95	17.58
0.60	454.03	.492E+04	5.3	1.08	15.43
0.72	454.15	.653E+04	8.0	1.23	13.54
0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0012)	2922.70	26.85	13.75	25.54	1.24	1.75
OUTFLOW: ID= 1 (0011)	2922.70	26.86	13.75	25.54	1.24	1.74

ADD HYD (0200)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0011):	2922.70	26.858	13.75	25.54
+	ID2= 2 (0033):	2878.52	43.996	12.50	39.53
	ID = 3 (0200):	5801.22	69.338	13.00	32.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

		<---- hydrograph ---->		<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0200)	5801.22	69.34	13.00	32.48	1.62	2.24
OUTFLOW: ID= 1 (0031)	5801.22	69.35	13.00	32.48	1.61	2.23

ROUTE CHN(0032)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.69	451.07	0.0500	
13.38	451.10	0.0500	
23.86	450.00	0.0500 /0.0300	Main Channel
32.76	447.75	0.0300	Main Channel
35.26	447.50	0.0300	Main Channel
46.15	447.50	0.0300	Main Channel
49.16	447.75	0.0300	Main Channel
56.34	451.00	0.0300 /0.0500	Main Channel
67.16	452.61	0.0500	
73.93	452.92	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.18	447.68	.165E+03	1.8	0.77	1.55
0.36	447.86	.375E+03	6.3	1.21	0.99
0.54	448.04	.601E+03	13.3	1.59	0.75
0.71	448.21	.842E+03	22.4	1.91	0.63
0.89	448.39	.110E+04	33.5	2.20	0.55
1.07	448.57	.137E+04	46.5	2.45	0.49
1.25	448.75	.165E+04	61.5	2.68	0.45
1.43	448.93	.195E+04	78.4	2.90	0.41
1.61	449.11	.226E+04	97.3	3.10	0.39
1.79	449.29	.258E+04	118.2	3.30	0.36
1.96	449.46	.292E+04	141.1	3.48	0.35
2.14	449.64	.328E+04	166.1	3.65	0.33
2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

		<---- hydrograph ---->		<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0031)	5801.22	69.35	13.00	32.48	1.33	2.78
OUTFLOW: ID= 1 (0032)	5801.22	69.35	13.00	32.48	1.33	2.78

CHICAGO STORM	
Ptotal= 65.24 mm	IDF curve parameters: A= 820.542
	B= 0.000
	C= 0.699

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	7.63	0.83	164.10	1.67	11.83	2.50	7.36
0.17	8.98	1.00	34.75	1.83	10.45	2.67	6.89
0.33	11.13	1.17	21.91	2.00	9.40	2.83	6.49
0.50	15.22	1.33	16.71	2.17	8.58		
0.67	28.31	1.50	13.76	2.33	7.91		

CALIB		
NASHYD (3000)	Area (ha)= 25.69	Curve Number (CN)= 85.2
ID= 1 DT=15.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.57	

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.08	1.000	118.84	1.750	13.12	2.50	8.14
0.500	10.41	1.250	30.47	2.000	10.91	2.75	7.20
0.750	19.59	1.500	18.44	2.250	9.13	3.00	6.63

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 1.426 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 34.689
TOTAL RAINFALL (mm)= 65.238
RUNOFF COEFFICIENT = 0.532

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

READ HYD (0002)	AREA (ha)= 8.70
DT=15.0 min	TPEAK (hrs)= 1.25
	VOLUME (mm)= 45.89

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 50Yr, Outlet2

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.25	1.819	2.50	0.196	3.75	0.010	5.00	0.000
0.25	0.046	1.50	0.628	2.75	0.171	4.00	0.005		
0.50	0.102	1.75	0.372	3.00	0.153	4.25	0.003		
0.75	0.140	2.00	0.285	3.25	0.043	4.50	0.001		
1.00	0.212	2.25	0.230	3.50	0.019	4.75	0.000		

READ HYD (0022)	AREA (ha)= 2.23
DT=15.0 min	TPEAK (hrs)= 1.50
	VOLUME (mm)= 56.80

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago,50Yr, Commercial

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	2.50	0.089	5.00	0.003	7.50	0.000	10.00	0.000
0.25	0.001	2.75	0.066	5.25	0.002	7.75	0.000	10.25	0.000
0.50	0.008	3.00	0.054	5.50	0.002	8.00	0.000	10.50	0.000
0.75	0.024	3.25	0.037	5.75	0.001	8.25	0.000	10.75	0.000
1.00	0.047	3.50	0.023	6.00	0.001	8.50	0.000	11.00	0.000
1.25	0.168	3.75	0.014	6.25	0.001	8.75	0.000		
1.50	0.276	4.00	0.010	6.50	0.001	9.00	0.000		
1.75	0.236	4.25	0.007	6.75	0.001	9.25	0.000		
2.00	0.186	4.50	0.005	7.00	0.001	9.50	0.000		
2.25	0.136	4.75	0.004	7.25	0.001	9.75	0.000		

READ HYD (0003)	AREA (ha)= 1.06
DT=15.0 min	TPEAK (hrs)= 1.25
	VOLUME (mm)= 47.15

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 50Yr, Outlet3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.00	0.030	2.00	0.036	3.00	0.019	4.00	0.000
0.25	0.004	1.25	0.198	2.25	0.029	3.25	0.006	4.25	0.000
0.50	0.014	1.50	0.101	2.50	0.024	3.50	0.002		
0.75	0.020	1.75	0.051	2.75	0.021	3.75	0.001		

ADD HYD (0500)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	8.70	1.819	1.25	45.89
	+ ID2= 2 (0022):	2.23	0.276	1.50	56.80
	ID = 3 (0500):	10.93	1.987	1.25	48.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| ADD HYD  (  0500)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0500):    10.93   1.987     1.25    48.11
     + ID2= 2 (  0003):     1.06   0.198     1.25    47.15
       ================================================
       ID = 1 (  0500):    11.99   2.185     1.25    48.03

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0500):    11.99   2.185     1.25    48.03
     + ID2= 2 (  3000):    25.69   1.426     1.50    34.69
       ================================================
       ID = 3 (  0500):    37.68   3.397     1.25    38.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0032):  5801.22  69.355    13.00    32.48
     + ID2= 2 (  0500):    37.68   3.397     1.25    38.93
       ================================================
       ID = 3 (  0300):  5838.90  69.355    13.00    32.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=   1.25
-------------------   VOLUME      (mm)=  53.19
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 50Yr, Outlet1

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'    hrs      cms |   hrs      cms
  0.00    0.000 |  2.50    0.084 |  5.00    0.003 |  7.50    0.001 | 10.00    0.000
  0.25    0.005 |  2.75    0.062 |  5.25    0.003 |  7.75    0.000 | 10.25    0.000
  0.50    0.012 |  3.00    0.050 |  5.50    0.002 |  8.00    0.000 | 10.50    0.000
  0.75    0.022 |  3.25    0.031 |  5.75    0.002 |  8.25    0.000 | 10.75    0.000
  1.00    0.038 |  3.50    0.020 |  6.00    0.001 |  8.50    0.000 | 11.00    0.000
  1.25    0.211 |  3.75    0.014 |  6.25    0.001 |  8.75    0.000 | 11.25    0.000
  1.50    0.176 |  4.00    0.010 |  6.50    0.001 |  9.00    0.000 | 11.50    0.000
  1.75    0.149 |  4.25    0.007 |  6.75    0.001 |  9.25    0.000 | 11.75    0.000
  2.00    0.127 |  4.50    0.005 |  7.00    0.001 |  9.50    0.000 |
  2.25    0.105 |  4.75    0.004 |  7.25    0.001 |  9.75    0.000 |
--------------------------------------------------------------------------------


-------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     1.95   0.211     1.25    53.19
     + ID2= 2 (  0300):  5838.90  69.355    13.00    32.52
       ================================================
       ID = 3 (  0400):  5840.85  69.355    13.00    32.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
-------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
```

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0400)	5840.85	69.35	13.00	32.53	0.97	2.39
OUTFLOW:	ID= 1 (0062)	5840.85	69.36	13.00	32.53	0.97	2.39

FINISH

==========

Post-Development - 100-Year Storm Event

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

***** 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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\e10637d3-
Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\e10637d3-

DATE: 12/09/2024 TIME: 12:21:35

USER:

COMMENTS: _____

** SIMULATION : 211 Eliza - Rain 06 - 100yr **

READ STORM	Filename: C:\Users\atrenholm\AppD ata\Local\Temp\ 9ccfabd9-f666-47df-bea9-75340c0adc91\816d8916
Ptotal= 88.50 mm	Comments: 100-Year 12-Hour SCS II Design Storm

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.21	3.00	3.54	6.00	15.93	9.00	3.10
0.25	2.21	3.25	3.54	6.25	15.93	9.25	3.10
0.50	2.21	3.50	3.54	6.50	7.08	9.50	3.10
0.75	2.21	3.75	3.54	6.75	7.08	9.75	3.10
1.00	2.21	4.00	5.31	7.00	5.31	10.00	1.77
1.25	2.21	4.25	5.31	7.25	5.31	10.25	1.77
1.50	2.21	4.50	7.08	7.50	5.31	10.50	1.77
1.75	2.21	4.75	7.08	7.75	5.31	10.75	1.77
2.00	2.65	5.00	10.62	8.00	3.10	11.00	1.77
2.25	2.65	5.25	10.62	8.25	3.10	11.25	1.77
2.50	2.65	5.50	42.48	8.50	3.10	11.50	1.77
2.75	2.65	5.75	116.82	8.75	3.10	11.75	1.77

CALIB NASHYD (1000) ID= 1 DT=15.0 min	Area (ha)=2873.93 Curve Number (CN)= 78.5 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 2.65

Unit Hyd Qpeak (cms)= 41.423

PEAK FLOW (cms)= 58.300 (i)
TIME TO PEAK (hrs)= 8.750
RUNOFF VOLUME (mm)= 45.550
TOTAL RAINFALL (mm)= 88.500
RUNOFF COEFFICIENT = 0.515

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

ROUTE CHN(0010) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

```
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
               88.23        474.75        0.0500
               89.82        474.75    0.0500 /0.0300
               94.62        473.25        0.0300      Main Channel
               96.33        473.25        0.0300      Main Channel
              101.14        474.50    0.0300 /0.0500  Main Channel
              108.03        474.46        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.06   473.31    .175E+03       0.0          0.22     107.71
       0.13   473.38    .391E+03       0.1          0.33      72.28
       0.19   473.44    .647E+03       0.2          0.41      58.08
       0.25   473.50    .944E+03       0.3          0.47      50.05
       0.32   473.57    .128E+04       0.5          0.53      44.73
       0.38   473.63    .166E+04       0.7          0.58      40.85
       0.45   473.70    .208E+04       0.9          0.63      37.86
       0.51   473.76    .254E+04       1.2          0.67      35.46
       0.57   473.82    .304E+04       1.5          0.71      33.46
       0.64   473.89    .358E+04       1.9          0.75      31.76
       0.70   473.95    .416E+04       2.3          0.78      30.29
       0.76   474.01    .478E+04       2.7          0.82      29.01
       0.83   474.08    .544E+04       3.3          0.85      27.86
       0.89   474.14    .615E+04       3.8          0.88      26.84
       0.96   474.21    .689E+04       4.4          0.91      25.91
       1.02   474.27    .767E+04       5.1          0.94      25.07
       1.08   474.33    .850E+04       5.8          0.97      24.29
       1.15   474.40    .936E+04       6.6          1.00      23.58
       1.21   474.46    .103E+05       7.5          1.03      22.92

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  1000) 2873.93    58.30    8.75  45.55      1.19      1.03
   OUTFLOW: ID= 1 (  0010) 2873.93    57.07    9.25  45.55      1.21      1.03



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
            <------ DATA FOR SECTION (   1.1) ------>
            Distance      Elevation       Manning
               59.79        473.44        0.0500
               67.47        472.75        0.0500
               90.84        472.50    0.0500 /0.0300  Main Channel
               93.81        472.25        0.0300      Main Channel
               95.43        472.25        0.0300      Main Channel
              115.15        472.50    0.0300 /0.0500  Main Channel
              119.95        472.50        0.0500
              143.58        472.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.03   472.28    .689E+02       0.0          0.07     232.76
       0.05   472.30    .194E+03       0.0          0.11     158.29
       0.08   472.33    .377E+03       0.1          0.13     125.54
       0.10   472.35    .616E+03       0.1          0.16     106.06
       0.13   472.38    .912E+03       0.2          0.18      92.83
       0.15   472.40    .126E+04       0.3          0.20      83.13
       0.18   472.43    .167E+04       0.4          0.22      75.64
       0.20   472.45    .214E+04       0.5          0.24      69.65
       0.23   472.48    .266E+04       0.7          0.26      64.73
       0.25   472.50    .324E+04       0.9          0.28      60.59
       0.28   472.53    .412E+04       1.2          0.30      55.76
       0.31   472.56    .515E+04       1.6          0.32      52.56
       0.33   472.58    .632E+04       2.1          0.33      50.26
       0.36   472.61    .764E+04       2.6          0.34      48.49
       0.39   472.64    .910E+04       3.2          0.35      47.04
       0.42   472.67    .107E+05       3.9          0.36      45.81
       0.44   472.69    .125E+05       4.6          0.37      44.73
       0.47   472.72    .144E+05       5.5          0.38      43.76
       0.50   472.75    .164E+05       6.4          0.39      42.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                              (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
```

```
   INFLOW : ID= 2 (  0010) 2873.93    57.07    9.25  45.55      0.50      0.39
   OUTFLOW: ID= 1 (  0009) 2873.93    54.06   10.25  45.55      0.50      0.39



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0008)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  16.22        472.00        0.0500
                  17.77        472.00    0.0500 /0.0300
                  21.59        471.25        0.0300      Main Channel
                  25.64        472.25    0.0300 /0.0500  Main Channel
                  28.55        472.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.04   471.29    .712E+01        0.0          0.09      186.75
       0.08   471.33    .285E+02        0.0          0.14      117.64
       0.12   471.37    .641E+02        0.0          0.19       89.78
       0.16   471.41    .114E+03        0.0          0.22       74.11
       0.20   471.45    .178E+03        0.0          0.26       63.87
       0.24   471.49    .256E+03        0.1          0.29       56.56
       0.28   471.53    .349E+03        0.1          0.33       51.03
       0.32   471.57    .456E+03        0.2          0.36       46.69
       0.36   471.61    .577E+03        0.2          0.39       43.16
       0.39   471.64    .712E+03        0.3          0.41       40.23
       0.43   471.68    .862E+03        0.4          0.44       37.76
       0.47   471.72    .103E+04        0.5          0.47       35.63
       0.51   471.76    .120E+04        0.6          0.49       33.78
       0.55   471.80    .140E+04        0.7          0.52       32.15
       0.59   471.84    .160E+04        0.9          0.54       30.70
       0.63   471.88    .182E+04        1.0          0.57       29.41
       0.67   471.92    .206E+04        1.2          0.59       28.25
       0.71   471.96    .231E+04        1.4          0.61       27.19
       0.75   472.00    .257E+04        1.6          0.64       26.23

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  0009) 2873.93    54.06   10.25  45.55      0.75      0.63
   OUTFLOW: ID= 1 (  0008) 2873.93    52.79   10.75  45.55      0.75      0.64



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0007)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   9.36        470.00        0.0500
                  13.30        470.05    0.0500 /0.0300
                  18.94        469.00        0.0300      Main Channel
                  22.08        469.00        0.0300      Main Channel
                  26.35        470.00    0.0300 /0.0500  Main Channel
                  28.73        470.00        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)        (m/s)      (min)
       0.06   469.06    .188E+03        0.0          0.21       79.24
       0.11   469.11    .406E+03        0.1          0.32       52.24
       0.17   469.17    .653E+03        0.3          0.40       41.50
       0.22   469.22    .929E+03        0.4          0.47       35.50
       0.28   469.28    .124E+04        0.7          0.53       31.57
       0.33   469.33    .157E+04        0.9          0.58       28.77
       0.39   469.39    .194E+04        1.2          0.63       26.63
       0.44   469.44    .233E+04        1.6          0.67       24.93
       0.50   469.50    .275E+04        1.9          0.71       23.54
       0.55   469.55    .321E+04        2.4          0.75       22.37
       0.61   469.61    .369E+04        2.9          0.78       21.37
       0.66   469.66    .420E+04        3.4          0.81       20.49
       0.72   469.72    .474E+04        4.0          0.85       19.72
       0.77   469.77    .531E+04        4.7          0.88       19.03
       0.83   469.83    .591E+04        5.4          0.91       18.41
       0.88   469.88    .654E+04        6.1          0.93       17.85
       0.94   469.94    .720E+04        6.9          0.96       17.33
```

0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0008)	2873.93	52.79	10.75	45.55	1.00	0.99
OUTFLOW: ID= 1 (0007)	2873.93	52.39	11.25	45.55	1.05	1.01

ROUTE CHN(0006)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0007)	2873.93	52.39	11.25	45.55	1.02	1.06
OUTFLOW: ID= 1 (0006)	2873.93	52.11	11.50	45.55	1.07	1.05

ROUTE CHN(0005)
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47

0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0006)	2873.93	52.11	11.50	45.55	1.24	0.86
OUTFLOW: ID= 1 (0005)	2873.93	51.65	11.75	45.55	1.25	0.86

ROUTE CHN(0004)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0005)	2873.93	51.65	11.75	45.55	1.98	1.35
OUTFLOW: ID= 1 (0004)	2873.93	51.49	12.00	45.55	1.99	1.35

ROUTE CHN(0003)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
15.00	462.75	0.0500	
20.00	462.00	0.0500 /0.0500	
29.16	461.75	0.0500 /0.0500	
35.50	460.00	0.0500	
42.46	460.00	0.0300	Main Channel
47.87	462.00	0.0300 /0.0500	Main Channel
60.00	463.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)

0.14	460.14	.107E+04	0.3	0.28	58.97
0.29	460.29	.228E+04	1.0	0.44	37.60
0.43	460.43	.362E+04	2.1	0.57	29.01
0.58	460.58	.509E+04	3.5	0.69	24.18
0.72	460.72	.669E+04	5.3	0.79	21.03
0.87	460.87	.843E+04	7.5	0.89	18.78
1.01	461.01	.103E+05	10.1	0.98	17.07
1.16	461.16	.123E+05	13.0	1.06	15.73
1.30	461.30	.144E+05	16.4	1.14	14.63
1.45	461.45	.167E+05	20.3	1.21	13.72
1.59	461.59	.191E+05	24.6	1.29	12.95
1.74	461.74	.216E+05	29.4	1.36	12.28
1.88	461.88	.246E+05	34.9	1.42	11.73
2.03	462.03	.283E+05	41.4	1.46	11.42
2.17	462.17	.327E+05	49.2	1.51	11.05
2.32	462.32	.373E+05	58.0	1.55	10.72
2.46	462.46	.424E+05	67.9	1.60	10.42
2.61	462.61	.479E+05	78.7	1.64	10.15
2.75	462.75	.538E+05	90.7	1.69	9.89

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0004)	2873.93	51.49	12.00	45.55	2.21	1.52
OUTFLOW: ID= 1 (| 0003)	2873.93	51.37	12.25	45.55	2.20	1.52

ROUTE CHN(0002)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
10.00	460.25	0.0500	
19.50	459.19	0.0500	
25.29	457.44	0.0500 /0.0300	Main Channel
27.28	457.26	0.0300	Main Channel
35.31	457.75	0.0300 /0.0500	Main Channel
44.00	458.00	0.0500	
54.00	459.00	0.0500	
58.00	459.00	0.0500	
60.00	459.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.09	457.35	.111E+03	0.0	0.21	77.66
0.18	457.44	.444E+03	0.2	0.34	48.93
0.29	457.55	.108E+04	0.5	0.49	33.88
0.39	457.65	.194E+04	1.2	0.61	27.50
0.50	457.76	.303E+04	2.2	0.71	23.47
0.61	457.87	.446E+04	3.7	0.83	20.04
0.71	457.97	.632E+04	5.7	0.90	18.42
0.82	458.08	.854E+04	8.3	0.97	17.20
0.93	458.19	.109E+05	11.3	1.04	16.05
1.03	458.29	.134E+05	14.9	1.11	15.06
1.14	458.40	.161E+05	18.9	1.17	14.22
1.24	458.50	.189E+05	23.4	1.23	13.51
1.35	458.61	.219E+05	28.3	1.29	12.89
1.46	458.72	.251E+05	33.8	1.35	12.36
1.56	458.82	.283E+05	39.7	1.40	11.89
1.67	458.93	.318E+05	46.2	1.45	11.47
1.78	459.04	.355E+05	51.7	1.46	11.45
1.88	459.14	.397E+05	59.6	1.50	11.09
1.99	459.25	.439E+05	68.2	1.55	10.74

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0003)	2873.93	51.37	12.25	45.55	1.77	1.46
OUTFLOW: ID= 1 (| 0002)	2873.93	51.19	12.25	45.55	1.76	1.46

ROUTE CHN(0001)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
39.74	459.25	0.0500

41.86	459.00	0.0500		
49.51	457.47	0.0500		
58.73	456.75	0.0500		
85.31	456.25	0.0500		
91.00	456.00	0.0500 /0.0300	Main Channel	
98.50	454.75	0.0300	Main Channel	
103.78	454.75	0.0300	Main Channel	
116.96	458.50	0.0300 /0.0500	Main Channel	
125.11	458.75	0.0500		

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.21	454.96	.885E+03	1.0	0.77	14.66
0.42	455.17	.205E+04	3.5	1.14	9.86
0.62	455.37	.349E+04	7.4	1.43	7.88
0.83	455.58	.522E+04	12.9	1.68	6.72
1.04	455.79	.722E+04	20.2	1.90	5.95
1.25	456.00	.950E+04	29.4	2.10	5.38
1.46	456.21	.124E+05	42.5	2.33	4.85
1.67	456.42	.163E+05	58.3	2.42	4.67
1.88	456.63	.220E+05	78.1	2.40	4.69
2.10	456.85	.292E+05	103.3	2.39	4.72
2.31	457.06	.372E+05	134.3	2.45	4.61
2.52	457.27	.456E+05	170.3	2.53	4.46
2.73	457.48	.545E+05	211.2	2.62	4.30
2.94	457.69	.638E+05	258.3	2.74	4.12
3.15	457.90	.733E+05	310.2	2.86	3.94
3.37	458.12	.832E+05	367.0	2.99	3.78
3.58	458.33	.932E+05	428.5	3.11	3.63
3.79	458.54	.104E+06	495.8	3.24	3.48
4.00	458.75	.115E+06	573.1	3.38	3.34

		<---- hydrograph ---->			<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0002)	2873.93	51.19	12.25	45.55	1.58	2.38
OUTFLOW: ID= 1 (0001)	2873.93	51.22	12.50	45.55	1.58	2.38

READ HYD (0204)	AREA (ha)= 4.59
DT=15.0 min	TPEAK (hrs)= 1.00
	VOLUME (mm)= 58.46

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 100Yr, Outlet4

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.50	0.202	3.00	0.086	4.50	0.003	6.00	0.001
0.25	0.044	1.75	0.157	3.25	0.025	4.75	0.003	6.25	0.000
0.50	0.083	2.00	0.133	3.50	0.013	5.00	0.002	6.50	0.000
0.75	0.179	2.25	0.115	3.75	0.009	5.25	0.002		
1.00	1.418	2.50	0.103	4.00	0.006	5.50	0.001		
1.25	0.298	2.75	0.093	4.25	0.005	5.75	0.001		

ADD HYD (0100)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	2873.93	51.224	12.50	45.55
+ ID2= 2 (0204):	4.59	1.418	1.00	58.46
ID = 3 (0100):	2878.52	51.224	12.50	45.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0033)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning		
39.74	459.25	0.0500		
41.86	459.00	0.0500		
49.51	457.47	0.0500		
58.73	456.75	0.0500		
85.31	456.25	0.0500		
91.00	456.00	0.0500 /0.0300	Main Channel	
98.50	454.75	0.0300	Main Channel	
103.78	454.75	0.0300	Main Channel	

```
              116.96        458.50    0.0300 /0.0500  Main Channel
              125.11        458.75        0.0500
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.21	454.96	.442E+03	1.0	0.77	7.33
0.42	455.17	.102E+04	3.5	1.14	4.93
0.62	455.37	.175E+04	7.4	1.43	3.94
0.83	455.58	.261E+04	12.9	1.68	3.36
1.04	455.79	.361E+04	20.2	1.90	2.97
1.25	456.00	.475E+04	29.4	2.10	2.69
1.46	456.21	.618E+04	42.5	2.33	2.42
1.67	456.42	.816E+04	58.3	2.42	2.33
1.88	456.63	.110E+05	78.1	2.40	2.35
2.10	456.85	.146E+05	103.3	2.39	2.36
2.31	457.06	.186E+05	134.3	2.45	2.31
2.52	457.27	.228E+05	170.3	2.53	2.23
2.73	457.48	.273E+05	211.2	2.62	2.15
2.94	457.69	.319E+05	258.3	2.74	2.06
3.15	457.90	.367E+05	310.2	2.86	1.97
3.37	458.12	.416E+05	367.0	2.99	1.89
3.58	458.33	.466E+05	428.5	3.11	1.81
3.79	458.54	.518E+05	495.8	3.24	1.74
4.00	458.75	.573E+05	573.1	3.38	1.67

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2	(0100)	2878.52	51.22	12.50	45.57	1.58	2.38
OUTFLOW: ID= 1	(0033)	2878.52	51.23	12.50	45.57	1.58	2.37

```
| CALIB              |
| NASHYD   (  2000)|   Area     (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
                     U.H. Tp(hrs)=   2.60

     Unit Hyd Qpeak  (cms)=  42.936

     PEAK FLOW       (cms)=  38.810 (i)
     TIME TO PEAK    (hrs)=   8.750
     RUNOFF VOLUME    (mm)=  29.965
     TOTAL RAINFALL   (mm)=  88.500
     RUNOFF COEFFICIENT   =   0.339

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00

               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87        0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25        0.0300      Main Channel
                  24.23        470.25        0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00        0.0500
                  40.00        471.16        0.0500
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.03	470.28	.106E+03	0.0	0.18	109.47
0.07	470.32	.229E+03	0.1	0.27	72.36
0.10	470.35	.371E+03	0.1	0.34	57.58
0.13	470.38	.531E+03	0.2	0.39	49.31
0.16	470.41	.708E+03	0.3	0.44	43.90
0.20	470.45	.904E+03	0.4	0.48	40.01
0.23	470.48	.112E+04	0.5	0.52	37.05
0.26	470.51	.135E+04	0.6	0.56	34.69
0.29	470.54	.160E+04	0.8	0.59	32.75
0.33	470.58	.186E+04	1.0	0.62	31.11
0.36	470.61	.215E+04	1.2	0.65	29.71
0.39	470.64	.245E+04	1.4	0.68	28.49
0.42	470.67	.277E+04	1.7	0.70	27.40
0.46	470.71	.311E+04	2.0	0.73	26.44
0.49	470.74	.347E+04	2.3	0.75	25.56

0.52	470.77	.386E+04	2.6	0.79	24.42
0.55	470.80	.432E+04	3.1	0.82	23.53
0.59	470.84	.485E+04	3.5	0.84	22.95
0.62	470.87	.545E+04	4.0	0.86	22.57

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 2000)	2922.70	38.81	8.75	29.97	0.61	0.85
OUTFLOW: ID= 1 (| 0020)	2922.70	38.02	9.25	29.97	0.62	0.86

ROUTE CHN(0019)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
60.00	467.50	0.0500	
68.78	467.50	0.0500 /0.0300	
75.63	467.28	0.0300	Main Channel
75.99	467.25	0.0300	Main Channel
80.23	467.25	0.0300	Main Channel
82.81	467.75	0.0300 /0.0500	Main Channel
87.19	467.93	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.01	467.26	.433E+02	0.0	0.05	328.94
0.02	467.27	.883E+02	0.0	0.08	209.84
0.03	467.28	.135E+03	0.0	0.10	162.03
0.04	467.29	.204E+03	0.0	0.13	127.07
0.06	467.31	.280E+03	0.0	0.15	108.18
0.07	467.32	.362E+03	0.1	0.17	96.07
0.09	467.34	.452E+03	0.1	0.19	87.54
0.10	467.35	.548E+03	0.1	0.21	81.15
0.11	467.36	.652E+03	0.1	0.22	76.14
0.13	467.38	.762E+03	0.2	0.23	72.09
0.14	467.39	.879E+03	0.2	0.24	68.72
0.15	467.40	.100E+04	0.3	0.25	65.86
0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (| 0020)	2922.70	38.02	9.25	29.97	0.25	0.31
OUTFLOW: ID= 1 (| 0019)	2922.70	34.84	10.50	29.96	0.25	0.31

ROUTE CHN(0018)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18

0.41	466.55	.161E+04	1.2	0.75	22.17
0.47	466.61	.198E+04	1.6	0.81	20.60
0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0019)	2922.70	34.84	10.50	29.96	1.09	1.11
OUTFLOW: ID= 1 (0018)	2922.70	34.67	10.75	29.96	1.11	1.11

ROUTE CHN(0017) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0018)	2922.70	34.67	10.75	29.96	0.74	1.20
OUTFLOW: ID= 1 (0017)	2922.70	34.47	11.00	29.96	0.77	1.23

ROUTE CHN(0016) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel

```
                26.18        458.75        0.0300      Main Channel
                30.53        460.25    0.0300 /0.0500  Main Channel
                60.87        460.75        0.0500
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	458.81	.262E+03	0.1	0.20	82.51
0.13	458.88	.554E+03	0.2	0.31	53.72
0.19	458.94	.875E+03	0.3	0.40	42.17
0.25	459.00	.123E+04	0.6	0.47	35.68
0.31	459.06	.160E+04	0.9	0.53	31.42
0.38	459.13	.201E+04	1.2	0.59	28.36
0.44	459.19	.245E+04	1.6	0.64	26.03
0.50	459.25	.292E+04	2.0	0.69	24.18
0.56	459.31	.342E+04	2.5	0.74	22.66
0.63	459.38	.394E+04	3.1	0.78	21.39
0.69	459.44	.450E+04	3.7	0.82	20.31
0.75	459.50	.509E+04	4.4	0.86	19.36
0.81	459.56	.570E+04	5.1	0.90	18.53
0.88	459.63	.634E+04	5.9	0.94	17.80
0.94	459.69	.702E+04	6.8	0.97	17.14
1.00	459.75	.772E+04	7.8	1.01	16.54
1.08	459.83	.879E+04	9.3	1.06	15.68
1.17	459.92	.101E+05	11.1	1.10	15.19
1.25	460.00	.116E+05	13.0	1.12	14.91

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0017)	2922.70	34.47	11.00	29.96	1.22	1.11
OUTFLOW:	ID= 1 (0016)	2922.70	34.29	11.25	29.96	1.25	1.12

ROUTE CHN(0015)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

```
Distance      Elevation       Manning
  131.87        458.25        0.0500
  140.91        458.66    0.0500 /0.0300
  147.80        457.48        0.0300      Main Channel
  149.90        457.48        0.0300      Main Channel
  153.04        458.50    0.0300 /0.0500  Main Channel
  156.08        458.60        0.0500
  157.70        458.75        0.0500
  160.00        458.75        0.0500
```

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	457.52	.924E+02	0.0	0.12	134.80
0.08	457.56	.199E+03	0.0	0.19	89.01
0.12	457.60	.321E+03	0.1	0.24	70.81
0.16	457.64	.457E+03	0.1	0.27	60.67
0.20	457.68	.608E+03	0.2	0.31	54.05
0.24	457.72	.774E+03	0.3	0.34	49.33
0.28	457.76	.954E+03	0.3	0.36	45.73
0.32	457.80	.115E+04	0.4	0.39	42.89
0.36	457.84	.136E+04	0.6	0.41	40.55
0.41	457.89	.158E+04	0.7	0.43	38.59
0.45	457.93	.182E+04	0.8	0.45	36.91
0.49	457.97	.208E+04	1.0	0.47	35.45
0.53	458.01	.234E+04	1.1	0.49	34.15
0.57	458.05	.263E+04	1.3	0.51	33.00
0.61	458.09	.292E+04	1.5	0.52	31.96
0.65	458.13	.324E+04	1.7	0.54	31.02
0.69	458.17	.356E+04	2.0	0.55	30.15
0.73	458.21	.390E+04	2.2	0.57	29.36
0.77	458.25	.426E+04	2.5	0.58	28.62

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0016)	2922.70	34.29	11.25	29.96	0.75	0.57
OUTFLOW:	ID= 1 (0015)	2922.70	33.60	12.00	29.96	0.77	0.58

```
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0014)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 150.00        456.75        0.0500
                 155.75        456.75    0.0500 /0.0300
                 160.05        456.00        0.0300      Main Channel
                 165.32        456.00        0.0300      Main Channel
                 170.87        457.50    0.0300 /0.0500  Main Channel
                 172.96        457.75        0.0500
                 175.82        457.75        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.04   456.04    .215E+03       0.0          0.09     180.09
        0.08   456.08    .445E+03       0.1          0.14     115.91
        0.12   456.12    .690E+03       0.1          0.18      90.27
        0.16   456.16    .950E+03       0.2          0.22      75.96
        0.20   456.20    .122E+04       0.3          0.25      66.67
        0.24   456.24    .151E+04       0.4          0.28      60.07
        0.28   456.28    .182E+04       0.5          0.30      55.11
        0.32   456.32    .213E+04       0.7          0.33      51.21
        0.36   456.36    .247E+04       0.9          0.35      48.06
        0.39   456.39    .282E+04       1.0          0.37      45.44
        0.43   456.43    .318E+04       1.2          0.39      43.23
        0.47   456.47    .356E+04       1.4          0.40      41.33
        0.51   456.51    .395E+04       1.7          0.42      39.67
        0.55   456.55    .435E+04       1.9          0.44      38.22
        0.59   456.59    .477E+04       2.2          0.45      36.92
        0.63   456.63    .521E+04       2.4          0.47      35.76
        0.67   456.67    .566E+04       2.7          0.48      34.70
        0.71   456.71    .613E+04       3.0          0.49      33.75
        0.75   456.75    .661E+04       3.3          0.51      32.87

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)     (m)      (m/s)
   INFLOW : ID= 2 (  0015) 2922.70    33.60   12.00  29.96      0.70      0.49
   OUTFLOW: ID= 1 (  0014) 2922.70    32.81   12.50  29.96      0.75      0.51



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--------------------
| ROUTE CHN(  0013)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 155.00        456.25        0.0500
                 161.70        456.25    0.0500 /0.0300
                 169.49        455.25        0.0300      Main Channel
                 170.18        455.25        0.0300      Main Channel
                 176.86        456.75    0.0300 /0.0500  Main Channel
                 181.81        456.75        0.0500
                 188.74        456.25        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.08   455.33    .926E+02       0.0          0.18      90.89
        0.16   455.41    .262E+03       0.1          0.25      65.50
        0.24   455.49    .507E+03       0.2          0.31      53.95
        0.32   455.57    .828E+03       0.3          0.36      46.77
        0.39   455.64    .123E+04       0.5          0.40      41.69
        0.47   455.72    .170E+04       0.7          0.44      37.85
        0.55   455.80    .225E+04       1.1          0.48      34.80
        0.63   455.88    .288E+04       1.5          0.52      32.31
        0.71   455.96    .358E+04       2.0          0.55      30.23
        0.79   456.04    .436E+04       2.6          0.59      28.46
        0.87   456.12    .522E+04       3.2          0.62      26.93
        0.95   456.20    .615E+04       4.0          0.65      25.59
        1.03   456.28    .734E+04       4.9          0.67      24.78
        1.11   456.36    .898E+04       6.2          0.68      24.34
        1.18   456.43    .107E+05       7.6          0.71      23.62
        1.26   456.51    .126E+05       9.2          0.73      22.81
        1.34   456.59    .146E+05      11.1          0.76      22.00
        1.42   456.67    .167E+05      13.1          0.79      21.22
        1.50   456.75    .189E+05      15.2          0.81      20.70
```

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2	(0014)	2922.70	32.81	12.50	29.96	1.47	0.80
OUTFLOW: ID= 1	(0013)	2922.70	32.56	13.00	29.96	1.50	0.81

ROUTE CHN(0012)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.10	455.50	0.0500	
144.47	455.50	0.0500	
148.86	455.75	0.0500	
150.17	455.75	0.0500	
151.79	455.50	0.0500 /0.0300	Main Channel
155.72	454.00	0.0300	Main Channel
158.28	453.76	0.0300	Main Channel
161.63	454.00	0.0300	Main Channel
165.55	455.50	0.0300 /0.0500	Main Channel
169.69	455.50	0.0500	
175.87	455.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	453.86	.129E+03	0.0	0.08	209.88
0.20	453.96	.516E+03	0.1	0.13	132.21
0.31	454.07	.112E+04	0.2	0.18	91.49
0.41	454.17	.179E+04	0.4	0.23	70.94
0.51	454.27	.251E+04	0.7	0.28	59.65
0.61	454.37	.329E+04	1.0	0.32	52.34
0.72	454.48	.412E+04	1.5	0.35	47.15
0.82	454.58	.501E+04	1.9	0.39	43.22
0.92	454.68	.595E+04	2.5	0.42	40.11
1.02	454.78	.695E+04	3.1	0.44	37.58
1.13	454.89	.800E+04	3.8	0.47	35.47
1.23	454.99	.911E+04	4.5	0.50	33.66
1.33	455.09	.103E+05	5.3	0.52	32.10
1.43	455.19	.115E+05	6.2	0.54	30.73
1.54	455.30	.128E+05	7.2	0.56	29.57
1.64	455.40	.144E+05	8.3	0.58	28.91
1.74	455.50	.162E+05	9.4	0.58	28.67
1.87	455.63	.220E+05	11.7	0.53	31.39
1.99	455.75	.281E+05	14.4	0.51	32.45

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2	(0013)	2922.70	32.56	13.00	29.96	1.95	0.52
OUTFLOW: ID= 1	(0012)	2922.70	32.23	13.50	29.96	1.95	0.52

ROUTE CHN(0011)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.00	455.75	0.0500	
137.92	455.00	0.0500 /0.0300	
144.47	453.45	0.0300	Main Channel
146.45	453.43	0.0300	Main Channel
148.74	453.48	0.0300	Main Channel
151.36	453.75	0.0300	Main Channel
154.10	453.93	0.0300	Main Channel
155.00	454.00	0.0300	Main Channel
161.50	455.18	0.0300 /0.0500	Main Channel
168.74	455.67	0.0500	
170.19	455.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.02	453.45	.290E+02	0.0	0.10	164.18

0.14	453.57	.573E+03	0.3	0.48	35.05
0.25	453.68	.132E+04	0.9	0.69	24.05
0.37	453.80	.227E+04	1.9	0.84	19.87
0.49	453.92	.347E+04	3.3	0.95	17.58
0.60	454.03	.492E+04	5.3	1.08	15.43
0.72	454.15	.653E+04	8.0	1.23	13.54
0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0012)	2922.70	32.23	13.50	29.96	1.35	1.84
OUTFLOW: ID= 1 (0011)	2922.70	32.24	13.50	29.96	1.35	1.83

ADD HYD (0200)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0011):	2922.70	32.240	13.50	29.96	
+ ID2= 2 (0033):	2878.52	51.234	12.50	45.57	
ID = 3 (0200):	5801.22	82.081	12.75	37.71	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
23.66	457.50	0.0500	
47.14	455.00	0.0500	
62.60	454.50	0.0500	
62.72	454.25	0.0500	
73.90	453.50	0.0500 /0.0300	Main Channel
83.00	450.25	0.0300	Main Channel
85.93	450.00	0.0300	Main Channel
93.20	449.75	0.0300	Main Channel
101.08	449.00	0.0300	Main Channel
107.87	449.00	0.0300	Main Channel
114.70	453.40	0.0300 /0.0500	Main Channel
117.36	454.00	0.0500	
123.95	454.11	0.0500	
180.00	458.52	0.0500	
200.00	459.04	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.44	449.44	.143E+04	4.5	1.09	5.26
0.88	449.88	.371E+04	16.0	1.48	3.87
1.32	450.32	.740E+04	41.0	1.90	3.01
1.76	450.76	.116E+05	82.9	2.44	2.34
2.20	451.20	.162E+05	136.9	2.91	1.97
2.64	451.64	.210E+05	202.6	3.31	1.73
3.08	452.08	.261E+05	279.7	3.68	1.55
3.52	452.52	.315E+05	368.3	4.01	1.42
3.96	452.96	.372E+05	468.4	4.32	1.32
4.40	453.40	.431E+05	580.3	4.62	1.24
4.86	453.86	.500E+05	727.3	4.99	1.15
5.31	454.31	.588E+05	895.2	5.22	1.09
5.77	454.77	.696E+05	1084.5	5.35	1.07
6.22	455.22	.831E+05	1302.7	5.37	1.06
6.68	455.68	.985E+05	1553.5	5.41	1.06
7.13	456.13	.115E+06	1834.9	5.46	1.05
7.59	456.59	.134E+06	2148.3	5.51	1.04
8.04	457.04	.154E+06	2494.8	5.56	1.03
8.50	457.50	.175E+06	2875.7	5.62	1.02

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0200)	5801.22	82.08	12.75	37.71	1.75	2.43
OUTFLOW: ID= 1 (0031)	5801.22	82.11	13.00	37.71	1.74	2.42

ROUTE CHN(0032) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

DATA FOR SECTION (1.1)

Distance	Elevation	Manning	
4.69	451.07	0.0500	
13.38	451.10	0.0500	
23.86	450.00	0.0500 /0.0300	Main Channel
32.76	447.75	0.0300	Main Channel
35.26	447.50	0.0300	Main Channel
46.15	447.50	0.0300	Main Channel
49.16	447.75	0.0300	Main Channel
56.34	451.00	0.0300 /0.0500	Main Channel
67.16	452.61	0.0500	
73.93	452.92	0.0500	

TRAVEL TIME TABLE

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.18	447.68	.165E+03	1.8	0.77	1.55
0.36	447.86	.375E+03	6.3	1.21	0.99
0.54	448.04	.601E+03	13.3	1.59	0.75
0.71	448.21	.842E+03	22.4	1.91	0.63
0.89	448.39	.110E+04	33.5	2.20	0.55
1.07	448.57	.137E+04	46.5	2.45	0.49
1.25	448.75	.165E+04	61.5	2.68	0.45
1.43	448.93	.195E+04	78.4	2.90	0.41
1.61	449.11	.226E+04	97.3	3.10	0.39
1.79	449.29	.258E+04	118.2	3.30	0.36
1.96	449.46	.292E+04	141.1	3.48	0.35
2.14	449.64	.328E+04	166.1	3.65	0.33
2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0031)	5801.22	82.11	13.00	37.71	1.46	2.94
OUTFLOW: ID= 1 (0032)	5801.22	82.13	13.00	37.71	1.46	2.93

CHICAGO STORM Ptotal= 71.64 mm	IDF curve parameters: A= 901.021 B= 0.000 C= 0.699

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	8.38	0.83	180.19	1.67	12.99	2.50	8.08
0.17	9.86	1.00	38.16	1.83	11.47	2.67	7.57
0.33	12.22	1.17	24.06	2.00	10.33	2.83	7.13
0.50	16.72	1.33	18.35	2.17	9.42		
0.67	31.09	1.50	15.11	2.33	8.69		

CALIB NASHYD (3000) ID= 1 DT=15.0 min	Area (ha)= 25.69 Curve Number (CN)= 85.2 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.57

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	8.87	1.000	130.49	1.750	14.41	2.50	8.93
0.500	11.43	1.250	33.46	2.000	11.98	2.75	7.91
0.750	21.51	1.500	20.25	2.250	10.02	3.00	7.27

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 1.660 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 39.998
TOTAL RAINFALL (mm)= 71.636
RUNOFF COEFFICIENT = 0.558

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

READ HYD (0002)	AREA (ha)= 8.70
DT=15.0 min	TPEAK (hrs)= 1.00
	VOLUME (mm)= 53.29

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 100Yr, Outlet2

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.25	0.584	2.50	0.196	3.75	0.010	5.00	0.000
0.25	0.076	1.50	0.404	2.75	0.175	4.00	0.006		
0.50	0.141	1.75	0.311	3.00	0.160	4.25	0.003		
0.75	0.307	2.00	0.260	3.25	0.045	4.50	0.001		
1.00	2.229	2.25	0.222	3.50	0.020	4.75	0.000		

READ HYD (0022)	AREA (ha)= 2.23
DT=15.0 min	TPEAK (hrs)= 1.25
	VOLUME (mm)= 63.54

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 100Yr, Commercial

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	2.50	0.074	5.00	0.003	7.50	0.000	10.00	0.000
0.25	0.001	2.75	0.061	5.25	0.002	7.75	0.000	10.25	0.000
0.50	0.014	3.00	0.052	5.50	0.002	8.00	0.000	10.50	0.000
0.75	0.046	3.25	0.036	5.75	0.001	8.25	0.000	10.75	0.000
1.00	0.255	3.50	0.022	6.00	0.001	8.50	0.000	11.00	0.000
1.25	0.281	3.75	0.014	6.25	0.001	8.75	0.000		
1.50	0.240	4.00	0.010	6.50	0.001	9.00	0.000		
1.75	0.192	4.25	0.007	6.75	0.001	9.25	0.000		
2.00	0.145	4.50	0.005	7.00	0.001	9.50	0.000		
2.25	0.098	4.75	0.004	7.25	0.001	9.75	0.000		

READ HYD (0003)	AREA (ha)= 1.06
DT=15.0 min	TPEAK (hrs)= 1.00
	VOLUME (mm)= 61.37

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 100Yr, Outlet3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	1.00	0.341	2.00	0.032	3.00	0.020	4.00	0.000
0.25	0.008	1.25	0.087	2.25	0.027	3.25	0.006	4.25	0.000
0.50	0.020	1.50	0.054	2.50	0.024	3.50	0.002		
0.75	0.040	1.75	0.040	2.75	0.022	3.75	0.001		

ADD HYD (0500)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	8.70	2.229	1.00	53.29
	+ ID2= 2 (0022):	2.23	0.281	1.25	63.54
	ID = 3 (0500):	10.93	2.484	1.00	55.38

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| ADD HYD  (  0500)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 3 (  0500):     10.93   2.484     1.00     55.38
     + ID2= 2 (  0003):      1.06   0.341     1.00     61.37
       ================================================
       ID = 1 (  0500):     11.99   2.825     1.00     55.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0500)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0500):     11.99   2.825     1.00     55.91
     + ID2= 2 (  3000):     25.69   1.660     1.50     40.00
       ================================================
       ID = 3 (  0500):     37.68   3.548     1.00     45.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0032):   5801.22  82.125    13.00     37.71
     + ID2= 2 (  0500):     37.68   3.548     1.00     45.06
       ================================================
       ID = 3 (  0300):   5838.90  82.125    13.00     37.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=   1.50
--------------------   VOLUME      (mm)=  88.19
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, 100Yr, Outlet1

  TIME    FLOW |  TIME    FLOW |  TIME    FLOW |'  TIME    FLOW |  TIME    FLOW
   hrs     cms |   hrs     cms |   hrs     cms |'   hrs     cms |   hrs     cms
  0.00   0.000 |  3.75   0.071 |  7.50   0.003 | 11.25   0.001 | 15.00   0.000
  0.25   0.004 |  4.00   0.061 |  7.75   0.003 | 11.50   0.001 | 15.25   0.000
  0.50   0.010 |  4.25   0.054 |  8.00   0.002 | 11.75   0.000 | 15.50   0.000
  0.75   0.017 |  4.50   0.048 |  8.25   0.002 | 12.00   0.000 | 15.75   0.000
  1.00   0.029 |  4.75   0.034 |  8.50   0.002 | 12.25   0.000 | 16.00   0.000
  1.25   0.058 |  5.00   0.026 |  8.75   0.002 | 12.50   0.000 | 16.25   0.000
  1.50   0.311 |  5.25   0.020 |  9.00   0.001 | 12.75   0.000 | 16.50   0.000
  1.75   0.190 |  5.50   0.015 |  9.25   0.001 | 13.00   0.000 | 16.75   0.000
  2.00   0.170 |  5.75   0.012 |  9.50   0.001 | 13.25   0.000 | 17.00   0.000
  2.25   0.155 |  6.00   0.010 |  9.75   0.001 | 13.50   0.000 | 17.25   0.000
  2.50   0.140 |  6.25   0.008 | 10.00   0.001 | 13.75   0.000 | 17.50   0.000
  2.75   0.126 |  6.50   0.006 | 10.25   0.001 | 14.00   0.000 | 17.75   0.000
  3.00   0.112 |  6.75   0.005 | 10.50   0.001 | 14.25   0.000 |
  3.25   0.098 |  7.00   0.004 | 10.75   0.001 | 14.50   0.000 |
  3.50   0.085 |  7.25   0.004 | 11.00   0.001 | 14.75   0.000 |
--------------------------------------------------------------------------------


--------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0001):      1.95   0.311     1.50     88.19
     + ID2= 2 (  0300):   5838.90  82.125    13.00     37.75
       ================================================
       ID = 3 (  0400):   5840.85  82.126    13.00     37.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
```

120.00	448.92	0.0300	Main Channel
140.00	454.00	0.0300 /0.0500	Main Channel
160.00	454.00	0.0500	

<-------------------- TRAVEL TIME TABLE ---------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.35	447.48	.169E+04	10.3	1.33	2.74
0.70	447.83	.399E+04	36.9	2.02	1.80
1.06	448.19	.682E+04	79.6	2.54	1.43
1.41	448.54	.102E+05	139.5	2.99	1.21
1.76	448.89	.141E+05	218.4	3.39	1.07
2.11	449.24	.184E+05	323.6	3.84	0.95
2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW :	ID= 2 (0400)	5840.85	82.13	13.00	37.77	1.07	2.56
OUTFLOW:	ID= 1 (0062)	5840.85	82.13	13.00	37.77	1.07	2.56

FINISH

==========

Post-Development - Regional Storm Hazel

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       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

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  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\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\8362955f-
  Summary filename: C:\Users\atrenholm\AppData\Local\Civica\VH5\703d6c7e-7df4-4a7a-9dea-3a094d233c0e\8362955f-


DATE: 12/09/2024                          TIME: 12:26:35

USER:


COMMENTS: _____________________________________________________________

--------------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Hazel                         **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\atrenholm\AppD
|                  |              ata\Local\Temp\
|                  |              929ecfb3-0c97-47ac-b3d5-8d75e5800369\83013d31
| Ptotal=210.33 mm |    Comments: Hazel992
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    5.95 |  3.00   12.90 |  6.00   22.82 |  9.00   52.58
                1.00    3.97 |  4.00   16.86 |  7.00   12.90 | 10.00   37.70
                2.00    5.95 |  5.00   12.90 |  8.00   12.90 | 11.00   12.90

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  1000)|   Area    (ha)=2873.93   Curve Number   (CN)= 78.5
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.65

         NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
               0.250    5.95 | 3.250   12.90 | 6.250   22.82 |  9.25   52.58
               0.500    5.95 | 3.500   12.90 | 6.500   22.82 |  9.50   52.58
               0.750    5.95 | 3.750   12.90 | 6.750   22.82 |  9.75   52.58
               1.000    5.95 | 4.000   12.90 | 7.000   22.82 | 10.00   52.58
               1.250    3.97 | 4.250   16.86 | 7.250   12.90 | 10.25   37.70
               1.500    3.97 | 4.500   16.86 | 7.500   12.90 | 10.50   37.70
               1.750    3.97 | 4.750   16.86 | 7.750   12.90 | 10.75   37.70
               2.000    3.97 | 5.000   16.86 | 8.000   12.90 | 11.00   37.70
               2.250    5.95 | 5.250   12.90 | 8.250   12.90 | 11.25   12.90
               2.500    5.95 | 5.500   12.90 | 8.500   12.90 | 11.50   12.90
               2.750    5.95 | 5.750   12.90 | 8.750   12.90 | 11.75   12.90
               3.000    5.95 | 6.000   12.90 | 9.000   12.90 | 12.00   12.90

    Unit Hyd Qpeak  (cms)=  41.423

    PEAK FLOW       (cms)= 176.823 (i)
    TIME TO PEAK    (hrs)=  12.500
    RUNOFF VOLUME    (mm)= 153.367
```

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     TOTAL RAINFALL   (mm)= 210.330
     RUNOFF COEFFICIENT   =   0.729

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

--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0010)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  88.23        474.75        0.0500
                  89.82        474.75    0.0500 /0.0300
                  94.62        473.25        0.0300      Main Channel
                  96.33        473.25        0.0300      Main Channel
                 101.14        474.50    0.0300 /0.0500  Main Channel
                 108.03        474.46        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.06   473.31    .175E+03       0.0          0.22     107.71
        0.13   473.38    .391E+03       0.1          0.33      72.28
        0.19   473.44    .647E+03       0.2          0.41      58.08
        0.25   473.50    .944E+03       0.3          0.47      50.05
        0.32   473.57    .128E+04       0.5          0.53      44.73
        0.38   473.63    .166E+04       0.7          0.58      40.85
        0.45   473.70    .208E+04       0.9          0.63      37.86
        0.51   473.76    .254E+04       1.2          0.67      35.46
        0.57   473.82    .304E+04       1.5          0.71      33.46
        0.64   473.89    .358E+04       1.9          0.75      31.76
        0.70   473.95    .416E+04       2.3          0.78      30.29
        0.76   474.01    .478E+04       2.7          0.82      29.01
        0.83   474.08    .544E+04       3.3          0.85      27.86
        0.89   474.14    .615E+04       3.8          0.88      26.84
        0.96   474.21    .689E+04       4.4          0.91      25.91
        1.02   474.27    .767E+04       5.1          0.94      25.07
        1.08   474.33    .850E+04       5.8          0.97      24.29
        1.15   474.40    .936E+04       6.6          1.00      23.58
        1.21   474.46    .103E+05       7.5          1.03      22.92

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  1000) 2873.93   176.82   12.50 153.37      1.18      1.02
    OUTFLOW: ID= 1 (  0010) 2873.93   173.57   13.00 153.37      1.21      1.03



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0009)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  59.79        473.44        0.0500
                  67.47        472.75        0.0500
                  90.84        472.50    0.0500 /0.0300  Main Channel
                  93.81        472.25        0.0300      Main Channel
                  95.43        472.25        0.0300      Main Channel
                 115.15        472.50    0.0300 /0.0500  Main Channel
                 119.95        472.50        0.0500
                 143.58        472.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)     (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   472.28    .689E+02       0.0          0.07     232.76
        0.05   472.30    .194E+03       0.0          0.11     158.29
        0.08   472.33    .377E+03       0.1          0.13     125.54
        0.10   472.35    .616E+03       0.1          0.16     106.06
        0.13   472.38    .912E+03       0.2          0.18      92.83
        0.15   472.40    .126E+04       0.3          0.20      83.13
        0.18   472.43    .167E+04       0.4          0.22      75.64
        0.20   472.45    .214E+04       0.5          0.24      69.65
        0.23   472.48    .266E+04       0.7          0.26      64.73
        0.25   472.50    .324E+04       0.9          0.28      60.59
        0.28   472.53    .412E+04       1.2          0.30      55.76
        0.31   472.56    .515E+04       1.6          0.32      52.56
        0.33   472.58    .632E+04       2.1          0.33      50.26
        0.36   472.61    .764E+04       2.6          0.34      48.49
```

0.39	472.64	.910E+04	3.2	0.35	47.04
0.42	472.67	.107E+05	3.9	0.36	45.81
0.44	472.69	.125E+05	4.6	0.37	44.73
0.47	472.72	.144E+05	5.5	0.38	43.76
0.50	472.75	.164E+05	6.4	0.39	42.87

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0010)	2873.93	173.57	13.00	153.37	0.50	0.39
OUTFLOW: ID= 1 (0009)	2873.93	165.39	13.50	153.37	0.50	0.39

ROUTE CHN(0008)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
16.22	472.00	0.0500	
17.77	472.00	0.0500 /0.0300	
21.59	471.25	0.0300	Main Channel
25.64	472.25	0.0300 /0.0500	Main Channel
28.55	472.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.04	471.29	.712E+01	0.0	0.09	186.75
0.08	471.33	.285E+02	0.0	0.14	117.64
0.12	471.37	.641E+02	0.0	0.19	89.78
0.16	471.41	.114E+03	0.0	0.22	74.11
0.20	471.45	.178E+03	0.0	0.26	63.87
0.24	471.49	.256E+03	0.1	0.29	56.56
0.28	471.53	.349E+03	0.1	0.33	51.03
0.32	471.57	.456E+03	0.2	0.36	46.69
0.36	471.61	.577E+03	0.2	0.39	43.16
0.39	471.64	.712E+03	0.3	0.41	40.23
0.43	471.68	.862E+03	0.4	0.44	37.76
0.47	471.72	.103E+04	0.5	0.47	35.63
0.51	471.76	.120E+04	0.6	0.49	33.78
0.55	471.80	.140E+04	0.7	0.52	32.15
0.59	471.84	.160E+04	0.9	0.54	30.70
0.63	471.88	.182E+04	1.0	0.57	29.41
0.67	471.92	.206E+04	1.2	0.59	28.25
0.71	471.96	.231E+04	1.4	0.61	27.19
0.75	472.00	.257E+04	1.6	0.64	26.23

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0009)	2873.93	165.39	13.50	153.37	0.74	0.63
OUTFLOW: ID= 1 (0008)	2873.93	162.16	14.00	153.37	0.75	0.64

ROUTE CHN(0007)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
9.36	470.00	0.0500	
13.30	470.05	0.0500 /0.0300	
18.94	469.00	0.0300	Main Channel
22.08	469.00	0.0300	Main Channel
26.35	470.00	0.0300 /0.0500	Main Channel
28.73	470.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	469.06	.188E+03	0.0	0.21	79.24
0.11	469.11	.406E+03	0.1	0.32	52.24
0.17	469.17	.653E+03	0.3	0.40	41.50
0.22	469.22	.929E+03	0.4	0.47	35.50
0.28	469.28	.124E+04	0.7	0.53	31.57
0.33	469.33	.157E+04	0.9	0.58	28.77
0.39	469.39	.194E+04	1.2	0.63	26.63

0.44	469.44	.233E+04	1.6	0.67	24.93
0.50	469.50	.275E+04	1.9	0.71	23.54
0.55	469.55	.321E+04	2.4	0.75	22.37
0.61	469.61	.369E+04	2.9	0.78	21.37
0.66	469.66	.420E+04	3.4	0.81	20.49
0.72	469.72	.474E+04	4.0	0.85	19.72
0.77	469.77	.531E+04	4.7	0.88	19.03
0.83	469.83	.591E+04	5.4	0.91	18.41
0.88	469.88	.654E+04	6.1	0.93	17.85
0.94	469.94	.720E+04	6.9	0.96	17.33
0.99	469.99	.789E+04	7.8	0.99	16.86
1.05	470.05	.882E+04	8.9	1.01	16.55

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0008)	2873.93	162.16	14.00	153.37	1.03	1.00
OUTFLOW: ID= 1 (| 0007)	2873.93	161.06	14.50	153.37	1.05	1.01

ROUTE CHN(0006)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
4.43	467.50	0.0500	
12.90	467.50	0.0500 /0.0300	
15.77	466.92	0.0300	Main Channel
18.56	467.04	0.0300 /0.0500	Main Channel
24.14	467.99	0.0500	
28.55	467.96	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.98	.447E+02	0.0	0.17	95.69
0.11	467.03	.179E+03	0.0	0.28	60.28
0.17	467.09	.382E+03	0.2	0.41	40.36
0.23	467.15	.619E+03	0.3	0.52	32.04
0.28	467.20	.891E+03	0.5	0.61	27.51
0.34	467.26	.120E+04	0.8	0.68	24.60
0.39	467.31	.154E+04	1.1	0.74	22.54
0.45	467.37	.191E+04	1.5	0.79	20.98
0.51	467.43	.232E+04	2.0	0.84	19.75
0.56	467.48	.277E+04	2.5	0.89	18.74
0.62	467.54	.358E+04	3.1	0.86	19.30
0.68	467.60	.455E+04	3.9	0.86	19.43
0.73	467.65	.554E+04	4.9	0.88	19.02
0.79	467.71	.654E+04	5.9	0.91	18.38
0.84	467.76	.757E+04	7.1	0.94	17.67
0.90	467.82	.862E+04	8.5	0.98	16.97
0.96	467.88	.968E+04	9.9	1.02	16.29
1.01	467.93	.108E+05	11.5	1.06	15.66
1.07	467.99	.119E+05	12.6	1.05	15.84

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0007)	2873.93	161.06	14.50	153.37	1.06	1.06
OUTFLOW: ID= 1 (| 0006)	2873.93	160.22	14.75	153.37	1.07	1.05

ROUTE CHN(0005)|
IN= 2---> OUT= 1 | Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.00	464.50	0.0500	
15.50	464.26	0.0500 /0.0500	
19.30	463.25	0.0500	
23.50	463.25	0.0300	Main Channel
29.00	463.75	0.0300 /0.0500	Main Channel
34.65	465.00	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH	ELEV	VOLUME	FLOW RATE	VELOCITY	TRAV.TIME

(m)	(m)	(cu.m.)	(cms)	(m/s)	(min)
0.07	463.32	.308E+03	0.0	0.12	137.56
0.13	463.38	.680E+03	0.1	0.19	87.12
0.20	463.45	.112E+04	0.3	0.25	66.78
0.26	463.51	.162E+04	0.5	0.30	55.34
0.33	463.58	.218E+04	0.8	0.35	47.84
0.39	463.64	.281E+04	1.1	0.39	42.48
0.46	463.71	.350E+04	1.5	0.43	38.43
0.53	463.78	.425E+04	2.0	0.48	34.80
0.59	463.84	.505E+04	2.7	0.53	31.47
0.66	463.91	.588E+04	3.4	0.58	28.89
0.72	463.97	.674E+04	4.2	0.62	26.84
0.79	464.04	.764E+04	5.1	0.66	25.15
0.86	464.11	.858E+04	6.0	0.70	23.75
0.92	464.17	.955E+04	7.1	0.74	22.56
0.99	464.24	.106E+05	8.2	0.77	21.53
1.05	464.30	.116E+05	9.4	0.81	20.64
1.12	464.37	.129E+05	10.7	0.83	20.05
1.18	464.43	.144E+05	12.2	0.85	19.67
1.25	464.50	.161E+05	13.8	0.86	19.43

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->				<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (	0006)	2873.93	160.22	14.75	153.37	1.19	0.85
OUTFLOW: ID= 1 (	0005)	2873.93	159.03	15.00	153.37	1.25	0.86

ROUTE CHN(0004) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.82	463.66	0.0500	
9.82	463.74	0.0500 /0.0300	
19.96	461.75	0.0300	Main Channel
22.25	461.75	0.0300	Main Channel
32.24	463.00	0.0300 /0.0500	Main Channel
39.71	463.25	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.10	461.85	.312E+03	0.1	0.27	61.71
0.21	461.96	.767E+03	0.3	0.39	42.72
0.31	462.06	.137E+04	0.7	0.48	34.76
0.42	462.17	.211E+04	1.2	0.55	30.06
0.52	462.27	.299E+04	1.9	0.62	26.83
0.63	462.38	.402E+04	2.7	0.68	24.42
0.73	462.48	.520E+04	3.8	0.74	22.52
0.84	462.59	.651E+04	5.2	0.79	20.98
0.94	462.69	.797E+04	6.8	0.85	19.69
1.05	462.80	.958E+04	8.6	0.90	18.59
1.15	462.90	.113E+05	10.7	0.95	17.63
1.26	463.01	.132E+05	13.1	0.99	16.76
1.36	463.11	.154E+05	16.4	1.06	15.68
1.47	463.22	.179E+05	20.0	1.11	14.98
1.57	463.32	.208E+05	24.0	1.16	14.42
1.68	463.43	.237E+05	28.6	1.20	13.85
1.78	463.53	.267E+05	33.5	1.25	13.30
1.89	463.64	.298E+05	38.8	1.30	12.78
1.99	463.74	.330E+05	44.6	1.35	12.36

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->				<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (	0005)	2873.93	159.03	15.00	153.37	1.95	1.33
OUTFLOW: ID= 1 (	0004)	2873.93	158.47	15.25	153.37	1.99	1.35

ROUTE CHN(0003) IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
15.00	462.75	0.0500

```
                20.00        462.00    0.0500 /0.0500
                29.16        461.75    0.0500 /0.0500
                35.50        460.00        0.0500
                42.46        460.00        0.0300      Main Channel
                47.87        462.00    0.0300 /0.0500  Main Channel
                60.00        463.00        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.14   460.14    .107E+04       0.3          0.28      58.97
       0.29   460.29    .228E+04       1.0          0.44      37.60
       0.43   460.43    .362E+04       2.1          0.57      29.01
       0.58   460.58    .509E+04       3.5          0.69      24.18
       0.72   460.72    .669E+04       5.3          0.79      21.03
       0.87   460.87    .843E+04       7.5          0.89      18.78
       1.01   461.01    .103E+05      10.1          0.98      17.07
       1.16   461.16    .123E+05      13.0          1.06      15.73
       1.30   461.30    .144E+05      16.4          1.14      14.63
       1.45   461.45    .167E+05      20.3          1.21      13.72
       1.59   461.59    .191E+05      24.6          1.29      12.95
       1.74   461.74    .216E+05      29.4          1.36      12.28
       1.88   461.88    .246E+05      34.9          1.42      11.73
       2.03   462.03    .283E+05      41.4          1.46      11.42
       2.17   462.17    .327E+05      49.2          1.51      11.05
       2.32   462.32    .373E+05      58.0          1.55      10.72
       2.46   462.46    .424E+05      67.9          1.60      10.42
       2.61   462.61    .479E+05      78.7          1.64      10.15
       2.75   462.75    .538E+05      90.7          1.69       9.89

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0004) 2873.93   158.47   15.25 153.37      2.75      1.68
    OUTFLOW: ID= 1 (  0003) 2873.93   158.02   15.25 153.37      2.75      1.69



--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0002)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  10.00        460.25        0.0500
                  19.50        459.19        0.0500
                  25.29        457.44    0.0500 /0.0300  Main Channel
                  27.28        457.26        0.0300      Main Channel
                  35.31        457.75    0.0300 /0.0500  Main Channel
                  44.00        458.00        0.0500
                  54.00        459.00        0.0500
                  58.00        459.00        0.0500
                  60.00        459.25        0.0500

     <---------------------- TRAVEL TIME TABLE ----------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.09   457.35    .111E+03       0.0          0.21      77.66
       0.18   457.44    .444E+03       0.2          0.34      48.93
       0.29   457.55    .108E+04       0.5          0.49      33.88
       0.39   457.65    .194E+04       1.2          0.61      27.50
       0.50   457.76    .303E+04       2.2          0.71      23.47
       0.61   457.87    .446E+04       3.7          0.83      20.04
       0.71   457.97    .632E+04       5.7          0.90      18.42
       0.82   458.08    .854E+04       8.3          0.97      17.20
       0.93   458.19    .109E+05      11.3          1.04      16.05
       1.03   458.29    .134E+05      14.9          1.11      15.06
       1.14   458.40    .161E+05      18.9          1.17      14.22
       1.24   458.50    .189E+05      23.4          1.23      13.51
       1.35   458.61    .219E+05      28.3          1.29      12.89
       1.46   458.72    .251E+05      33.8          1.35      12.36
       1.56   458.82    .283E+05      39.7          1.40      11.89
       1.67   458.93    .318E+05      46.2          1.45      11.47
       1.78   459.04    .355E+05      51.7          1.46      11.45
       1.88   459.14    .397E+05      59.6          1.50      11.09
       1.99   459.25    .439E+05      68.2          1.55      10.74

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                               AREA    QPEAK   TPEAK   R.V.    MAX DEPTH  MAX VEL
                               (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0003) 2873.93   158.02   15.25 153.37      1.98      1.55
```

```
   OUTFLOW: ID= 1 (  0002) 2873.93   157.77   15.50 153.37      1.99      1.55


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--------------------
| ROUTE CHN(  0001)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74        459.25        0.0500
                  41.86        459.00        0.0500
                  49.51        457.47        0.0500
                  58.73        456.75        0.0500
                  85.31        456.25        0.0500
                  91.00        456.00    0.0500 /0.0300  Main Channel
                  98.50        454.75        0.0300      Main Channel
                 103.78        454.75        0.0300      Main Channel
                 116.96        458.50    0.0300 /0.0500  Main Channel
                 125.11        458.75        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.21   454.96    .885E+03       1.0          0.77       14.66
        0.42   455.17    .205E+04       3.5          1.14        9.86
        0.62   455.37    .349E+04       7.4          1.43        7.88
        0.83   455.58    .522E+04      12.9          1.68        6.72
        1.04   455.79    .722E+04      20.2          1.90        5.95
        1.25   456.00    .950E+04      29.4          2.10        5.38
        1.46   456.21    .124E+05      42.5          2.33        4.85
        1.67   456.42    .163E+05      58.3          2.42        4.67
        1.88   456.63    .220E+05      78.1          2.40        4.69
        2.10   456.85    .292E+05     103.3          2.39        4.72
        2.31   457.06    .372E+05     134.3          2.45        4.61
        2.52   457.27    .456E+05     170.3          2.53        4.46
        2.73   457.48    .545E+05     211.2          2.62        4.30
        2.94   457.69    .638E+05     258.3          2.74        4.12
        3.15   457.90    .733E+05     310.2          2.86        3.94
        3.37   458.12    .832E+05     367.0          2.99        3.78
        3.58   458.33    .932E+05     428.5          3.11        3.63
        3.79   458.54    .104E+06     495.8          3.24        3.48
        4.00   458.75    .115E+06     573.1          3.38        3.34

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA    QPEAK    TPEAK    R.V.    MAX DEPTH  MAX VEL
                              (ha)    (cms)    (hrs)    (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0002) 2873.93   157.77   15.50 153.37      2.45      2.50
   OUTFLOW: ID= 1 (  0001) 2873.93   157.62   15.50 153.37      2.44      2.50


--------------------------------------------------------------------------------
--------------------
| READ HYD (  0004)|   AREA       (ha)=   4.59
| DT=15.0 min      |   TPEAK     (hrs)=  10.00
--------------------   VOLUME     (mm)= 182.56
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, Hazel, Outlet4

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'   hrs      cms |   hrs      cms
  0.00    0.000 |  3.75    0.098 |  7.50    0.155 | 11.25    0.214 | 15.00    0.003
  0.25    0.017 |  4.00    0.106 |  7.75    0.153 | 11.50    0.190 | 15.25    0.002
  0.50    0.041 |  4.25    0.144 |  8.00    0.152 | 11.75    0.179 | 15.50    0.002
  0.75    0.042 |  4.50    0.151 |  8.25    0.152 | 12.00    0.174 | 15.75    0.002
  1.00    0.042 |  4.75    0.157 |  8.50    0.152 | 12.25    0.051 | 16.00    0.001
  1.25    0.028 |  5.00    0.162 |  8.75    0.152 | 12.50    0.030 | 16.25    0.001
  1.50    0.028 |  5.25    0.132 |  9.00    0.152 | 12.75    0.021 | 16.50    0.001
  1.75    0.028 |  5.50    0.133 |  9.25    0.544 | 13.00    0.015 | 16.75    0.001
  2.00    0.028 |  5.75    0.134 |  9.50    0.584 | 13.25    0.012 | 17.00    0.001
  2.25    0.041 |  6.00    0.136 |  9.75    0.606 | 13.50    0.009 | 17.25    0.001
  2.50    0.042 |  6.25    0.227 | 10.00    0.620 | 13.75    0.007 | 17.50    0.000
  2.75    0.042 |  6.50    0.238 | 10.25    0.475 | 14.00    0.006 | 17.75    0.000
  3.00    0.042 |  6.75    0.245 | 10.50    0.468 | 14.25    0.005 | 18.00    0.000
  3.25    0.089 |  7.00    0.250 | 10.75    0.467 | 14.50    0.004 | 18.25    0.000
  3.50    0.090 |  7.25    0.161 | 11.00    0.467 | 14.75    0.003 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0100)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
```

```
      ID1= 1 (  0004):     4.59   0.620    10.00   182.56
    + ID2= 2 (  0001):  2873.93 157.625    15.50   153.37
      ================================================
      ID = 3 (  0100):  2878.52 157.627    15.50   153.41

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0033)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  39.74         459.25        0.0500
                  41.86         459.00        0.0500
                  49.51         457.47        0.0500
                  58.73         456.75        0.0500
                  85.31         456.25        0.0500
                  91.00         456.00    0.0500 /0.0300  Main Channel
                  98.50         454.75        0.0300      Main Channel
                 103.78         454.75        0.0300      Main Channel
                 116.96         458.50    0.0300 /0.0500  Main Channel
                 125.11         458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.21   454.96    .442E+03       1.0          0.77       7.33
       0.42   455.17    .102E+04       3.5          1.14       4.93
       0.62   455.37    .175E+04       7.4          1.43       3.94
       0.83   455.58    .261E+04      12.9          1.68       3.36
       1.04   455.79    .361E+04      20.2          1.90       2.97
       1.25   456.00    .475E+04      29.4          2.10       2.69
       1.46   456.21    .618E+04      42.5          2.33       2.42
       1.67   456.42    .816E+04      58.3          2.42       2.33
       1.88   456.63    .110E+05      78.1          2.40       2.35
       2.10   456.85    .146E+05     103.3          2.39       2.36
       2.31   457.06    .186E+05     134.3          2.45       2.31
       2.52   457.27    .228E+05     170.3          2.53       2.23
       2.73   457.48    .273E+05     211.2          2.62       2.15
       2.94   457.69    .319E+05     258.3          2.74       2.06
       3.15   457.90    .367E+05     310.2          2.86       1.97
       3.37   458.12    .416E+05     367.0          2.99       1.89
       3.58   458.33    .466E+05     428.5          3.11       1.81
       3.79   458.54    .518E+05     495.8          3.24       1.74
       4.00   458.75    .573E+05     573.1          3.38       1.67

                                    <---- hydrograph ---->   <-pipe / channel->
                              AREA     QPEAK    TPEAK    R.V.   MAX DEPTH  MAX VEL
                              (ha)     (cms)    (hrs)    (mm)      (m)       (m/s)
   INFLOW : ID= 2 (  0100) 2878.52   157.63    15.50  153.41      2.44       2.50
   OUTFLOW: ID= 1 (  0033) 2878.52   157.66    15.75  153.41      2.44       2.50



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--------------------
| CALIB             |
| NASHYD   (  2000)|   Area    (ha)=2922.70   Curve Number   (CN)= 63.0
|ID= 1 DT=15.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.60

        NOTE:  RAINFALL WAS TRANSFORMED TO  15.0 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
               0.250     5.95 | 3.250    12.90 | 6.250    22.82 |  9.25    52.58
               0.500     5.95 | 3.500    12.90 | 6.500    22.82 |  9.50    52.58
               0.750     5.95 | 3.750    12.90 | 6.750    22.82 |  9.75    52.58
               1.000     5.95 | 4.000    12.90 | 7.000    22.82 | 10.00    52.58
               1.250     3.97 | 4.250    16.86 | 7.250    12.90 | 10.25    37.70
               1.500     3.97 | 4.500    16.86 | 7.500    12.90 | 10.50    37.70
               1.750     3.97 | 4.750    16.86 | 7.750    12.90 | 10.75    37.70
               2.000     3.97 | 5.000    16.86 | 8.000    12.90 | 11.00    37.70
               2.250     5.95 | 5.250    12.90 | 8.250    12.90 | 11.25    12.90
               2.500     5.95 | 5.500    12.90 | 8.500    12.90 | 11.50    12.90
               2.750     5.95 | 5.750    12.90 | 8.750    12.90 | 11.75    12.90
               3.000     5.95 | 6.000    12.90 | 9.000    12.90 | 12.00    12.90

    Unit Hyd Qpeak  (cms)=  42.936

    PEAK FLOW       (cms)= 147.021 (i)
```

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     TIME TO PEAK    (hrs)=  12.500
     RUNOFF VOLUME    (mm)= 118.927
     TOTAL RAINFALL   (mm)= 210.330
     RUNOFF COEFFICIENT   =   0.565

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

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--------------------
| ROUTE CHN(  0020)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  12.14        470.87        0.0500
                  17.70        470.75    0.0500 /0.0300
                  21.67        470.25        0.0300      Main Channel
                  24.23        470.25        0.0300      Main Channel
                  27.54        470.75    0.0300 /0.0500  Main Channel
                  30.81        471.00        0.0500
                  40.00        471.16        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.03   470.28    .106E+03       0.0          0.18     109.47
        0.07   470.32    .229E+03       0.1          0.27      72.36
        0.10   470.35    .371E+03       0.1          0.34      57.58
        0.13   470.38    .531E+03       0.2          0.39      49.31
        0.16   470.41    .708E+03       0.3          0.44      43.90
        0.20   470.45    .904E+03       0.4          0.48      40.01
        0.23   470.48    .112E+04       0.5          0.52      37.05
        0.26   470.51    .135E+04       0.6          0.56      34.69
        0.29   470.54    .160E+04       0.8          0.59      32.75
        0.33   470.58    .186E+04       1.0          0.62      31.11
        0.36   470.61    .215E+04       1.2          0.65      29.71
        0.39   470.64    .245E+04       1.4          0.68      28.49
        0.42   470.67    .277E+04       1.7          0.70      27.40
        0.46   470.71    .311E+04       2.0          0.73      26.44
        0.49   470.74    .347E+04       2.3          0.75      25.56
        0.52   470.77    .386E+04       2.6          0.79      24.42
        0.55   470.80    .432E+04       3.1          0.82      23.53
        0.59   470.84    .485E+04       3.5          0.84      22.95
        0.62   470.87    .545E+04       4.0          0.86      22.57

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                    <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
   INFLOW : ID= 2 (  2000) 2922.70   147.02   12.50 118.93      0.62      0.85
   OUTFLOW: ID= 1 (  0020) 2922.70   144.36   13.00 118.93      0.62      0.86



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--------------------
| ROUTE CHN(  0019)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  60.00        467.50        0.0500
                  68.78        467.50    0.0500 /0.0300
                  75.63        467.28        0.0300      Main Channel
                  75.99        467.25        0.0300      Main Channel
                  80.23        467.25        0.0300      Main Channel
                  82.81        467.75    0.0300 /0.0500  Main Channel
                  87.19        467.93        0.0500

      <---------------------- TRAVEL TIME TABLE ----------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
        0.01   467.26    .433E+02       0.0          0.05     328.94
        0.02   467.27    .883E+02       0.0          0.08     209.84
        0.03   467.28    .135E+03       0.0          0.10     162.03
        0.04   467.29    .204E+03       0.0          0.13     127.07
        0.06   467.31    .280E+03       0.0          0.15     108.18
        0.07   467.32    .362E+03       0.1          0.17      96.07
        0.09   467.34    .452E+03       0.1          0.19      87.54
        0.10   467.35    .548E+03       0.1          0.21      81.15
        0.11   467.36    .652E+03       0.1          0.22      76.14
        0.13   467.38    .762E+03       0.2          0.23      72.09
        0.14   467.39    .879E+03       0.2          0.24      68.72
        0.15   467.40    .100E+04       0.3          0.25      65.86
```

0.17	467.42	.113E+04	0.3	0.26	63.40
0.18	467.43	.127E+04	0.3	0.27	61.25
0.20	467.45	.142E+04	0.4	0.28	59.34
0.21	467.46	.157E+04	0.5	0.29	57.64
0.22	467.47	.173E+04	0.5	0.30	56.10
0.24	467.49	.189E+04	0.6	0.30	54.71
0.25	467.50	.207E+04	0.6	0.31	53.49

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2	(0020)	2922.70	144.36	13.00	118.93	0.24	0.31
OUTFLOW: ID= 1	(0019)	2922.70	131.56	14.00	118.93	0.25	0.31

ROUTE CHN(0018)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
6.54	467.25	0.0500	
19.67	466.75	0.0500 /0.0300	
22.61	466.14	0.0300	Main Channel
25.22	466.22	0.0300	Main Channel
28.78	467.00	0.0300 /0.0500	Main Channel
47.66	467.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	466.20	.639E+02	0.0	0.18	94.08
0.12	466.26	.237E+03	0.1	0.32	51.84
0.18	466.32	.448E+03	0.2	0.44	37.57
0.23	466.37	.691E+03	0.4	0.54	30.91
0.29	466.43	.966E+03	0.6	0.62	26.91
0.35	466.49	.127E+04	0.9	0.69	24.18
0.41	466.55	.161E+04	1.2	0.75	22.17
0.47	466.61	.198E+04	1.6	0.81	20.60
0.53	466.67	.239E+04	2.1	0.86	19.33
0.58	466.72	.282E+04	2.6	0.91	18.28
0.64	466.78	.330E+04	3.2	0.96	17.34
0.70	466.84	.388E+04	3.9	1.00	16.72
0.76	466.90	.456E+04	4.7	1.02	16.32
0.82	466.96	.535E+04	5.6	1.04	16.04
0.88	467.02	.624E+04	6.6	1.06	15.73
0.93	467.07	.730E+04	7.9	1.08	15.38
0.99	467.13	.855E+04	9.4	1.10	15.19
1.05	467.19	.998E+04	11.0	1.10	15.08
1.11	467.25	.116E+05	12.9	1.11	15.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2	(0019)	2922.70	131.56	14.00	118.93	1.10	1.11
OUTFLOW: ID= 1	(0018)	2922.70	130.90	14.25	118.93	1.11	1.11

ROUTE CHN(0017)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
27.82	463.25	0.0500	
39.01	463.50	0.0500	
41.03	463.50	0.0500	
44.22	463.25	0.0500 /0.0300	Main Channel
47.11	462.50	0.0300	Main Channel
48.44	462.44	0.0300	Main Channel
49.79	462.50	0.0300	Main Channel
52.47	463.25	0.0300 /0.0500	Main Channel
56.68	463.50	0.0500	
64.37	463.50	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)

0.04	462.48	.367E+02	0.0	0.15	110.68
0.08	462.52	.138E+03	0.0	0.27	61.69
0.12	462.56	.259E+03	0.1	0.38	43.49
0.16	462.60	.392E+03	0.2	0.47	35.13
0.20	462.64	.538E+03	0.3	0.55	30.16
0.24	462.68	.695E+03	0.4	0.62	26.79
0.28	462.72	.865E+03	0.6	0.69	24.32
0.32	462.76	.105E+04	0.8	0.74	22.42
0.36	462.80	.124E+04	1.0	0.80	20.89
0.40	462.84	.145E+04	1.2	0.85	19.62
0.45	462.89	.166E+04	1.5	0.90	18.56
0.49	462.93	.189E+04	1.8	0.94	17.64
0.53	462.97	.214E+04	2.1	0.99	16.84
0.57	463.01	.239E+04	2.5	1.03	16.14
0.61	463.05	.266E+04	2.9	1.07	15.51
0.65	463.09	.294E+04	3.3	1.12	14.94
0.69	463.13	.323E+04	3.7	1.15	14.43
0.73	463.17	.353E+04	4.2	1.19	13.97
0.77	463.21	.385E+04	4.7	1.23	13.54

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0018)	2922.70	130.90	14.25	118.93	0.75	1.21
OUTFLOW: ID= 1 (| 0017)	2922.70	130.24	14.50	118.93	0.77	1.23

ROUTE CHN(0016)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
5.63	460.00	0.0500	
10.00	460.00	0.0500	
17.60	459.75	0.0500 /0.0300	Main Channel
22.22	458.75	0.0300	Main Channel
26.18	458.75	0.0300	Main Channel
30.53	460.25	0.0300 /0.0500	Main Channel
60.87	460.75	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.06	458.81	.262E+03	0.1	0.20	82.51
0.13	458.88	.554E+03	0.2	0.31	53.72
0.19	458.94	.875E+03	0.3	0.40	42.17
0.25	459.00	.123E+04	0.6	0.47	35.68
0.31	459.06	.160E+04	0.9	0.53	31.42
0.38	459.13	.201E+04	1.2	0.59	28.36
0.44	459.19	.245E+04	1.6	0.64	26.03
0.50	459.25	.292E+04	2.0	0.69	24.18
0.56	459.31	.342E+04	2.5	0.74	22.66
0.63	459.38	.394E+04	3.1	0.78	21.39
0.69	459.44	.450E+04	3.7	0.82	20.31
0.75	459.50	.509E+04	4.4	0.86	19.36
0.81	459.56	.570E+04	5.1	0.90	18.53
0.88	459.63	.634E+04	5.9	0.94	17.80
0.94	459.69	.702E+04	6.8	0.97	17.14
1.00	459.75	.772E+04	7.8	1.01	16.54
1.08	459.83	.879E+04	9.3	1.06	15.68
1.17	459.92	.101E+05	11.1	1.10	15.19
1.25	460.00	.116E+05	13.0	1.12	14.91

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		<---- hydrograph ---->			<-pipe / channel->	
		AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
		(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (| 0017)	2922.70	130.24	14.50	118.93	1.24	1.12
OUTFLOW: ID= 1 (| 0016)	2922.70	129.62	14.75	118.93	1.25	1.12

ROUTE CHN(0015)|
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning
131.87	458.25	0.0500

```
                140.91        458.66    0.0500 /0.0300
                147.80        457.48        0.0300      Main Channel
                149.90        457.48        0.0300      Main Channel
                153.04        458.50    0.0300 /0.0500  Main Channel
                156.08        458.60        0.0500
                157.70        458.75        0.0500
                160.00        458.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.04   457.52    .924E+02       0.0          0.12     134.80
       0.08   457.56    .199E+03       0.0          0.19      89.01
       0.12   457.60    .321E+03       0.1          0.24      70.81
       0.16   457.64    .457E+03       0.1          0.27      60.67
       0.20   457.68    .608E+03       0.2          0.31      54.05
       0.24   457.72    .774E+03       0.3          0.34      49.33
       0.28   457.76    .954E+03       0.3          0.36      45.73
       0.32   457.80    .115E+04       0.4          0.39      42.89
       0.36   457.84    .136E+04       0.6          0.41      40.55
       0.41   457.89    .158E+04       0.7          0.43      38.59
       0.45   457.93    .182E+04       0.8          0.45      36.91
       0.49   457.97    .208E+04       1.0          0.47      35.45
       0.53   458.01    .234E+04       1.1          0.49      34.15
       0.57   458.05    .263E+04       1.3          0.51      33.00
       0.61   458.09    .292E+04       1.5          0.52      31.96
       0.65   458.13    .324E+04       1.7          0.54      31.02
       0.69   458.17    .356E+04       2.0          0.55      30.15
       0.73   458.21    .390E+04       2.2          0.57      29.36
       0.77   458.25    .426E+04       2.5          0.58      28.62

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0016) 2922.70   129.62   14.75 118.93      0.73      0.57
  OUTFLOW: ID= 1 (  0015) 2922.70   127.10   15.25 118.93      0.77      0.58



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--------------------
| ROUTE CHN(  0014)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
              <------ DATA FOR SECTION (   1.1) ------>
              Distance      Elevation       Manning
                150.00        456.75        0.0500
                155.75        456.75    0.0500 /0.0300
                160.05        456.00        0.0300      Main Channel
                165.32        456.00        0.0300      Main Channel
                170.87        457.50    0.0300 /0.0500  Main Channel
                172.96        457.75        0.0500
                175.82        457.75        0.0500

     <---------------------- TRAVEL TIME TABLE ---------------------->
      DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
        (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.04   456.04    .215E+03       0.0          0.09     180.09
       0.08   456.08    .445E+03       0.1          0.14     115.91
       0.12   456.12    .690E+03       0.1          0.18      90.27
       0.16   456.16    .950E+03       0.2          0.22      75.96
       0.20   456.20    .122E+04       0.3          0.25      66.67
       0.24   456.24    .151E+04       0.4          0.28      60.07
       0.28   456.28    .182E+04       0.5          0.30      55.11
       0.32   456.32    .213E+04       0.7          0.33      51.21
       0.36   456.36    .247E+04       0.9          0.35      48.06
       0.39   456.39    .282E+04       1.0          0.37      45.44
       0.43   456.43    .318E+04       1.2          0.39      43.23
       0.47   456.47    .356E+04       1.4          0.40      41.33
       0.51   456.51    .395E+04       1.7          0.42      39.67
       0.55   456.55    .435E+04       1.9          0.44      38.22
       0.59   456.59    .477E+04       2.2          0.45      36.92
       0.63   456.63    .521E+04       2.4          0.47      35.76
       0.67   456.67    .566E+04       2.7          0.48      34.70
       0.71   456.71    .613E+04       3.0          0.49      33.75
       0.75   456.75    .661E+04       3.3          0.51      32.87

    **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                            AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                            (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
  INFLOW : ID= 2 (  0015) 2922.70   127.10   15.25 118.93      0.74      0.50
  OUTFLOW: ID= 1 (  0014) 2922.70   124.54   15.75 118.93      0.75      0.51
```

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--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0013)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 155.00        456.25        0.0500
                 161.70        456.25    0.0500 /0.0300
                 169.49        455.25        0.0300      Main Channel
                 170.18        455.25        0.0300      Main Channel
                 176.86        456.75    0.0300 /0.0500  Main Channel
                 181.81        456.75        0.0500
                 188.74        456.25        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
        0.08   455.33    .926E+02        0.0          0.18       90.89
        0.16   455.41    .262E+03        0.1          0.25       65.50
        0.24   455.49    .507E+03        0.2          0.31       53.95
        0.32   455.57    .828E+03        0.3          0.36       46.77
        0.39   455.64    .123E+04        0.5          0.40       41.69
        0.47   455.72    .170E+04        0.7          0.44       37.85
        0.55   455.80    .225E+04        1.1          0.48       34.80
        0.63   455.88    .288E+04        1.5          0.52       32.31
        0.71   455.96    .358E+04        2.0          0.55       30.23
        0.79   456.04    .436E+04        2.6          0.59       28.46
        0.87   456.12    .522E+04        3.2          0.62       26.93
        0.95   456.20    .615E+04        4.0          0.65       25.59
        1.03   456.28    .734E+04        4.9          0.67       24.78
        1.11   456.36    .898E+04        6.2          0.68       24.34
        1.18   456.43    .107E+05        7.6          0.71       23.62
        1.26   456.51    .126E+05        9.2          0.73       22.81
        1.34   456.59    .146E+05       11.1          0.76       22.00
        1.42   456.67    .167E+05       13.1          0.79       21.22
        1.50   456.75    .189E+05       15.2          0.81       20.70

     **** WARNING:  TRAVEL TIME TABLE EXCEEDED
                                  <---- hydrograph ---->   <-pipe / channel->
                                AREA    QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                                (ha)    (cms)   (hrs)   (mm)      (m)      (m/s)
    INFLOW : ID= 2 (  0014) 2922.70   124.54   15.75 118.93      1.47      0.80
    OUTFLOW: ID= 1 (  0013) 2922.70   123.41   16.00 118.93      1.50      0.81



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--------------------
| ROUTE CHN(  0012)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                 124.10        455.50        0.0500
                 144.47        455.50        0.0500
                 148.86        455.75        0.0500
                 150.17        455.75        0.0500
                 151.79        455.50    0.0500 /0.0300  Main Channel
                 155.72        454.00        0.0300      Main Channel
                 158.28        453.76        0.0300      Main Channel
                 161.63        454.00        0.0300      Main Channel
                 165.55        455.50    0.0300 /0.0500  Main Channel
                 169.69        455.50        0.0500
                 175.87        455.25        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME     FLOW RATE     VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)       (cms)         (m/s)      (min)
        0.10   453.86    .129E+03        0.0          0.08      209.88
        0.20   453.96    .516E+03        0.1          0.13      132.21
        0.31   454.07    .112E+04        0.2          0.18       91.49
        0.41   454.17    .179E+04        0.4          0.23       70.94
        0.51   454.27    .251E+04        0.7          0.28       59.65
        0.61   454.37    .329E+04        1.0          0.32       52.34
        0.72   454.48    .412E+04        1.5          0.35       47.15
        0.82   454.58    .501E+04        1.9          0.39       43.22
        0.92   454.68    .595E+04        2.5          0.42       40.11
        1.02   454.78    .695E+04        3.1          0.44       37.58
        1.13   454.89    .800E+04        3.8          0.47       35.47
        1.23   454.99    .911E+04        4.5          0.50       33.66
```

1.33	455.09	.103E+05	5.3	0.52	32.10
1.43	455.19	.115E+05	6.2	0.54	30.73
1.54	455.30	.128E+05	7.2	0.56	29.57
1.64	455.40	.144E+05	8.3	0.58	28.91
1.74	455.50	.162E+05	9.4	0.58	28.67
1.87	455.63	.220E+05	11.7	0.53	31.39
1.99	455.75	.281E+05	14.4	0.51	32.45

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (0013)		2922.70	123.41	16.00	118.93	1.94	0.52
OUTFLOW: ID= 1 (0012)		2922.70	122.11	16.50	118.92	1.99	0.51

**** WARNING: COMPUTATIONS FAILED TO CONVERGE.

ROUTE CHN(0011)	
IN= 2---> OUT= 1	Routing time step (min)'= 15.00

<------ DATA FOR SECTION (1.1) ------>

Distance	Elevation	Manning	
124.00	455.75	0.0500	
137.92	455.00	0.0500 /0.0300	
144.47	453.45	0.0300	Main Channel
146.45	453.43	0.0300	Main Channel
148.74	453.48	0.0300	Main Channel
151.36	453.75	0.0300	Main Channel
154.10	453.93	0.0300	Main Channel
155.00	454.00	0.0300	Main Channel
161.50	455.18	0.0300 /0.0500	Main Channel
168.74	455.67	0.0500	
170.19	455.67	0.0500	

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)
0.02	453.45	.290E+02	0.0	0.10	164.18
0.14	453.57	.573E+03	0.3	0.48	35.05
0.25	453.68	.132E+04	0.9	0.69	24.05
0.37	453.80	.227E+04	1.9	0.84	19.87
0.49	453.92	.347E+04	3.3	0.95	17.58
0.60	454.03	.492E+04	5.3	1.08	15.43
0.72	454.15	.653E+04	8.0	1.23	13.54
0.84	454.27	.827E+04	11.3	1.37	12.21
0.95	454.38	.101E+05	15.1	1.49	11.21
1.07	454.50	.121E+05	19.4	1.60	10.43
1.19	454.62	.143E+05	24.3	1.70	9.79
1.31	454.74	.166E+05	29.8	1.80	9.26
1.42	454.85	.190E+05	35.9	1.89	8.81
1.54	454.97	.215E+05	42.5	1.98	8.42
1.66	455.09	.242E+05	50.0	2.07	8.07
1.77	455.20	.273E+05	58.6	2.15	7.76
1.89	455.32	.307E+05	69.0	2.25	7.42
2.01	455.44	.346E+05	80.3	2.32	7.19
2.12	455.55	.390E+05	92.7	2.38	7.01

**** WARNING: TRAVEL TIME TABLE EXCEEDED

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
		<---- hydrograph ---->				<-pipe / channel->	
INFLOW : ID= 2 (0012)		2922.70	122.11	16.50	118.92	2.12	2.37
OUTFLOW: ID= 1 (0011)		2922.70	121.89	16.75	118.92	2.12	2.38

ADD HYD (0200)	
1 + 2 = 3	

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0011):		2922.70	121.890	16.75	118.92
+ ID2= 2 (0033):		2878.52	157.659	15.75	153.41
ID = 3 (0200):		5801.22	275.206	16.00	136.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTE CHN(0031)	

```
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                  23.66        457.50        0.0500
                  47.14        455.00        0.0500
                  62.60        454.50        0.0500
                  62.72        454.25        0.0500
                  73.90        453.50    0.0500 /0.0300  Main Channel
                  83.00        450.25        0.0300      Main Channel
                  85.93        450.00        0.0300      Main Channel
                  93.20        449.75        0.0300      Main Channel
                 101.08        449.00        0.0300      Main Channel
                 107.87        449.00        0.0300      Main Channel
                 114.70        453.40    0.0300 /0.0500  Main Channel
                 117.36        454.00        0.0500
                 123.95        454.11        0.0500
                 180.00        458.52        0.0500
                 200.00        459.04        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.44   449.44    .143E+04       4.5          1.09       5.26
       0.88   449.88    .371E+04      16.0          1.48       3.87
       1.32   450.32    .740E+04      41.0          1.90       3.01
       1.76   450.76    .116E+05      82.9          2.44       2.34
       2.20   451.20    .162E+05     136.9          2.91       1.97
       2.64   451.64    .210E+05     202.6          3.31       1.73
       3.08   452.08    .261E+05     279.7          3.68       1.55
       3.52   452.52    .315E+05     368.3          4.01       1.42
       3.96   452.96    .372E+05     468.4          4.32       1.32
       4.40   453.40    .431E+05     580.3          4.62       1.24
       4.86   453.86    .500E+05     727.3          4.99       1.15
       5.31   454.31    .588E+05     895.2          5.22       1.09
       5.77   454.77    .696E+05    1084.5          5.35       1.07
       6.22   455.22    .831E+05    1302.7          5.37       1.06
       6.68   455.68    .985E+05    1553.5          5.41       1.06
       7.13   456.13    .115E+06    1834.9          5.46       1.05
       7.59   456.59    .134E+06    2148.3          5.51       1.04
       8.04   457.04    .154E+06    2494.8          5.56       1.03
       8.50   457.50    .175E+06    2875.7          5.62       1.02

                                    <---- hydrograph ---->   <-pipe / channel->
                             AREA     QPEAK   TPEAK   R.V.   MAX DEPTH  MAX VEL
                             (ha)     (cms)   (hrs)   (mm)       (m)      (m/s)
   INFLOW : ID= 2 (  0200) 5801.22   275.21   16.00 136.04      3.05      3.65
   OUTFLOW: ID= 1 (  0031) 5801.22   275.26   16.00 136.04      3.04      3.65



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| ROUTE CHN(  0032)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   4.69        451.07        0.0500
                  13.38        451.10        0.0500
                  23.86        450.00    0.0500 /0.0300  Main Channel
                  32.76        447.75        0.0300      Main Channel
                  35.26        447.50        0.0300      Main Channel
                  46.15        447.50        0.0300      Main Channel
                  49.16        447.75        0.0300      Main Channel
                  56.34        451.00    0.0300 /0.0500  Main Channel
                  67.16        452.61        0.0500
                  73.93        452.92        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH    ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.18   447.68    .165E+03       1.8          0.77       1.55
       0.36   447.86    .375E+03       6.3          1.21       0.99
       0.54   448.04    .601E+03      13.3          1.59       0.75
       0.71   448.21    .842E+03      22.4          1.91       0.63
       0.89   448.39    .110E+04      33.5          2.20       0.55
       1.07   448.57    .137E+04      46.5          2.45       0.49
       1.25   448.75    .165E+04      61.5          2.68       0.45
       1.43   448.93    .195E+04      78.4          2.90       0.41
       1.61   449.11    .226E+04      97.3          3.10       0.39
       1.79   449.29    .258E+04     118.2          3.30       0.36
       1.96   449.46    .292E+04     141.1          3.48       0.35
       2.14   449.64    .328E+04     166.1          3.65       0.33
```

2.32	449.82	.364E+04	193.2	3.82	0.31
2.50	450.00	.403E+04	222.4	3.98	0.30
2.68	450.18	.443E+04	257.2	4.18	0.29
2.89	450.39	.495E+04	302.1	4.40	0.27
3.11	450.61	.550E+04	350.5	4.59	0.26
3.32	450.82	.610E+04	402.6	4.75	0.25
3.53	451.03	.673E+04	459.2	4.91	0.24

		<---- hydrograph ---->			<-pipe / channel->	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 2 (0031)		5801.22	275.26	16.00	136.04	2.76	4.27
OUTFLOW: ID= 1 (0032)		5801.22	275.30	16.00	136.04	2.76	4.26

READ STORM | Filename: C:\Users\atrenholm\AppData\Local\Temp\929ecfb3-0c97-47ac-b3d5-8d75e5800369\9b431259
Ptotal=212.00 mm | Comments: Hazel

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN 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 | NASHYD (3000) | ID= 1 DT=15.0 min

Area (ha)= 25.69 Curve Number (CN)= 85.2
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.57

NOTE: RAINFALL WAS TRANSFORMED TO 15.0 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
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 1.721

PEAK FLOW (cms)= 3.027 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 170.234
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.803

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

READ HYD (0002) | DT=15.0 min

AREA (ha)= 8.70
TPEAK (hrs)= 10.00
VOLUME (mm)= 179.74

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, Hazel, Outlet2

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	3.25	0.152	6.50	0.454	9.75	1.175	13.00	0.015
0.25	0.029	3.50	0.153	6.75	0.469	10.00	1.197	13.25	0.010
0.50	0.069	3.75	0.170	7.00	0.478	10.25	0.910	13.50	0.007
0.75	0.071	4.00	0.189	7.25	0.311	10.50	0.887	13.75	0.004
1.00	0.071	4.25	0.262	7.50	0.294	10.75	0.882	14.00	0.003
1.25	0.048	4.50	0.283	7.75	0.288	11.00	0.882	14.25	0.002
1.50	0.047	4.75	0.298	8.00	0.285	11.25	0.398	14.50	0.001

1.75	0.047	5.00	0.310	8.25	0.284	11.50	0.343	14.75	0.001
2.00	0.047	5.25	0.256	8.50	0.284	11.75	0.323	15.00	0.000
2.25	0.070	5.50	0.255	8.75	0.285	12.00	0.314		
2.50	0.071	5.75	0.257	9.00	0.286	12.25	0.085		
2.75	0.071	6.00	0.259	9.25	1.031	12.50	0.043		
3.00	0.071	6.25	0.428	9.50	1.132	12.75	0.025		

READ HYD (0022)	AREA (ha)=	2.23
DT=15.0 min	TPEAK (hrs)=	10.00
	VOLUME (mm)=	198.80

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, Hazel, Commercial

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	4.00	0.064	8.00	0.080	12.00	0.096	16.00	0.001
0.25	0.000	4.25	0.076	8.25	0.079	12.25	0.060	16.25	0.001
0.50	0.005	4.50	0.085	8.50	0.078	12.50	0.035	16.50	0.001
0.75	0.012	4.75	0.091	8.75	0.078	12.75	0.021	16.75	0.000
1.00	0.019	5.00	0.094	9.00	0.078	13.00	0.014	17.00	0.000
1.25	0.021	5.25	0.086	9.25	0.168	13.25	0.009	17.25	0.000
1.50	0.021	5.50	0.080	9.50	0.220	13.50	0.006	17.50	0.000
1.75	0.020	5.75	0.077	9.75	0.250	13.75	0.005	17.75	0.000
2.00	0.020	6.00	0.076	10.00	0.270	14.00	0.004	18.00	0.000
2.25	0.022	6.25	0.099	10.25	0.265	14.25	0.003	18.25	0.000
2.50	0.025	6.50	0.119	10.50	0.256	14.50	0.002	18.50	0.000
2.75	0.027	6.75	0.128	10.75	0.249	14.75	0.002		
3.00	0.028	7.00	0.132	11.00	0.244	15.00	0.001		
3.25	0.040	7.25	0.109	11.25	0.206	15.25	0.001		
3.50	0.052	7.50	0.091	11.50	0.160	15.50	0.001		
3.75	0.059	7.75	0.084	11.75	0.120	15.75	0.001		

READ HYD (0003)	AREA (ha)=	1.06
DT=15.0 min	TPEAK (hrs)=	10.00
	VOLUME (mm)=	187.19

Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago,Hazel, Outlet3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
0.00	0.000	3.00	0.011	6.00	0.033	9.00	0.036	12.00	0.037
0.25	0.003	3.25	0.022	6.25	0.055	9.25	0.134	12.25	0.010
0.50	0.010	3.50	0.023	6.50	0.059	9.50	0.145	12.50	0.004
0.75	0.011	3.75	0.024	6.75	0.060	9.75	0.148	12.75	0.002
1.00	0.011	4.00	0.027	7.00	0.061	10.00	0.149	13.00	0.001
1.25	0.008	4.25	0.037	7.25	0.039	10.25	0.111	13.25	0.000
1.50	0.007	4.50	0.039	7.50	0.036	10.50	0.108	13.50	0.000
1.75	0.007	4.75	0.041	7.75	0.035	10.75	0.108		
2.00	0.007	5.00	0.041	8.00	0.035	11.00	0.108		
2.25	0.010	5.25	0.034	8.25	0.035	11.25	0.047		
2.50	0.011	5.50	0.033	8.50	0.035	11.50	0.039		
2.75	0.011	5.75	0.033	8.75	0.035	11.75	0.038		

ADD HYD (0500)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	8.70	1.197	10.00	179.74
	+ ID2= 2 (0022):	2.23	0.270	10.00	198.80
	ID = 3 (0500):	10.93	1.467	10.00	183.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0500)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1	ID1= 3 (0500):	10.93	1.467	10.00	183.63
	+ ID2= 2 (0003):	1.06	0.149	10.00	187.19
	ID = 1 (0500):	11.99	1.616	10.00	183.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0500)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				

```
       ID1= 1 (  0500):    11.99   1.616    10.00   183.94
     + ID2= 2 (  3000):    25.69   3.027    10.25   170.23
       ================================================
       ID = 3 (  0500):    37.68   4.484    10.00   174.60

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0300)|
|   1 +  2 =  3    |         AREA    QPEAK     TPEAK      R.V.
--------------------         (ha)    (cms)     (hrs)      (mm)
       ID1= 1 (  0032):  5801.22 275.304    16.00   136.04
     + ID2= 2 (  0500):    37.68   4.484    10.00   174.60
       ================================================
       ID = 3 (  0300):  5838.90 275.305    16.00   136.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| READ HYD (  0001)|   AREA       (ha)=   1.95
| DT=15.0 min      |   TPEAK     (hrs)=  10.00
--------------------   VOLUME     (mm)= 193.03
  Filename: C:\Users\atrenholm\RJB\300042585.1000 211 Eliza Street Arthur - Documents\02_Technical and Project
  Comments: HYDROGRAPH FROM PCSWMM, 3hr Chicago, Hazel, Outlet1

  TIME     FLOW |  TIME     FLOW |  TIME     FLOW |'  TIME     FLOW |  TIME     FLOW
   hrs      cms |   hrs      cms |   hrs      cms |'   hrs      cms |   hrs      cms
  0.00    0.000 |  4.50    0.067 |  9.00    0.067 | 13.50    0.008 | 18.00    0.000
  0.25    0.003 |  4.75    0.072 |  9.25    0.155 | 13.75    0.006 | 18.25    0.000
  0.50    0.007 |  5.00    0.076 |  9.50    0.185 | 14.00    0.005 | 18.50    0.000
  0.75    0.011 |  5.25    0.069 |  9.75    0.205 | 14.25    0.004 | 18.75    0.000
  1.00    0.014 |  5.50    0.067 | 10.00    0.220 | 14.50    0.003 | 19.00    0.000
  1.25    0.014 |  5.75    0.065 | 10.25    0.206 | 14.75    0.002 | 19.25    0.000
  1.50    0.014 |  6.00    0.064 | 10.50    0.205 | 15.00    0.002 | 19.50    0.000
  1.75    0.015 |  6.25    0.087 | 10.75    0.205 | 15.25    0.002 | 19.75    0.000
  2.00    0.015 |  6.50    0.099 | 11.00    0.204 | 15.50    0.001 | 20.00    0.000
  2.25    0.018 |  6.75    0.105 | 11.25    0.162 | 15.75    0.001 | 20.25    0.000
  2.50    0.019 |  7.00    0.108 | 11.50    0.142 | 16.00    0.001 | 20.50    0.000
  2.75    0.021 |  7.25    0.091 | 11.75    0.123 | 16.25    0.001 | 20.75    0.000
  3.00    0.021 |  7.50    0.080 | 12.00    0.108 | 16.50    0.001 | 21.00    0.000
  3.25    0.033 |  7.75    0.074 | 12.25    0.066 | 16.75    0.001 | 21.25    0.000
  3.50    0.039 |  8.00    0.070 | 12.50    0.039 | 17.00    0.001 |
  3.75    0.045 |  8.25    0.069 | 12.75    0.025 | 17.25    0.000 |
  4.00    0.049 |  8.50    0.068 | 13.00    0.017 | 17.50    0.000 |
  4.25    0.060 |  8.75    0.067 | 13.25    0.012 | 17.75    0.000 |
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0400)|
|   1 +  2 =  3    |         AREA    QPEAK     TPEAK      R.V.
--------------------         (ha)    (cms)     (hrs)      (mm)
       ID1= 1 (  0001):     1.95    0.220    10.00   193.03
     + ID2= 2 (  0300):  5838.90 275.305    16.00   136.29
       ================================================
       ID = 3 (  0400):  5840.85 275.306    16.00   136.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ROUTE CHN(  0062)|
| IN= 2---> OUT= 1 |     Routing time step (min)'= 15.00
--------------------
               <------ DATA FOR SECTION (   1.1) ------>
               Distance      Elevation       Manning
                   0.00         457.07        0.0500
                  20.00         455.31        0.0500
                  40.00         452.41    0.0500 /0.0300  Main Channel
                  60.00         449.56        0.0300      Main Channel
                  80.00         447.17        0.0300      Main Channel
                 100.00         447.13        0.0300      Main Channel
                 120.00         448.92        0.0300      Main Channel
                 140.00         454.00    0.0300 /0.0500  Main Channel
                 160.00         454.00        0.0500

      <---------------------- TRAVEL TIME TABLE ---------------------->
       DEPTH     ELEV      VOLUME    FLOW RATE    VELOCITY   TRAV.TIME
         (m)      (m)     (cu.m.)      (cms)        (m/s)      (min)
       0.35   447.48    .169E+04      10.3          1.33       2.74
       0.70   447.83    .399E+04      36.9          2.02       1.80
       1.06   448.19    .682E+04      79.6          2.54       1.43
       1.41   448.54    .102E+05     139.5          2.99       1.21
       1.76   448.89    .141E+05     218.4          3.39       1.07
       2.11   449.24    .184E+05     323.6          3.84       0.95
```

2.46	449.59	.230E+05	449.8	4.25	0.85
2.82	449.95	.280E+05	598.4	4.66	0.78
3.17	450.30	.333E+05	767.8	5.03	0.72
3.52	450.65	.389E+05	958.5	5.38	0.68
3.87	451.00	.447E+05	1170.8	5.71	0.64
4.22	451.35	.509E+05	1405.4	6.02	0.60
4.58	451.71	.573E+05	1662.8	6.32	0.57
4.93	452.06	.641E+05	1943.5	6.61	0.55
5.28	452.41	.711E+05	2248.1	6.89	0.53
5.63	452.76	.785E+05	2616.6	7.27	0.50
6.03	453.16	.871E+05	3062.5	7.66	0.47
6.43	453.56	.961E+05	3540.5	8.03	0.45
6.82	453.95	.106E+06	4051.0	8.37	0.43

		<---- hydrograph ---->			<-pipe / channel->	
	AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
	(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : ID= 2 (0400)	5840.85	275.31	16.00	136.30	1.95	3.62
OUTFLOW: ID= 1 (0062)	5840.85	275.29	16.00	136.30	1.94	3.61

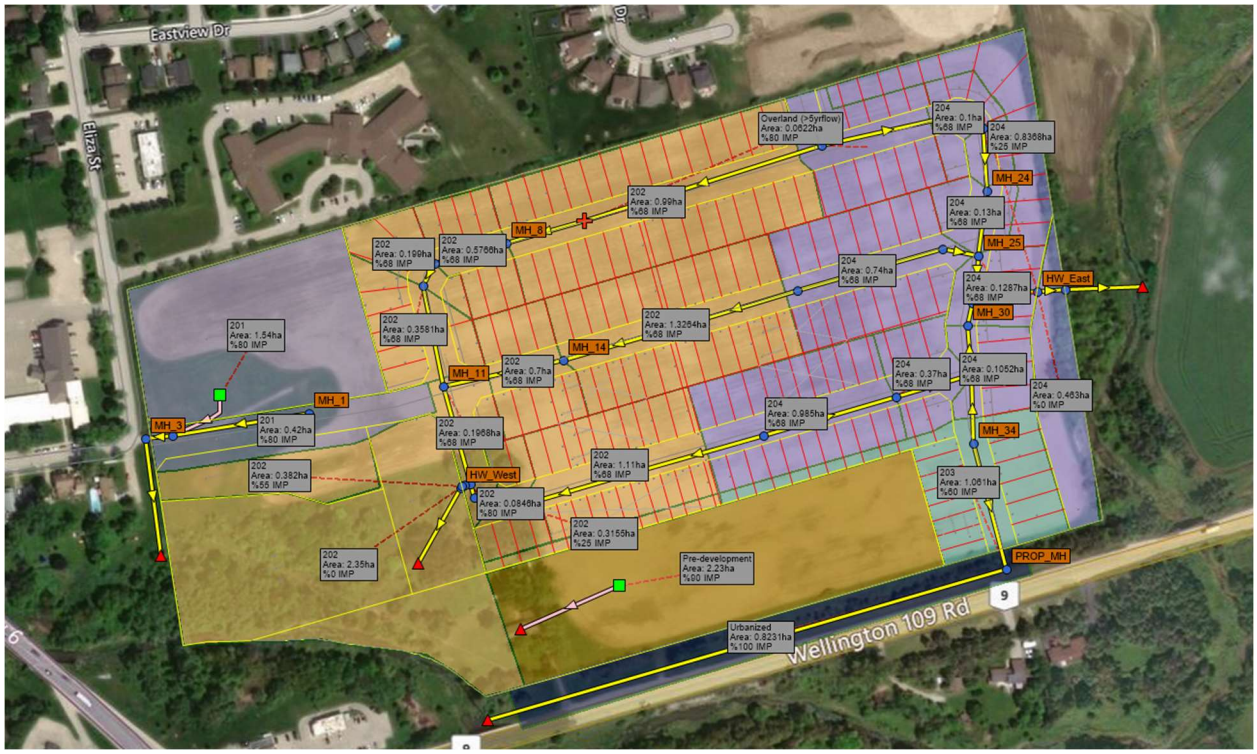
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Appendix E
PCSWMM Model Results



PCSWMM Schematic Plan

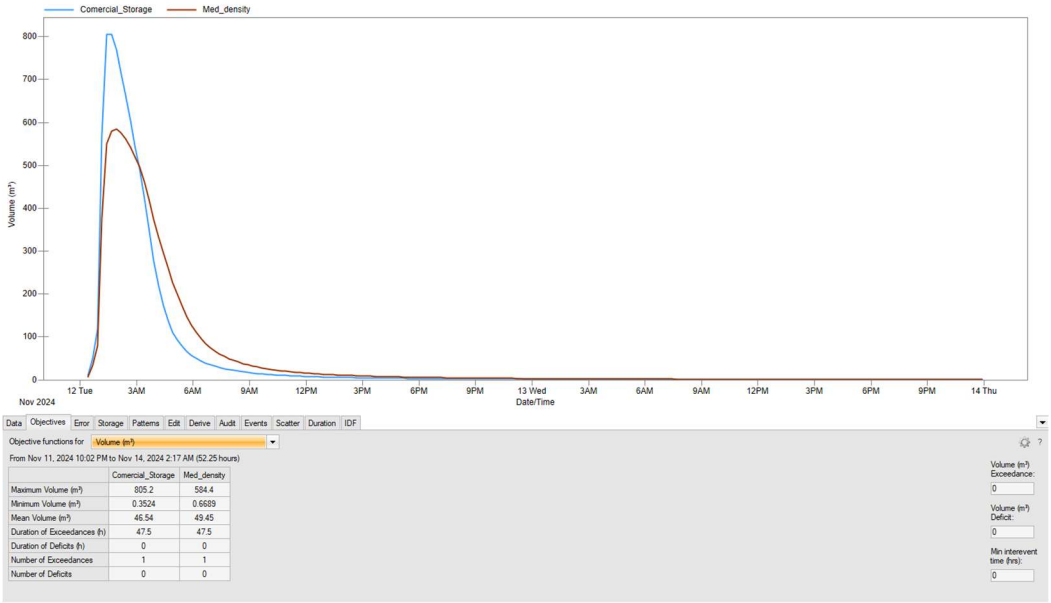
Input data:

```
**********
Subcatchment Summary
**********
Name                 Area     Width   %Imperv   %Slope Rain Gage           Outlet
------------------------------------------------------------------------------------------
201_1                1.54    174.01     80.00    2.1500 Chicago_3hr_5Yr     Med_density
201_2                0.42    420.00     80.00    0.5000 Chicago_3hr_5Yr     MH_1
202_1                0.36    132.63     68.00    2.0000 Chicago_3hr_5Yr     MH_10
202_10               0.06     62.20     80.00    2.0000 Chicago_3hr_5Yr     MH_7
202_11               0.32    157.75     25.00    2.5000 Chicago_3hr_5Yr     MH_43
202_12               0.38     54.57     55.00    2.0000 Chicago_3hr_5Yr     MH_43
202_13               2.35    335.71      0.00    2.0000 Chicago_3hr_5Yr     MH_43
202_2                0.20     99.50     68.00    2.0000 Chicago_3hr_5Yr     MH_9
202_3                0.58    288.30     68.00    2.0000 Chicago_3hr_5Yr     MH_8
202_4                0.99    330.00     68.00    2.0000 Chicago_3hr_5Yr     MH_7
202_5                0.20    196.80     68.00    2.0000 Chicago_3hr_5Yr     MH_11
202_6                0.70    134.62     68.00    2.0000 Chicago_3hr_5Yr     MH_14
202_7                1.33    255.08     68.00    2.0000 Chicago_3hr_5Yr     MH_13
202_8                0.08     84.60     80.00    2.0000 Chicago_3hr_5Yr     MH_19
202_9                1.11    222.00     68.00    2.0000 Chicago_3hr_5Yr     MH_18
203                  1.06    222.65     60.00    2.0000 Chicago_3hr_5Yr     PROP_MH
204_1                0.54    174.76     80.00    2.0000 Chicago_3hr_5Yr     MH_6
204_10               0.11    105.20     68.00    2.0000 Chicago_3hr_5Yr     MH_29
204_11               0.46    154.33      0.00    0.5000 Chicago_3hr_5Yr     HW_East
204_2                0.84    278.93     25.00    5.0000 Chicago_3hr_5Yr     HW_East
204_3                0.10    100.00     68.00    2.0000 Chicago_3hr_5Yr     MH_22
204_4                0.16    160.00     68.00    2.0000 Chicago_3hr_5Yr     MH_23
204_5                0.74    142.31     68.00    2.0000 Chicago_3hr_5Yr     MH_26
204_6                0.13    130.00     68.00    2.0000 Chicago_3hr_5Yr     MH_24
204_7                0.98    328.33     68.00    2.0000 Chicago_3hr_5Yr     MH_16
204_8                0.37     74.00     68.00    2.0000 Chicago_3hr_5Yr     MH_28
204_9                0.13    128.70     68.00    2.0000 Chicago_3hr_5Yr     MH_25
500_Commercial       2.23    240.41     90.00    2.0000 Chicago_3hr_5Yr     Comercial_Storage
Commercial           2.23    961.62     95.00    2.0000 Chicago_3hr_5Yr     PC
EX.Commercial        2.23    240.41      2.66    8.9800 Chicago_3hr_5Yr     EC
EX.MediumDensity     1.54    174.01      0.00    2.1500 Chicago_3hr_5Yr     EM
MediumDensity        1.54    348.02     80.00    2.0000 Chicago_3hr_5Yr     PM
Road                 0.82    150.00    100.00    2.0000 Chicago_3hr_5Yr     PROP_MH
```

****
Link Summary
****

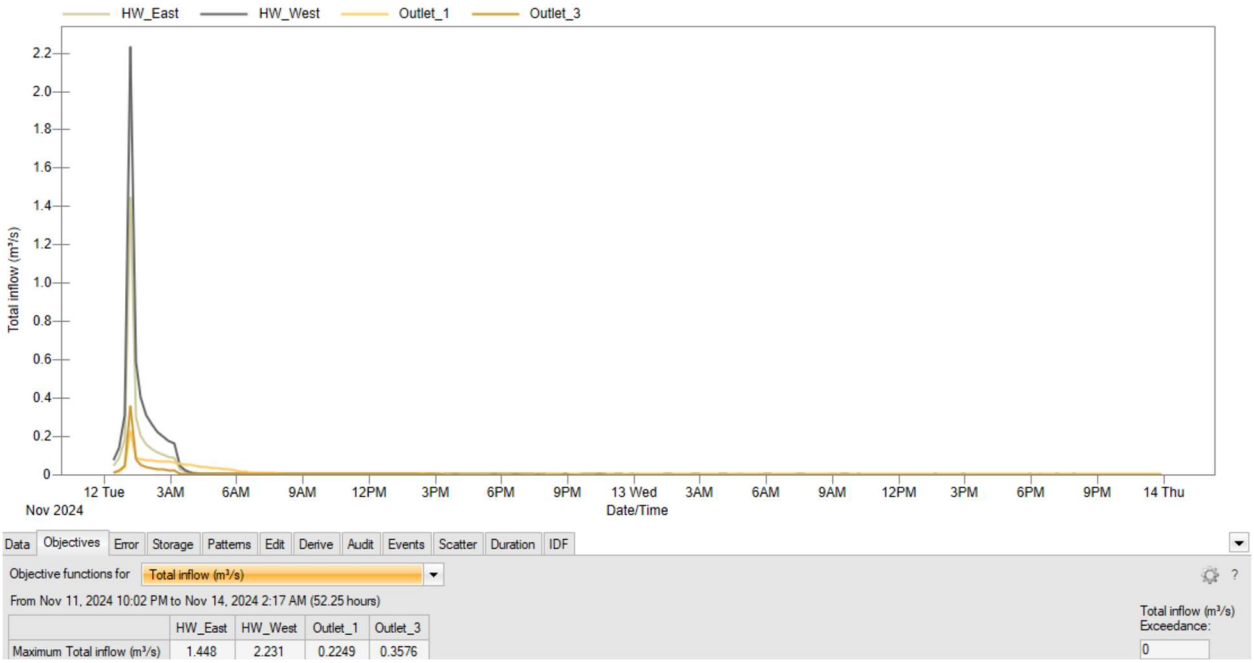
Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	MH_6	MH_22	CONDUIT	93.7	1.9951	0.0130
C10	MH_27	MH_25	CONDUIT	14.0	0.5714	0.0130
C11	MH_28	MH_29	CONDUIT	51.9	0.5973	0.0130
C12	MH_21	MH_OGS_1	CONDUIT	4.1	1.9516	0.0130
C13	MH_7	MH_8	CONDUIT	90.0	1.5557	0.0130
C14	MH_8	MH_9	CONDUIT	90.3	1.5506	0.0130
C15	MH_9	MH_10	CONDUIT	17.3	1.5609	0.0130
C16	MH_10	MH_11	CONDUIT	69.5	1.7110	0.0130
C17	MH_OGS_1	MH_43	CONDUIT	9.4	2.0217	0.0130
C18	MH_13	MH_14	CONDUIT	74.9	1.7483	0.0130
C19	MH_14	MH_11	CONDUIT	96.3	1.3916	0.0130
C2	MH_22	MH_23	CONDUIT	17.1	1.9887	0.0130
C20	MH_20	MH_21	CONDUIT	9.7	1.1341	0.0130
C21	MH_19	MH_20	CONDUIT	18.5	1.1893	0.0130
C22	MH_18	MH_19	CONDUIT	90.0	1.2223	0.0130
C23	MH_30	MH_31	CONDUIT	20.3	0.7389	0.0130
C24	MH_29	MH_30	CONDUIT	32.8	0.2134	0.0130
C25	HW_West	Outlet_2	CONDUIT	86.0	6.3266	0.0130
C26	MH_34	MH_29	CONDUIT	30.0	0.6000	0.0130
C27	MH_3	Outlet_1	CONDUIT	76.5	5.0902	0.0130
C28	MH_31	MH223	CONDUIT	6.4	3.2830	0.0130
C29	MH_OGS	MH223	CONDUIT	8.1	3.3352	0.0130
C3	MH_23	MH_24	CONDUIT	44.3	1.8513	0.0130
C30	MH_25	MH_OGS	CONDUIT	27.1	1.1071	0.0130
C31	MH223	HW_East	CONDUIT	35.6	0.5000	0.0130
C32	HW_East	J6	CONDUIT	29.0	18.3061	0.0130
C33	J6	Outlet_4	CONDUIT	9.0	6.6815	0.0130
C34	MH_43	HW_West	CONDUIT	20.6	1.9907	0.0130
C35	PROP_MH	Outlet_3	CONDUIT	330.0	1.7275	0.0130
C36	MH_6	MH_7	CONDUIT	162.3	0.9912	0.0130
C37	MH_26	MH_13	CONDUIT	84.3	-0.0712	0.0130
C38	MH_16	MH_18	CONDUIT	90.0	2.3108	0.0130
C39	MH_34	PROP_MH	CONDUIT	84.3	3.8469	0.0130
C4	MH_24	MH_25	CONDUIT	34.5	1.9714	0.0130
C5	MH_16	MH_28	CONDUIT	90.0	0.6000	0.0130
C6	MH_1	OGS_E	CONDUIT	90.1	2.9202	0.0130
C7	MH_11	MH_21	CONDUIT	65.6	0.8994	0.0130
C8	OGS_E	MH_3	CONDUIT	16.9	4.2049	0.0130
C9	MH_26	MH_27	CONDUIT	76.4	0.6021	0.0130

Required storage for the commercial area and medium-density lot to meet the allowable flow rate (Pre-development):



*Quantity control methods for these two lots will be discussed per available information in the detailed design stage.

Outflow – 100yr Storm Event



The outflow data from the PCSWMM model for each outlet has been integrated into the VO model. This flow, along with external flows, has been incorporated into the unsteady state of the HEC-RAS model to assess water levels in each section. At this stage of the project, only the storm sewer pipe network has been modelled. The "allow ponding" option has been selected in PCSWMM to ensure that all flow generated from significant storm events exceeding the 5-year storm event is accounted for in the outlets ‘design.

Notes:

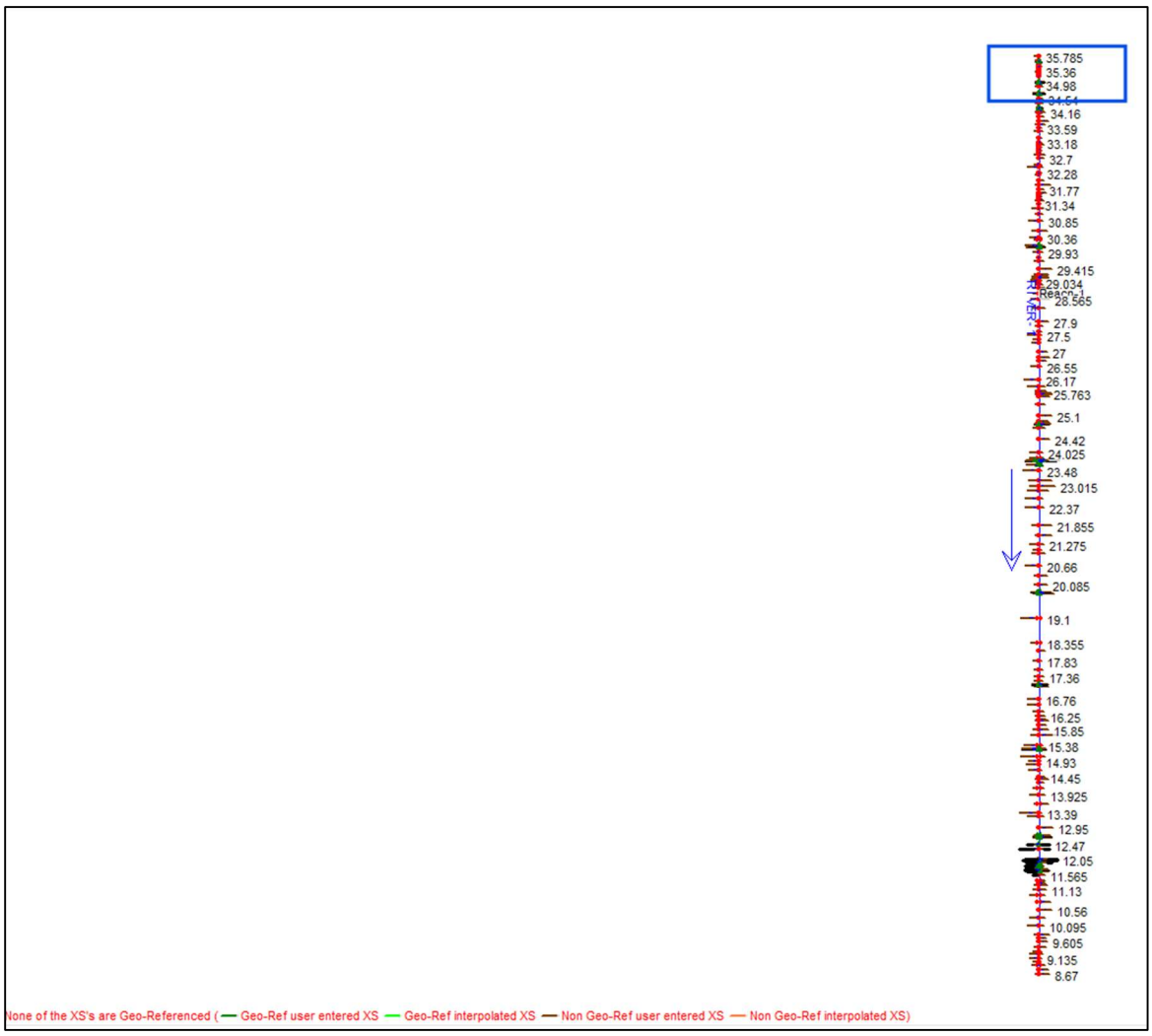
This model will be refined during the detailed design stage, based on final grading and the stormwater network. A preliminary stormwater network has been implemented on-site to evaluate the effects of flow routing on outflow hydrographs.

BURNSIDE

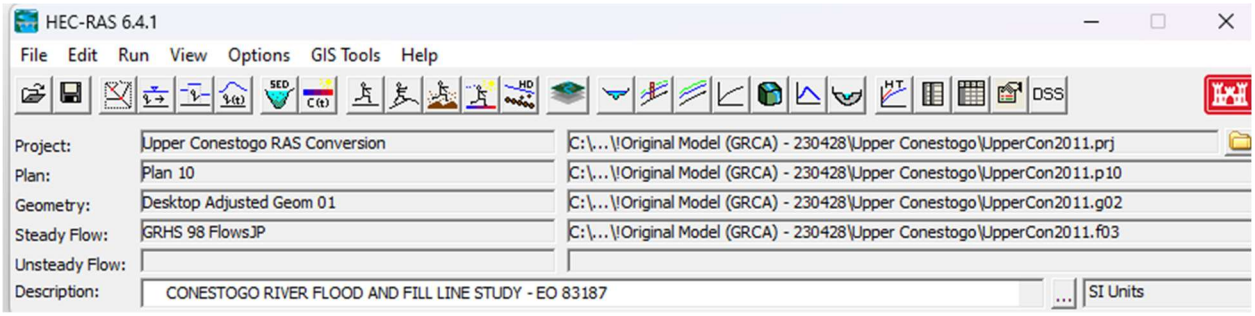
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Appendix F
Hec-Ras Model Results

Steady State Hec Ras Model (Received Model):



HEC RAS Geometric Data Plan (Received Model)



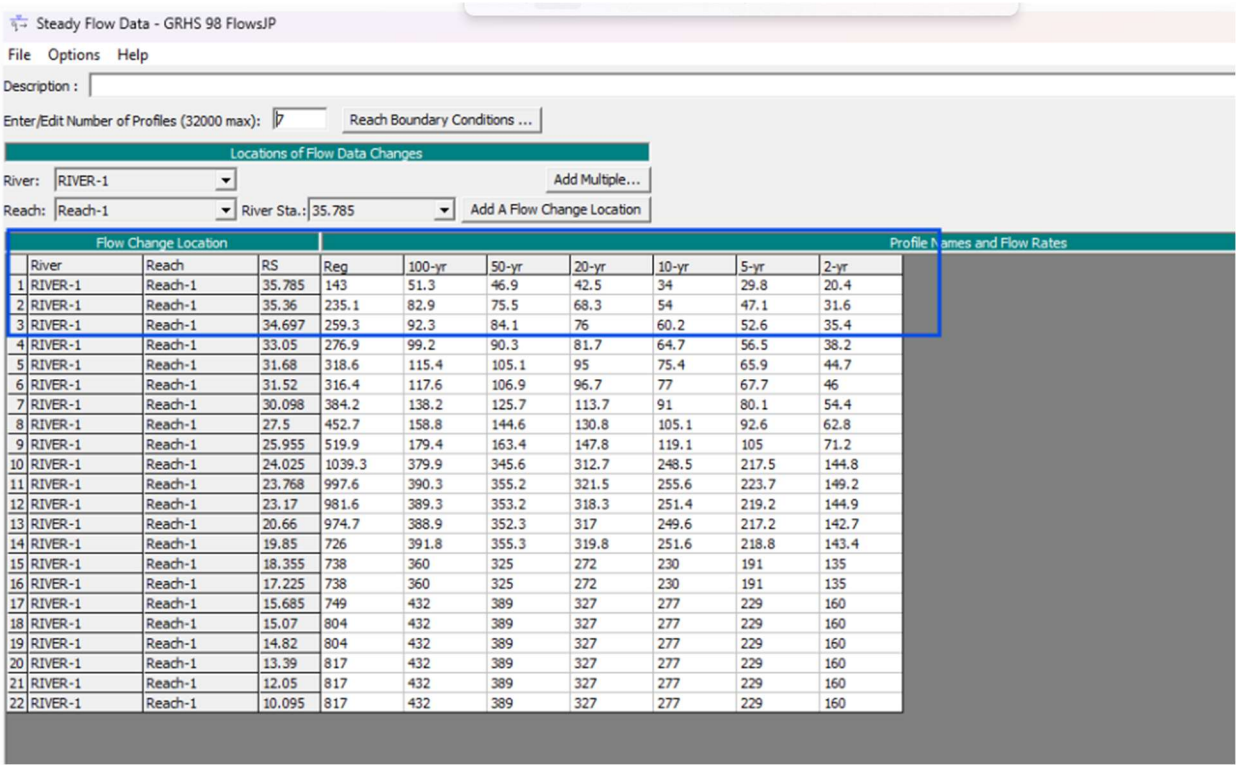
HEC RAS Setup (Received Model)

Description: ONESTOGO RIVER FLOOD AND FILL LINE STUDY - EO 83187

GRAND RIVER CONSERVATION AUTHORITY

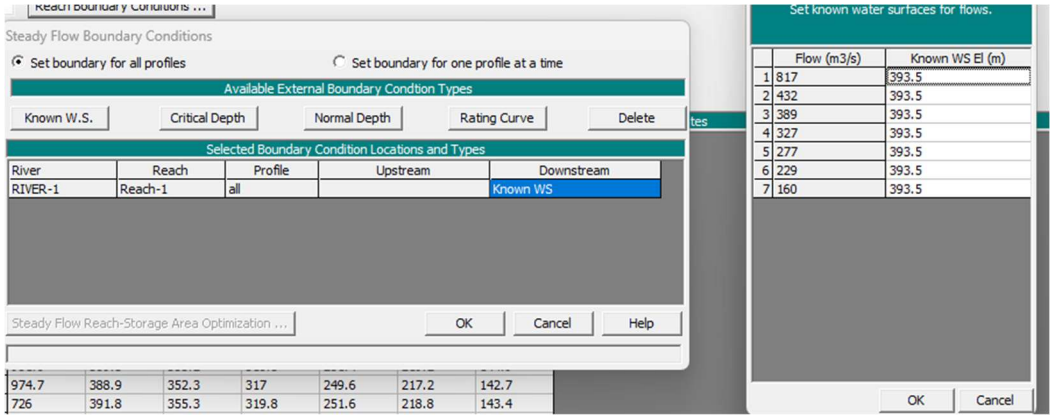
CONESTOGO RIVER -REGIONAL

- HEC2 has all profiles starting at 393.5m - identified as the max reservoir WL under normal operating conditions in P&R study (reviewed by GRCA).
- Missing ineffective flow areas inserted for all bridges coded as NORMAL in HEC2
- To keep bridge widths equal to those in HEC2, which were presumably measured or provided by bridge plans, the following adjustments were made:
- At each bridge, in the Downstream Reach Lengths table, reach lengths at upstream sections were increased by 2m. This automatically became the available distance between up and downstream bridge sections.
- The next upstream distance and the immediate downstream downstream were each decreased by half of the increase in Step 1 (1m each). Where these distances were already very small (1m or less) the next distance, up or downstream, was adjusted.
- In the Bridge Width and Upstream Distance table, upstream distances were set to 1m. This automatically set downstream distances to 1m.
- Note: To maintain the original alignment of cross-sections, the same adjustments were made in over bank areas.
- In HEC2 Normal Bridges had up and downstream cross-sections within 1m of bridge sections with equal GR stations and elevations. These were deleted to better reflect expansion and contraction zones.
- Wellington Road 7 bridge geometry adjusted as per GPS survey (jsp, Aug 2011)
- Regulatory flows revised to GRHS 98 flows from downstream limit to Cross-section 19.85 - fixed at guage stations and aerially weighted at othe flow change stations (jsp Aug. 2011)
- GRHS reduced the regulatory flow at Drayton by 29%. Reduction factors applied to this model range from 29% to 15% downstream to upstream for floodplain inquiries. Revised hydrolgy is needed for more reliable adjustment (jsp Mar. 2012)



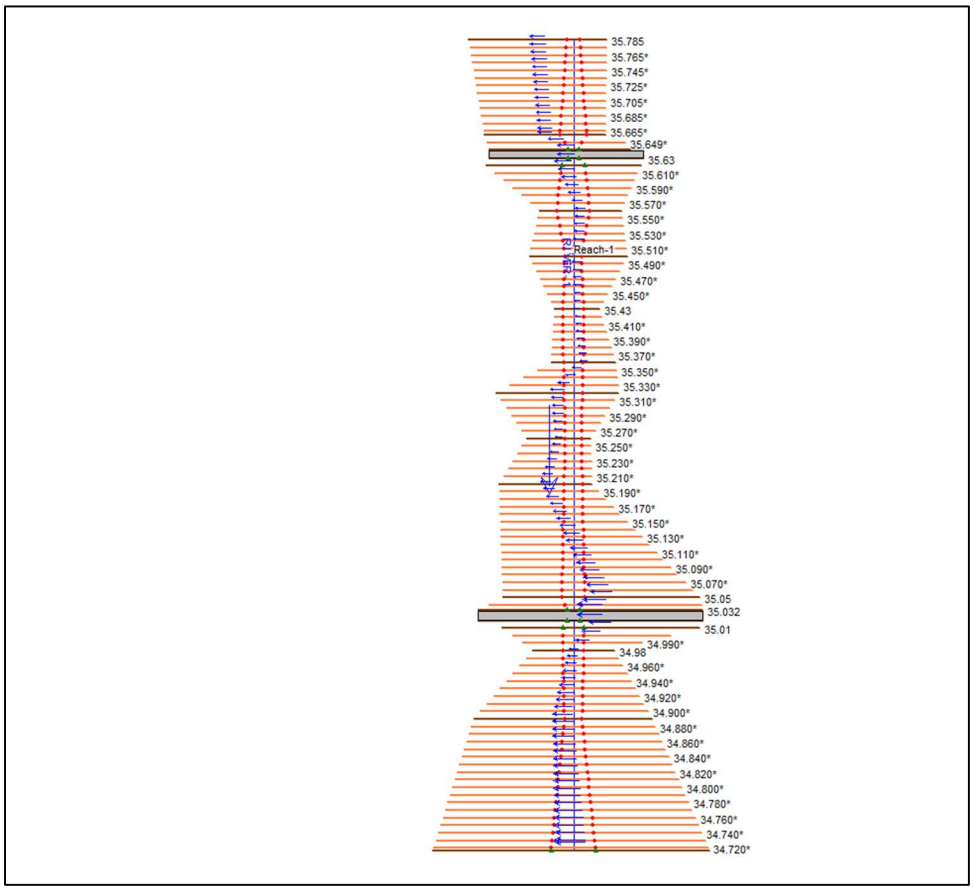
	River	Reach	RS	Reg	100-yr	50-yr	20-yr	10-yr	5-yr	2-yr
1	RIVER-1	Reach-1	35.785	143	51.3	46.9	42.5	34	29.8	20.4
2	RIVER-1	Reach-1	35.36	235.1	82.9	75.5	68.3	54	47.1	31.6
3	RIVER-1	Reach-1	34.697	259.3	92.3	84.1	76	60.2	52.6	35.4
4	RIVER-1	Reach-1	33.05	276.9	99.2	90.3	81.7	64.7	56.5	38.2
5	RIVER-1	Reach-1	31.68	318.6	115.4	105.1	95	75.4	65.9	44.7
6	RIVER-1	Reach-1	31.52	316.4	117.6	106.9	96.7	77	67.7	46
7	RIVER-1	Reach-1	30.098	384.2	138.2	125.7	113.7	91	80.1	54.4
8	RIVER-1	Reach-1	27.5	452.7	158.8	144.6	130.8	105.1	92.6	62.8
9	RIVER-1	Reach-1	25.955	519.9	179.4	163.4	147.8	119.1	105	71.2
10	RIVER-1	Reach-1	24.025	1039.3	379.9	345.6	312.7	248.5	217.5	144.8
11	RIVER-1	Reach-1	23.768	997.6	390.3	355.2	321.5	255.6	223.7	149.2
12	RIVER-1	Reach-1	23.17	981.6	389.3	353.2	318.3	251.4	219.2	144.9
13	RIVER-1	Reach-1	20.66	974.7	388.9	352.3	317	249.6	217.2	142.7
14	RIVER-1	Reach-1	19.85	726	391.8	355.3	319.8	251.6	218.8	143.4
15	RIVER-1	Reach-1	18.355	738	360	325	272	230	191	135
16	RIVER-1	Reach-1	17.225	738	360	325	272	230	191	135
17	RIVER-1	Reach-1	15.685	749	432	389	327	277	229	160
18	RIVER-1	Reach-1	15.07	804	432	389	327	277	229	160
19	RIVER-1	Reach-1	14.82	804	432	389	327	277	229	160
20	RIVER-1	Reach-1	13.39	817	432	389	327	277	229	160
21	RIVER-1	Reach-1	12.05	817	432	389	327	277	229	160
22	RIVER-1	Reach-1	10.095	817	432	389	327	277	229	160

Steady State Flow Data (Received model)



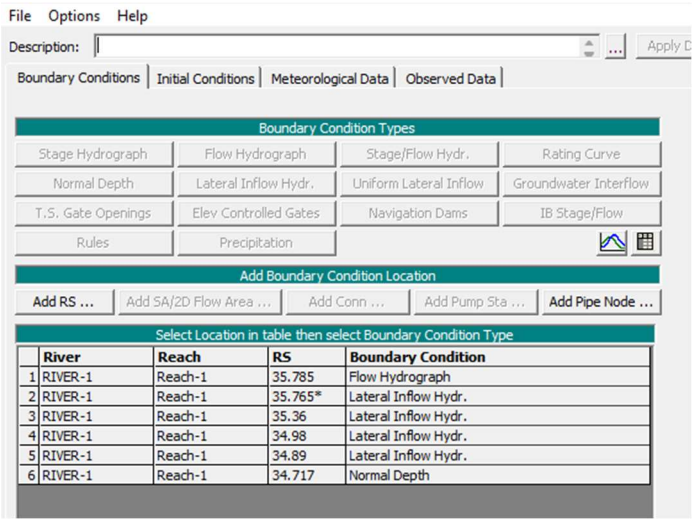
Steady Boundary Condition (Received model)

Unsteady State Hec Ras Model:

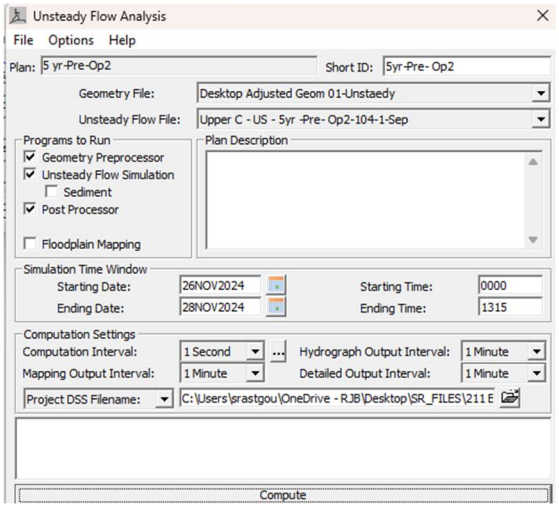


HEC RAS Geometric Data - Unsteady State

The routing flow from the pipes in PCSWMM was used to generate the inflow hydrograph, which was then input into Visual Ottohymo (VO). The resulting data was integrated with the external flow at each outlet, and the VO output was subsequently incorporated into the HEC-RAS model. This methodology was adopted to evaluate the impact of the additional flow from the proposed development on the water levels of the main river. Since the peak flows from the post-development conditions and the main river occur at different times, the results were validated using the VO model. The validation indicates that no significant changes in the main river's water levels are expected. Additionally, the HEC-RAS model was run under unsteady flow conditions, and the results corroborate these findings. In this unsteady-state analysis, both pre- and post-development flow hydrographs were applied at designated sections, with water levels remaining unchanged in both scenarios.



Boundary Condition for Unsteady Condition



Unsteady Flow Setup (Unsteady State Setup)

The unsteady flow scenario was designed to assess pre- and post-development water level conditions, with all boundary conditions remaining consistent throughout. As detailed in the following section, only the flow corresponding to a 100-year storm event aligns with the steady-state model results. The remaining hydrographs were also generated using the VO model, and no concerns arise from this approach, as external flows remain consistent across both scenarios. Survey data indicates that water levels at the edge adjacent to the development range from 0.5m to 1.1m lower than those predicted by the model for a 2-year storm event. Therefore, there is no need to run steady-state models for higher flow scenarios based on the VO model results.

Two key considerations must be addressed when reviewing the unsteady-state analysis:

1. Since the VO model was employed, the unsteady-state analysis cannot be directly compared to the steady-state analysis, as the flows do not match. Instead, the proposed unsteady-state model should be compared with existing unsteady-state analyses.
2. The unsteady-state analysis confirms that the additional flow resulting from the post-development scenario does not impact peak flows through the main river, and no adverse effects on water levels (WL) are anticipated. While lateral flows differ between the pre- and post-development conditions, the model indicates that the maximum flow values for both scenarios remain the same in the main section, as shown in the provided tables

GRCA Received Model

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-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)	
Reach-1	35.785	Reg	143.00	451.40	455.01		455.19	0.002968	2.11	94.49	126.11	0.40
Reach-1	35.785	100-yr	51.30	451.40	453.55		453.67	0.003655	1.67	39.86	31.34	0.41
Reach-1	35.785	50-yr	46.90	451.40	453.46		453.58	0.003642	1.62	37.30	30.74	0.41
Reach-1	35.785	20-yr	42.50	451.40	453.38		453.49	0.003632	1.57	34.66	30.10	0.40
Reach-1	35.785	10-yr	34.00	451.40	453.20		453.29	0.003624	1.46	29.29	28.76	0.40
Reach-1	35.785	5-yr	29.80	451.40	453.10		453.19	0.003610	1.40	26.52	28.05	0.39
Reach-1	35.785	2-yr	20.40	451.40	452.85		452.92	0.003571	1.23	19.81	25.15	0.38
Reach-1	35.66	Reg	143.00	450.50	454.65		454.82	0.002865	1.82	87.64	65.97	0.38
Reach-1	35.66	100-yr	51.30	450.50	452.77		452.99	0.008666	2.04	25.11	20.81	0.59
Reach-1	35.66	50-yr	46.90	450.50	452.67		452.88	0.009307	2.05	22.93	20.00	0.61
Reach-1	35.66	20-yr	42.50	450.50	452.58		452.79	0.009425	2.00	21.26	19.37	0.61
Reach-1	35.66	10-yr	34.00	450.50	452.41		452.59	0.009568	1.89	18.01	18.07	0.60
Reach-1	35.66	5-yr	29.80	450.50	452.31		452.48	0.009663	1.83	16.33	17.35	0.60
Reach-1	35.66	2-yr	20.40	450.50	452.06		452.20	0.010291	1.67	12.20	15.46	0.60
Reach-1	35.64	Reg	143.00	450.20	454.05	453.09	454.62	0.005980	3.35	42.68	35.04	0.59
Reach-1	35.64	100-yr	51.30	450.20	452.62	451.94	452.85	0.005262	2.14	23.97	23.59	0.51
Reach-1	35.64	50-yr	46.90	450.20	452.54	451.89	452.75	0.005137	2.05	22.88	22.84	0.50
Reach-1	35.64	20-yr	42.50	450.20	452.46	451.82	452.65	0.004880	1.94	21.90	22.17	0.48
Reach-1	35.64	10-yr	34.00	450.20	452.31	451.67	452.46	0.004323	1.71	19.87	20.77	0.44
Reach-1	35.64	5-yr	29.80	450.20	452.22	451.60	452.35	0.004038	1.59	18.74	19.99	0.42
Reach-1	35.64	2-yr	20.40	450.20	451.98	451.39	452.07	0.003456	1.30	15.64	17.85	0.38
Reach-1	35.635		Bridge									
Reach-1	35.63	Reg	143.00	450.20	453.50	453.09	454.33	0.011075	4.03	35.47	30.24	0.78
Reach-1	35.63	100-yr	51.30	450.20	452.48	451.94	452.75	0.006908	2.32	22.09	22.30	0.57
Reach-1	35.63	50-yr	46.90	450.20	452.41	451.89	452.66	0.006682	2.22	21.15	21.65	0.56
Reach-1	35.63	20-yr	42.50	450.20	452.34	451.82	452.57	0.006230	2.09	20.36	21.10	0.53
Reach-1	35.63	10-yr	34.00	450.20	452.22	451.67	452.38	0.005332	1.82	18.66	19.94	0.49
Reach-1	35.63	5-yr	29.80	450.20	452.14	451.60	452.28	0.004914	1.69	17.67	19.25	0.46
Reach-1	35.63	2-yr	20.40	450.20	451.92	451.39	452.02	0.004132	1.38	14.82	17.24	0.41
Reach-1	35.62	Reg	143.00	450.10	453.67	453.04	454.00	0.007041	2.55	56.14	31.02	0.58
Reach-1	35.62	100-yr	51.30	450.10	452.41	452.12	452.66	0.011958	2.23	22.98	21.67	0.69
Reach-1	35.62	50-yr	46.90	450.10	452.33	452.06	452.57	0.012366	2.21	21.26	20.94	0.70
Reach-1	35.62	20-yr	42.50	450.10	452.24	452.00	452.48	0.012813	2.18	19.53	20.18	0.71
Reach-1	35.62	10-yr	34.00	450.10	452.07	451.85	452.29	0.013836	2.11	16.15	18.61	0.72
Reach-1	35.62	5-yr	29.80	450.10	451.98	451.77	452.19	0.014192	2.05	14.51	17.71	0.72
Reach-1	35.62	2-yr	20.40	450.10	451.75	451.53	451.93	0.013826	1.89	10.81	14.66	0.70
Reach-1	35.56	Reg	143.00	450.10	453.68		453.77	0.001338	1.31	113.54	54.53	0.27
Reach-1	35.56	100-yr	51.30	450.10	452.33		452.38	0.001741	1.02	50.41	37.60	0.28
Reach-1	35.56	50-yr	46.90	450.10	452.24		452.29	0.001735	0.99	47.28	36.42	0.28
Reach-1	35.56	20-yr	42.50	450.10	452.16		452.20	0.001722	0.96	44.15	35.19	0.27
Reach-1	35.56	10-yr	34.00	450.10	451.98		452.02	0.001682	0.89	38.00	32.82	0.27
Reach-1	35.56	5-yr	29.80	450.10	451.88		451.92	0.001660	0.85	34.93	32.11	0.26
Reach-1	35.56	2-yr	20.40	450.10	451.64		451.67	0.001592	0.74	27.53	30.33	0.25
Reach-1	35.5	Reg	143.00	450.00	453.38		453.63	0.003970	2.34	80.21	50.33	0.47
Reach-1	35.5	100-yr	51.30	450.00	451.88		452.14	0.011482	2.28	22.93	21.49	0.69
Reach-1	35.5	50-yr	46.90	450.00	451.80		452.06	0.011909	2.25	21.20	20.79	0.70
Reach-1	35.5	20-yr	42.50	450.00	451.72		451.97	0.012230	2.21	19.55	20.10	0.70
Reach-1	35.5	10-yr	34.00	450.00	451.56		451.78	0.012541	2.08	16.50	18.77	0.70
Reach-1	35.5	5-yr	29.80	450.00	451.49		451.69	0.012329	1.99	15.10	18.13	0.69
Reach-1	35.5	2-yr	20.40	450.00	451.32		451.46	0.010676	1.69	12.16	16.69	0.62
Reach-1	35.43	Reg	143.00	449.80	453.32		453.44	0.001415	1.58	100.67	41.07	0.29
Reach-1	35.43	100-yr	51.30	449.80	451.71		451.79	0.002238	1.22	43.01	31.67	0.32
Reach-1	35.43	50-yr	46.90	449.80	451.61		451.68	0.002367	1.20	39.86	31.15	0.33
Reach-1	35.43	20-yr	42.50	449.80	451.51		451.58	0.002506	1.17	36.75	30.63	0.33
Reach-1	35.43	10-yr	34.00	449.80	451.29		451.36	0.002960	1.13	30.28	29.52	0.35
Reach-1	35.43	5-yr	29.80	449.80	451.18		451.24	0.003319	1.11	26.93	28.93	0.36
Reach-1	35.43	2-yr	20.40	449.80	450.90		450.96	0.004755	1.07	19.01	27.33	0.41
Reach-1	35.36	Reg	235.10	448.80	452.93		453.25	0.003565	2.60	105.97	43.59	0.46
Reach-1	35.36	100-yr	82.90	448.80	451.36		451.54	0.004553	1.89	45.78	31.61	0.47
Reach-1	35.36	50-yr	75.50	448.80	451.26		451.43	0.004680	1.83	42.60	30.59	0.47
Reach-1	35.36	20-yr	68.30	448.80	451.15		451.32	0.004834	1.78	39.45	29.55	0.47
Reach-1	35.36	10-yr	54.00	448.80	450.92		451.07	0.005201	1.67	32.89	27.24	0.48
Reach-1	35.36	5-yr	47.10	448.80	450.80		450.93	0.005290	1.62	29.56	25.99	0.47
Reach-1	35.36	2-yr	31.60	448.80	450.48		450.59	0.005442	1.46	21.89	22.84	0.47

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	35.32	Reg	235.10	448.50	452.70		453.09	0.004179	2.83	92.05	34.59	0.50
Reach-1	35.32	100-yr	82.90	448.50	451.18		451.36	0.004270	1.90	44.95	27.51	0.45
Reach-1	35.32	50-yr	75.50	448.50	451.08		451.25	0.004339	1.84	42.10	27.03	0.45
Reach-1	35.32	20-yr	68.30	448.50	450.97		451.13	0.004412	1.78	39.22	26.49	0.45
Reach-1	35.32	10-yr	54.00	448.50	450.73		450.87	0.004535	1.66	33.07	25.14	0.45
Reach-1	35.32	5-yr	47.10	448.50	450.60		450.73	0.004650	1.60	29.89	24.42	0.45
Reach-1	35.32	2-yr	31.60	448.50	450.28		450.38	0.005133	1.43	22.20	22.56	0.45
Reach-1	35.26	Reg	235.10	448.20	452.08		452.72	0.008225	3.60	69.87	29.76	0.68
Reach-1	35.26	100-yr	82.90	448.20	450.71		451.01	0.007925	2.43	34.51	21.98	0.60
Reach-1	35.26	50-yr	75.50	448.20	450.62		450.90	0.007752	2.35	32.46	21.32	0.59
Reach-1	35.26	20-yr	68.30	448.20	450.52		450.78	0.007556	2.26	30.43	20.64	0.58
Reach-1	35.26	10-yr	54.00	448.20	450.31		450.53	0.007055	2.06	26.29	19.18	0.55
Reach-1	35.26	5-yr	47.10	448.20	450.20		450.39	0.006825	1.96	24.11	18.37	0.54
Reach-1	35.26	2-yr	31.60	448.20	449.90		450.04	0.006148	1.67	18.92	16.59	0.50
Reach-1	35.2	Reg	235.10	447.90	451.84		452.29	0.004952	2.99	86.49	35.18	0.54
Reach-1	35.2	100-yr	82.90	447.90	450.42		450.62	0.004723	1.97	42.64	26.57	0.47
Reach-1	35.2	50-yr	75.50	447.90	450.33		450.51	0.004730	1.90	40.13	25.98	0.47
Reach-1	35.2	20-yr	68.30	447.90	450.23		450.40	0.004750	1.82	37.60	25.39	0.47
Reach-1	35.2	10-yr	54.00	447.90	450.02		450.16	0.004847	1.67	32.33	24.10	0.46
Reach-1	35.2	5-yr	47.10	447.90	449.90		450.03	0.004868	1.60	29.52	23.59	0.46
Reach-1	35.2	2-yr	31.60	447.90	449.60		449.70	0.004945	1.40	22.60	22.39	0.44
Reach-1	35.05	Reg	235.10	446.60	451.28		451.60	0.003839	2.54	101.65	47.45	0.47
Reach-1	35.05	100-yr	82.90	446.60	449.58		449.80	0.006424	2.06	40.27	26.85	0.54
Reach-1	35.05	50-yr	75.50	446.60	449.49		449.69	0.006334	2.00	37.84	26.16	0.53
Reach-1	35.05	20-yr	68.30	446.60	449.40		449.59	0.006207	1.93	35.46	25.47	0.52
Reach-1	35.05	10-yr	54.00	446.60	449.19		449.35	0.005976	1.78	30.38	23.93	0.50
Reach-1	35.05	5-yr	47.10	446.60	449.07		449.22	0.005968	1.71	27.57	23.03	0.50
Reach-1	35.05	2-yr	31.60	446.60	448.75		448.87	0.006102	1.53	20.63	20.65	0.49
Reach-1	35.032	Reg	235.10	446.47	450.83	449.53	451.44	0.004792	3.46	67.96	69.90	0.55
Reach-1	35.032	100-yr	82.90	446.47	449.55	448.19	449.71	0.002171	1.80	46.11	30.19	0.35
Reach-1	35.032	50-yr	75.50	446.47	449.46	448.11	449.61	0.002005	1.69	44.65	29.47	0.33
Reach-1	35.032	20-yr	68.30	446.47	449.37	448.02	449.50	0.001835	1.58	43.18	28.74	0.32
Reach-1	35.032	10-yr	54.00	446.47	449.18	447.83	449.27	0.001500	1.36	39.84	27.09	0.28
Reach-1	35.032	5-yr	47.10	446.47	449.06	447.72	449.14	0.001351	1.24	37.87	26.12	0.27
Reach-1	35.032	2-yr	31.60	446.47	448.75	447.45	448.80	0.001002	0.97	32.59	23.52	0.22
Reach-1	35.026		Bridge									
Reach-1	35.02	Reg	235.10	446.47	450.71	449.54	451.36	0.005297	3.56	65.95	64.69	0.58
Reach-1	35.02	100-yr	82.90	446.47	449.51	448.19	449.68	0.002273	1.82	45.48	29.88	0.36
Reach-1	35.02	50-yr	75.50	446.47	449.43	448.11	449.58	0.002093	1.71	44.08	29.18	0.34
Reach-1	35.02	20-yr	68.30	446.47	449.35	448.02	449.48	0.001909	1.60	42.66	28.49	0.32
Reach-1	35.02	10-yr	54.00	446.47	449.16	447.83	449.25	0.001552	1.37	39.43	26.89	0.29
Reach-1	35.02	5-yr	47.10	446.47	449.04	447.72	449.12	0.001395	1.26	37.51	25.94	0.27
Reach-1	35.02	2-yr	31.60	446.47	448.74	447.45	448.79	0.001029	0.98	32.34	23.39	0.23
Reach-1	35.01	Reg	235.10	446.50	450.77	449.77	451.20	0.005264	2.89	81.23	68.54	0.54
Reach-1	35.01	100-yr	82.90	446.50	449.49	448.51	449.65	0.003809	1.81	45.92	28.88	0.43
Reach-1	35.01	50-yr	75.50	446.50	449.40	448.43	449.55	0.003604	1.72	43.82	28.21	0.41
Reach-1	35.01	20-yr	68.30	446.50	449.31	448.35	449.45	0.003394	1.64	41.69	27.51	0.40
Reach-1	35.01	10-yr	54.00	446.50	449.12	448.16	449.23	0.002950	1.46	37.10	25.96	0.37
Reach-1	35.01	5-yr	47.10	446.50	449.01	448.07	449.10	0.002758	1.37	34.50	25.05	0.35
Reach-1	35.01	2-yr	31.60	446.50	448.71	447.75	448.77	0.002266	1.13	27.95	22.64	0.31
Reach-1	34.98	Reg	235.10	446.70	450.75		451.03	0.003762	2.50	124.52	71.91	0.46
Reach-1	34.98	100-yr	82.90	446.70	449.33		449.52	0.005219	1.91	44.86	37.64	0.49
Reach-1	34.98	50-yr	75.50	446.70	449.25		449.42	0.005232	1.84	41.82	35.22	0.49
Reach-1	34.98	20-yr	68.30	446.70	449.16		449.32	0.005247	1.77	38.93	32.75	0.48
Reach-1	34.98	10-yr	54.00	446.70	448.98		449.11	0.005289	1.62	33.27	27.71	0.47
Reach-1	34.98	5-yr	47.10	446.70	448.87		448.99	0.005156	1.56	30.28	26.38	0.46
Reach-1	34.98	2-yr	31.60	446.70	448.58		448.67	0.004679	1.36	23.20	22.94	0.43
Reach-1	34.89	Reg	235.10	446.40	450.49		450.72	0.002876	2.38	145.43	70.03	0.42
Reach-1	34.89	100-yr	82.90	446.40	448.87		449.06	0.004925	2.00	48.83	44.67	0.49
Reach-1	34.89	50-yr	75.50	446.40	448.78		448.96	0.004948	1.93	45.03	42.49	0.48
Reach-1	34.89	20-yr	68.30	446.40	448.69		448.86	0.004934	1.86	41.47	40.34	0.48
Reach-1	34.89	10-yr	54.00	446.40	448.50		448.65	0.005003	1.71	34.08	35.47	0.47
Reach-1	34.89	5-yr	47.10	446.40	448.39		448.53	0.005096	1.63	30.41	32.78	0.47
Reach-1	34.89	2-yr	31.60	446.40	448.12		448.22	0.005387	1.42	22.36	25.93	0.46

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	34.717	Reg	235.10	445.20	450.19	448.32	450.31	0.001741	1.55	151.39	91.16	0.31
Reach-1	34.717	100-yr	82.90	445.20	448.32	447.37	448.42	0.002692	1.36	61.06	48.33	0.35
Reach-1	34.717	50-yr	75.50	445.20	448.21	447.30	448.30	0.002855	1.34	56.45	45.00	0.36
Reach-1	34.717	20-yr	68.30	445.20	448.09	447.22	448.18	0.003079	1.32	51.71	41.52	0.37
Reach-1	34.717	10-yr	54.00	445.20	447.83	447.05	447.91	0.003474	1.29	41.84	36.07	0.38
Reach-1	34.717	5-yr	47.10	445.20	447.69	446.96	447.77	0.003634	1.27	37.02	33.73	0.39
Reach-1	34.717	2-yr	31.60	445.20	447.32	446.72	447.40	0.004142	1.22	25.83	27.51	0.40
Reach-1	34.697	Reg	259.30	445.20	449.87	447.62	450.19	0.002041	2.52	102.72	85.21	0.37
Reach-1	34.697	100-yr	92.30	445.20	448.29	446.42	448.39	0.001021	1.36	68.04	48.82	0.25
Reach-1	34.697	50-yr	84.10	445.20	448.18	446.34	448.27	0.000958	1.28	65.59	45.48	0.24
Reach-1	34.697	20-yr	76.00	445.20	448.07	446.27	448.14	0.000893	1.21	63.03	42.00	0.23
Reach-1	34.697	10-yr	60.20	445.20	447.81	446.12	447.87	0.000761	1.05	57.50	36.72	0.21
Reach-1	34.697	5-yr	52.60	445.20	447.68	446.03	447.73	0.000693	0.96	54.54	34.32	0.20
Reach-1	34.697	2-yr	35.40	445.20	447.32	445.84	447.35	0.000527	0.76	46.69	27.96	0.17
Reach-1	34.691		Bridge									
Reach-1	34.685	Reg	259.30	445.20	449.83	447.62	450.16	0.002093	2.54	101.95	84.59	0.38
Reach-1	34.685	100-yr	92.30	445.20	448.28	446.42	448.37	0.001038	1.36	67.70	48.35	0.25
Reach-1	34.685	50-yr	84.10	445.20	448.17	446.34	448.25	0.000974	1.29	65.27	45.04	0.24
Reach-1	34.685	20-yr	76.00	445.20	448.05	446.27	448.13	0.000907	1.21	62.73	41.60	0.23
Reach-1	34.685	10-yr	60.20	445.20	447.80	446.12	447.86	0.000772	1.05	57.25	36.52	0.21
Reach-1	34.685	5-yr	52.60	445.20	447.67	446.03	447.72	0.000703	0.97	54.31	34.14	0.20
Reach-1	34.685	2-yr	35.40	445.20	447.31	445.84	447.34	0.000533	0.76	46.52	27.82	0.17
Reach-1	34.67	Reg	259.30	445.10	449.83	448.20	450.08	0.002998	2.24	115.94	65.49	0.41
Reach-1	34.67	100-yr	92.30	445.10	448.22	447.04	448.34	0.002461	1.54	59.93	41.88	0.35
Reach-1	34.67	50-yr	84.10	445.10	448.11	446.96	448.22	0.002416	1.49	56.53	40.24	0.35
Reach-1	34.67	20-yr	76.00	445.10	447.99	446.88	448.10	0.002366	1.43	53.09	38.53	0.34
Reach-1	34.67	10-yr	60.20	445.10	447.74	446.71	447.83	0.002257	1.31	45.96	34.88	0.33
Reach-1	34.67	5-yr	52.60	445.10	447.61	446.62	447.69	0.002193	1.24	42.32	32.94	0.32
Reach-1	34.67	2-yr	35.40	445.10	447.26	446.40	447.32	0.002038	1.07	33.16	27.84	0.30
Reach-1	34.54	Reg	259.30	444.80	449.52		449.72	0.002443	2.36	174.91	80.37	0.39
Reach-1	34.54	100-yr	92.30	444.80	447.78		447.95	0.003812	1.96	61.21	45.21	0.44
Reach-1	34.54	50-yr	84.10	444.80	447.66		447.83	0.003958	1.92	55.98	43.21	0.44
Reach-1	34.54	20-yr	76.00	444.80	447.54		447.70	0.004122	1.87	50.85	41.14	0.45
Reach-1	34.54	10-yr	60.20	444.80	447.27		447.42	0.004660	1.79	40.48	36.60	0.46
Reach-1	34.54	5-yr	52.60	444.80	447.12		447.27	0.005121	1.75	35.28	34.10	0.48
Reach-1	34.54	2-yr	35.40	444.80	446.74		446.88	0.006608	1.68	23.38	27.53	0.52
Reach-1	34.48	Reg	259.30	444.40	449.22		449.55	0.002988	2.79	131.77	49.08	0.44
Reach-1	34.48	100-yr	92.30	444.40	447.61		447.76	0.002432	1.81	63.57	36.66	0.36
Reach-1	34.48	50-yr	84.10	444.40	447.49		447.64	0.002416	1.75	59.29	35.96	0.36
Reach-1	34.48	20-yr	76.00	444.40	447.37		447.50	0.002397	1.68	54.96	35.23	0.35
Reach-1	34.48	10-yr	60.20	444.40	447.10		447.21	0.002418	1.55	45.54	33.59	0.35
Reach-1	34.48	5-yr	52.60	444.40	446.94		447.05	0.002479	1.49	40.42	32.14	0.35
Reach-1	34.48	2-yr	35.40	444.40	446.53		446.62	0.002714	1.32	28.47	25.97	0.35
Reach-1	34.425	Reg	259.30	444.00	448.95		449.34	0.004333	3.11	128.07	59.60	0.51
Reach-1	34.425	100-yr	92.30	444.00	447.20		447.53	0.006966	2.59	39.69	28.27	0.59
Reach-1	34.425	50-yr	84.10	444.00	447.10		447.40	0.006937	2.49	36.99	24.79	0.58
Reach-1	34.425	20-yr	76.00	444.00	447.00		447.27	0.006865	2.39	34.60	21.37	0.57
Reach-1	34.425	10-yr	60.20	444.00	446.75		446.99	0.006483	2.20	29.60	19.87	0.55
Reach-1	34.425	5-yr	52.60	444.00	446.60		446.82	0.006486	2.12	26.70	18.94	0.54
Reach-1	34.425	2-yr	35.40	444.00	446.19		446.38	0.006797	1.93	19.44	16.39	0.54
Reach-1	34.288	Reg	259.30	443.30	448.48		448.83	0.003190	2.73	116.26	45.17	0.44
Reach-1	34.288	100-yr	92.30	443.30	446.43		446.67	0.005306	2.17	43.27	26.03	0.50
Reach-1	34.288	50-yr	84.10	443.30	446.33		446.56	0.005256	2.09	40.76	25.11	0.49
Reach-1	34.288	20-yr	76.00	443.30	446.23		446.43	0.005217	2.00	38.22	24.15	0.49
Reach-1	34.288	10-yr	60.20	443.30	446.01		446.18	0.005208	1.82	33.05	22.06	0.47
Reach-1	34.288	5-yr	52.60	443.30	445.88		446.04	0.004905	1.73	30.38	20.82	0.46
Reach-1	34.288	2-yr	35.40	443.30	445.56		445.67	0.003834	1.46	24.18	17.59	0.40
Reach-1	34.273	Reg	259.30	443.10	447.64	446.39	448.52	0.005680	4.14	62.70	37.34	0.62
Reach-1	34.273	100-yr	92.30	443.10	446.40	444.76	446.61	0.002098	2.03	45.49	25.70	0.36
Reach-1	34.273	50-yr	84.10	443.10	446.30	444.66	446.49	0.001917	1.90	44.20	24.83	0.34
Reach-1	34.273	20-yr	76.00	443.10	446.20	444.56	446.36	0.001737	1.77	42.84	23.91	0.32
Reach-1	34.273	10-yr	60.20	443.10	445.99	444.35	446.11	0.001386	1.51	39.87	21.95	0.28
Reach-1	34.273	5-yr	52.60	443.10	445.87	444.24	445.97	0.001219	1.38	38.21	21.44	0.26
Reach-1	34.273	2-yr	35.40	443.10	445.55	443.98	445.61	0.000825	1.05	33.86	20.10	0.21

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	34.269		Bridge									
Reach-1	34.265	Reg	259.30	443.10	447.50	446.41	448.43	0.006332	4.27	60.69	35.98	0.65
Reach-1	34.265	100-yr	92.30	443.10	446.37	444.76	446.58	0.002154	2.05	45.13	25.46	0.36
Reach-1	34.265	50-yr	84.10	443.10	446.28	444.66	446.47	0.001963	1.92	43.88	24.61	0.34
Reach-1	34.265	20-yr	76.00	443.10	446.18	444.56	446.35	0.001776	1.79	42.56	23.72	0.32
Reach-1	34.265	10-yr	60.20	443.10	445.97	444.35	446.09	0.001411	1.52	39.65	21.88	0.29
Reach-1	34.265	5-yr	52.60	443.10	445.86	444.24	445.95	0.001239	1.38	38.02	21.38	0.27
Reach-1	34.265	2-yr	35.40	443.10	445.55	443.97	445.60	0.000835	1.05	33.74	20.06	0.21
Reach-1	34.255	Reg	259.30	443.10	447.58	446.56	448.06	0.005822	3.07	84.38	33.10	0.56
Reach-1	34.255	100-yr	92.30	443.10	446.36	445.27	446.52	0.003519	1.79	51.55	27.62	0.41
Reach-1	34.255	50-yr	84.10	443.10	446.27	445.17	446.42	0.003411	1.71	49.12	27.21	0.40
Reach-1	34.255	20-yr	76.00	443.10	446.17	445.08	446.31	0.003308	1.63	46.55	26.77	0.39
Reach-1	34.255	10-yr	60.20	443.10	445.96	444.86	446.07	0.003072	1.47	41.00	25.61	0.37
Reach-1	34.255	5-yr	52.60	443.10	445.84	444.73	445.94	0.002847	1.38	38.03	24.55	0.35
Reach-1	34.255	2-yr	35.40	443.10	445.51	444.45	445.58	0.002260	1.16	30.55	21.63	0.31
Reach-1	34.2	Reg	259.30	443.10	447.05		447.67	0.008266	3.65	89.46	46.45	0.68
Reach-1	34.2	100-yr	92.30	443.10	446.09		446.30	0.004624	2.08	49.87	35.48	0.48
Reach-1	34.2	50-yr	84.10	443.10	446.00		446.20	0.004484	1.99	46.99	34.53	0.47
Reach-1	34.2	20-yr	76.00	443.10	445.92		446.09	0.004350	1.90	44.02	33.44	0.46
Reach-1	34.2	10-yr	60.20	443.10	445.72		445.87	0.004091	1.71	37.84	31.04	0.44
Reach-1	34.2	5-yr	52.60	443.10	445.62		445.75	0.003958	1.61	34.69	29.75	0.42
Reach-1	34.2	2-yr	35.40	443.10	445.33		445.42	0.003852	1.36	26.50	26.08	0.40
Reach-1	34.16	Reg	259.30	443.10	447.03		447.31	0.004969	2.51	129.72	71.37	0.52
Reach-1	34.16	100-yr	92.30	443.10	445.91		446.07	0.006099	1.87	56.32	56.39	0.52
Reach-1	34.16	50-yr	84.10	443.10	445.82		445.98	0.006160	1.84	51.45	53.00	0.52
Reach-1	34.16	20-yr	76.00	443.10	445.72		445.88	0.006212	1.80	46.64	49.44	0.52
Reach-1	34.16	10-yr	60.20	443.10	445.52		445.67	0.006207	1.72	37.51	41.84	0.51
Reach-1	34.16	5-yr	52.60	443.10	445.41		445.55	0.006142	1.66	33.22	37.74	0.50
Reach-1	34.16	2-yr	35.40	443.10	445.12		445.23	0.005857	1.51	23.65	26.39	0.48
Reach-1	34.1	Reg	259.30	442.80	446.51		446.96	0.007359	3.44	119.04	71.81	0.64
Reach-1	34.1	100-yr	92.30	442.80	445.56		445.76	0.004778	2.13	61.06	50.85	0.49
Reach-1	34.1	50-yr	84.10	442.80	445.49		445.67	0.004616	2.04	57.35	49.30	0.47
Reach-1	34.1	20-yr	76.00	442.80	445.41		445.58	0.004464	1.95	53.48	47.62	0.46
Reach-1	34.1	10-yr	60.20	442.80	445.23		445.37	0.004199	1.77	45.28	43.85	0.44
Reach-1	34.1	5-yr	52.60	442.80	445.13		445.26	0.004088	1.67	41.00	41.75	0.43
Reach-1	34.1	2-yr	35.40	442.80	444.85		444.95	0.003839	1.44	30.11	35.40	0.41
Reach-1	34	Reg	259.30	442.50	446.01		446.31	0.005683	2.86	160.43	130.22	0.56
Reach-1	34	100-yr	92.30	442.50	445.12		445.29	0.004640	1.96	65.55	82.34	0.47
Reach-1	34	50-yr	84.10	442.50	445.05		445.22	0.004541	1.89	60.24	78.78	0.47
Reach-1	34	20-yr	76.00	442.50	444.98		445.14	0.004436	1.81	54.83	74.35	0.46
Reach-1	34	10-yr	60.20	442.50	444.82		444.95	0.004220	1.65	43.97	60.32	0.44
Reach-1	34	5-yr	52.60	442.50	444.73		444.85	0.004115	1.56	38.84	52.41	0.43
Reach-1	34	2-yr	35.40	442.50	444.47		444.56	0.003942	1.33	28.10	31.77	0.40
Reach-1	33.89	Reg	259.30	442.10	445.50		445.77	0.005473	2.76	173.14	147.59	0.55
Reach-1	33.89	100-yr	92.30	442.10	444.60		444.78	0.005017	1.98	67.09	98.86	0.49
Reach-1	33.89	50-yr	84.10	442.10	444.55		444.72	0.004813	1.90	62.00	97.28	0.48
Reach-1	33.89	20-yr	76.00	442.10	444.50		444.65	0.004591	1.81	56.70	95.09	0.46
Reach-1	33.89	10-yr	60.20	442.10	444.38		444.50	0.003963	1.60	46.60	78.75	0.43
Reach-1	33.89	5-yr	52.60	442.10	444.32		444.43	0.003591	1.48	42.01	70.09	0.40
Reach-1	33.89	2-yr	35.40	442.10	444.10		444.17	0.003031	1.21	30.08	39.48	0.36
Reach-1	33.79	Reg	259.30	441.60	445.14		445.32	0.004462	2.40	195.04	132.07	0.49
Reach-1	33.79	100-yr	92.30	441.60	444.03		444.20	0.007775	2.12	70.23	96.69	0.58
Reach-1	33.79	50-yr	84.10	441.60	443.93		444.12	0.008653	2.16	61.33	90.76	0.61
Reach-1	33.79	20-yr	76.00	441.60	443.83		444.04	0.009649	2.21	52.47	82.58	0.64
Reach-1	33.79	10-yr	60.20	441.60	443.59	443.50	443.85	0.013223	2.38	34.83	63.22	0.73
Reach-1	33.79	5-yr	52.60	441.60	443.44	443.41	443.75	0.016693	2.53	26.40	51.46	0.81
Reach-1	33.79	2-yr	35.40	441.60	443.10	443.10	443.47	0.025865	2.69	13.52	24.24	0.97
Reach-1	33.7	Reg	259.30	441.30	444.93		445.13	0.003518	2.35	193.30	136.82	0.45
Reach-1	33.7	100-yr	92.30	441.30	443.93		444.05	0.003154	1.66	78.71	91.14	0.39
Reach-1	33.7	50-yr	84.10	441.30	443.86		443.97	0.003112	1.60	72.17	86.05	0.39
Reach-1	33.7	20-yr	76.00	441.30	443.78		443.89	0.003069	1.54	65.66	80.65	0.38
Reach-1	33.7	10-yr	60.20	441.30	443.61		443.70	0.002979	1.41	52.77	68.75	0.37
Reach-1	33.7	5-yr	52.60	441.30	443.51		443.60	0.002943	1.34	46.46	62.10	0.36
Reach-1	33.7	2-yr	35.40	441.30	443.25		443.32	0.002835	1.15	32.67	44.19	0.35

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	33.59	Reg	259.30	440.90	444.26		444.61	0.006890	3.01	143.08	112.53	0.61
Reach-1	33.59	100-yr	92.30	440.90	443.58		443.71	0.003329	1.69	77.29	78.72	0.40
Reach-1	33.59	50-yr	84.10	440.90	443.52		443.64	0.003179	1.62	72.51	75.24	0.39
Reach-1	33.59	20-yr	76.00	440.90	443.46		443.56	0.003015	1.53	67.76	71.62	0.38
Reach-1	33.59	10-yr	60.20	440.90	443.31		443.39	0.002713	1.37	57.71	63.28	0.35
Reach-1	33.59	5-yr	52.60	440.90	443.22		443.29	0.002601	1.29	52.31	58.30	0.34
Reach-1	33.59	2-yr	35.40	440.90	442.99		443.04	0.002258	1.07	40.19	45.55	0.31
Reach-1	33.485	Reg	259.30	440.60	443.97		444.07	0.003104	2.14	267.05	185.88	0.42
Reach-1	33.485	100-yr	92.30	440.60	442.77	442.77	443.09	0.011977	2.86	62.20	125.64	0.74
Reach-1	33.485	50-yr	84.10	440.60	442.71	442.71	443.03	0.012175	2.81	55.24	115.00	0.74
Reach-1	33.485	20-yr	76.00	440.60	442.64	442.64	442.97	0.012711	2.78	47.67	102.16	0.75
Reach-1	33.485	10-yr	60.20	440.60	442.47	442.47	442.81	0.014521	2.72	33.03	72.81	0.79
Reach-1	33.485	5-yr	52.60	440.60	442.39	442.39	442.72	0.015159	2.65	27.36	62.78	0.79
Reach-1	33.485	2-yr	35.40	440.60	442.05	442.05	442.44	0.026043	2.75	13.01	22.35	0.98
Reach-1	33.3	Reg	259.30	439.30	443.54		443.68	0.001735	1.81	190.39	87.27	0.32
Reach-1	33.3	100-yr	92.30	439.30	442.09		442.17	0.001926	1.30	81.21	61.40	0.31
Reach-1	33.3	50-yr	84.10	439.30	442.00		442.08	0.001919	1.25	75.72	59.54	0.30
Reach-1	33.3	20-yr	76.00	439.30	441.91		441.98	0.001913	1.20	70.19	57.42	0.30
Reach-1	33.3	10-yr	60.20	439.30	441.71		441.77	0.001900	1.10	59.10	52.89	0.29
Reach-1	33.3	5-yr	52.60	439.30	441.60		441.65	0.001895	1.04	53.59	50.50	0.29
Reach-1	33.3	2-yr	35.40	439.30	441.31		441.35	0.001990	0.91	39.85	43.95	0.28
Reach-1	33.18	Reg	259.30	438.60	443.10		443.38	0.004185	2.84	153.84	85.77	0.50
Reach-1	33.18	100-yr	92.30	438.60	441.48		441.75	0.007852	2.50	49.61	44.78	0.61
Reach-1	33.18	50-yr	84.10	438.60	441.39		441.65	0.008104	2.45	45.52	42.89	0.61
Reach-1	33.18	20-yr	76.00	438.60	441.30		441.55	0.008291	2.38	41.68	41.04	0.61
Reach-1	33.18	10-yr	60.20	438.60	441.09		441.32	0.009157	2.27	33.55	36.81	0.63
Reach-1	33.18	5-yr	52.60	438.60	440.97		441.20	0.009799	2.22	29.43	34.38	0.64
Reach-1	33.18	2-yr	35.40	438.60	440.66		440.87	0.010713	2.08	19.82	27.02	0.65
Reach-1	33.1	Reg	259.30	438.10	443.04		443.16	0.001361	1.63	192.25	83.76	0.29
Reach-1	33.1	100-yr	92.30	438.10	441.29		441.38	0.002350	1.31	71.78	51.52	0.33
Reach-1	33.1	50-yr	84.10	438.10	441.18		441.27	0.002503	1.29	66.08	48.93	0.34
Reach-1	33.1	20-yr	76.00	438.10	441.07		441.15	0.002669	1.26	60.68	46.34	0.34
Reach-1	33.1	10-yr	60.20	438.10	440.82		440.90	0.002888	1.21	49.87	41.43	0.35
Reach-1	33.1	5-yr	52.60	438.10	440.69		440.76	0.002959	1.19	44.54	38.94	0.35
Reach-1	33.1	2-yr	35.40	438.10	440.35		440.41	0.003067	1.10	32.37	32.53	0.35
Reach-1	33.05	Reg	276.90	437.90	442.84		443.07	0.002263	2.29	166.38	73.01	0.38
Reach-1	33.05	100-yr	99.20	437.90	441.11		441.25	0.002817	1.70	64.98	39.15	0.38
Reach-1	33.05	50-yr	90.30	437.90	441.00		441.13	0.002820	1.64	60.82	36.39	0.38
Reach-1	33.05	20-yr	81.70	437.90	440.89		441.01	0.002835	1.58	56.77	35.78	0.37
Reach-1	33.05	10-yr	64.70	437.90	440.65		440.75	0.002888	1.45	48.34	34.49	0.37
Reach-1	33.05	5-yr	56.50	437.90	440.52		440.61	0.002956	1.38	43.90	33.78	0.37
Reach-1	33.05	2-yr	38.20	437.90	440.17		440.24	0.003438	1.24	32.48	31.91	0.38
Reach-1	33	Reg	276.90	437.80	441.61	441.61	442.72	0.014297	4.98	75.34	44.48	0.88
Reach-1	33	100-yr	99.20	437.80	440.62		440.99	0.007317	2.78	41.16	26.79	0.60
Reach-1	33	50-yr	90.30	437.80	440.54		440.88	0.006848	2.63	39.21	25.98	0.57
Reach-1	33	20-yr	81.70	437.80	440.47		440.77	0.006390	2.48	37.24	25.13	0.55
Reach-1	33	10-yr	64.70	437.80	440.29		440.52	0.005461	2.17	33.07	23.23	0.50
Reach-1	33	5-yr	56.50	437.80	440.19		440.39	0.005041	2.01	30.79	22.13	0.48
Reach-1	33	2-yr	38.20	437.80	439.89		440.03	0.004315	1.65	24.60	19.45	0.43
Reach-1	32.955	Reg	276.90	437.70	441.22	440.99	441.91	0.011812	3.78	84.50	53.23	0.79
Reach-1	32.955	100-yr	99.20	437.70	440.37		440.62	0.007368	2.21	46.02	37.48	0.58
Reach-1	32.955	50-yr	90.30	437.70	440.30		440.53	0.007244	2.12	43.34	36.02	0.57
Reach-1	32.955	20-yr	81.70	437.70	440.23		440.44	0.007148	2.03	40.66	34.50	0.56
Reach-1	32.955	10-yr	64.70	437.70	440.05		440.23	0.007080	1.85	35.06	31.09	0.55
Reach-1	32.955	5-yr	56.50	437.70	439.96		440.11	0.006997	1.76	32.11	29.30	0.54
Reach-1	32.955	2-yr	38.20	437.70	439.66		439.79	0.006525	1.58	24.19	24.60	0.51
Reach-1	32.88	Reg	276.90	437.40	440.94		441.21	0.005362	2.37	128.38	71.74	0.53
Reach-1	32.88	100-yr	99.20	437.40	439.94		440.08	0.006295	1.70	61.42	60.61	0.51
Reach-1	32.88	50-yr	90.30	437.40	439.86		440.00	0.006312	1.67	56.68	57.57	0.51
Reach-1	32.88	20-yr	81.70	437.40	439.77		439.91	0.006315	1.64	52.05	54.43	0.51
Reach-1	32.88	10-yr	64.70	437.40	439.60		439.72	0.006201	1.56	42.92	47.62	0.50
Reach-1	32.88	5-yr	56.50	437.40	439.50		439.61	0.006055	1.50	38.53	43.98	0.49
Reach-1	32.88	2-yr	38.20	437.40	439.23		439.33	0.005571	1.37	28.15	33.84	0.46
Reach-1	32.805	Reg	276.90	437.10	440.33		440.72	0.007531	2.91	115.92	79.04	0.63
Reach-1	32.805	100-yr	99.20	437.10	439.48		439.65	0.005337	1.81	57.98	54.81	0.49

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	32.805	50-yr	90.30	437.10	439.41		439.57	0.005226	1.74	54.36	52.44	0.48
Reach-1	32.805	20-yr	81.70	437.10	439.34		439.48	0.005155	1.67	50.67	49.92	0.47
Reach-1	32.805	10-yr	64.70	437.10	439.18		439.30	0.005095	1.52	43.01	44.23	0.46
Reach-1	32.805	5-yr	56.50	437.10	439.09		439.19	0.005125	1.45	39.17	41.08	0.46
Reach-1	32.805	2-yr	38.20	437.10	438.84		438.92	0.005114	1.28	29.88	35.14	0.44
Reach-1	32.7	Reg	276.90	436.60	439.83		440.09	0.005274	2.65	171.96	118.68	0.54
Reach-1	32.7	100-yr	99.20	436.60	439.02		439.17	0.004126	1.80	80.20	107.31	0.44
Reach-1	32.7	50-yr	90.30	436.60	438.95		439.09	0.004080	1.74	73.15	101.49	0.44
Reach-1	32.7	20-yr	81.70	436.60	438.88		439.01	0.004018	1.67	66.28	92.88	0.43
Reach-1	32.7	10-yr	64.70	436.60	438.73		438.84	0.003844	1.52	53.25	73.80	0.42
Reach-1	32.7	5-yr	56.50	436.60	438.64		438.74	0.003722	1.44	47.36	63.34	0.40
Reach-1	32.7	2-yr	38.20	436.60	438.39		438.47	0.003773	1.25	33.61	47.93	0.39
Reach-1	32.52	Reg	276.90	435.80	439.17		439.37	0.004249	2.15	193.14	170.77	0.47
Reach-1	32.52	100-yr	99.20	435.80	438.42		438.52	0.003397	1.44	77.05	90.15	0.39
Reach-1	32.52	50-yr	90.30	435.80	438.35		438.45	0.003315	1.38	71.71	84.84	0.38
Reach-1	32.52	20-yr	81.70	435.80	438.28		438.37	0.003336	1.33	65.65	78.39	0.38
Reach-1	32.52	10-yr	64.70	435.80	438.11		438.19	0.003479	1.23	53.61	63.63	0.38
Reach-1	32.52	5-yr	56.50	435.80	438.02		438.09	0.003578	1.18	48.18	55.72	0.38
Reach-1	32.52	2-yr	38.20	435.80	437.75		437.81	0.003524	1.07	35.84	41.81	0.37
Reach-1	32.43	Reg	276.90	435.40	438.95		439.07	0.003063	1.73	230.92	177.37	0.39
Reach-1	32.43	100-yr	99.20	435.40	438.09		438.19	0.004090	1.39	80.16	171.90	0.42
Reach-1	32.43	50-yr	90.30	435.40	438.02		438.11	0.004284	1.37	68.10	171.45	0.42
Reach-1	32.43	20-yr	81.70	435.40	437.94		438.03	0.004356	1.34	61.10	59.38	0.42
Reach-1	32.43	10-yr	64.70	435.40	437.75		437.83	0.004494	1.28	50.46	53.47	0.42
Reach-1	32.43	5-yr	56.50	435.40	437.64		437.72	0.004597	1.25	45.05	50.20	0.42
Reach-1	32.43	2-yr	38.20	435.40	437.36		437.43	0.005080	1.20	31.94	41.21	0.43
Reach-1	32.28	Reg	276.90	435.00	438.31		438.57	0.004675	2.51	181.93	156.98	0.51
Reach-1	32.28	100-yr	99.20	435.00	437.46		437.60	0.003728	1.70	68.89	88.23	0.42
Reach-1	32.28	50-yr	90.30	435.00	437.40		437.53	0.003527	1.62	64.06	81.52	0.41
Reach-1	32.28	20-yr	81.70	435.00	437.34		437.45	0.003387	1.54	58.84	73.57	0.40
Reach-1	32.28	10-yr	64.70	435.00	437.18		437.27	0.003127	1.38	48.69	54.93	0.37
Reach-1	32.28	5-yr	56.50	435.00	437.09		437.17	0.003014	1.29	44.17	44.18	0.36
Reach-1	32.28	2-yr	38.20	435.00	436.82		436.88	0.002717	1.09	34.92	32.22	0.34
Reach-1	32.2	Reg	276.90	434.70	438.03		438.20	0.003853	2.28	216.13	143.93	0.46
Reach-1	32.2	100-yr	99.20	434.70	437.13		437.27	0.004568	1.84	86.83	141.36	0.46
Reach-1	32.2	50-yr	90.30	434.70	437.06		437.21	0.004747	1.82	76.96	141.17	0.47
Reach-1	32.2	20-yr	81.70	434.70	436.99		437.13	0.004855	1.78	66.86	121.34	0.47
Reach-1	32.2	10-yr	64.70	434.70	436.82		436.96	0.005055	1.68	49.32	92.06	0.47
Reach-1	32.2	5-yr	56.50	434.70	436.73		436.86	0.005128	1.61	41.73	75.99	0.47
Reach-1	32.2	2-yr	38.20	434.70	436.48		436.58	0.005339	1.41	28.33	34.64	0.46
Reach-1	32.03	Reg	276.90	433.80	437.56		437.71	0.002788	2.00	223.15	155.86	0.39
Reach-1	32.03	100-yr	99.20	433.80	436.59		436.69	0.002752	1.46	84.09	105.60	0.36
Reach-1	32.03	50-yr	90.30	433.80	436.50		436.60	0.002784	1.42	75.73	96.21	0.36
Reach-1	32.03	20-yr	81.70	433.80	436.42		436.51	0.002820	1.37	67.86	86.44	0.36
Reach-1	32.03	10-yr	64.70	433.80	436.23		436.31	0.002881	1.27	53.63	65.18	0.36
Reach-1	32.03	5-yr	56.50	433.80	436.12		436.20	0.002959	1.22	47.30	53.03	0.36
Reach-1	32.03	2-yr	38.20	433.80	435.82		435.88	0.003215	1.10	34.82	36.30	0.36
Reach-1	31.915	Reg	276.90	433.20	437.32		437.46	0.002526	2.25	258.92	150.88	0.38
Reach-1	31.915	100-yr	99.20	433.20	436.37		436.45	0.001883	1.57	126.53	124.10	0.31
Reach-1	31.915	50-yr	90.30	433.20	436.27		436.36	0.001933	1.55	115.01	121.25	0.32
Reach-1	31.915	20-yr	81.70	433.20	436.17		436.26	0.002013	1.53	102.93	118.19	0.32
Reach-1	31.915	10-yr	64.70	433.20	435.94		436.03	0.002261	1.52	76.43	107.07	0.33
Reach-1	31.915	5-yr	56.50	433.20	435.81		435.90	0.002392	1.49	63.12	94.26	0.34
Reach-1	31.915	2-yr	38.20	433.20	435.44		435.54	0.002774	1.40	35.29	59.03	0.35
Reach-1	31.77	Reg	276.90	432.50	436.90		437.09	0.003707	2.64	218.70	139.96	0.46
Reach-1	31.77	100-yr	99.20	432.50	435.52	435.14	435.93	0.009232	2.93	44.93	71.59	0.66
Reach-1	31.77	50-yr	90.30	432.50	435.43	434.98	435.83	0.009205	2.85	39.24	60.00	0.66
Reach-1	31.77	20-yr	81.70	432.50	435.35	434.88	435.72	0.009012	2.73	34.63	48.60	0.64
Reach-1	31.77	10-yr	64.70	432.50	435.15		435.46	0.008584	2.47	27.09	29.04	0.62
Reach-1	31.77	5-yr	56.50	432.50	435.04		435.31	0.008276	2.32	24.46	19.52	0.60
Reach-1	31.77	2-yr	38.20	432.50	434.74		434.93	0.007038	1.94	19.66	14.94	0.54
Reach-1	31.68	Reg	318.60	432.00	436.42		436.68	0.003798	2.52	174.28	86.22	0.47
Reach-1	31.68	100-yr	115.40	432.00	435.24		435.37	0.003406	1.71	83.55	67.71	0.41
Reach-1	31.68	50-yr	105.10	432.00	435.13		435.26	0.003528	1.67	76.69	66.10	0.41
Reach-1	31.68	20-yr	95.00	432.00	435.03		435.15	0.003686	1.63	69.72	64.42	0.41

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	31.68	10-yr	75.40	432.00	434.78		434.90	0.003933	1.57	55.10	55.82	0.42
Reach-1	31.68	5-yr	65.90	432.00	434.65		434.77	0.004080	1.53	48.00	50.76	0.42
Reach-1	31.68	2-yr	44.70	432.00	434.29		434.39	0.004727	1.44	32.12	37.00	0.44
Reach-1	31.63	Reg	318.60	431.80	436.21		436.49	0.004028	3.00	201.47	102.01	0.50
Reach-1	31.63	100-yr	115.40	431.80	434.92		435.16	0.004596	2.41	79.04	77.95	0.50
Reach-1	31.63	50-yr	105.10	431.80	434.82		435.05	0.004700	2.36	70.85	72.11	0.50
Reach-1	31.63	20-yr	95.00	431.80	434.70		434.93	0.004773	2.30	63.20	66.19	0.50
Reach-1	31.63	10-yr	75.40	431.80	434.46		434.68	0.004915	2.16	48.82	53.31	0.50
Reach-1	31.63	5-yr	65.90	431.80	434.34		434.54	0.004903	2.06	42.54	46.58	0.49
Reach-1	31.63	2-yr	44.70	431.80	434.01		434.16	0.004679	1.76	30.04	28.85	0.46
Reach-1	31.58	Reg	318.60	431.70	436.06		436.30	0.003126	2.58	204.99	98.50	0.43
Reach-1	31.58	100-yr	115.40	431.70	434.81		434.96	0.002832	1.85	89.38	79.13	0.39
Reach-1	31.58	50-yr	105.10	431.70	434.70		434.85	0.002868	1.80	80.90	73.34	0.38
Reach-1	31.58	20-yr	95.00	431.70	434.59		434.73	0.002882	1.74	73.01	67.51	0.38
Reach-1	31.58	10-yr	75.40	431.70	434.34		434.46	0.002924	1.62	57.96	54.70	0.38
Reach-1	31.58	5-yr	65.90	431.70	434.21		434.33	0.002897	1.54	51.41	48.07	0.37
Reach-1	31.58	2-yr	44.70	431.70	433.87		433.96	0.002839	1.32	37.72	35.07	0.36
Reach-1	31.52	Reg	316.40	431.50	435.81		436.09	0.003681	2.82	198.72	111.23	0.48
Reach-1	31.52	100-yr	117.60	431.50	434.64		434.79	0.002848	1.90	89.97	65.39	0.39
Reach-1	31.52	50-yr	106.90	431.50	434.53		434.67	0.002856	1.84	82.84	63.06	0.39
Reach-1	31.52	20-yr	96.70	431.50	434.41		434.55	0.002873	1.79	75.84	60.68	0.39
Reach-1	31.52	10-yr	77.00	431.50	434.16		434.28	0.003029	1.69	60.88	55.26	0.39
Reach-1	31.52	5-yr	67.70	431.50	434.02		434.14	0.003137	1.64	53.57	52.41	0.39
Reach-1	31.52	2-yr	46.00	431.50	433.67		433.77	0.003354	1.46	36.93	41.66	0.39
Reach-1	31.46	Reg	316.40	431.30	435.65		435.88	0.003021	2.53	227.23	129.54	0.43
Reach-1	31.46	100-yr	117.60	431.30	434.45		434.62	0.002942	1.90	90.70	90.83	0.40
Reach-1	31.46	50-yr	106.90	431.30	434.33		434.49	0.003063	1.87	80.03	85.25	0.40
Reach-1	31.46	20-yr	96.70	431.30	434.21		434.37	0.003177	1.84	70.01	79.66	0.40
Reach-1	31.46	10-yr	77.00	431.30	433.95		434.09	0.003328	1.72	52.05	42.91	0.40
Reach-1	31.46	5-yr	67.70	431.30	433.81		433.95	0.003399	1.65	46.40	40.05	0.40
Reach-1	31.46	2-yr	46.00	431.30	433.46		433.56	0.003586	1.45	33.45	32.56	0.40
Reach-1	31.34	Reg	316.40	430.40	434.46	434.46	435.19	0.011567	4.24	122.05	91.28	0.80
Reach-1	31.34	100-yr	117.60	430.40	433.24	433.12	433.87	0.016605	3.52	35.13	35.80	0.87
Reach-1	31.34	50-yr	106.90	430.40	433.17	432.99	433.74	0.015845	3.34	32.87	31.39	0.85
Reach-1	31.34	20-yr	96.70	430.40	433.10	432.90	433.62	0.015189	3.17	30.78	26.66	0.82
Reach-1	31.34	10-yr	77.00	430.40	432.93		433.34	0.014003	2.85	27.02	19.65	0.78
Reach-1	31.34	5-yr	67.70	430.40	432.83		433.20	0.013405	2.70	25.07	19.15	0.75
Reach-1	31.34	2-yr	46.00	430.40	432.53		432.81	0.012524	2.34	19.62	17.67	0.71
Reach-1	31.215	Reg	316.40	429.80	433.77		434.02	0.003857	2.58	207.64	128.58	0.47
Reach-1	31.215	100-yr	117.60	429.80	432.83		432.98	0.003072	1.80	91.69	106.34	0.40
Reach-1	31.215	50-yr	106.90	429.80	432.76		432.90	0.002975	1.73	83.76	99.09	0.39
Reach-1	31.215	20-yr	96.70	429.80	432.68		432.81	0.002877	1.66	76.14	91.58	0.38
Reach-1	31.215	10-yr	77.00	429.80	432.50		432.61	0.002662	1.50	61.45	75.00	0.36
Reach-1	31.215	5-yr	67.70	429.80	432.39		432.49	0.002624	1.42	53.77	64.66	0.35
Reach-1	31.215	2-yr	46.00	429.80	432.08		432.16	0.002482	1.21	38.38	35.88	0.33
Reach-1	31.06	Reg	316.40	429.40	433.51		433.61	0.001725	1.85	347.13	190.17	0.32
Reach-1	31.06	100-yr	117.60	429.40	432.64		432.69	0.001137	1.23	188.09	163.77	0.25
Reach-1	31.06	50-yr	106.90	429.40	432.57		432.61	0.001093	1.18	176.33	159.70	0.24
Reach-1	31.06	20-yr	96.70	429.40	432.49		432.53	0.001054	1.13	164.27	155.41	0.24
Reach-1	31.06	10-yr	77.00	429.40	432.32		432.36	0.000988	1.04	138.37	145.78	0.23
Reach-1	31.06	5-yr	67.70	429.40	432.20		432.24	0.001026	1.02	121.11	138.99	0.23
Reach-1	31.06	2-yr	46.00	429.40	431.86		431.90	0.001160	0.96	77.66	112.97	0.24
Reach-1	30.85	Reg	316.40	428.90	433.10		433.23	0.002432	2.20	336.28	244.31	0.38
Reach-1	30.85	100-yr	117.60	428.90	432.34		432.43	0.001683	1.55	162.54	210.18	0.30
Reach-1	30.85	50-yr	106.90	428.90	432.27		432.36	0.001643	1.51	148.61	207.17	0.30
Reach-1	30.85	20-yr	96.70	428.90	432.20		432.28	0.001625	1.47	133.43	203.85	0.29
Reach-1	30.85	10-yr	77.00	428.90	432.02		432.11	0.001622	1.40	98.99	196.10	0.29
Reach-1	30.85	5-yr	67.70	428.90	431.90		431.98	0.001596	1.34	79.65	137.81	0.29
Reach-1	30.85	2-yr	46.00	428.90	431.56		431.63	0.001518	1.17	45.73	59.96	0.27
Reach-1	30.54	Reg	316.40	428.20	432.70		432.76	0.001370	1.46	451.89	322.17	0.28
Reach-1	30.54	100-yr	117.60	428.20	431.33	430.86	431.54	0.006934	2.10	74.99	170.22	0.56
Reach-1	30.54	50-yr	106.90	428.20	431.24	430.78	431.46	0.007419	2.08	61.87	135.35	0.57
Reach-1	30.54	20-yr	96.70	428.20	431.16	430.69	431.37	0.007695	2.04	52.31	102.74	0.58
Reach-1	30.54	10-yr	77.00	428.20	431.00		431.18	0.007742	1.87	41.16	38.75	0.57
Reach-1	30.54	5-yr	67.70	428.20	430.91		431.08	0.007373	1.79	37.91	35.20	0.55

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	30.54	2-yr	46.00	428.20	430.66		430.78	0.006269	1.56	29.55	29.80	0.50
Reach-1	30.36	Reg	316.40	427.80	432.51		432.57	0.000878	1.40	413.35	196.88	0.23
Reach-1	30.36	100-yr	117.60	427.80	430.96		431.02	0.001412	1.24	152.76	140.92	0.27
Reach-1	30.36	50-yr	106.90	427.80	430.83		430.90	0.001525	1.23	135.78	135.01	0.28
Reach-1	30.36	20-yr	96.70	427.80	430.71		430.78	0.001642	1.23	120.02	129.29	0.29
Reach-1	30.36	10-yr	77.00	427.80	430.48		430.55	0.001870	1.20	91.19	118.10	0.30
Reach-1	30.36	5-yr	67.70	427.80	430.37		430.43	0.001976	1.18	78.01	112.62	0.30
Reach-1	30.36	2-yr	46.00	427.80	430.05		430.11	0.002356	1.10	44.59	97.34	0.32
Reach-1	30.28	Reg	316.40	427.40	432.46		432.51	0.000580	1.08	419.98	191.20	0.19
Reach-1	30.28	100-yr	117.60	427.40	430.89		430.92	0.000895	0.88	163.22	133.20	0.21
Reach-1	30.28	50-yr	106.90	427.40	430.76		430.79	0.000980	0.87	146.27	127.75	0.22
Reach-1	30.28	20-yr	96.70	427.40	430.63		430.67	0.001077	0.87	130.40	122.42	0.22
Reach-1	30.28	10-yr	77.00	427.40	430.38		430.41	0.001319	0.85	100.94	111.86	0.24
Reach-1	30.28	5-yr	67.70	427.40	430.25		430.29	0.001483	0.84	87.19	106.57	0.25
Reach-1	30.28	2-yr	46.00	427.40	429.88		429.91	0.002352	0.86	53.54	63.84	0.30
Reach-1	30.125	Reg	316.40	426.80	432.41	430.43	432.43	0.000338	1.00	698.84	287.04	0.15
Reach-1	30.125	100-yr	117.60	426.80	430.45	429.17	430.62	0.002484	1.87	62.92	208.93	0.37
Reach-1	30.125	50-yr	106.90	426.80	430.34	429.09	430.50	0.002368	1.77	60.28	206.73	0.36
Reach-1	30.125	20-yr	96.70	426.80	430.23	429.01	430.37	0.002244	1.68	57.68	204.56	0.35
Reach-1	30.125	10-yr	77.00	426.80	430.02	428.81	430.13	0.001935	1.46	52.59	200.33	0.32
Reach-1	30.125	5-yr	67.70	426.80	429.91	428.70	430.00	0.001768	1.35	50.02	167.30	0.30
Reach-1	30.125	2-yr	46.00	426.80	429.54	428.43	429.61	0.001555	1.12	41.23	108.42	0.27
Reach-1	30.098	Reg	384.20	426.70	432.39	430.71	432.42	0.000483	1.20	723.80	310.30	0.18
Reach-1	30.098	100-yr	138.20	426.70	430.20	429.28	430.48	0.004345	2.33	59.24	202.85	0.48
Reach-1	30.098	50-yr	125.70	426.70	430.12	429.19	430.36	0.004050	2.20	57.16	199.04	0.46
Reach-1	30.098	20-yr	113.70	426.70	430.03	429.10	430.25	0.003743	2.06	55.11	195.25	0.44
Reach-1	30.098	10-yr	91.00	426.70	429.87	428.90	430.03	0.003110	1.79	50.97	174.31	0.40
Reach-1	30.098	5-yr	80.10	426.70	429.78	428.79	429.92	0.002775	1.64	48.86	161.86	0.37
Reach-1	30.098	2-yr	54.40	426.70	429.45	428.47	429.54	0.002370	1.34	40.61	44.58	0.33
Reach-1	30.094		Bridge									
Reach-1	30.09	Reg	384.20	426.70	431.13	430.70	432.24	0.011278	4.67	82.18	273.03	0.82
Reach-1	30.09	100-yr	138.20	426.70	430.13	429.28	430.42	0.004816	2.41	57.44	199.56	0.50
Reach-1	30.09	50-yr	125.70	426.70	430.05	429.19	430.31	0.004450	2.26	55.57	196.10	0.48
Reach-1	30.09	20-yr	113.70	426.70	429.98	429.10	430.21	0.004080	2.12	53.70	190.41	0.46
Reach-1	30.09	10-yr	91.00	426.70	429.82	428.90	429.99	0.003332	1.82	49.93	168.16	0.41
Reach-1	30.09	5-yr	80.10	426.70	429.74	428.79	429.89	0.002952	1.67	47.96	156.55	0.38
Reach-1	30.09	2-yr	54.40	426.70	429.42	428.47	429.51	0.002518	1.36	39.88	43.28	0.34
Reach-1	30.065	Reg	384.20	426.70	431.24	430.37	431.33	0.001977	1.62	395.14	274.77	0.33
Reach-1	30.065	100-yr	138.20	426.70	430.02	429.49	430.19	0.006147	1.82	75.84	198.67	0.52
Reach-1	30.065	50-yr	125.70	426.70	429.95	429.39	430.11	0.006257	1.76	71.26	189.84	0.52
Reach-1	30.065	20-yr	113.70	426.70	429.87	429.29	430.02	0.006359	1.70	66.77	178.17	0.52
Reach-1	30.065	10-yr	91.00	426.70	429.72	428.99	429.85	0.006566	1.57	57.86	155.00	0.51
Reach-1	30.065	5-yr	80.10	426.70	429.65	428.87	429.76	0.006693	1.50	53.29	124.95	0.51
Reach-1	30.065	2-yr	54.40	426.70	429.31	428.56	429.42	0.005572	1.47	37.07	37.54	0.47
Reach-1	29.93	Reg	384.20	426.30	430.97		431.07	0.001743	1.93	392.24	195.28	0.33
Reach-1	29.93	100-yr	138.20	426.30	429.61		429.70	0.002339	1.62	155.20	151.17	0.35
Reach-1	29.93	50-yr	125.70	426.30	429.51		429.60	0.002436	1.61	140.46	147.42	0.35
Reach-1	29.93	20-yr	113.70	426.30	429.41		429.50	0.002564	1.60	125.51	143.51	0.36
Reach-1	29.93	10-yr	91.00	426.30	429.19		429.29	0.002954	1.58	94.77	135.13	0.38
Reach-1	29.93	5-yr	80.10	426.30	429.08		429.18	0.003102	1.56	80.62	131.09	0.38
Reach-1	29.93	2-yr	54.40	426.30	428.72		428.82	0.003678	1.51	47.36	66.65	0.41
Reach-1	29.77	Reg	384.20	425.90	430.09		430.59	0.005989	3.35	152.28	74.68	0.59
Reach-1	29.77	100-yr	138.20	425.90	429.08		429.26	0.003247	1.93	84.84	60.06	0.41
Reach-1	29.77	50-yr	125.70	425.90	429.00		429.16	0.003092	1.83	79.95	58.98	0.40
Reach-1	29.77	20-yr	113.70	425.90	428.91		429.06	0.002911	1.74	75.08	56.44	0.38
Reach-1	29.77	10-yr	91.00	425.90	428.72		428.84	0.002609	1.55	64.78	50.67	0.36
Reach-1	29.77	5-yr	80.10	425.90	428.66		428.76	0.002275	1.42	61.57	48.74	0.33
Reach-1	29.77	2-yr	54.40	425.90	428.28		428.36	0.002240	1.23	45.32	37.42	0.32
Reach-1	29.645	Reg	384.20	425.70	429.86		430.02	0.002598	2.26	316.00	175.49	0.39
Reach-1	29.645	100-yr	138.20	425.70	428.80		428.91	0.002207	1.62	141.02	147.03	0.34
Reach-1	29.645	50-yr	125.70	425.70	428.72		428.82	0.002161	1.57	129.63	141.91	0.33
Reach-1	29.645	20-yr	113.70	425.70	428.64		428.74	0.002099	1.51	118.71	136.82	0.33
Reach-1	29.645	10-yr	91.00	425.70	428.45		428.54	0.002090	1.42	93.66	124.34	0.32
Reach-1	29.645	5-yr	80.10	425.70	428.43		428.51	0.001691	1.27	91.38	123.15	0.29

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	29.645	2-yr	54.40	425.70	428.00		428.08	0.002242	1.23	44.13	29.00	0.32
Reach-1	29.415	Reg	384.20	424.90	429.54		429.61	0.001194	1.63	509.40	287.79	0.27
Reach-1	29.415	100-yr	138.20	424.90	428.55		428.59	0.000873	1.13	247.83	234.94	0.22
Reach-1	29.415	50-yr	125.70	424.90	428.47		428.52	0.000842	1.09	231.12	230.74	0.22
Reach-1	29.415	20-yr	113.70	424.90	428.41		428.45	0.000801	1.04	215.48	226.74	0.21
Reach-1	29.415	10-yr	91.00	424.90	428.21		428.25	0.000817	1.00	171.34	215.05	0.21
Reach-1	29.415	5-yr	80.10	424.90	428.26		428.29	0.000553	0.83	183.59	218.36	0.17
Reach-1	29.415	2-yr	54.40	424.90	427.72		427.75	0.000909	0.90	86.36	124.02	0.21
Reach-1	29.255	Reg	384.20	424.70	429.41		429.48	0.000987	1.60	488.95	223.49	0.25
Reach-1	29.255	100-yr	138.20	424.70	428.47		428.50	0.000481	0.94	290.03	195.00	0.17
Reach-1	29.255	50-yr	125.70	424.70	428.41		428.43	0.000444	0.89	276.99	192.40	0.16
Reach-1	29.255	20-yr	113.70	424.70	428.34		428.37	0.000404	0.83	264.90	189.95	0.15
Reach-1	29.255	10-yr	91.00	424.70	428.15		428.17	0.000366	0.76	228.28	182.35	0.14
Reach-1	29.255	5-yr	80.10	424.70	428.22		428.24	0.000247	0.64	242.30	185.30	0.12
Reach-1	29.255	2-yr	54.40	424.70	427.65		427.67	0.000362	0.66	142.28	164.18	0.14
Reach-1	29.203	Reg	384.20	424.50	429.35		429.42	0.000977	1.48	444.49	224.48	0.25
Reach-1	29.203	100-yr	138.20	424.50	428.45		428.48	0.000454	0.84	258.39	189.41	0.16
Reach-1	29.203	50-yr	125.70	424.50	428.38		428.41	0.000419	0.79	246.19	186.88	0.15
Reach-1	29.203	20-yr	113.70	424.50	428.32		428.34	0.000380	0.74	234.94	184.51	0.15
Reach-1	29.203	10-yr	91.00	424.50	428.13		428.15	0.000344	0.67	199.88	176.95	0.14
Reach-1	29.203	5-yr	80.10	424.50	428.21		428.22	0.000229	0.56	214.66	180.18	0.11
Reach-1	29.203	2-yr	54.40	424.50	427.63		427.65	0.000316	0.55	122.72	128.41	0.13
Reach-1	29.198	Reg	384.20	424.50	429.35		429.41	0.002501	2.86	431.33	224.48	0.42
Reach-1	29.198	100-yr	138.20	424.50	428.43		428.47	0.001642	2.02	242.72	188.89	0.33
Reach-1	29.198	50-yr	125.70	424.50	428.37		428.40	0.001574	1.95	230.32	186.31	0.32
Reach-1	29.198	20-yr	113.70	424.50	428.31		428.34	0.001483	1.88	218.97	183.92	0.31
Reach-1	29.198	10-yr	91.00	424.50	428.10		428.14	0.001569	1.86	182.73	176.07	0.31
Reach-1	29.198	5-yr	80.10	424.50	428.20		428.22	0.000955	1.48	199.41	179.72	0.25
Reach-1	29.198	2-yr	54.40	424.50	427.59		427.64	0.002009	1.90	103.82	119.89	0.35
Reach-1	29.191	Reg	384.20	424.50	429.33		429.39	0.002574	2.90	426.95	223.71	0.42
Reach-1	29.191	100-yr	138.20	424.50	428.42		428.46	0.001689	2.04	240.32	188.39	0.33
Reach-1	29.191	50-yr	125.70	424.50	428.35		428.39	0.001618	1.98	228.05	185.83	0.32
Reach-1	29.191	20-yr	113.70	424.50	428.29		428.33	0.001524	1.90	216.87	183.47	0.31
Reach-1	29.191	10-yr	91.00	424.50	428.09		428.13	0.001622	1.89	180.54	175.58	0.32
Reach-1	29.191	5-yr	80.10	424.50	428.19		428.21	0.000973	1.49	198.13	179.44	0.25
Reach-1	29.191	2-yr	54.40	424.50	427.57		427.62	0.002019	1.90	102.17	114.70	0.35
Reach-1	29.19	Reg	384.20	424.50	429.30		429.39	0.001030	1.51	434.95	222.81	0.25
Reach-1	29.19	100-yr	138.20	424.50	428.42		428.45	0.000472	0.85	254.01	188.50	0.16
Reach-1	29.19	50-yr	125.70	424.50	428.36		428.39	0.000436	0.80	241.85	185.97	0.16
Reach-1	29.19	20-yr	113.70	424.50	428.30		428.32	0.000395	0.75	230.74	183.63	0.15
Reach-1	29.19	10-yr	91.00	424.50	428.10		428.12	0.000363	0.68	194.90	175.85	0.14
Reach-1	29.19	5-yr	80.10	424.50	428.19		428.21	0.000236	0.56	211.87	179.57	0.11
Reach-1	29.19	2-yr	54.40	424.50	427.59		427.60	0.000345	0.57	117.11	120.33	0.13
Reach-1	29.167	Reg	384.20	424.40	429.17		429.33	0.002330	2.20	348.50	224.33	0.38
Reach-1	29.167	100-yr	138.20	424.40	428.35		428.42	0.001224	1.34	181.64	181.31	0.26
Reach-1	29.167	50-yr	125.70	424.40	428.29		428.36	0.001139	1.27	170.87	178.01	0.25
Reach-1	29.167	20-yr	113.70	424.40	428.24		428.30	0.001038	1.20	161.34	175.04	0.24
Reach-1	29.167	10-yr	91.00	424.40	428.04		428.10	0.000999	1.11	127.93	164.21	0.23
Reach-1	29.167	5-yr	80.10	424.40	428.16		428.19	0.000604	0.90	147.86	170.75	0.18
Reach-1	29.167	2-yr	54.40	424.40	427.54		427.58	0.000923	0.92	73.22	89.14	0.21
Reach-1	29.166	Reg	384.20	424.40	429.18		429.31	0.005116	4.06	343.39	224.70	0.59
Reach-1	29.166	100-yr	138.20	424.40	428.23	427.84	428.39	0.005490	3.63	153.80	174.88	0.59
Reach-1	29.166	50-yr	125.70	424.40	428.03	427.83	428.30	0.008236	4.29	119.57	163.76	0.72
Reach-1	29.166	20-yr	113.70	424.40	428.03		428.25	0.006872	3.91	118.53	163.42	0.66
Reach-1	29.166	10-yr	91.00	424.40	427.91	427.62	428.06	0.004982	3.26	103.41	115.37	0.56
Reach-1	29.166	5-yr	80.10	424.40	428.09	426.96	428.18	0.002809	2.53	129.01	166.90	0.42
Reach-1	29.166	2-yr	54.40	424.40	427.08	426.92	427.48	0.011696	4.17	35.99	38.59	0.81
Reach-1	29.161	Reg	384.20	424.40	429.14		429.28	0.005501	4.19	334.62	223.01	0.61
Reach-1	29.161	100-yr	138.20	424.40	427.84	427.84	428.27	0.013517	5.30	96.07	110.69	0.91
Reach-1	29.161	50-yr	125.70	424.40	427.83	427.83	428.20	0.011449	4.87	95.04	110.01	0.84
Reach-1	29.161	20-yr	113.70	424.40	427.77	427.77	428.13	0.010923	4.70	88.53	105.67	0.82
Reach-1	29.161	10-yr	91.00	424.40	427.62	427.62	427.97	0.010404	4.45	73.23	94.67	0.79
Reach-1	29.161	5-yr	80.10	424.40	426.96	426.96	427.89	0.028834	6.36	32.17	29.68	1.27
Reach-1	29.161	2-yr	54.40	424.40	426.92	426.92	427.39	0.014500	4.46	31.09	29.39	0.90

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	29.16	Reg	384.20	424.40	429.10		429.27	0.002566	2.28	334.88	221.31	0.39
Reach-1	29.16	100-yr	138.20	424.40	427.77		427.95	0.003713	1.98	95.79	106.95	0.44
Reach-1	29.16	50-yr	125.70	424.40	427.67		427.85	0.003741	1.93	85.86	99.84	0.43
Reach-1	29.16	20-yr	113.70	424.40	427.58		427.75	0.003758	1.87	76.47	92.63	0.43
Reach-1	29.16	10-yr	91.00	424.40	427.37		427.52	0.003724	1.73	59.53	72.53	0.42
Reach-1	29.16	5-yr	80.10	424.40	427.26		427.40	0.003684	1.65	52.17	59.87	0.41
Reach-1	29.16	2-yr	54.40	424.40	426.95		427.05	0.003508	1.40	38.80	29.57	0.39
Reach-1	29.09	Reg	384.20	424.30	428.57		428.96	0.006745	3.17	186.17	108.29	0.61
Reach-1	29.09	100-yr	138.20	424.30	427.42		427.63	0.005838	2.23	84.74	71.42	0.53
Reach-1	29.09	50-yr	125.70	424.30	427.32		427.53	0.005851	2.18	77.96	69.00	0.53
Reach-1	29.09	20-yr	113.70	424.30	427.22		427.42	0.005881	2.14	71.20	66.51	0.53
Reach-1	29.09	10-yr	91.00	424.30	427.00		427.20	0.006090	2.05	57.28	61.05	0.53
Reach-1	29.09	5-yr	80.10	424.30	426.88		427.07	0.006182	1.99	50.35	56.24	0.53
Reach-1	29.09	2-yr	54.40	424.30	426.55		426.71	0.006556	1.84	33.81	42.51	0.53
Reach-1	29.034	Reg	384.20	424.00	428.38		428.60	0.003086	2.49	257.83	138.03	0.43
Reach-1	29.034	100-yr	138.20	424.00	427.22		427.36	0.002558	1.72	114.79	109.55	0.37
Reach-1	29.034	50-yr	125.70	424.00	427.12		427.25	0.002583	1.68	104.03	107.06	0.36
Reach-1	29.034	20-yr	113.70	424.00	427.02		427.15	0.002617	1.64	93.14	104.49	0.36
Reach-1	29.034	10-yr	91.00	424.00	426.80		426.92	0.002619	1.52	72.68	82.69	0.36
Reach-1	29.034	5-yr	80.10	424.00	426.69		426.79	0.002589	1.45	63.86	70.23	0.35
Reach-1	29.034	2-yr	54.40	424.00	426.35		426.43	0.002546	1.25	45.71	44.45	0.34
Reach-1	28.955	Reg	384.20	423.70	427.88	427.53	428.28	0.005647	3.30	211.48	141.44	0.58
Reach-1	28.955	100-yr	138.20	423.70	426.79		427.07	0.005111	2.41	74.45	89.99	0.51
Reach-1	28.955	50-yr	125.70	423.70	426.71		426.97	0.004826	2.29	68.29	80.23	0.50
Reach-1	28.955	20-yr	113.70	423.70	426.64		426.87	0.004527	2.17	62.64	70.09	0.48
Reach-1	28.955	10-yr	91.00	423.70	426.48		426.66	0.003867	1.90	53.22	50.36	0.44
Reach-1	28.955	5-yr	80.10	423.70	426.39		426.55	0.003539	1.77	49.02	45.54	0.41
Reach-1	28.955	2-yr	54.40	423.70	426.11		426.22	0.002858	1.43	38.48	30.25	0.36
Reach-1	28.885	Reg	384.20	423.40	427.25		427.77	0.008917	3.62	165.79	112.68	0.71
Reach-1	28.885	100-yr	138.20	423.40	426.57		426.73	0.003772	1.93	97.81	89.57	0.44
Reach-1	28.885	50-yr	125.70	423.40	426.50		426.65	0.003545	1.84	92.36	88.10	0.42
Reach-1	28.885	20-yr	113.70	423.40	426.44		426.57	0.003324	1.74	86.77	84.12	0.41
Reach-1	28.885	10-yr	91.00	423.40	426.30		426.41	0.002883	1.54	75.75	75.26	0.37
Reach-1	28.885	5-yr	80.10	423.40	426.22		426.32	0.002667	1.43	70.13	70.32	0.36
Reach-1	28.885	2-yr	54.40	423.40	425.96		426.03	0.002347	1.21	53.67	54.48	0.33
Reach-1	28.73	Reg	384.20	422.80	427.01		427.06	0.001462	1.47	562.44	377.61	0.28
Reach-1	28.73	100-yr	138.20	422.80	425.95		426.04	0.003462	1.62	180.41	336.22	0.40
Reach-1	28.73	50-yr	125.70	422.80	425.89		425.99	0.003573	1.61	160.94	324.97	0.41
Reach-1	28.73	20-yr	113.70	422.80	425.83		425.93	0.003653	1.59	142.62	314.02	0.41
Reach-1	28.73	10-yr	91.00	422.80	425.70		425.81	0.004013	1.57	102.47	288.57	0.42
Reach-1	28.73	5-yr	80.10	422.80	425.63		425.74	0.004137	1.54	82.90	275.32	0.42
Reach-1	28.73	2-yr	54.40	422.80	425.42		425.51	0.003872	1.34	44.24	56.11	0.40
Reach-1	28.565	Reg	384.20	422.30	426.86		426.89	0.000720	1.10	717.12	391.79	0.20
Reach-1	28.565	100-yr	138.20	422.30	425.64		425.67	0.001452	1.10	268.67	332.85	0.26
Reach-1	28.565	50-yr	125.70	422.30	425.56		425.60	0.001545	1.11	243.53	327.13	0.27
Reach-1	28.565	20-yr	113.70	422.30	425.49		425.52	0.001641	1.11	219.40	321.55	0.28
Reach-1	28.565	10-yr	91.00	422.30	425.33		425.36	0.001766	1.07	169.62	288.64	0.28
Reach-1	28.565	5-yr	80.10	422.30	425.24		425.28	0.001829	1.05	146.81	258.41	0.29
Reach-1	28.565	2-yr	54.40	422.30	424.99		425.03	0.002153	1.00	93.46	169.21	0.30
Reach-1	28.3	Reg	384.20	421.80	426.60		426.66	0.001168	1.53	438.44	189.15	0.27
Reach-1	28.3	100-yr	138.20	421.80	425.25		425.30	0.001500	1.24	194.48	172.98	0.28
Reach-1	28.3	50-yr	125.70	421.80	425.15		425.21	0.001571	1.23	177.71	171.82	0.28
Reach-1	28.3	20-yr	113.70	421.80	425.05		425.11	0.001660	1.22	160.78	170.63	0.29
Reach-1	28.3	10-yr	91.00	421.80	424.84		424.90	0.001854	1.22	125.34	167.17	0.30
Reach-1	28.3	5-yr	80.10	421.80	424.73		424.79	0.001973	1.23	106.50	165.13	0.31
Reach-1	28.3	2-yr	54.40	421.80	424.39		424.46	0.002248	1.19	57.58	94.38	0.32
Reach-1	27.9	Reg	384.20	420.80	426.19		426.27	0.001226	1.70	427.95	203.80	0.28
Reach-1	27.9	100-yr	138.20	420.80	424.76		424.82	0.001246	1.30	182.37	139.71	0.26
Reach-1	27.9	50-yr	125.70	420.80	424.65		424.71	0.001233	1.27	167.67	134.24	0.26
Reach-1	27.9	20-yr	113.70	420.80	424.54		424.60	0.001219	1.24	153.11	128.59	0.25
Reach-1	27.9	10-yr	91.00	420.80	424.31		424.36	0.001186	1.17	124.56	116.72	0.25
Reach-1	27.9	5-yr	80.10	420.80	424.18		424.23	0.001172	1.13	109.95	110.15	0.24
Reach-1	27.9	2-yr	54.40	420.80	423.79		423.84	0.001172	1.03	71.15	84.05	0.24
Reach-1	27.763	Reg	384.20	420.60	425.90		426.06	0.001850	2.25	328.26	159.53	0.35
Reach-1	27.763	100-yr	138.20	420.60	424.56		424.64	0.001338	1.49	152.03	108.00	0.28

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	27.763	50-yr	125.70	420.60	424.46		424.54	0.001298	1.44	141.36	105.30	0.27
Reach-1	27.763	20-yr	113.70	420.60	424.35		424.43	0.001261	1.38	130.55	102.49	0.27
Reach-1	27.763	10-yr	91.00	420.60	424.13		424.20	0.001183	1.27	108.73	96.57	0.25
Reach-1	27.763	5-yr	80.10	420.60	424.01		424.07	0.001150	1.21	97.09	93.26	0.25
Reach-1	27.763	2-yr	54.40	420.60	423.63		423.68	0.001080	1.04	66.22	68.93	0.23
Reach-1	27.6	Reg	384.20	420.30	425.59		425.75	0.002060	2.24	310.90	149.01	0.36
Reach-1	27.6	100-yr	138.20	420.30	424.31		424.41	0.001627	1.54	137.98	101.20	0.30
Reach-1	27.6	50-yr	125.70	420.30	424.22		424.31	0.001558	1.47	129.17	95.23	0.29
Reach-1	27.6	20-yr	113.70	420.30	424.13		424.21	0.001490	1.41	120.53	89.00	0.28
Reach-1	27.6	10-yr	91.00	420.30	423.93		424.00	0.001348	1.27	104.01	79.61	0.26
Reach-1	27.6	5-yr	80.10	420.30	423.81		423.88	0.001300	1.20	94.87	78.16	0.26
Reach-1	27.6	2-yr	54.40	420.30	423.43		423.49	0.001343	1.08	65.98	73.40	0.25
Reach-1	27.5	Reg	452.70	420.20	425.13		425.45	0.004032	2.89	275.37	170.62	0.49
Reach-1	27.5	100-yr	158.80	420.20	424.03		424.19	0.002769	1.86	118.27	111.70	0.38
Reach-1	27.5	50-yr	144.60	420.20	423.96		424.11	0.002612	1.77	110.36	106.73	0.37
Reach-1	27.5	20-yr	130.80	420.20	423.88		424.02	0.002451	1.68	102.48	100.81	0.36
Reach-1	27.5	10-yr	105.10	420.20	423.72		423.82	0.002151	1.50	86.83	87.87	0.33
Reach-1	27.5	5-yr	92.60	420.20	423.61		423.71	0.002026	1.40	78.32	79.96	0.32
Reach-1	27.5	2-yr	62.80	420.20	423.25		423.32	0.001956	1.20	54.32	51.47	0.30
Reach-1	27.36	Reg	452.70	419.90	424.78		424.98	0.003554	2.58	326.29	178.96	0.46
Reach-1	27.36	100-yr	158.80	419.90	423.52		423.72	0.004800	2.16	119.74	150.28	0.49
Reach-1	27.36	50-yr	144.60	419.90	423.44		423.64	0.004986	2.14	106.72	148.23	0.49
Reach-1	27.36	20-yr	130.80	419.90	423.35		423.55	0.005194	2.12	93.47	146.12	0.50
Reach-1	27.36	10-yr	105.10	419.90	423.16	422.50	423.37	0.005587	2.05	67.06	141.81	0.51
Reach-1	27.36	5-yr	92.60	419.90	423.06	422.38	423.26	0.005691	1.98	53.15	139.48	0.51
Reach-1	27.36	2-yr	62.80	419.90	422.77		422.91	0.004820	1.67	37.66	27.91	0.46
Reach-1	27.25	Reg	452.70	419.60	424.37		424.61	0.003709	2.84	288.73	128.49	0.48
Reach-1	27.25	100-yr	158.80	419.60	423.22		423.34	0.002513	1.82	151.79	111.36	0.37
Reach-1	27.25	50-yr	144.60	419.60	423.14		423.25	0.002430	1.75	142.86	110.15	0.36
Reach-1	27.25	20-yr	130.80	419.60	423.06		423.16	0.002349	1.68	133.68	108.90	0.35
Reach-1	27.25	10-yr	105.10	419.60	422.88		422.98	0.002220	1.55	114.66	107.59	0.34
Reach-1	27.25	5-yr	92.60	419.60	422.78		422.87	0.002189	1.49	103.72	107.24	0.33
Reach-1	27.25	2-yr	62.80	419.60	422.42		422.52	0.002607	1.43	65.63	105.99	0.35
Reach-1	27	Reg	452.70	419.00	423.93		424.07	0.001919	2.20	421.67	215.02	0.35
Reach-1	27	100-yr	158.80	419.00	422.86		422.94	0.001315	1.48	202.24	196.31	0.27
Reach-1	27	50-yr	144.60	419.00	422.79		422.87	0.001251	1.42	188.60	195.15	0.27
Reach-1	27	20-yr	130.80	419.00	422.72		422.79	0.001183	1.36	174.60	193.95	0.26
Reach-1	27	10-yr	105.10	419.00	422.56		422.63	0.001051	1.23	145.00	191.39	0.24
Reach-1	27	5-yr	92.60	419.00	422.47		422.53	0.000984	1.17	127.69	182.77	0.23
Reach-1	27	2-yr	62.80	419.00	422.12		422.17	0.000859	0.99	80.05	88.40	0.21
Reach-1	26.83	Reg	452.70	418.70	423.70		423.82	0.002242	2.17	458.40	263.16	0.37
Reach-1	26.83	100-yr	158.80	418.70	422.53		422.67	0.002965	1.91	169.69	227.03	0.40
Reach-1	26.83	50-yr	144.60	418.70	422.45		422.59	0.003030	1.89	152.07	224.25	0.40
Reach-1	26.83	20-yr	130.80	418.70	422.37		422.51	0.003078	1.86	134.59	221.46	0.40
Reach-1	26.83	10-yr	105.10	418.70	422.21		422.35	0.003179	1.80	98.43	215.57	0.40
Reach-1	26.83	5-yr	92.60	418.70	422.11	421.15	422.26	0.003205	1.75	78.51	212.25	0.40
Reach-1	26.83	2-yr	62.80	418.70	421.82		421.92	0.002786	1.46	46.45	40.57	0.36
Reach-1	26.73	Reg	452.70	418.40	423.40		423.59	0.003339	2.46	336.38	190.35	0.44
Reach-1	26.73	100-yr	158.80	418.40	422.23		422.37	0.003552	1.86	138.11	152.58	0.42
Reach-1	26.73	50-yr	144.60	418.40	422.14		422.28	0.003619	1.83	125.50	150.32	0.42
Reach-1	26.73	20-yr	130.80	418.40	422.06		422.20	0.003696	1.79	112.70	147.98	0.42
Reach-1	26.73	10-yr	105.10	418.40	421.88		422.01	0.003852	1.71	87.06	133.56	0.43
Reach-1	26.73	5-yr	92.60	418.40	421.78		421.91	0.003963	1.66	73.92	122.78	0.43
Reach-1	26.73	2-yr	62.80	418.40	421.48		421.59	0.004120	1.48	43.24	35.04	0.42
Reach-1	26.55	Reg	452.70	418.00	423.00		423.13	0.002358	2.26	401.10	197.30	0.38
Reach-1	26.55	100-yr	158.80	418.00	421.78		421.88	0.002421	1.75	170.93	164.38	0.36
Reach-1	26.55	50-yr	144.60	418.00	421.70		421.80	0.002357	1.69	158.23	156.70	0.35
Reach-1	26.55	20-yr	130.80	418.00	421.62		421.71	0.002273	1.62	146.14	149.03	0.34
Reach-1	26.55	10-yr	105.10	418.00	421.45		421.53	0.002124	1.49	122.06	132.43	0.33
Reach-1	26.55	5-yr	92.60	418.00	421.34		421.42	0.002106	1.43	108.29	121.93	0.32
Reach-1	26.55	2-yr	62.80	418.00	420.97		421.05	0.002389	1.33	70.06	87.14	0.33
Reach-1	26.17	Reg	452.70	417.20	422.65		422.72	0.001025	1.66	615.01	306.93	0.26
Reach-1	26.17	100-yr	158.80	417.20	421.17		421.27	0.001612	1.57	202.29	235.43	0.30
Reach-1	26.17	50-yr	144.60	417.20	421.06		421.16	0.001713	1.57	176.39	227.93	0.31
Reach-1	26.17	20-yr	130.80	417.20	420.94		421.05	0.001832	1.58	149.99	217.94	0.32

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	26.17	10-yr	105.10	417.20	420.70		420.82	0.002036	1.56	101.12	193.73	0.33
Reach-1	26.17	5-yr	92.60	417.20	420.57		420.69	0.002076	1.52	78.18	161.74	0.33
Reach-1	26.17	2-yr	62.80	417.20	420.21		420.30	0.001837	1.27	50.79	34.43	0.30
Reach-1	25.955	Reg	519.90	417.00	422.35		422.46	0.001187	1.70	465.54	227.98	0.27
Reach-1	25.955	100-yr	179.40	417.00	420.95		421.01	0.000853	1.07	216.41	143.61	0.22
Reach-1	25.955	50-yr	163.40	417.00	420.84		420.89	0.000843	1.03	200.95	140.34	0.21
Reach-1	25.955	20-yr	147.80	417.00	420.73		420.78	0.000839	1.00	184.85	136.86	0.21
Reach-1	25.955	10-yr	119.10	417.00	420.50		420.54	0.000829	0.92	153.80	129.87	0.21
Reach-1	25.955	5-yr	105.00	417.00	420.37		420.41	0.000827	0.88	137.36	126.02	0.20
Reach-1	25.955	2-yr	71.20	417.00	420.00		420.03	0.000819	0.76	93.52	115.11	0.20
Reach-1	25.83	Reg	519.90	416.90	422.12		422.28	0.002172	2.45	414.03	163.24	0.37
Reach-1	25.83	100-yr	179.40	416.90	420.77		420.87	0.001612	1.66	206.10	146.60	0.30
Reach-1	25.83	50-yr	163.40	416.90	420.66		420.76	0.001631	1.63	189.76	145.21	0.30
Reach-1	25.83	20-yr	147.80	416.90	420.54		420.63	0.001675	1.61	172.16	143.70	0.30
Reach-1	25.83	10-yr	119.10	416.90	420.29		420.39	0.001789	1.57	137.05	140.63	0.31
Reach-1	25.83	5-yr	105.00	416.90	420.15		420.25	0.001884	1.55	117.57	138.91	0.31
Reach-1	25.83	2-yr	71.20	416.90	419.77		419.87	0.002030	1.44	68.05	113.87	0.32
Reach-1	25.763	Reg	519.90	416.80	422.10		422.16	0.000910	1.59	622.95	227.81	0.24
Reach-1	25.763	100-yr	179.40	416.80	420.75		420.79	0.000635	1.04	328.96	209.09	0.19
Reach-1	25.763	50-yr	163.40	416.80	420.64		420.67	0.000640	1.02	305.53	207.13	0.19
Reach-1	25.763	20-yr	147.80	416.80	420.52		420.55	0.000654	1.00	280.22	204.99	0.19
Reach-1	25.763	10-yr	119.10	416.80	420.27		420.30	0.000697	0.97	229.60	200.65	0.19
Reach-1	25.763	5-yr	105.00	416.80	420.13		420.16	0.000738	0.96	201.31	198.18	0.20
Reach-1	25.763	2-yr	71.20	416.80	419.73		419.77	0.000861	0.94	124.85	190.65	0.21
Reach-1	25.753	Reg	519.90	416.80	421.97		422.12	0.002299	2.25	475.74	266.27	0.34
Reach-1	25.753	100-yr	179.40	416.80	420.49		420.70	0.002957	2.07	117.59	175.55	0.38
Reach-1	25.753	50-yr	163.40	416.80	420.40		420.59	0.002838	2.00	101.37	156.19	0.37
Reach-1	25.753	20-yr	147.80	416.80	420.29		420.48	0.002678	1.90	86.51	136.05	0.36
Reach-1	25.753	10-yr	119.10	416.80	420.11		420.25	0.002184	1.65	72.00	27.34	0.33
Reach-1	25.753	5-yr	105.00	416.80	420.00		420.11	0.001939	1.52	68.98	27.34	0.31
Reach-1	25.753	2-yr	71.20	416.80	419.68		419.75	0.001361	1.18	60.24	27.33	0.25
Reach-1	25.745	Reg	519.90	416.80	421.94		422.09	0.002384	2.28	468.71	265.68	0.34
Reach-1	25.745	100-yr	179.40	416.80	420.45		420.67	0.003151	2.13	110.37	167.21	0.39
Reach-1	25.745	50-yr	163.40	416.80	420.36		420.57	0.002990	2.04	95.85	149.03	0.38
Reach-1	25.745	20-yr	147.80	416.80	420.26		420.45	0.002788	1.93	82.50	130.09	0.37
Reach-1	25.745	10-yr	119.10	416.80	420.09		420.23	0.002237	1.67	71.44	27.34	0.33
Reach-1	25.745	5-yr	105.00	416.80	419.98		420.10	0.001982	1.53	68.49	27.34	0.31
Reach-1	25.745	2-yr	71.20	416.80	419.66		419.74	0.001385	1.19	59.90	27.33	0.26
Reach-1	25.74	Reg	519.90	416.80	421.96		422.04	0.001490	1.79	542.73	221.38	0.30
Reach-1	25.74	100-yr	179.40	416.80	420.50		420.57	0.001922	1.44	237.15	198.06	0.31
Reach-1	25.74	50-yr	163.40	416.80	420.41		420.47	0.002013	1.43	217.83	196.50	0.32
Reach-1	25.74	20-yr	147.80	416.80	420.30		420.37	0.002143	1.43	197.53	194.84	0.33
Reach-1	25.74	10-yr	119.10	416.80	420.10		420.17	0.002435	1.42	159.28	191.67	0.34
Reach-1	25.74	5-yr	105.00	416.80	419.99		420.05	0.002398	1.35	137.79	169.23	0.34
Reach-1	25.74	2-yr	71.20	416.80	419.65		419.73	0.003013	1.35	85.53	141.41	0.37
Reach-1	25.67	Reg	519.90	416.30	421.87		421.94	0.001147	1.65	592.61	239.20	0.27
Reach-1	25.67	100-yr	179.40	416.30	420.39		420.45	0.001326	1.29	255.83	211.11	0.27
Reach-1	25.67	50-yr	163.40	416.30	420.29		420.35	0.001359	1.27	234.57	207.22	0.27
Reach-1	25.67	20-yr	147.80	416.30	420.18		420.24	0.001415	1.25	212.14	203.03	0.27
Reach-1	25.67	10-yr	119.10	416.30	419.98		420.03	0.001504	1.21	170.64	193.71	0.27
Reach-1	25.67	5-yr	105.00	416.30	419.86		419.91	0.001540	1.19	148.84	183.16	0.28
Reach-1	25.67	2-yr	71.20	416.30	419.50		419.56	0.001806	1.17	88.31	149.32	0.29
Reach-1	25.43	Reg	519.90	416.00	421.38		421.60	0.002554	2.64	376.50	169.85	0.40
Reach-1	25.43	100-yr	179.40	416.00	419.89		420.05	0.002550	1.99	144.49	123.41	0.38
Reach-1	25.43	50-yr	163.40	416.00	419.79		419.95	0.002483	1.92	132.78	117.74	0.37
Reach-1	25.43	20-yr	147.80	416.00	419.68		419.83	0.002441	1.85	120.30	111.39	0.36
Reach-1	25.43	10-yr	119.10	416.00	419.50		419.62	0.002185	1.67	100.74	100.63	0.34
Reach-1	25.43	5-yr	105.00	416.00	419.40		419.52	0.002001	1.56	91.76	95.28	0.32
Reach-1	25.43	2-yr	71.20	416.00	419.07		419.15	0.001711	1.30	62.95	65.56	0.29
Reach-1	25.1	Reg	519.90	415.20	421.25		421.29	0.000683	1.40	794.22	299.76	0.21
Reach-1	25.1	100-yr	179.40	415.20	419.62		419.66	0.000855	1.20	335.98	260.16	0.22
Reach-1	25.1	50-yr	163.40	415.20	419.50		419.54	0.000907	1.21	304.46	258.57	0.22
Reach-1	25.1	20-yr	147.80	415.20	419.33		419.38	0.001066	1.28	261.33	256.37	0.24
Reach-1	25.1	10-yr	119.10	415.20	418.99		419.07	0.001597	1.48	173.93	251.46	0.29
Reach-1	25.1	5-yr	105.00	415.20	418.83		418.93	0.001863	1.55	135.01	243.28	0.31

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	25.1	2-yr	71.20	415.20	418.42		418.53	0.002098	1.51	52.73	50.22	0.32
Reach-1	24.925	Reg	519.90	414.90	421.14		421.20	0.000727	1.55	654.79	222.80	0.22
Reach-1	24.925	100-yr	179.40	414.90	419.52		419.56	0.000650	1.13	304.99	207.49	0.20
Reach-1	24.925	50-yr	163.40	414.90	419.40		419.44	0.000658	1.11	279.58	203.32	0.20
Reach-1	24.925	20-yr	147.80	414.90	419.21		419.26	0.000734	1.13	243.03	197.18	0.20
Reach-1	24.925	10-yr	119.10	414.90	418.82		418.88	0.000991	1.20	167.79	179.52	0.23
Reach-1	24.925	5-yr	105.00	414.90	418.63		418.70	0.001098	1.20	136.02	169.13	0.24
Reach-1	24.925	2-yr	71.20	414.90	418.19		418.25	0.001195	1.10	78.25	89.16	0.24
Reach-1	24.858	Reg	519.90	414.30	421.12		421.16	0.000461	1.38	841.43	283.28	0.18
Reach-1	24.858	100-yr	179.40	414.30	419.50		419.53	0.000360	0.99	406.08	254.00	0.15
Reach-1	24.858	50-yr	163.40	414.30	419.38		419.41	0.000360	0.97	374.66	251.76	0.15
Reach-1	24.858	20-yr	147.80	414.30	419.19		419.22	0.000395	0.98	328.31	248.43	0.16
Reach-1	24.858	10-yr	119.10	414.30	418.78		418.83	0.000504	1.04	230.50	227.14	0.17
Reach-1	24.858	5-yr	105.00	414.30	418.60		418.64	0.000539	1.03	189.75	211.73	0.18
Reach-1	24.858	2-yr	71.20	414.30	418.16		418.19	0.000492	0.90	113.62	120.05	0.17
Reach-1	24.848	Reg	519.90	414.30	421.09	417.90	421.15	0.000444	1.51	780.81	266.86	0.19
Reach-1	24.848	100-yr	179.40	414.30	419.38	416.06	419.49	0.000599	1.45	123.97	227.55	0.21
Reach-1	24.848	50-yr	163.40	414.30	419.28	415.96	419.37	0.000532	1.35	121.47	223.84	0.19
Reach-1	24.848	20-yr	147.80	414.30	419.11	415.86	419.20	0.000487	1.26	117.48	218.44	0.18
Reach-1	24.848	10-yr	119.10	414.30	418.75	415.64	418.81	0.000410	1.10	108.63	206.56	0.17
Reach-1	24.848	5-yr	105.00	414.30	418.59	415.54	418.64	0.000362	1.00	104.56	200.90	0.15
Reach-1	24.848	2-yr	71.20	414.30	418.16	415.26	418.19	0.000237	0.76	94.09	83.34	0.12
Reach-1	24.844		Bridge									
Reach-1	24.84	Reg	519.90	414.30	421.04	417.90	421.10	0.000466	1.54	766.46	266.02	0.19
Reach-1	24.84	100-yr	179.40	414.30	419.39	416.06	419.44	0.000317	1.05	345.00	228.03	0.15
Reach-1	24.84	50-yr	163.40	414.30	419.29	415.96	419.33	0.000300	1.01	322.78	224.22	0.14
Reach-1	24.84	20-yr	147.80	414.30	419.12	415.86	419.16	0.000304	0.99	287.69	218.66	0.14
Reach-1	24.84	10-yr	119.10	414.30	418.75	415.65	418.81	0.000412	1.10	108.52	206.42	0.17
Reach-1	24.84	5-yr	105.00	414.30	418.58	415.54	418.63	0.000363	1.01	104.47	200.77	0.16
Reach-1	24.84	2-yr	71.20	414.30	418.15	415.26	418.18	0.000237	0.76	94.03	83.15	0.12
Reach-1	24.83	Reg	519.90	414.30	421.03		421.09	0.000581	1.42	745.10	266.56	0.20
Reach-1	24.83	100-yr	179.40	414.30	419.39		419.43	0.000532	1.06	332.14	228.70	0.18
Reach-1	24.83	50-yr	163.40	414.30	419.29		419.32	0.000523	1.03	308.22	225.01	0.17
Reach-1	24.83	20-yr	147.80	414.30	419.12		419.16	0.000569	1.04	270.97	219.14	0.18
Reach-1	24.83	10-yr	119.10	414.30	418.75		418.80	0.000697	1.09	191.80	206.37	0.20
Reach-1	24.83	5-yr	105.00	414.30	418.57		418.63	0.000727	1.09	156.67	200.50	0.20
Reach-1	24.83	2-yr	71.20	414.30	418.14		418.18	0.000540	0.89	106.76	82.71	0.17
Reach-1	24.73	Reg	519.90	414.30	420.98		421.02	0.000417	1.21	838.51	257.02	0.17
Reach-1	24.73	100-yr	179.40	414.30	419.36		419.37	0.000299	0.80	438.29	226.11	0.13
Reach-1	24.73	50-yr	163.40	414.30	419.25		419.27	0.000286	0.76	415.12	222.60	0.13
Reach-1	24.73	20-yr	147.80	414.30	419.09		419.10	0.000298	0.75	378.25	216.90	0.13
Reach-1	24.73	10-yr	119.10	414.30	418.71		418.73	0.000358	0.76	298.73	209.96	0.14
Reach-1	24.73	5-yr	105.00	414.30	418.54		418.56	0.000384	0.76	262.72	207.55	0.15
Reach-1	24.73	2-yr	71.20	414.30	418.10		418.12	0.000459	0.74	172.09	201.34	0.15
Reach-1	24.42	Reg	519.90	414.20	420.85		420.89	0.000448	1.27	870.42	280.30	0.18
Reach-1	24.42	100-yr	179.40	414.20	419.26		419.28	0.000350	0.88	446.76	257.66	0.15
Reach-1	24.42	50-yr	163.40	414.20	419.16		419.18	0.000341	0.86	420.88	257.21	0.14
Reach-1	24.42	20-yr	147.80	414.20	418.98		419.00	0.000377	0.87	375.63	255.22	0.15
Reach-1	24.42	10-yr	119.10	414.20	418.58		418.60	0.000491	0.91	278.25	228.44	0.17
Reach-1	24.42	5-yr	105.00	414.20	418.39		418.42	0.000544	0.92	236.93	216.08	0.17
Reach-1	24.42	2-yr	71.20	414.20	417.91		417.94	0.000706	0.93	140.49	179.30	0.19
Reach-1	24.025	Reg	1039.30	413.80	420.28		420.49	0.002198	2.93	749.43	256.75	0.39
Reach-1	24.025	100-yr	379.90	413.80	418.90		419.01	0.001273	1.85	419.90	222.88	0.29
Reach-1	24.025	50-yr	345.60	413.80	418.83		418.92	0.001154	1.74	403.61	219.13	0.27
Reach-1	24.025	20-yr	312.70	413.80	418.63		418.73	0.001218	1.74	361.15	209.01	0.28
Reach-1	24.025	10-yr	248.50	413.80	418.12		418.24	0.001562	1.80	262.10	183.26	0.31
Reach-1	24.025	5-yr	217.50	413.80	417.90		418.02	0.001681	1.78	222.14	169.05	0.31
Reach-1	24.025	2-yr	144.80	413.80	417.36		417.47	0.001740	1.61	142.51	127.73	0.31
Reach-1	23.84	Reg	1039.30	413.50	420.18		420.27	0.000863	1.62	1012.77	325.96	0.24
Reach-1	23.84	100-yr	379.90	413.50	418.86		418.89	0.000381	0.86	636.10	245.53	0.15
Reach-1	23.84	50-yr	345.60	413.50	418.79		418.82	0.000342	0.81	619.02	244.21	0.14
Reach-1	23.84	20-yr	312.70	413.50	418.59		418.61	0.000355	0.79	570.37	240.43	0.14
Reach-1	23.84	10-yr	248.50	413.50	418.07		418.09	0.000453	0.79	447.61	230.60	0.16
Reach-1	23.84	5-yr	217.50	413.50	417.83		417.86	0.000507	0.78	393.14	227.96	0.16

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	23.84	2-yr	144.80	413.50	417.24		417.27	0.000724	0.77	260.09	223.33	0.19
Reach-1	23.768	Reg	997.60	413.30	420.22	416.71	420.23	0.000149	0.63	2218.85	588.62	0.09
Reach-1	23.768	100-yr	390.30	413.30	418.87	415.63	418.87	0.000073	0.35	1483.99	502.36	0.06
Reach-1	23.768	50-yr	355.20	413.30	418.80	415.56	418.80	0.000065	0.33	1448.49	500.95	0.06
Reach-1	23.768	20-yr	321.50	413.30	418.60	415.50	418.60	0.000066	0.32	1347.97	496.92	0.06
Reach-1	23.768	10-yr	255.60	413.30	418.07	415.37	418.08	0.000081	0.31	1090.88	486.46	0.06
Reach-1	23.768	5-yr	223.70	413.30	417.83	415.30	417.84	0.000135	0.38	686.36	475.72	0.08
Reach-1	23.768	2-yr	149.20	413.30	417.24	415.13	417.24	0.000163	0.35	491.24	464.26	0.08
Reach-1	23.748	Reg	997.60	411.50	420.18	417.90	420.22	0.000404	1.39	1833.72	557.57	0.16
Reach-1	23.748	100-yr	390.30	411.50	418.85	415.53	418.86	0.000210	0.88	1146.59	480.44	0.11
Reach-1	23.748	50-yr	355.20	411.50	418.78	415.35	418.79	0.000189	0.83	1113.59	478.37	0.11
Reach-1	23.748	20-yr	321.50	411.50	418.58	415.17	418.59	0.000196	0.83	1017.17	472.29	0.11
Reach-1	23.748	10-yr	255.60	411.50	418.05	414.80	418.06	0.000251	0.88	770.64	456.36	0.12
Reach-1	23.748	5-yr	223.70	411.50	417.56	414.62	417.73	0.001236	1.83	121.93	410.81	0.26
Reach-1	23.748	2-yr	149.20	411.50	417.09	414.12	417.18	0.000763	1.35	110.50	371.62	0.20
Reach-1	23.747	Reg	997.60	411.50	420.18	417.90	420.21	0.000404	1.39	1833.47	557.54	0.16
Reach-1	23.747	100-yr	390.30	411.50	418.85	415.53	418.86	0.000211	0.88	1146.48	480.43	0.11
Reach-1	23.747	50-yr	355.20	411.50	418.78	415.35	418.79	0.000189	0.83	1113.50	478.37	0.11
Reach-1	23.747	20-yr	321.50	411.50	418.58	415.18	418.59	0.000196	0.83	1017.08	472.28	0.11
Reach-1	23.747	10-yr	255.60	411.50	418.05	414.82	418.06	0.000251	0.88	770.52	456.35	0.12
Reach-1	23.747	5-yr	223.70	411.50	417.56	414.62	417.72	0.001175	1.79	128.73	410.87	0.26
Reach-1	23.747	2-yr	149.20	411.50	417.09	414.13	417.18	0.000729	1.32	116.35	371.65	0.20
Reach-1	23.744		Bridge									
Reach-1	23.741	Reg	997.60	411.50	420.12	417.60	420.16	0.000423	1.41	1801.39	553.54	0.16
Reach-1	23.741	100-yr	390.30	411.50	418.35	415.53	418.38	0.000386	1.13	910.24	465.45	0.15
Reach-1	23.741	50-yr	355.20	411.50	418.20	415.35	418.23	0.000389	1.12	842.61	461.07	0.15
Reach-1	23.741	20-yr	321.50	411.50	418.03	415.17	418.06	0.000409	1.12	762.13	455.80	0.15
Reach-1	23.741	10-yr	255.60	411.50	417.69	414.80	417.72	0.000402	1.06	618.35	418.03	0.15
Reach-1	23.741	5-yr	223.70	411.50	417.49	414.62	417.67	0.001296	1.86	120.19	398.74	0.27
Reach-1	23.741	2-yr	149.20	411.50	417.08	414.12	417.17	0.000772	1.35	110.11	370.53	0.20
Reach-1	23.74	Reg	997.60	411.50	420.12	417.57	420.16	0.000423	1.41	1801.14	553.51	0.16
Reach-1	23.74	100-yr	390.30	411.50	418.35	415.53	418.38	0.000386	1.13	910.05	465.43	0.15
Reach-1	23.74	50-yr	355.20	411.50	418.20	415.35	418.23	0.000389	1.12	842.42	461.05	0.15
Reach-1	23.74	20-yr	321.50	411.50	418.03	415.17	418.06	0.000409	1.12	761.93	455.79	0.15
Reach-1	23.74	10-yr	255.60	411.50	417.69	414.80	417.72	0.000402	1.06	618.16	418.00	0.15
Reach-1	23.74	5-yr	223.70	411.50	417.52	414.62	417.55	0.000403	1.04	546.29	408.44	0.15
Reach-1	23.74	2-yr	149.20	411.50	417.08	414.12	417.17	0.000773	1.36	110.09	370.47	0.20
Reach-1	23.72	Reg	997.60	412.40	420.12	417.30	420.14	0.000356	1.16	1879.77	553.51	0.15
Reach-1	23.72	100-yr	390.30	412.40	418.34	415.78	418.36	0.000309	0.87	987.53	467.93	0.13
Reach-1	23.72	50-yr	355.20	412.40	418.20	415.63	418.22	0.000310	0.85	919.56	464.13	0.13
Reach-1	23.72	20-yr	321.50	412.40	418.02	415.48	418.04	0.000325	0.85	838.44	459.57	0.13
Reach-1	23.72	10-yr	255.60	412.40	417.69	415.16	417.71	0.000328	0.81	691.66	433.67	0.13
Reach-1	23.72	5-yr	223.70	412.40	417.51	414.98	417.53	0.000335	0.79	616.50	430.72	0.13
Reach-1	23.72	2-yr	149.20	412.40	417.07	414.47	417.13	0.000725	1.07	139.25	409.39	0.19
Reach-1	23.62	Reg	997.60	413.00	420.06	417.28	420.10	0.000545	1.20	1464.85	465.25	0.18
Reach-1	23.62	100-yr	390.30	413.00	418.30	416.55	418.32	0.000503	0.85	745.24	348.25	0.16
Reach-1	23.62	50-yr	355.20	413.00	418.16	416.45	418.18	0.000509	0.83	694.91	343.94	0.16
Reach-1	23.62	20-yr	321.50	413.00	417.98	416.37	418.00	0.000541	0.82	634.52	338.99	0.16
Reach-1	23.62	10-yr	255.60	413.00	417.64	416.18	417.66	0.000603	0.80	521.08	333.71	0.16
Reach-1	23.62	5-yr	223.70	413.00	417.47	415.74	417.49	0.000644	0.78	462.83	330.96	0.17
Reach-1	23.62	2-yr	149.20	413.00	417.02	415.23	417.04	0.000791	0.75	316.46	323.96	0.18
Reach-1	23.48	Reg	997.60	412.90	419.97		420.02	0.000883	1.77	1298.00	399.11	0.23
Reach-1	23.48	100-yr	390.30	412.90	418.20		418.24	0.000992	1.49	638.63	341.86	0.23
Reach-1	23.48	50-yr	355.20	412.90	418.05		418.09	0.001029	1.48	587.83	336.62	0.23
Reach-1	23.48	20-yr	321.50	412.90	417.88		417.92	0.000921	1.36	537.66	279.48	0.22
Reach-1	23.48	10-yr	255.60	412.90	417.53		417.57	0.000968	1.31	443.72	263.93	0.22
Reach-1	23.48	5-yr	223.70	412.90	417.35		417.39	0.000994	1.28	396.76	255.79	0.22
Reach-1	23.48	2-yr	149.20	412.90	416.89		416.92	0.001065	1.21	282.34	238.28	0.22
Reach-1	23.17	Reg	981.60	412.40	419.74		419.81	0.000926	1.70	1125.74	338.65	0.23
Reach-1	23.17	100-yr	389.30	412.40	417.97		418.01	0.000857	1.27	589.75	269.57	0.21
Reach-1	23.17	50-yr	353.20	412.40	417.81		417.85	0.000864	1.24	548.42	264.09	0.20
Reach-1	23.17	20-yr	318.30	412.40	417.65		417.69	0.000878	1.22	506.17	258.38	0.20
Reach-1	23.17	10-yr	251.40	412.40	417.29		417.32	0.000957	1.18	414.10	245.46	0.21
Reach-1	23.17	5-yr	219.20	412.40	417.09		417.13	0.001016	1.17	367.08	238.60	0.21

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	23.17	2-yr	144.90	412.40	416.58		416.62	0.001189	1.18	246.79	230.97	0.23
Reach-1	23.015	Reg	981.60	412.10	419.48		419.60	0.001721	2.14	942.03	391.10	0.31
Reach-1	23.015	100-yr	389.30	412.10	417.70		417.80	0.002073	1.74	393.11	218.05	0.31
Reach-1	23.015	50-yr	353.20	412.10	417.55		417.64	0.002076	1.69	360.99	204.36	0.31
Reach-1	23.015	20-yr	318.30	412.10	417.39		417.48	0.002030	1.61	330.65	186.17	0.31
Reach-1	23.015	10-yr	251.40	412.10	417.05		417.11	0.001810	1.39	274.26	141.43	0.28
Reach-1	23.015	5-yr	219.20	412.10	416.86		416.92	0.001760	1.33	248.36	132.51	0.28
Reach-1	23.015	2-yr	144.90	412.10	416.34		416.39	0.001780	1.22	182.14	123.45	0.27
Reach-1	22.86	Reg	981.60	411.90	419.20		419.34	0.001573	2.18	836.50	301.08	0.30
Reach-1	22.86	100-yr	389.30	411.90	417.42		417.51	0.001609	1.68	391.35	195.21	0.28
Reach-1	22.86	50-yr	353.20	411.90	417.26		417.35	0.001623	1.64	361.75	187.31	0.28
Reach-1	22.86	20-yr	318.30	411.90	417.10		417.19	0.001639	1.60	332.80	179.26	0.28
Reach-1	22.86	10-yr	251.40	411.90	416.77		416.85	0.001585	1.49	275.50	159.83	0.27
Reach-1	22.86	5-yr	219.20	411.90	416.58		416.66	0.001523	1.42	247.28	148.77	0.27
Reach-1	22.86	2-yr	144.90	411.90	416.10		416.16	0.001272	1.20	182.53	119.57	0.24
Reach-1	22.64	Reg	981.60	411.60	418.87		418.99	0.001588	2.11	877.64	301.74	0.30
Reach-1	22.64	100-yr	389.30	411.60	417.04		417.14	0.001823	1.68	395.55	204.42	0.30
Reach-1	22.64	50-yr	353.20	411.60	416.89		416.98	0.001839	1.64	364.23	194.26	0.30
Reach-1	22.64	20-yr	318.30	411.60	416.73		416.81	0.001858	1.59	333.67	184.66	0.30
Reach-1	22.64	10-yr	251.40	411.60	416.39		416.47	0.001865	1.47	275.85	164.98	0.29
Reach-1	22.64	5-yr	219.20	411.60	416.22		416.29	0.001846	1.40	248.16	154.68	0.29
Reach-1	22.64	2-yr	144.90	411.60	415.77		415.83	0.001789	1.20	183.71	138.90	0.27
Reach-1	22.37	Reg	981.60	411.70	418.73		418.76	0.000493	1.27	1600.83	435.91	0.17
Reach-1	22.37	100-yr	389.30	411.70	416.88		416.89	0.000526	1.01	832.99	384.00	0.16
Reach-1	22.37	50-yr	353.20	411.70	416.71		416.73	0.000542	0.99	770.12	377.40	0.16
Reach-1	22.37	20-yr	318.30	411.70	416.54		416.56	0.000563	0.98	706.14	370.55	0.17
Reach-1	22.37	10-yr	251.40	411.70	416.18		416.20	0.000620	0.96	577.48	356.40	0.17
Reach-1	22.37	5-yr	219.20	411.70	416.00		416.02	0.000663	0.95	511.02	348.77	0.18
Reach-1	22.37	2-yr	144.90	411.70	415.50		415.53	0.000808	0.93	347.05	317.25	0.19
Reach-1	21.855	Reg	981.60	411.20	418.39		418.50	0.001159	2.12	972.57	286.23	0.27
Reach-1	21.855	100-yr	389.30	411.20	416.59		416.65	0.000840	1.45	523.61	216.88	0.21
Reach-1	21.855	50-yr	353.20	411.20	416.42		416.48	0.000821	1.40	488.30	209.59	0.21
Reach-1	21.855	20-yr	318.30	411.20	416.25		416.30	0.000804	1.35	452.71	201.98	0.21
Reach-1	21.855	10-yr	251.40	411.20	415.89		415.94	0.000764	1.24	382.66	189.23	0.20
Reach-1	21.855	5-yr	219.20	411.20	415.69		415.74	0.000753	1.19	345.62	186.07	0.20
Reach-1	21.855	2-yr	144.90	411.20	415.17		415.21	0.000714	1.05	251.05	177.75	0.19
Reach-1	21.55	Reg	981.60	411.10	418.15		418.24	0.000962	1.82	972.01	285.72	0.24
Reach-1	21.55	100-yr	389.30	411.10	416.40		416.45	0.000713	1.24	529.61	218.91	0.19
Reach-1	21.55	50-yr	353.20	411.10	416.24		416.29	0.000694	1.19	494.79	211.88	0.19
Reach-1	21.55	20-yr	318.30	411.10	416.07		416.11	0.000676	1.14	459.51	204.51	0.19
Reach-1	21.55	10-yr	251.40	411.10	415.72		415.76	0.000643	1.04	389.31	193.39	0.18
Reach-1	21.55	5-yr	219.20	411.10	415.52		415.56	0.000632	1.00	351.96	187.81	0.18
Reach-1	21.55	2-yr	144.90	411.10	415.01		415.04	0.000590	0.86	259.23	173.16	0.17
Reach-1	21.275	Reg	981.60	410.80	417.75		417.92	0.001939	2.44	751.64	247.66	0.34
Reach-1	21.275	100-yr	389.30	410.80	416.06		416.18	0.001830	1.85	366.69	200.75	0.31
Reach-1	21.275	50-yr	353.20	410.80	415.90		416.02	0.001841	1.80	335.41	191.94	0.30
Reach-1	21.275	20-yr	318.30	410.80	415.73		415.85	0.001850	1.75	304.50	180.86	0.30
Reach-1	21.275	10-yr	251.40	410.80	415.39		415.49	0.001832	1.62	246.63	158.04	0.30
Reach-1	21.275	5-yr	219.20	410.80	415.20		415.30	0.001832	1.55	217.65	145.28	0.29
Reach-1	21.275	2-yr	144.90	410.80	414.70		414.78	0.001791	1.35	152.45	122.53	0.28
Reach-1	21.11	Reg	981.60	410.60	417.34		417.59	0.002510	2.81	618.67	200.13	0.38
Reach-1	21.11	100-yr	389.30	410.60	415.76		415.90	0.001816	1.91	331.90	156.67	0.31
Reach-1	21.11	50-yr	353.20	410.60	415.61		415.74	0.001731	1.82	309.86	146.92	0.30
Reach-1	21.11	20-yr	318.30	410.60	415.46		415.58	0.001640	1.72	288.38	136.73	0.29
Reach-1	21.11	10-yr	251.40	410.60	415.15		415.24	0.001396	1.50	249.30	115.94	0.26
Reach-1	21.11	5-yr	219.20	410.60	414.98		415.05	0.001263	1.37	230.19	105.44	0.25
Reach-1	21.11	2-yr	144.90	410.60	414.51		414.56	0.001063	1.13	181.41	101.57	0.22
Reach-1	21	Reg	981.60	410.50	416.97		417.30	0.003840	3.43	560.26	205.27	0.46
Reach-1	21	100-yr	389.30	410.50	415.44		415.66	0.003111	2.50	277.37	156.14	0.40
Reach-1	21	50-yr	353.20	410.50	415.30		415.51	0.003062	2.42	255.70	149.33	0.39
Reach-1	21	20-yr	318.30	410.50	415.15		415.35	0.003015	2.34	234.10	142.22	0.38
Reach-1	21	10-yr	251.40	410.50	414.86		415.04	0.002785	2.13	195.17	129.53	0.36
Reach-1	21	5-yr	219.20	410.50	414.70		414.87	0.002675	2.03	174.77	123.07	0.35
Reach-1	21	2-yr	144.90	410.50	414.27		414.40	0.002294	1.71	125.37	105.80	0.32

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	20.66	Reg	974.70	410.10	416.37		416.49	0.001684	2.15	858.58	286.17	0.31
Reach-1	20.66	100-yr	388.90	410.10	414.91		414.98	0.001385	1.54	467.59	248.72	0.26
Reach-1	20.66	50-yr	352.30	410.10	414.76		414.83	0.001405	1.51	430.50	243.13	0.26
Reach-1	20.66	20-yr	317.00	410.10	414.59		414.66	0.001459	1.49	390.30	236.94	0.27
Reach-1	20.66	10-yr	249.60	410.10	414.33		414.39	0.001389	1.37	328.63	227.10	0.26
Reach-1	20.66	5-yr	217.20	410.10	414.16		414.22	0.001420	1.33	290.46	220.80	0.26
Reach-1	20.66	2-yr	142.70	410.10	413.72		413.77	0.001493	1.21	196.52	204.45	0.26
Reach-1	20.34	Reg	974.70	409.80	415.62		415.88	0.003234	3.04	610.41	217.84	0.43
Reach-1	20.34	100-yr	388.90	409.80	414.37		414.51	0.002082	2.03	353.81	194.26	0.33
Reach-1	20.34	50-yr	352.30	409.80	414.21		414.35	0.002149	2.01	321.45	190.84	0.33
Reach-1	20.34	20-yr	317.00	409.80	413.98		414.14	0.002398	2.04	279.83	186.31	0.35
Reach-1	20.34	10-yr	249.60	409.80	413.78		413.91	0.002033	1.80	242.64	181.59	0.31
Reach-1	20.34	5-yr	217.20	409.80	413.58		413.71	0.002137	1.78	206.96	176.94	0.32
Reach-1	20.34	2-yr	142.70	409.80	413.10		413.23	0.002193	1.61	124.44	165.71	0.31
Reach-1	20.085	Reg	974.70	409.50	414.97		415.15	0.003266	2.49	634.44	231.98	0.41
Reach-1	20.085	100-yr	388.90	409.50	414.01		414.08	0.001649	1.45	428.20	199.99	0.28
Reach-1	20.085	50-yr	352.30	409.50	413.83		413.89	0.001725	1.47	390.91	195.94	0.28
Reach-1	20.085	20-yr	317.00	409.50	413.52		413.60	0.002112	1.60	332.23	189.70	0.31
Reach-1	20.085	10-yr	249.60	409.50	413.43		413.49	0.001488	1.34	315.29	187.86	0.26
Reach-1	20.085	5-yr	217.20	409.50	413.20		413.27	0.001588	1.38	272.38	183.12	0.27
Reach-1	20.085	2-yr	142.70	409.50	412.64		412.72	0.001872	1.37	174.09	167.94	0.29
Reach-1	19.87	Reg	974.70	408.90	414.43	412.90	414.61	0.001904	2.07	677.48	327.00	0.35
Reach-1	19.87	100-yr	388.90	408.90	413.80	411.85	413.85	0.000683	1.09	477.59	304.00	0.20
Reach-1	19.87	50-yr	352.30	408.90	413.59	411.75	413.65	0.000755	1.09	416.01	294.39	0.21
Reach-1	19.87	20-yr	317.00	408.90	413.20	411.63	413.27	0.001133	1.21	303.19	275.93	0.25
Reach-1	19.87	10-yr	249.60	408.90	413.23	411.35	413.28	0.000663	0.94	313.21	277.62	0.19
Reach-1	19.87	5-yr	217.20	408.90	412.99	411.13	413.03	0.000740	0.92	247.75	136.30	0.20
Reach-1	19.87	2-yr	142.70	408.90	412.39	410.64	412.43	0.000940	0.84	169.53	117.37	0.21
Reach-1	19.85	Reg	726.00	408.90	414.40	412.90	414.56	0.001550	2.23	664.38	325.64	0.33
Reach-1	19.85	100-yr	391.80	408.90	413.71	411.84	413.81	0.001096	1.69	446.65	298.71	0.27
Reach-1	19.85	50-yr	355.30	408.90	413.49	411.70	413.60	0.001233	1.72	381.63	288.19	0.28
Reach-1	19.85	20-yr	319.80	408.90	412.64	411.56	413.04	0.004547	2.80	114.06	124.05	0.52
Reach-1	19.85	10-yr	251.60	408.90	413.14	411.27	413.23	0.001033	1.48	285.29	271.84	0.25
Reach-1	19.85	5-yr	218.80	408.90	412.76	411.12	412.93	0.001862	1.84	118.72	127.75	0.33
Reach-1	19.85	2-yr	143.40	408.90	412.26	410.75	412.36	0.001426	1.44	99.82	112.75	0.28
Reach-1	19.849	Reg	726.00	408.90	413.91	412.95	414.37	0.004177	3.40	379.85	308.37	0.52
Reach-1	19.849	100-yr	391.80	408.90	413.52	411.84	413.74	0.002041	2.23	288.61	289.92	0.36
Reach-1	19.849	50-yr	355.30	408.90	413.27	411.70	413.52	0.002403	2.31	231.53	277.80	0.39
Reach-1	19.849	20-yr	319.80	408.90	412.63	411.56	413.02	0.004441	2.77	117.60	124.00	0.51
Reach-1	19.849	10-yr	251.60	408.90	413.01	411.28	413.18	0.001738	1.87	176.23	265.57	0.32
Reach-1	19.849	5-yr	218.80	408.90	412.76	411.13	412.92	0.001814	1.82	122.56	127.73	0.33
Reach-1	19.849	2-yr	143.40	408.90	412.26	410.75	412.36	0.001397	1.42	102.65	112.73	0.28
Reach-1	19.845		Bridge									
Reach-1	19.841	Reg	726.00	408.90	413.87	413.51	414.36	0.004501	3.50	365.35	306.10	0.54
Reach-1	19.841	100-yr	391.80	408.90	412.99	411.84	413.37	0.003962	2.82	170.97	163.16	0.49
Reach-1	19.841	50-yr	355.30	408.90	412.88	411.70	413.30	0.004329	2.88	123.29	131.38	0.51
Reach-1	19.841	20-yr	319.80	408.90	412.32	411.56	412.82	0.006553	3.13	102.22	114.65	0.61
Reach-1	19.841	10-yr	251.60	408.90	412.85	411.27	413.07	0.002231	2.06	122.28	130.58	0.37
Reach-1	19.841	5-yr	218.80	408.90	412.69	411.12	412.87	0.002014	1.89	115.96	125.56	0.34
Reach-1	19.841	2-yr	143.40	408.90	412.21	410.75	412.32	0.001509	1.46	98.13	111.41	0.29
Reach-1	19.84	Reg	726.00	408.90	413.91	412.90	414.18	0.002888	2.82	506.28	308.05	0.44
Reach-1	19.84	100-yr	391.80	408.90	413.01	411.84	413.28	0.003058	2.49	250.20	265.64	0.43
Reach-1	19.84	50-yr	355.30	408.90	412.92	411.70	413.13	0.002625	2.26	234.24	138.07	0.40
Reach-1	19.84	20-yr	319.80	408.90	411.56	411.56	412.53	0.019867	4.36	73.28	76.17	1.00
Reach-1	19.84	10-yr	251.60	408.90	412.85	411.27	413.07	0.002237	2.06	122.19	130.50	0.37
Reach-1	19.84	5-yr	218.80	408.90	412.68	411.12	412.86	0.002019	1.89	115.87	125.49	0.34
Reach-1	19.84	2-yr	143.40	408.90	412.21	410.75	412.32	0.001513	1.46	98.07	111.36	0.29
Reach-1	19.825	Reg	726.00	408.90	413.93	412.26	413.99	0.000741	1.46	1005.90	438.96	0.22
Reach-1	19.825	100-yr	391.80	408.90	413.04	411.32	413.09	0.000778	1.29	619.25	425.54	0.22
Reach-1	19.825	50-yr	355.30	408.90	412.93	411.20	412.98	0.000765	1.26	575.18	423.99	0.22
Reach-1	19.825	20-yr	319.80	408.90	411.09	411.09	411.89	0.021039	3.96	80.70	60.46	1.00
Reach-1	19.825	10-yr	251.60	408.90	412.85	410.83	412.96	0.001112	1.49	168.82	422.74	0.26
Reach-1	19.825	5-yr	218.80	408.90	412.68	410.69	412.78	0.000997	1.36	160.41	420.22	0.24
Reach-1	19.825	2-yr	143.40	408.90	412.21	410.35	412.26	0.000729	1.05	136.78	413.13	0.20

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	19.1	Reg	726.00	408.20	413.37		413.46	0.001198	1.62	826.43	431.28	0.27
Reach-1	19.1	100-yr	391.80	408.20	412.25		412.35	0.002044	1.64	396.51	329.96	0.33
Reach-1	19.1	50-yr	355.30	408.20	412.13		412.24	0.002100	1.61	359.66	319.69	0.34
Reach-1	19.1	20-yr	319.80	408.20	411.99		412.09	0.002322	1.62	312.85	306.00	0.35
Reach-1	19.1	10-yr	251.60	408.20	411.80		411.89	0.002175	1.48	257.61	287.38	0.33
Reach-1	19.1	5-yr	218.80	408.20	411.68		411.77	0.002179	1.43	224.27	275.53	0.33
Reach-1	19.1	2-yr	143.40	408.20	411.42		411.49	0.001770	1.17	159.31	232.23	0.29
Reach-1	18.355	Reg	738.00	407.10	412.55		412.82	0.000877	2.31	362.73	137.37	0.39
Reach-1	18.355	100-yr	360.00	407.10	411.13		411.32	0.001198	1.93	195.06	103.86	0.42
Reach-1	18.355	50-yr	325.00	407.10	410.99		411.17	0.001220	1.86	180.99	101.58	0.42
Reach-1	18.355	20-yr	272.00	407.10	410.77		410.93	0.001260	1.75	159.13	97.92	0.42
Reach-1	18.355	10-yr	230.00	407.10	410.58		410.72	0.001311	1.66	140.78	94.73	0.42
Reach-1	18.355	5-yr	191.00	407.10	410.35		410.49	0.001511	1.61	119.46	90.90	0.44
Reach-1	18.355	2-yr	135.00	407.10	410.00		410.12	0.002007	1.53	88.37	84.99	0.48
Reach-1	18.135	Reg	738.00	406.60	412.38		412.63	0.000875	2.60	442.22	159.65	0.40
Reach-1	18.135	100-yr	360.00	406.60	410.68		410.99	0.001741	2.64	186.91	136.12	0.52
Reach-1	18.135	50-yr	325.00	406.60	410.51		410.83	0.001861	2.61	164.77	131.21	0.53
Reach-1	18.135	20-yr	272.00	406.60	410.25		410.57	0.002071	2.55	131.25	123.40	0.55
Reach-1	18.135	10-yr	230.00	406.60	410.03		410.34	0.002250	2.48	104.65	116.83	0.56
Reach-1	18.135	5-yr	191.00	406.60	409.80		410.07	0.002220	2.32	87.94	64.30	0.55
Reach-1	18.135	2-yr	135.00	406.60	409.42		409.64	0.002220	2.08	66.40	50.47	0.54
Reach-1	17.83	Reg	738.00	406.00	412.02		412.36	0.000904	2.68	324.64	101.34	0.41
Reach-1	17.83	100-yr	360.00	406.00	410.26		410.53	0.001298	2.29	166.08	76.74	0.45
Reach-1	17.83	50-yr	325.00	406.00	410.09		410.33	0.001343	2.22	152.69	73.53	0.45
Reach-1	17.83	20-yr	272.00	406.00	409.80		410.03	0.001407	2.11	132.36	68.65	0.45
Reach-1	17.83	10-yr	230.00	406.00	409.55		409.76	0.001476	2.02	115.78	64.50	0.46
Reach-1	17.83	5-yr	191.00	406.00	409.29		409.48	0.001586	1.93	99.71	60.20	0.46
Reach-1	17.83	2-yr	135.00	406.00	408.85		409.02	0.001826	1.80	74.82	51.94	0.48
Reach-1	17.58	Reg	738.00	405.00	411.73		412.12	0.001006	3.22	370.35	115.45	0.44
Reach-1	17.58	100-yr	360.00	405.00	409.68		410.13	0.001826	3.15	156.44	87.21	0.55
Reach-1	17.58	50-yr	325.00	405.00	409.48		409.92	0.001908	3.09	139.48	82.42	0.56
Reach-1	17.58	20-yr	272.00	405.00	409.17		409.59	0.001993	2.96	115.71	75.17	0.56
Reach-1	17.58	10-yr	230.00	405.00	408.92		409.31	0.002035	2.81	97.65	68.00	0.56
Reach-1	17.58	5-yr	191.00	405.00	408.67		409.02	0.002036	2.63	81.94	58.30	0.55
Reach-1	17.58	2-yr	135.00	405.00	408.26		408.53	0.002017	2.30	61.10	42.10	0.53
Reach-1	17.36	Reg	738.00	405.40	411.74		411.92	0.000395	2.13	549.03	167.41	0.28
Reach-1	17.36	100-yr	360.00	405.40	409.65		409.83	0.000611	1.98	232.39	117.97	0.32
Reach-1	17.36	50-yr	325.00	405.40	409.45		409.62	0.000609	1.90	210.14	103.71	0.32
Reach-1	17.36	20-yr	272.00	405.40	409.15		409.29	0.000582	1.75	182.25	82.43	0.31
Reach-1	17.36	10-yr	230.00	405.40	408.90		409.02	0.000544	1.61	163.55	70.81	0.29
Reach-1	17.36	5-yr	191.00	405.40	408.64		408.75	0.000505	1.48	145.90	67.89	0.28
Reach-1	17.36	2-yr	135.00	405.40	408.21		408.29	0.000441	1.25	117.73	62.94	0.26
Reach-1	17.3	Reg	738.00	405.30	411.69		411.86	0.000458	2.14	545.95	176.64	0.30
Reach-1	17.3	100-yr	360.00	405.30	409.46		409.71	0.001118	2.32	194.09	124.64	0.42
Reach-1	17.3	50-yr	325.00	405.30	409.25		409.50	0.001193	2.28	169.50	105.65	0.43
Reach-1	17.3	20-yr	272.00	405.30	408.94		409.18	0.001261	2.17	140.81	86.01	0.44
Reach-1	17.3	10-yr	230.00	405.30	408.69		408.91	0.001305	2.06	120.63	76.32	0.44
Reach-1	17.3	5-yr	191.00	405.30	408.45		408.64	0.001341	1.94	103.02	66.73	0.43
Reach-1	17.3	2-yr	135.00	405.30	408.03		408.18	0.001456	1.73	78.26	52.35	0.44
Reach-1	17.225	Reg	738.00	405.10	411.70		411.82	0.000331	1.77	636.72	215.45	0.25
Reach-1	17.225	100-yr	360.00	405.10	409.44		409.62	0.000861	1.93	237.54	143.13	0.37
Reach-1	17.225	50-yr	325.00	405.10	409.22		409.40	0.000973	1.94	206.07	135.87	0.39
Reach-1	17.225	20-yr	272.00	405.10	408.89		409.07	0.001146	1.92	163.36	121.12	0.41
Reach-1	17.225	10-yr	230.00	405.10	408.62		408.80	0.001296	1.87	133.52	102.68	0.43
Reach-1	17.225	5-yr	191.00	405.10	408.36		408.53	0.001398	1.81	109.25	83.22	0.43
Reach-1	17.225	2-yr	135.00	405.10	407.92		408.07	0.001602	1.69	79.79	55.16	0.45
Reach-1	17.199	Reg	738.00	405.10	411.60	409.39	411.79	0.000491	2.27	566.85	195.82	0.31
Reach-1	17.199	100-yr	360.00	405.10	408.98	408.16	409.48	0.002255	3.15	114.92	123.70	0.60
Reach-1	17.199	50-yr	325.00	405.10	408.81	408.02	409.27	0.002257	3.03	107.96	111.41	0.59
Reach-1	17.199	20-yr	272.00	405.10	408.57	407.80	408.97	0.002143	2.78	98.42	94.58	0.57
Reach-1	17.199	10-yr	230.00	405.10	408.38	407.60	408.71	0.002026	2.55	90.38	80.39	0.54
Reach-1	17.199	5-yr	191.00	405.10	408.18	407.40	408.45	0.001914	2.33	82.10	65.76	0.52
Reach-1	17.199	2-yr	135.00	405.10	407.80	407.00	408.01	0.001838	2.02	66.92	47.14	0.49
Reach-1	17.195		Bridge									

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	17.191	Reg	738.00	405.10	409.76	409.39	411.08	0.004244	5.08	145.19	140.22	0.85
Reach-1	17.191	100-yr	360.00	405.10	408.88	408.15	409.43	0.002545	3.27	110.03	116.34	0.63
Reach-1	17.191	50-yr	325.00	405.10	408.72	408.02	409.22	0.002532	3.14	103.64	104.83	0.62
Reach-1	17.191	20-yr	272.00	405.10	408.51	407.80	408.93	0.002341	2.85	95.36	89.91	0.59
Reach-1	17.191	10-yr	230.00	405.10	408.33	407.60	408.68	0.002184	2.61	88.05	76.73	0.56
Reach-1	17.191	5-yr	191.00	405.10	408.14	407.40	408.42	0.002042	2.38	80.36	62.89	0.53
Reach-1	17.191	2-yr	135.00	405.10	407.77	407.00	407.98	0.001946	2.05	65.73	46.25	0.51
Reach-1	17.14	Reg	738.00	405.10	409.92		410.06	0.000780	2.11	628.92	288.94	0.36
Reach-1	17.14	100-yr	360.00	405.10	408.89		409.02	0.000906	1.89	338.65	273.04	0.37
Reach-1	17.14	50-yr	325.00	405.10	408.71		408.86	0.001039	1.95	290.52	267.10	0.40
Reach-1	17.14	20-yr	272.00	405.10	408.48		408.64	0.001176	1.96	229.67	259.39	0.42
Reach-1	17.14	10-yr	230.00	405.10	408.28		408.46	0.001325	1.98	177.73	252.63	0.44
Reach-1	17.14	5-yr	191.00	405.10	408.07		408.26	0.001488	1.97	125.38	245.63	0.45
Reach-1	17.14	2-yr	135.00	405.10	407.70		407.85	0.001495	1.75	84.42	73.03	0.44
Reach-1	16.76	Reg	738.00	404.00	409.23		409.68	0.001797	3.53	392.70	218.25	0.56
Reach-1	16.76	100-yr	360.00	404.00	408.01	407.49	408.50	0.002491	3.27	158.51	143.62	0.62
Reach-1	16.76	50-yr	325.00	404.00	407.91		408.32	0.002241	3.03	147.19	103.45	0.59
Reach-1	16.76	20-yr	272.00	404.00	407.70		408.07	0.002147	2.81	126.99	94.52	0.57
Reach-1	16.76	10-yr	230.00	404.00	407.52		407.85	0.002058	2.62	110.63	86.62	0.55
Reach-1	16.76	5-yr	191.00	404.00	407.34		407.62	0.001936	2.41	95.70	78.72	0.52
Reach-1	16.76	2-yr	135.00	404.00	407.00		407.22	0.001848	2.09	71.20	63.64	0.50
Reach-1	16.575	Reg	738.00	403.50	409.15		409.37	0.000956	2.46	489.58	221.14	0.40
Reach-1	16.575	100-yr	360.00	403.50	407.91		408.10	0.001217	2.13	240.36	164.81	0.42
Reach-1	16.575	50-yr	325.00	403.50	407.76		407.95	0.001251	2.08	217.38	156.95	0.43
Reach-1	16.575	20-yr	272.00	403.50	407.53		407.71	0.001316	1.99	182.18	144.09	0.43
Reach-1	16.575	10-yr	230.00	403.50	407.32		407.49	0.001400	1.92	153.20	132.57	0.44
Reach-1	16.575	5-yr	191.00	403.50	407.11		407.28	0.001476	1.83	127.21	121.31	0.44
Reach-1	16.575	2-yr	135.00	403.50	406.75		406.90	0.001416	1.68	88.93	86.54	0.42
Reach-1	16.37	Reg	738.00	403.20	408.91		409.17	0.001080	2.65	422.19	159.52	0.43
Reach-1	16.37	100-yr	360.00	403.20	407.66		407.86	0.001203	2.19	236.51	136.80	0.43
Reach-1	16.37	50-yr	325.00	403.20	407.51		407.71	0.001219	2.13	216.53	133.19	0.43
Reach-1	16.37	20-yr	272.00	403.20	407.27		407.45	0.001263	2.05	184.35	127.18	0.43
Reach-1	16.37	10-yr	230.00	403.20	407.03		407.21	0.001359	2.01	155.12	121.46	0.44
Reach-1	16.37	5-yr	191.00	403.20	406.79		406.97	0.001499	1.97	126.29	118.31	0.45
Reach-1	16.37	2-yr	135.00	403.20	406.38		406.56	0.001853	1.91	79.50	97.83	0.49
Reach-1	16.25	Reg	738.00	403.10	408.78		409.06	0.000775	2.66	438.78	185.22	0.38
Reach-1	16.25	100-yr	360.00	403.10	407.60		407.76	0.000572	1.90	260.56	124.34	0.32
Reach-1	16.25	50-yr	325.00	403.10	407.45		407.60	0.000545	1.81	243.37	119.77	0.31
Reach-1	16.25	20-yr	272.00	403.10	407.22		407.34	0.000500	1.66	216.07	112.11	0.29
Reach-1	16.25	10-yr	230.00	403.10	406.99		407.10	0.000471	1.53	191.67	104.78	0.28
Reach-1	16.25	5-yr	191.00	403.10	406.77		406.86	0.000434	1.40	168.76	96.59	0.26
Reach-1	16.25	2-yr	135.00	403.10	406.38		406.44	0.000372	1.18	133.76	82.52	0.24
Reach-1	16.16	Reg	738.00	403.00	407.97	407.78	408.87	0.003184	4.66	254.04	142.37	0.75
Reach-1	16.16	100-yr	360.00	403.00	407.19		407.64	0.001920	3.13	158.39	103.46	0.56
Reach-1	16.16	50-yr	325.00	403.00	407.09		407.49	0.001784	2.96	148.14	98.38	0.54
Reach-1	16.16	20-yr	272.00	403.00	406.91		407.25	0.001580	2.68	131.49	89.53	0.50
Reach-1	16.16	10-yr	230.00	403.00	406.73		407.02	0.001457	2.46	115.76	80.26	0.47
Reach-1	16.16	5-yr	191.00	403.00	406.54		406.78	0.001310	2.23	101.70	70.96	0.44
Reach-1	16.16	2-yr	135.00	403.00	406.21		406.38	0.001075	1.84	81.09	54.55	0.39
Reach-1	16.1	Reg	738.00	402.90	407.69	407.69	408.65	0.004438	4.70	228.05	139.12	0.84
Reach-1	16.1	100-yr	360.00	402.90	406.96	406.57	407.49	0.003126	3.31	136.08	112.16	0.68
Reach-1	16.1	50-yr	325.00	402.90	406.88	406.42	407.35	0.002910	3.12	127.16	106.19	0.65
Reach-1	16.1	20-yr	272.00	402.90	406.72		407.12	0.002647	2.85	111.48	94.80	0.61
Reach-1	16.1	10-yr	230.00	402.90	406.54		406.90	0.002619	2.67	95.20	81.31	0.60
Reach-1	16.1	5-yr	191.00	402.90	406.37		406.67	0.002486	2.45	82.25	68.70	0.58
Reach-1	16.1	2-yr	135.00	402.90	406.06		406.28	0.002308	2.09	64.66	46.39	0.54
Reach-1	15.98	Reg	738.00	402.80	407.37	407.18	408.04	0.003678	3.88	275.32	221.94	0.76
Reach-1	15.98	100-yr	360.00	402.80	406.80		407.11	0.002245	2.58	171.85	140.83	0.57
Reach-1	15.98	50-yr	325.00	402.80	406.72		407.01	0.002087	2.43	161.71	132.74	0.54
Reach-1	15.98	20-yr	272.00	402.80	406.57		406.81	0.001936	2.22	142.60	116.00	0.52
Reach-1	15.98	10-yr	230.00	402.80	406.35		406.57	0.002153	2.15	119.08	98.90	0.53
Reach-1	15.98	5-yr	191.00	402.80	406.14		406.35	0.002350	2.06	100.21	86.05	0.55
Reach-1	15.98	2-yr	135.00	402.80	405.79		405.98	0.002609	1.93	73.41	68.28	0.56
Reach-1	15.85	Reg	738.00	402.60	407.17		407.61	0.002474	3.54	402.46	294.70	0.64
Reach-1	15.85	100-yr	360.00	402.60	406.53	405.97	406.85	0.001964	2.72	223.43	265.52	0.55

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	15.85	50-yr	325.00	402.60	406.30	405.84	406.70	0.002610	2.94	164.78	235.81	0.62
Reach-1	15.85	20-yr	272.00	402.60	406.03	405.61	406.47	0.003221	3.00	110.78	139.17	0.67
Reach-1	15.85	10-yr	230.00	402.60	405.85	405.41	406.23	0.003056	2.78	94.77	78.00	0.65
Reach-1	15.85	5-yr	191.00	402.60	405.66		406.00	0.002992	2.61	80.80	69.07	0.63
Reach-1	15.85	2-yr	135.00	402.60	405.39		405.64	0.002571	2.21	63.82	56.35	0.57
Reach-1	15.685	Reg	749.00	402.40	407.33		407.37	0.000303	1.35	1180.89	579.40	0.23
Reach-1	15.685	100-yr	432.00	402.40	406.63		406.66	0.000293	1.15	804.32	503.14	0.22
Reach-1	15.685	50-yr	389.00	402.40	406.44		406.47	0.000334	1.17	708.11	483.64	0.23
Reach-1	15.685	20-yr	327.00	402.40	406.17		406.21	0.000393	1.19	584.63	457.40	0.24
Reach-1	15.685	10-yr	277.00	402.40	405.93		405.97	0.000479	1.24	475.58	433.47	0.26
Reach-1	15.685	5-yr	229.00	402.40	405.68		405.73	0.000594	1.33	368.92	410.20	0.29
Reach-1	15.685	2-yr	160.00	402.40	405.29		405.37	0.000813	1.47	218.67	358.58	0.34
Reach-1	15.38	Reg	749.00	401.90	407.10		407.23	0.000593	1.74	610.93	339.80	0.31
Reach-1	15.38	100-yr	432.00	401.90	406.45		406.54	0.000499	1.37	406.08	287.74	0.28
Reach-1	15.38	50-yr	389.00	401.90	406.24		406.33	0.000575	1.39	346.33	268.85	0.29
Reach-1	15.38	20-yr	327.00	401.90	405.95		406.05	0.000676	1.37	273.35	238.19	0.31
Reach-1	15.38	10-yr	277.00	401.90	405.68		405.77	0.000824	1.38	215.41	182.22	0.33
Reach-1	15.38	5-yr	229.00	401.90	405.39		405.48	0.001057	1.38	170.16	139.30	0.37
Reach-1	15.38	2-yr	160.00	401.90	404.89		405.00	0.001891	1.47	109.12	106.90	0.46
Reach-1	15.285	Reg	749.00	402.00	407.02	405.90	407.16	0.000779	2.08	674.87	348.91	0.36
Reach-1	15.285	100-yr	432.00	402.00	406.39	404.94	406.48	0.000602	1.65	469.58	298.93	0.31
Reach-1	15.285	50-yr	389.00	402.00	406.16	404.78	406.26	0.000687	1.69	403.08	281.75	0.33
Reach-1	15.285	20-yr	327.00	402.00	405.56	404.54	405.88	0.001836	2.50	130.56	221.36	0.52
Reach-1	15.285	10-yr	277.00	402.00	405.32	404.32	405.61	0.001754	2.35	117.78	190.24	0.50
Reach-1	15.285	5-yr	229.00	402.00	405.07	404.11	405.31	0.001670	2.19	104.56	154.63	0.49
Reach-1	15.285	2-yr	160.00	402.00	404.63	403.75	404.82	0.001553	1.93	83.11	105.77	0.46
Reach-1	15.264	Reg	749.00	402.00	406.91	406.13	407.13	0.000895	2.53	619.93	534.64	0.40
Reach-1	15.264	100-yr	432.00	402.00	405.90	404.90	406.36	0.001843	3.01	145.53	337.10	0.55
Reach-1	15.264	50-yr	389.00	402.00	405.74	404.76	406.15	0.001792	2.86	137.70	292.59	0.54
Reach-1	15.264	20-yr	327.00	402.00	405.48	404.54	405.83	0.001733	2.64	125.13	209.01	0.52
Reach-1	15.264	10-yr	277.00	402.00	405.26	404.33	405.57	0.001648	2.44	114.78	176.74	0.50
Reach-1	15.264	5-yr	229.00	402.00	405.02	404.11	405.28	0.001593	2.24	103.19	140.59	0.48
Reach-1	15.264	2-yr	160.00	402.00	404.59	403.75	404.78	0.001626	1.95	82.14	48.68	0.47
Reach-1	15.26		Bridge									
Reach-1	15.256	Reg	749.00	402.00	406.83	406.13	407.07	0.001007	2.65	588.29	529.74	0.42
Reach-1	15.256	100-yr	432.00	402.00	405.94	404.89	406.23	0.001301	2.55	294.72	348.76	0.46
Reach-1	15.256	50-yr	389.00	402.00	405.72	404.76	406.03	0.001492	2.60	233.69	288.41	0.49
Reach-1	15.256	20-yr	327.00	402.00	405.36	404.53	405.76	0.002022	2.77	117.92	191.89	0.56
Reach-1	15.256	10-yr	277.00	402.00	405.17	404.34	405.50	0.001885	2.54	109.01	162.91	0.53
Reach-1	15.256	5-yr	229.00	402.00	404.95	404.11	405.22	0.001798	2.32	98.64	54.22	0.51
Reach-1	15.256	2-yr	160.00	402.00	404.53	403.75	404.73	0.001810	2.02	79.05	47.78	0.49
Reach-1	15.24	Reg	749.00	402.00	406.85	406.15	407.00	0.000740	2.17	765.47	530.95	0.36
Reach-1	15.24	100-yr	432.00	402.00	405.66	404.94	406.14	0.002451	3.07	140.79	261.48	0.61
Reach-1	15.24	50-yr	389.00	402.00	405.54	404.79	405.97	0.002328	2.90	134.26	225.30	0.59
Reach-1	15.24	20-yr	327.00	402.00	405.35	404.53	405.70	0.002174	2.65	123.48	189.24	0.56
Reach-1	15.24	10-yr	277.00	402.00	405.15	404.31	405.46	0.002114	2.46	112.72	159.70	0.55
Reach-1	15.24	5-yr	229.00	402.00	404.92	404.08	405.19	0.002076	2.28	100.25	53.84	0.53
Reach-1	15.24	2-yr	160.00	402.00	404.49	403.73	404.71	0.001930	2.04	78.54	47.41	0.51
Reach-1	15.07	Reg	804.00	401.30	406.67		406.87	0.000726	2.12	485.16	322.61	0.35
Reach-1	15.07	100-yr	432.00	401.30	405.72		405.84	0.000644	1.63	310.82	153.61	0.32
Reach-1	15.07	50-yr	389.00	401.30	405.57		405.69	0.000642	1.57	288.61	151.87	0.31
Reach-1	15.07	20-yr	327.00	401.30	405.34		405.44	0.000649	1.48	253.36	149.06	0.31
Reach-1	15.07	10-yr	277.00	401.30	405.11		405.21	0.000688	1.42	219.29	146.29	0.31
Reach-1	15.07	5-yr	229.00	401.30	404.84		404.94	0.000751	1.37	181.97	134.52	0.32
Reach-1	15.07	2-yr	160.00	401.30	404.35		404.44	0.000998	1.32	123.57	102.63	0.35
Reach-1	14.93	Reg	804.00	401.00	406.21	405.11	406.70	0.001531	3.29	384.22	285.74	0.52
Reach-1	14.93	100-yr	432.00	401.00	405.50		405.73	0.000909	2.22	251.20	134.50	0.39
Reach-1	14.93	50-yr	389.00	401.00	405.37		405.58	0.000856	2.10	234.49	129.00	0.38
Reach-1	14.93	20-yr	327.00	401.00	405.16		405.34	0.000781	1.92	208.58	119.96	0.35
Reach-1	14.93	10-yr	277.00	401.00	404.95		405.10	0.000740	1.78	183.91	111.56	0.34
Reach-1	14.93	5-yr	229.00	401.00	404.70		404.83	0.000720	1.65	156.84	104.80	0.33
Reach-1	14.93	2-yr	160.00	401.00	404.21		404.32	0.000752	1.46	111.63	72.96	0.33
Reach-1	14.82	Reg	804.00	400.80	405.83	405.60	406.46	0.003109	3.86	334.98	222.57	0.71
Reach-1	14.82	100-yr	432.00	400.80	404.99	404.76	405.52	0.003572	3.34	169.14	168.64	0.72

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	14.82	50-yr	389.00	400.80	404.87	404.60	405.38	0.003587	3.23	149.79	155.18	0.71
Reach-1	14.82	20-yr	327.00	400.80	404.69	404.12	405.15	0.003540	3.04	123.59	134.86	0.70
Reach-1	14.82	10-yr	277.00	400.80	404.50	403.90	404.93	0.003174	2.89	100.86	103.92	0.66
Reach-1	14.82	5-yr	229.00	400.80	404.31		404.67	0.002862	2.66	86.15	48.64	0.62
Reach-1	14.82	2-yr	160.00	400.80	403.86		404.16	0.002764	2.40	66.69	40.77	0.60
Reach-1	14.67	Reg	804.00	400.50	405.60		406.03	0.001988	3.33	382.61	183.73	0.58
Reach-1	14.67	100-yr	432.00	400.50	404.77		405.08	0.001834	2.68	237.88	168.27	0.53
Reach-1	14.67	50-yr	389.00	400.50	404.64		404.94	0.001839	2.60	216.12	167.29	0.53
Reach-1	14.67	20-yr	327.00	400.50	404.44		404.73	0.001833	2.48	183.07	165.80	0.52
Reach-1	14.67	10-yr	277.00	400.50	404.24		404.52	0.001890	2.39	150.76	164.34	0.52
Reach-1	14.67	5-yr	229.00	400.50	404.02	403.10	404.28	0.002012	2.30	113.39	162.62	0.53
Reach-1	14.67	2-yr	160.00	400.50	403.58		403.80	0.001847	2.07	77.35	43.97	0.50
Reach-1	14.45	Reg	804.00	400.20	405.36		405.69	0.001227	2.78	395.86	166.48	0.46
Reach-1	14.45	100-yr	432.00	400.20	404.61		404.79	0.000866	2.01	277.43	146.43	0.37
Reach-1	14.45	50-yr	389.00	400.20	404.49		404.65	0.000826	1.91	259.93	143.16	0.36
Reach-1	14.45	20-yr	327.00	400.20	404.30		404.44	0.000757	1.75	234.02	138.19	0.34
Reach-1	14.45	10-yr	277.00	400.20	404.11		404.24	0.000724	1.63	208.24	133.06	0.33
Reach-1	14.45	5-yr	229.00	400.20	403.88		403.99	0.000727	1.53	177.67	127.07	0.33
Reach-1	14.45	2-yr	160.00	400.20	403.39		403.49	0.000896	1.44	118.52	105.36	0.35
Reach-1	14.4	Reg	804.00	400.10	404.88	404.74	405.56	0.003660	4.21	301.77	180.38	0.77
Reach-1	14.4	100-yr	432.00	400.10	404.01	404.01	404.66	0.004187	3.80	159.03	145.97	0.79
Reach-1	14.4	50-yr	389.00	400.10	403.93	403.93	404.53	0.003947	3.63	147.16	144.83	0.76
Reach-1	14.4	20-yr	327.00	400.10	403.72	403.72	404.32	0.004139	3.53	117.51	142.49	0.77
Reach-1	14.4	10-yr	277.00	400.10	403.58	403.24	404.12	0.003912	3.31	97.37	140.88	0.74
Reach-1	14.4	5-yr	229.00	400.10	403.46	402.97	403.89	0.003259	2.92	83.80	67.51	0.67
Reach-1	14.4	2-yr	160.00	400.10	403.03		403.38	0.003531	2.65	60.50	40.09	0.67
Reach-1	14.3	Reg	804.00	400.10	404.83		405.28	0.001649	3.31	367.06	172.60	0.54
Reach-1	14.3	100-yr	432.00	400.10	404.08		404.35	0.001209	2.45	244.78	153.08	0.44
Reach-1	14.3	50-yr	389.00	400.10	403.98		404.22	0.001129	2.32	229.38	150.02	0.43
Reach-1	14.3	20-yr	327.00	400.10	403.82		404.02	0.001000	2.10	206.35	142.95	0.40
Reach-1	14.3	10-yr	277.00	400.10	403.68		403.85	0.000887	1.91	186.68	136.62	0.37
Reach-1	14.3	5-yr	229.00	400.10	403.53		403.67	0.000772	1.72	166.10	129.66	0.34
Reach-1	14.3	2-yr	160.00	400.10	403.05		403.16	0.000809	1.53	115.69	80.24	0.34
Reach-1	14.14	Reg	804.00	399.80	404.54		404.95	0.002433	2.84	303.55	155.88	0.60
Reach-1	14.14	100-yr	432.00	399.80	403.80		404.07	0.002735	2.32	192.64	139.90	0.60
Reach-1	14.14	50-yr	389.00	399.80	403.70		403.95	0.002786	2.24	178.78	137.40	0.59
Reach-1	14.14	20-yr	327.00	399.80	403.54		403.77	0.002879	2.11	158.07	133.58	0.59
Reach-1	14.14	10-yr	277.00	399.80	403.41		403.61	0.003023	2.00	139.95	130.14	0.60
Reach-1	14.14	5-yr	229.00	399.80	403.25		403.43	0.003424	1.93	119.38	126.13	0.62
Reach-1	14.14	2-yr	160.00	399.80	402.77		402.98	0.001655	2.03	78.97	42.67	0.48
Reach-1	13.925	Reg	804.00	399.50	404.16		404.48	0.001819	2.91	419.35	196.75	0.54
Reach-1	13.925	100-yr	432.00	399.50	403.39		403.60	0.001692	2.29	275.48	175.99	0.50
Reach-1	13.925	50-yr	389.00	399.50	403.30		403.49	0.001633	2.19	258.77	173.31	0.48
Reach-1	13.925	20-yr	327.00	399.50	403.16		403.32	0.001518	2.01	234.52	169.35	0.46
Reach-1	13.925	10-yr	277.00	399.50	403.02		403.17	0.001442	1.87	212.02	165.58	0.44
Reach-1	13.925	5-yr	229.00	399.50	402.86		402.99	0.001337	1.76	185.33	159.27	0.42
Reach-1	13.925	2-yr	160.00	399.50	402.53		402.65	0.001212	1.62	135.40	146.19	0.40
Reach-1	13.655	Reg	804.00	398.90	403.88		404.09	0.001286	2.60	520.64	244.71	0.46
Reach-1	13.655	100-yr	432.00	398.90	402.98		403.19	0.001633	2.46	301.48	239.97	0.50
Reach-1	13.655	50-yr	389.00	398.90	402.82	402.46	403.06	0.001829	2.51	264.10	239.15	0.52
Reach-1	13.655	20-yr	327.00	398.90	402.60	402.32	402.86	0.002130	2.56	210.49	237.41	0.55
Reach-1	13.655	10-yr	277.00	398.90	402.41	402.18	402.69	0.002362	2.56	167.56	214.23	0.58
Reach-1	13.655	5-yr	229.00	398.90	402.22	401.69	402.51	0.002517	2.50	130.26	191.83	0.59
Reach-1	13.655	2-yr	160.00	398.90	401.95	401.30	402.20	0.002350	2.22	83.75	145.96	0.55
Reach-1	13.39	Reg	817.00	398.30	403.30		403.72	0.001846	3.21	441.33	310.57	0.56
Reach-1	13.39	100-yr	432.00	398.30	402.07	401.68	402.61	0.003548	3.28	150.99	192.44	0.72
Reach-1	13.39	50-yr	389.00	398.30	401.98	401.55	402.45	0.003302	3.08	136.14	82.74	0.69
Reach-1	13.39	20-yr	327.00	398.30	401.78	401.37	402.20	0.003300	2.88	120.31	78.50	0.67
Reach-1	13.39	10-yr	277.00	398.30	401.59		401.97	0.003432	2.73	105.70	74.37	0.68
Reach-1	13.39	5-yr	229.00	398.30	401.37		401.72	0.003823	2.62	89.61	69.54	0.70
Reach-1	13.39	2-yr	160.00	398.30	400.97		401.29	0.005396	2.54	63.41	60.17	0.79
Reach-1	13.285	Reg	817.00	397.90	403.35		403.50	0.000687	2.13	693.54	305.70	0.35
Reach-1	13.285	100-yr	432.00	397.90	402.06		402.28	0.001363	2.27	305.04	294.48	0.46
Reach-1	13.285	50-yr	389.00	397.90	401.92		402.15	0.001429	2.24	265.83	286.70	0.46
Reach-1	13.285	20-yr	327.00	397.90	401.64		401.90	0.001766	2.30	189.36	261.01	0.50

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	13.285	10-yr	277.00	397.90	401.40		401.66	0.001979	2.26	138.34	146.93	0.52
Reach-1	13.285	5-yr	229.00	397.90	401.14		401.39	0.002167	2.20	107.07	91.94	0.54
Reach-1	13.285	2-yr	160.00	397.90	400.67		400.89	0.002458	2.09	76.97	54.79	0.56
Reach-1	12.95	Reg	817.00	396.70	403.04		403.29	0.000796	2.72	560.80	251.96	0.39
Reach-1	12.95	100-yr	432.00	396.70	401.36		401.78	0.001731	3.05	206.49	173.79	0.53
Reach-1	12.95	50-yr	389.00	396.70	401.10	400.28	401.58	0.002055	3.15	163.14	164.20	0.57
Reach-1	12.95	20-yr	327.00	396.70	400.75	399.97	401.22	0.002303	3.07	122.33	88.49	0.59
Reach-1	12.95	10-yr	277.00	396.70	400.47		400.91	0.002473	2.96	100.05	69.48	0.60
Reach-1	12.95	5-yr	229.00	396.70	400.17		400.57	0.002659	2.81	82.32	49.37	0.61
Reach-1	12.95	2-yr	160.00	396.70	399.67		400.00	0.002852	2.55	62.62	35.66	0.62
Reach-1	12.72	Reg	817.00	396.20	402.93	399.64	403.16	0.000399	2.12	384.72	354.14	0.28
Reach-1	12.72	100-yr	432.00	396.20	401.43	398.65	401.55	0.000306	1.52	284.15	229.58	0.24
Reach-1	12.72	50-yr	389.00	396.20	401.22	398.52	401.32	0.000295	1.44	269.78	195.10	0.23
Reach-1	12.72	20-yr	327.00	396.20	400.87	398.32	400.96	0.000281	1.33	246.55	153.20	0.22
Reach-1	12.72	10-yr	277.00	396.20	400.59	398.15	400.66	0.000265	1.22	227.35	138.00	0.21
Reach-1	12.72	5-yr	229.00	396.20	400.27	397.98	400.33	0.000250	1.11	206.38	121.42	0.20
Reach-1	12.72	2-yr	160.00	396.20	399.74	397.60	399.79	0.000220	0.93	171.14	100.19	0.18
Reach-1	12.691	Reg	817.00	396.20	402.63	399.45	403.04	0.000613	2.85	291.09	372.73	0.36
Reach-1	12.691	100-yr	432.00	396.20	401.32	398.33	401.50	0.000366	1.89	230.35	320.97	0.27
Reach-1	12.691	50-yr	389.00	396.20	401.12	398.18	401.28	0.000338	1.77	221.19	311.12	0.26
Reach-1	12.691	20-yr	327.00	396.20	400.80	397.97	400.93	0.000300	1.60	206.15	141.91	0.24
Reach-1	12.691	10-yr	277.00	396.20	400.53	397.79	400.64	0.000263	1.44	193.65	113.29	0.22
Reach-1	12.691	5-yr	229.00	396.20	400.23	397.59	400.32	0.000228	1.28	180.07	53.99	0.20
Reach-1	12.691	2-yr	160.00	396.20	399.72	397.30	399.78	0.000175	1.02	157.12	44.67	0.17
Reach-1	12.688		Bridge									
Reach-1	12.685	Reg	817.00	396.20	402.59	399.46	403.01	0.000626	2.87	284.50	371.81	0.36
Reach-1	12.685	100-yr	432.00	396.20	401.31	398.33	401.49	0.000369	1.90	227.38	320.48	0.27
Reach-1	12.685	50-yr	389.00	396.20	401.11	398.19	401.28	0.000341	1.78	218.68	310.71	0.26
Reach-1	12.685	20-yr	327.00	396.20	400.79	397.97	400.92	0.000302	1.60	204.38	141.25	0.24
Reach-1	12.685	10-yr	277.00	396.20	400.53	397.78	400.63	0.000264	1.44	192.49	112.79	0.22
Reach-1	12.685	5-yr	229.00	396.20	400.23	397.60	400.31	0.000229	1.28	179.32	53.86	0.20
Reach-1	12.685	2-yr	160.00	396.20	399.72	397.30	399.78	0.000175	1.02	156.72	44.67	0.17
Reach-1	12.655	Reg	817.00	396.20	402.19	401.04	402.85	0.001897	3.58	228.47	360.81	0.58
Reach-1	12.655	100-yr	432.00	396.20	400.94	399.63	401.34	0.001612	2.80	154.05	158.45	0.56
Reach-1	12.655	50-yr	389.00	396.20	400.74	399.44	401.12	0.001617	2.74	142.14	135.51	0.57
Reach-1	12.655	20-yr	327.00	396.20	400.41	399.15	400.77	0.001646	2.65	123.29	57.70	0.53
Reach-1	12.655	10-yr	277.00	396.20	400.18	398.91	400.49	0.001509	2.47	112.15	47.54	0.51
Reach-1	12.655	5-yr	229.00	396.20	399.94	398.64	400.19	0.001356	2.25	101.61	39.61	0.45
Reach-1	12.655	2-yr	160.00	396.20	399.51	398.22	399.69	0.001083	1.88	85.31	37.06	0.39
Reach-1	12.47	Reg	817.00	396.20	402.37	400.21	402.55	0.000529	2.31	639.76	280.00	0.32
Reach-1	12.47	100-yr	432.00	396.20	400.96	399.36	401.11	0.000605	2.02	306.96	114.70	0.32
Reach-1	12.47	50-yr	389.00	396.20	400.74	399.24	400.90	0.000618	1.97	282.75	113.21	0.32
Reach-1	12.47	20-yr	327.00	396.20	400.39	399.04	400.54	0.000660	1.90	243.20	109.65	0.33
Reach-1	12.47	10-yr	277.00	396.20	400.15	398.77	400.28	0.000642	1.79	216.86	105.49	0.32
Reach-1	12.47	5-yr	229.00	396.20	399.88	398.52	400.00	0.000624	1.67	189.44	101.57	0.31
Reach-1	12.47	2-yr	160.00	396.20	399.43	398.07	399.53	0.000589	1.48	144.84	96.16	0.30
Reach-1	12.34	Reg	817.00	396.10	402.39		402.48	0.000289	1.71	924.32	300.00	0.24
Reach-1	12.34	100-yr	432.00	396.10	400.94		401.04	0.000432	1.69	488.76	300.00	0.27
Reach-1	12.34	50-yr	389.00	396.10	400.71		400.82	0.000493	1.74	419.99	300.00	0.29
Reach-1	12.34	20-yr	327.00	396.10	400.33		400.46	0.000618	1.81	307.38	278.10	0.32
Reach-1	12.34	10-yr	277.00	396.10	400.09		400.21	0.000602	1.70	243.32	246.33	0.31
Reach-1	12.34	5-yr	229.00	396.10	399.82		399.93	0.000576	1.57	201.84	115.32	0.30
Reach-1	12.34	2-yr	160.00	396.10	399.37		399.46	0.000574	1.42	150.09	110.98	0.29
Reach-1	12.05	Reg	817.00	396.00	402.38		402.43	0.000155	1.29	1149.26	335.00	0.18
Reach-1	12.05	100-yr	432.00	396.00	400.91		400.96	0.000206	1.21	658.85	335.00	0.19
Reach-1	12.05	50-yr	389.00	396.00	400.68		400.73	0.000230	1.23	580.30	335.00	0.20
Reach-1	12.05	20-yr	327.00	396.00	400.28		400.34	0.000302	1.30	445.29	335.00	0.23
Reach-1	12.05	10-yr	277.00	396.00	400.01		400.08	0.000342	1.31	355.62	335.00	0.24
Reach-1	12.05	5-yr	229.00	396.00	399.72		399.80	0.000385	1.31	263.95	301.59	0.25
Reach-1	12.05	2-yr	160.00	396.00	399.24		399.32	0.000422	1.21	143.95	162.03	0.25
Reach-1	11.999	Reg	817.00	395.90	402.37	399.10	402.41	0.000109	1.13	1369.07	410.00	0.15
Reach-1	11.999	100-yr	432.00	395.90	400.79	398.21	400.92	0.000334	1.60	272.90	410.00	0.25
Reach-1	11.999	50-yr	389.00	395.90	400.58	398.09	400.69	0.000320	1.52	259.38	410.00	0.24
Reach-1	11.999	20-yr	327.00	395.90	400.21	397.91	400.31	0.000309	1.40	236.11	362.47	0.23

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	11.999	10-yr	277.00	395.90	399.98	397.76	400.06	0.000275	1.27	221.18	328.17	0.22
Reach-1	11.999	5-yr	229.00	395.90	399.71	397.59	399.78	0.000247	1.14	203.73	300.14	0.20
Reach-1	11.999	2-yr	160.00	395.90	399.24	397.34	399.28	0.000205	0.93	173.41	184.08	0.18
Reach-1	11.995		Bridge									
Reach-1	11.991	Reg	817.00	395.90	402.31	399.10	402.35	0.000116	1.16	1341.24	410.00	0.15
Reach-1	11.991	100-yr	432.00	395.90	400.75	398.20	400.80	0.000164	1.12	704.50	410.00	0.17
Reach-1	11.991	50-yr	389.00	395.90	400.56	398.09	400.61	0.000171	1.11	626.08	410.00	0.18
Reach-1	11.991	20-yr	327.00	395.90	400.20	397.91	400.30	0.000319	1.42	230.28	359.69	0.24
Reach-1	11.991	10-yr	277.00	395.90	399.97	397.75	400.05	0.000283	1.28	216.01	326.75	0.22
Reach-1	11.991	5-yr	229.00	395.90	399.70	397.59	399.77	0.000253	1.15	199.27	299.00	0.21
Reach-1	11.991	2-yr	160.00	395.90	399.23	397.34	399.28	0.000209	0.94	170.12	180.19	0.18
Reach-1	11.94	Reg	817.00	396.20	402.25	400.25	402.32	0.000251	1.52	983.97	345.00	0.22
Reach-1	11.94	100-yr	432.00	396.20	400.65	398.69	400.76	0.000448	1.65	429.57	310.06	0.28
Reach-1	11.94	50-yr	389.00	396.20	400.45	398.55	400.57	0.000482	1.66	375.26	289.93	0.28
Reach-1	11.94	20-yr	327.00	396.20	400.14	398.33	400.27	0.000541	1.67	291.64	276.30	0.30
Reach-1	11.94	10-yr	277.00	396.20	399.88	398.13	400.01	0.000584	1.66	220.23	269.80	0.30
Reach-1	11.94	5-yr	229.00	396.20	399.60	397.94	399.72	0.000593	1.58	154.54	171.78	0.30
Reach-1	11.94	2-yr	160.00	396.20	399.15	397.63	399.24	0.000509	1.32	121.64	52.21	0.27
Reach-1	11.84	Reg	817.00	396.30	402.11	399.70	402.27	0.000426	1.91	659.13	216.34	0.28
Reach-1	11.84	100-yr	432.00	396.30	400.55	398.54	400.69	0.000547	1.72	291.07	171.16	0.30
Reach-1	11.84	50-yr	389.00	396.30	400.37	398.42	400.50	0.000540	1.65	270.94	165.18	0.30
Reach-1	11.84	20-yr	327.00	396.30	400.09	398.22	400.20	0.000529	1.55	240.00	155.88	0.29
Reach-1	11.84	10-yr	277.00	396.30	399.84	398.05	399.94	0.000519	1.45	213.26	148.67	0.28
Reach-1	11.84	5-yr	229.00	396.30	399.57	397.86	399.66	0.000519	1.36	184.18	141.25	0.28
Reach-1	11.84	2-yr	160.00	396.30	399.11	397.57	399.19	0.000513	1.19	137.60	101.80	0.27
Reach-1	11.73	Reg	817.00	396.30	401.68	399.94	402.15	0.001627	3.06	319.44	145.21	0.47
Reach-1	11.73	100-yr	432.00	396.30	400.29	398.88	400.58	0.001655	2.40	180.40	61.14	0.44
Reach-1	11.73	50-yr	389.00	396.30	400.13	398.74	400.39	0.001610	2.28	170.77	60.51	0.43
Reach-1	11.73	20-yr	327.00	396.30	399.88	398.50	400.10	0.001517	2.10	155.73	59.17	0.41
Reach-1	11.73	10-yr	277.00	396.30	399.65	398.34	399.85	0.001404	1.94	142.77	57.69	0.39
Reach-1	11.73	5-yr	229.00	396.30	399.40	398.15	399.56	0.001311	1.78	128.46	56.01	0.38
Reach-1	11.73	2-yr	160.00	396.30	398.98	397.84	399.10	0.001144	1.51	105.67	53.23	0.34
Reach-1	11.713	Reg	817.00	396.30	401.70	399.94	402.08	0.001394	2.81	363.88	189.27	0.43
Reach-1	11.713	100-yr	432.00	396.30	400.26	398.90	400.55	0.001673	2.35	184.00	65.59	0.44
Reach-1	11.713	50-yr	389.00	396.30	400.10	398.76	400.36	0.001641	2.24	173.63	64.51	0.43
Reach-1	11.713	20-yr	327.00	396.30	399.85	398.55	400.07	0.001558	2.07	157.66	62.45	0.42
Reach-1	11.713	10-yr	277.00	396.30	399.63	398.36	399.82	0.001453	1.92	144.05	60.71	0.40
Reach-1	11.713	5-yr	229.00	396.30	399.38	398.18	399.54	0.001370	1.77	129.05	58.73	0.38
Reach-1	11.713	2-yr	160.00	396.30	398.96	397.88	399.08	0.001219	1.52	105.27	55.46	0.35
Reach-1	11.707		Bridge									
Reach-1	11.701	Reg	817.00	396.30	401.46	399.93	401.92	0.001767	3.05	318.65	188.69	0.48
Reach-1	11.701	100-yr	432.00	396.30	400.23	398.90	400.52	0.001735	2.38	181.76	65.38	0.45
Reach-1	11.701	50-yr	389.00	396.30	400.07	398.76	400.34	0.001702	2.27	171.65	64.30	0.44
Reach-1	11.701	20-yr	327.00	396.30	399.83	398.55	400.05	0.001609	2.10	155.92	62.23	0.42
Reach-1	11.701	10-yr	277.00	396.30	399.61	398.37	399.80	0.001500	1.94	142.50	60.51	0.40
Reach-1	11.701	5-yr	229.00	396.30	399.36	398.18	399.52	0.001414	1.79	127.66	58.55	0.39
Reach-1	11.701	2-yr	160.00	396.30	398.94	397.88	399.06	0.001259	1.54	104.15	55.30	0.36
Reach-1	11.685	Reg	817.00	396.30	401.34		401.87	0.002137	3.25	278.42	142.06	0.52
Reach-1	11.685	100-yr	432.00	396.30	400.19		400.49	0.001691	2.44	177.42	59.86	0.45
Reach-1	11.685	50-yr	389.00	396.30	400.04		400.31	0.001609	2.31	168.48	57.96	0.43
Reach-1	11.685	20-yr	327.00	396.30	399.80		400.03	0.001468	2.11	154.87	56.59	0.41
Reach-1	11.685	10-yr	277.00	396.30	399.59		399.78	0.001343	1.94	142.94	55.64	0.39
Reach-1	11.685	5-yr	229.00	396.30	399.34		399.50	0.001244	1.77	129.37	54.53	0.37
Reach-1	11.685	2-yr	160.00	396.30	398.93		399.04	0.001074	1.49	107.43	52.69	0.33
Reach-1	11.66	Reg	817.00	396.20	401.00	399.87	401.74	0.002956	3.86	220.10	108.99	0.62
Reach-1	11.66	100-yr	432.00	396.20	400.08	398.77	400.43	0.001874	2.66	167.87	104.38	0.48
Reach-1	11.66	50-yr	389.00	396.20	399.94	398.64	400.25	0.001749	2.50	160.27	54.77	0.46
Reach-1	11.66	20-yr	327.00	396.20	399.72	398.43	399.98	0.001563	2.27	148.38	53.97	0.43
Reach-1	11.66	10-yr	277.00	396.20	399.52	398.23	399.74	0.001409	2.07	137.73	53.24	0.40
Reach-1	11.66	5-yr	229.00	396.20	399.29	398.06	399.46	0.001288	1.87	125.31	52.38	0.38
Reach-1	11.66	2-yr	160.00	396.20	398.89	397.76	399.01	0.001090	1.56	104.93	50.94	0.34
Reach-1	11.565	Reg	817.00	396.10	400.92		401.43	0.002281	3.22	295.12	124.74	0.53
Reach-1	11.565	100-yr	432.00	396.10	399.98		400.25	0.001394	2.32	193.99	75.60	0.41

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	11.565	50-yr	389.00	396.10	399.85		400.09	0.001298	2.19	184.04	72.74	0.39
Reach-1	11.565	20-yr	327.00	396.10	399.64		399.83	0.001151	1.97	169.14	68.23	0.37
Reach-1	11.565	10-yr	277.00	396.10	399.44		399.61	0.001027	1.79	156.43	64.14	0.34
Reach-1	11.565	5-yr	229.00	396.10	399.21		399.35	0.000928	1.61	142.23	59.22	0.32
Reach-1	11.565	2-yr	160.00	396.10	398.83		398.92	0.000751	1.32	120.80	53.93	0.28
Reach-1	11.42	Reg	817.00	395.70	400.90		401.15	0.000976	2.36	452.66	155.97	0.36
Reach-1	11.42	100-yr	432.00	395.70	399.93		400.07	0.000731	1.73	307.58	142.84	0.30
Reach-1	11.42	50-yr	389.00	395.70	399.79		399.92	0.000696	1.64	288.10	138.40	0.29
Reach-1	11.42	20-yr	327.00	395.70	399.58		399.69	0.000638	1.50	258.95	131.49	0.28
Reach-1	11.42	10-yr	277.00	395.70	399.38		399.48	0.000588	1.38	234.03	125.28	0.26
Reach-1	11.42	5-yr	229.00	395.70	399.15		399.23	0.000553	1.26	205.63	117.80	0.25
Reach-1	11.42	2-yr	160.00	395.70	398.77		398.82	0.000481	1.06	163.16	102.74	0.23
Reach-1	11.35	Reg	817.00	395.60	400.27		400.98	0.003563	4.35	313.52	155.31	0.68
Reach-1	11.35	100-yr	432.00	395.60	399.53		399.96	0.002471	3.18	206.07	130.14	0.55
Reach-1	11.35	50-yr	389.00	395.60	399.43		399.81	0.002298	3.00	192.80	125.05	0.53
Reach-1	11.35	20-yr	327.00	395.60	399.27		399.59	0.002029	2.73	172.99	117.03	0.49
Reach-1	11.35	10-yr	277.00	395.60	399.12		399.39	0.001801	2.49	155.88	109.63	0.46
Reach-1	11.35	5-yr	229.00	395.60	398.91		399.15	0.001649	2.27	134.86	99.18	0.44
Reach-1	11.35	2-yr	160.00	395.60	398.59		398.76	0.001315	1.87	105.94	81.23	0.38
Reach-1	11.265	Reg	817.00	395.40	400.00		400.62	0.003729	4.17	333.07	169.97	0.69
Reach-1	11.265	100-yr	432.00	395.40	399.33		399.72	0.002691	3.11	222.85	159.95	0.57
Reach-1	11.265	50-yr	389.00	395.40	399.23		399.59	0.002548	2.96	207.44	158.50	0.55
Reach-1	11.265	20-yr	327.00	395.40	399.08		399.40	0.002314	2.72	183.74	156.24	0.52
Reach-1	11.265	10-yr	277.00	395.40	398.95		399.22	0.002085	2.50	162.86	147.83	0.49
Reach-1	11.265	5-yr	229.00	395.40	398.76		398.99	0.001947	2.30	137.00	121.94	0.47
Reach-1	11.265	2-yr	160.00	395.40	398.47		398.64	0.001514	1.87	108.02	87.11	0.40
Reach-1	11.13	Reg	817.00	395.10	399.73		400.06	0.002743	3.71	507.91	301.77	0.59
Reach-1	11.13	100-yr	432.00	395.10	399.04		399.32	0.002481	3.10	312.46	259.27	0.55
Reach-1	11.13	50-yr	389.00	395.10	398.94		399.22	0.002433	3.01	287.59	254.97	0.54
Reach-1	11.13	20-yr	327.00	395.10	398.78		399.05	0.002409	2.89	247.68	249.59	0.53
Reach-1	11.13	10-yr	277.00	395.10	398.64		398.91	0.002408	2.80	211.71	244.64	0.53
Reach-1	11.13	5-yr	229.00	395.10	398.48		398.71	0.002098	2.52	174.49	225.59	0.49
Reach-1	11.13	2-yr	160.00	395.10	398.20		398.40	0.001911	2.23	127.36	152.98	0.46
Reach-1	10.985	Reg	817.00	394.50	399.39		399.67	0.002577	2.59	448.06	299.13	0.53
Reach-1	10.985	100-yr	432.00	394.50	398.67		398.91	0.003139	2.26	245.58	256.68	0.55
Reach-1	10.985	50-yr	389.00	394.50	398.57		398.80	0.003268	2.21	220.08	248.75	0.56
Reach-1	10.985	20-yr	327.00	394.50	398.41		398.63	0.003435	2.13	182.64	219.71	0.57
Reach-1	10.985	10-yr	277.00	394.50	398.27		398.47	0.003583	2.04	153.20	191.28	0.57
Reach-1	10.985	5-yr	229.00	394.50	398.12		398.31	0.003760	1.94	126.24	160.90	0.57
Reach-1	10.985	2-yr	160.00	394.50	397.84		398.00	0.004015	1.78	90.24	100.38	0.57
Reach-1	10.78	Reg	817.00	394.20	398.97		399.22	0.001912	2.60	491.09	280.50	0.48
Reach-1	10.78	100-yr	432.00	394.20	398.27		398.45	0.001621	2.01	311.05	240.79	0.42
Reach-1	10.78	50-yr	389.00	394.20	398.18		398.34	0.001580	1.93	287.57	235.11	0.41
Reach-1	10.78	20-yr	327.00	394.20	398.02		398.17	0.001514	1.80	251.91	226.23	0.40
Reach-1	10.78	10-yr	277.00	394.20	397.89		398.02	0.001425	1.67	222.75	212.19	0.38
Reach-1	10.78	5-yr	229.00	394.20	397.75		397.86	0.001307	1.53	194.73	196.42	0.36
Reach-1	10.78	2-yr	160.00	394.20	397.50		397.58	0.001139	1.29	149.48	167.84	0.33
Reach-1	10.56	Reg	817.00	393.50	398.57		398.78	0.002211	2.57	539.71	316.37	0.50
Reach-1	10.56	100-yr	432.00	393.50	397.79		397.99	0.002891	2.34	302.23	279.16	0.54
Reach-1	10.56	50-yr	389.00	393.50	397.69		397.88	0.003008	2.30	272.54	265.26	0.55
Reach-1	10.56	20-yr	327.00	393.50	397.51		397.70	0.003254	2.23	228.40	243.15	0.56
Reach-1	10.56	10-yr	277.00	393.50	397.35		397.55	0.003623	2.20	191.14	228.88	0.58
Reach-1	10.56	5-yr	229.00	393.50	397.18		397.38	0.004299	2.20	152.18	213.51	0.62
Reach-1	10.56	2-yr	160.00	393.50	396.86	396.74	397.09	0.006114	2.23	92.82	153.05	0.71
Reach-1	10.325	Reg	817.00	393.30	398.17		398.39	0.001410	2.54	592.92	338.03	0.42
Reach-1	10.325	100-yr	432.00	393.30	397.39		397.56	0.001290	2.07	349.63	282.09	0.39
Reach-1	10.325	50-yr	389.00	393.30	397.29		397.45	0.001261	2.00	319.67	273.58	0.38
Reach-1	10.325	20-yr	327.00	393.30	397.11		397.26	0.001225	1.88	272.67	259.65	0.37
Reach-1	10.325	10-yr	277.00	393.30	396.95		397.09	0.001187	1.78	232.27	242.83	0.36
Reach-1	10.325	5-yr	229.00	393.30	396.78		396.90	0.001129	1.65	192.50	214.66	0.35
Reach-1	10.325	2-yr	160.00	393.30	396.48		396.58	0.000984	1.41	136.55	165.97	0.32
Reach-1	10.095	Reg	817.00	392.80	397.85		398.05	0.001528	2.43	582.09	320.19	0.43
Reach-1	10.095	100-yr	432.00	392.80	397.07		397.23	0.001611	2.07	342.23	291.71	0.42
Reach-1	10.095	50-yr	389.00	392.80	396.96		397.12	0.001603	2.00	312.16	282.47	0.42
Reach-1	10.095	20-yr	327.00	392.80	396.80		396.94	0.001550	1.88	268.29	253.42	0.41

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	10.095	10-yr	277.00	392.80	396.65		396.78	0.001486	1.76	233.27	227.60	0.39
Reach-1	10.095	5-yr	229.00	392.80	396.50		396.61	0.001405	1.62	199.84	200.42	0.38
Reach-1	10.095	2-yr	160.00	392.80	396.22		396.32	0.001355	1.43	146.64	185.72	0.36
Reach-1	9.815	Reg	817.00	392.40	397.16		397.51	0.002942	3.35	414.81	199.87	0.60
Reach-1	9.815	100-yr	432.00	392.40	396.39		396.67	0.003000	2.81	261.52	196.10	0.58
Reach-1	9.815	50-yr	389.00	392.40	396.30		396.56	0.002919	2.70	244.09	195.67	0.56
Reach-1	9.815	20-yr	327.00	392.40	396.18		396.41	0.002665	2.49	220.99	195.09	0.53
Reach-1	9.815	10-yr	277.00	392.40	396.10		396.30	0.002300	2.26	205.26	194.70	0.49
Reach-1	9.815	5-yr	229.00	392.40	395.98		396.15	0.002104	2.08	181.82	193.99	0.47
Reach-1	9.815	2-yr	160.00	392.40	395.76		395.89	0.001787	1.78	139.32	182.64	0.42
Reach-1	9.7	Reg	817.00	392.10	396.95		397.22	0.002764	3.24	461.70	218.02	0.58
Reach-1	9.7	100-yr	432.00	392.10	396.07		396.34	0.003703	3.04	270.61	214.85	0.63
Reach-1	9.7	50-yr	389.00	392.10	395.95		396.22	0.003989	3.04	244.18	214.24	0.65
Reach-1	9.7	20-yr	327.00	392.10	395.75		396.06	0.004634	3.08	202.51	212.95	0.69
Reach-1	9.7	10-yr	277.00	392.10	395.57	395.56	395.93	0.005680	3.20	163.33	211.73	0.75
Reach-1	9.7	5-yr	229.00	392.10	395.46	395.46	395.80	0.005505	3.03	140.37	211.02	0.73
Reach-1	9.7	2-yr	160.00	392.10	395.30	395.30	395.58	0.004696	2.63	107.00	209.97	0.67
Reach-1	9.605	Reg	817.00	391.90	396.77		397.02	0.001835	2.98	487.51	200.19	0.49
Reach-1	9.605	100-yr	432.00	391.90	395.90		396.10	0.001737	2.44	316.82	195.70	0.45
Reach-1	9.605	50-yr	389.00	391.90	395.79		395.97	0.001725	2.37	293.78	195.09	0.45
Reach-1	9.605	20-yr	327.00	391.90	395.60		395.78	0.001709	2.26	258.24	194.14	0.44
Reach-1	9.605	10-yr	277.00	391.90	395.44		395.61	0.001690	2.15	227.29	193.31	0.43
Reach-1	9.605	5-yr	229.00	391.90	395.27		395.43	0.001686	2.05	193.93	192.41	0.43
Reach-1	9.605	2-yr	160.00	391.90	394.98		395.11	0.001569	1.81	140.78	162.66	0.40
Reach-1	9.45	Reg	817.00	391.40	396.29		396.65	0.003066	3.24	382.64	176.19	0.60
Reach-1	9.45	100-yr	432.00	391.40	395.50		395.75	0.002978	2.59	248.49	163.22	0.56
Reach-1	9.45	50-yr	389.00	391.40	395.39		395.62	0.002999	2.51	230.34	161.39	0.56
Reach-1	9.45	20-yr	327.00	391.40	395.21		395.43	0.003082	2.39	201.83	158.47	0.56
Reach-1	9.45	10-yr	277.00	391.40	395.05		395.26	0.003228	2.31	176.32	155.80	0.56
Reach-1	9.45	5-yr	229.00	391.40	394.87		395.07	0.003341	2.22	149.50	148.68	0.57
Reach-1	9.45	2-yr	160.00	391.40	394.51		394.73	0.004213	2.22	99.27	130.70	0.62
Reach-1	9.33	Reg	817.00	391.10	396.12		396.39	0.001619	2.64	456.93	193.17	0.45
Reach-1	9.33	100-yr	432.00	391.10	395.36		395.52	0.001243	1.97	313.22	183.37	0.38
Reach-1	9.33	50-yr	389.00	391.10	395.25		395.40	0.001191	1.88	293.51	182.04	0.37
Reach-1	9.33	20-yr	327.00	391.10	395.08		395.21	0.001118	1.74	262.24	179.93	0.35
Reach-1	9.33	10-yr	277.00	391.10	394.92		395.04	0.001038	1.61	235.02	171.93	0.33
Reach-1	9.33	5-yr	229.00	391.10	394.77		394.86	0.000924	1.45	209.17	157.66	0.31
Reach-1	9.33	2-yr	160.00	391.10	394.43		394.50	0.000829	1.23	161.65	129.66	0.29
Reach-1	9.25	Reg	817.00	390.90	395.81		396.22	0.002886	3.46	405.71	212.05	0.60
Reach-1	9.25	100-yr	432.00	390.90	395.07		395.37	0.002586	2.78	254.15	196.46	0.54
Reach-1	9.25	50-yr	389.00	390.90	394.97		395.26	0.002524	2.68	234.38	193.61	0.53
Reach-1	9.25	20-yr	327.00	390.90	394.81		395.07	0.002408	2.51	204.25	186.64	0.51
Reach-1	9.25	10-yr	277.00	390.90	394.67		394.91	0.002284	2.35	178.73	180.53	0.50
Reach-1	9.25	5-yr	229.00	390.90	394.54		394.75	0.002065	2.15	155.20	174.70	0.47
Reach-1	9.25	2-yr	160.00	390.90	394.21		394.39	0.002082	1.93	102.15	147.55	0.46
Reach-1	9.135	Reg	817.00	390.50	395.68		395.92	0.002007	2.81	508.04	242.76	0.49
Reach-1	9.135	100-yr	432.00	390.50	394.90		395.09	0.002036	2.37	320.30	238.73	0.47
Reach-1	9.135	50-yr	389.00	390.50	394.79		394.98	0.002057	2.32	294.09	238.16	0.47
Reach-1	9.135	20-yr	327.00	390.50	394.62	394.27	394.80	0.002125	2.26	252.11	237.23	0.48
Reach-1	9.135	10-yr	277.00	390.50	394.46	393.96	394.65	0.002203	2.20	214.96	236.41	0.48
Reach-1	9.135	5-yr	229.00	390.50	394.33	393.66	394.51	0.002079	2.06	184.74	235.73	0.46
Reach-1	9.135	2-yr	160.00	390.50	393.92		394.12	0.002747	2.07	96.12	126.40	0.51
Reach-1	9.02	Reg	817.00	390.20	395.01		395.64	0.004035	4.65	357.51	184.08	0.73
Reach-1	9.02	100-yr	432.00	390.20	394.24	394.24	394.80	0.003811	3.95	216.97	180.21	0.68
Reach-1	9.02	50-yr	389.00	390.20	394.14	394.14	394.69	0.003722	3.82	198.87	179.71	0.67
Reach-1	9.02	20-yr	327.00	390.20	393.99	393.99	394.51	0.003529	3.61	171.55	178.96	0.65
Reach-1	9.02	10-yr	277.00	390.20	393.84	393.84	394.34	0.003426	3.44	144.78	178.36	0.63
Reach-1	9.02	5-yr	229.00	390.20	393.50	393.23	394.14	0.004578	3.67	83.91	103.30	0.72
Reach-1	9.02	2-yr	160.00	390.20	393.50	392.61	393.83	0.002273	2.59	85.10	177.02	0.51
Reach-1	8.92	Reg	817.00	389.90	394.93		395.30	0.002295	2.88	353.70	151.03	0.52
Reach-1	8.92	100-yr	432.00	389.90	394.09		394.33	0.002126	2.24	232.11	139.31	0.48
Reach-1	8.92	50-yr	389.00	389.90	393.99		394.20	0.002054	2.13	217.86	137.70	0.47
Reach-1	8.92	20-yr	327.00	389.90	393.85		394.03	0.001799	1.95	198.43	133.11	0.43
Reach-1	8.92	10-yr	277.00	389.90	393.75		393.89	0.001508	1.76	185.19	129.89	0.40
Reach-1	8.92	5-yr	229.00	389.90	393.67		393.78	0.001170	1.52	174.86	127.31	0.35

HEC-RAS Plan: RFP River: RIVER-1 Reach: Reach-1 (Continued)

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)	
Reach-1	8.92	2-yr	160.00	389.90	393.58		393.64	0.000657	1.13	163.90	124.53	0.26
Reach-1	8.79	Reg	817.00	389.70	394.14	394.03	394.87	0.004222	4.41	312.29	179.20	0.73
Reach-1	8.79	100-yr	432.00	389.70	393.61		394.01	0.002516	3.07	220.43	171.27	0.55
Reach-1	8.79	50-yr	389.00	389.70	393.59		393.92	0.002124	2.81	216.03	170.87	0.50
Reach-1	8.79	20-yr	327.00	389.70	393.56		393.80	0.001572	2.40	211.01	170.41	0.43
Reach-1	8.79	10-yr	277.00	389.70	393.54		393.72	0.001161	2.06	207.91	170.12	0.37
Reach-1	8.79	5-yr	229.00	389.70	393.53		393.65	0.000811	1.71	205.61	169.91	0.31
Reach-1	8.79	2-yr	160.00	389.70	393.51		393.58	0.000405	1.21	203.26	169.69	0.22
Reach-1	8.67	Reg	817.00	389.50	393.50	393.49	394.31	0.006189	4.29	263.54	174.25	0.84
Reach-1	8.67	100-yr	432.00	389.50	393.50	392.67	393.73	0.001731	2.27	263.54	174.25	0.44
Reach-1	8.67	50-yr	389.00	389.50	393.50	392.53	393.68	0.001403	2.04	263.54	174.25	0.40
Reach-1	8.67	20-yr	327.00	389.50	393.50	392.30	393.63	0.000992	1.72	263.54	174.25	0.34
Reach-1	8.67	10-yr	277.00	389.50	393.50	392.13	393.59	0.000711	1.45	263.54	174.25	0.29
Reach-1	8.67	5-yr	229.00	389.50	393.50	391.97	393.56	0.000486	1.20	263.54	174.25	0.24
Reach-1	8.67	2-yr	160.00	389.50	393.50	391.68	393.53	0.000237	0.84	263.54	174.25	0.16

Unsteady State Hec Ras Model

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.785	Max WS	REG_POST_OP2	157.59	451.40	455.17		455.35	0.002843	2.15	114.68	127.70	0.39
Reach-1	35.785	Max WS	100-POST_OP2	51.22	451.40	453.64		453.74	0.003039	1.57	42.68	32.00	0.38
Reach-1	35.785	Max WS	50-post-op2	44.00	451.40	453.49		453.59	0.003012	1.49	38.18	30.95	0.37
Reach-1	35.785	Max WS	10-Post-Op2	28.74	451.40	453.14		453.22	0.002991	1.30	27.73	28.36	0.36
Reach-1	35.785	Max WS	5-Post-OP2	22.56	451.40	452.97		453.04	0.002955	1.20	23.10	26.96	0.35
Reach-1	35.785	Max WS	2-Post-Op2	14.11	451.40	452.69		452.74	0.002948	1.02	16.03	22.89	0.34
Reach-1	35.785	Max WS	Reg-Pre-Op2	157.59	451.40	455.17		455.35	0.002843	2.15	114.68	127.70	0.39
Reach-1	35.785	Max WS	100-Pre-Op2	51.22	451.40	453.64		453.74	0.003039	1.57	42.68	32.00	0.38
Reach-1	35.785	Max WS	50-PRE-OP2	44.00	451.40	453.49		453.59	0.003012	1.49	38.18	30.95	0.37
Reach-1	35.785	Max WS	25-Pre-OP2	37.17	451.40	453.35		453.43	0.002991	1.41	33.71	29.87	0.37
Reach-1	35.785	Max WS	10-Pre-OP2	28.74	451.40	453.14		453.22	0.002991	1.30	27.73	28.36	0.36
Reach-1	35.785	Max WS	5yr-Pre- Op2	22.56	451.40	452.97		453.04	0.002955	1.20	23.10	26.96	0.35
Reach-1	35.785	Max WS	2yr-Pre- Op2	14.11	451.40	452.69		452.74	0.002948	1.02	16.03	22.89	0.34
Reach-1	35.775*	Max WS	REG_POST_OP2	157.59	451.33	455.12		455.32	0.003109	2.22	105.84	124.55	0.41
Reach-1	35.775*	Max WS	100-POST_OP2	51.22	451.33	453.59		453.71	0.003588	1.65	38.12	30.79	0.41
Reach-1	35.775*	Max WS	50-post-op2	44.00	451.33	453.44		453.56	0.003601	1.58	33.82	29.73	0.40
Reach-1	35.775*	Max WS	10-Post-Op2	28.74	451.33	453.09		453.19	0.003648	1.38	24.01	25.86	0.39
Reach-1	35.775*	Max WS	5-Post-OP2	22.56	451.33	452.93		453.01	0.003610	1.26	19.95	23.66	0.38
Reach-1	35.775*	Max WS	2-Post-Op2	14.11	451.33	452.65		452.71	0.003727	1.08	13.81	19.89	0.37
Reach-1	35.775*	Max WS	Reg-Pre-Op2	157.59	451.33	455.12		455.32	0.003109	2.22	105.84	124.55	0.41
Reach-1	35.775*	Max WS	100-Pre-Op2	51.22	451.33	453.59		453.71	0.003588	1.65	38.12	30.79	0.41
Reach-1	35.775*	Max WS	50-PRE-OP2	44.00	451.33	453.44		453.56	0.003601	1.58	33.82	29.73	0.40
Reach-1	35.775*	Max WS	25-Pre-OP2	37.17	451.33	453.30		453.40	0.003632	1.50	29.52	28.57	0.40
Reach-1	35.775*	Max WS	10-Pre-OP2	28.74	451.33	453.09		453.19	0.003648	1.38	24.01	25.86	0.39
Reach-1	35.775*	Max WS	5yr-Pre- Op2	22.56	451.33	452.93		453.01	0.003610	1.26	19.95	23.66	0.38
Reach-1	35.775*	Max WS	2yr-Pre- Op2	14.11	451.33	452.65		452.71	0.003726	1.08	13.81	19.89	0.37
Reach-1	35.765*	Max WS	REG_POST_OP2	157.59	451.26	455.08		455.30	0.003308	2.26	98.82	110.52	0.42
Reach-1	35.765*	Max WS	100-POST_OP2	51.22	451.26	453.53		453.67	0.004174	1.72	34.16	29.15	0.44
Reach-1	35.765*	Max WS	50-post-op2	44.00	451.26	453.39		453.52	0.004190	1.64	30.21	27.39	0.43
Reach-1	35.765*	Max WS	10-Post-Op2	28.75	451.26	453.04		453.15	0.004295	1.43	21.49	23.04	0.42
Reach-1	35.765*	Max WS	5-Post-OP2	22.56	451.26	452.88		452.97	0.004320	1.31	17.90	20.98	0.41
Reach-1	35.765*	Max WS	2-Post-Op2	14.11	451.26	452.60		452.66	0.004749	1.14	12.46	17.42	0.41
Reach-1	35.765*	Max WS	Reg-Pre-Op2	157.59	451.26	455.08		455.30	0.003308	2.26	98.82	110.52	0.42
Reach-1	35.765*	Max WS	100-Pre-Op2	51.22	451.26	453.53		453.67	0.004174	1.72	34.16	29.15	0.44
Reach-1	35.765*	Max WS	50-PRE-OP2	44.00	451.26	453.39		453.52	0.004190	1.64	30.21	27.39	0.43
Reach-1	35.765*	Max WS	25-Pre-OP2	37.17	451.26	453.24		453.36	0.004227	1.55	26.36	25.56	0.43
Reach-1	35.765*	Max WS	10-Pre-OP2	28.74	451.26	453.04		453.15	0.004295	1.43	21.49	23.04	0.42
Reach-1	35.765*	Max WS	5yr-Pre- Op2	22.56	451.26	452.88		452.97	0.004320	1.31	17.90	20.98	0.41
Reach-1	35.765*	Max WS	2yr-Pre- Op2	14.11	451.26	452.60		452.66	0.004749	1.14	12.46	17.42	0.41
Reach-1	35.755*	Max WS	REG_POST_OP2	157.60	451.18	455.03		455.26	0.003472	2.28	93.50	103.05	0.43
Reach-1	35.755*	Max WS	100-POST_OP2	51.22	451.18	453.47		453.63	0.004708	1.76	31.31	26.50	0.46
Reach-1	35.755*	Max WS	50-post-op2	43.99	451.18	453.34		453.48	0.004753	1.68	27.76	24.85	0.45
Reach-1	35.755*	Max WS	10-Post-Op2	28.75	451.18	452.99		453.10	0.005040	1.47	19.89	20.74	0.45
Reach-1	35.755*	Max WS	5-Post-OP2	22.56	451.18	452.83		452.92	0.005241	1.36	16.64	18.78	0.45
Reach-1	35.755*	Max WS	2-Post-Op2	14.11	451.18	452.54		452.61	0.005446	1.20	11.74	15.56	0.44
Reach-1	35.755*	Max WS	Reg-Pre-Op2	157.59	451.18	455.03		455.26	0.003472	2.28	93.50	103.05	0.43
Reach-1	35.755*	Max WS	100-Pre-Op2	51.22	451.18	453.47		453.63	0.004708	1.76	31.31	26.50	0.46
Reach-1	35.755*	Max WS	50-PRE-OP2	43.99	451.18	453.34		453.48	0.004753	1.68	27.76	24.85	0.45
Reach-1	35.755*	Max WS	25-Pre-OP2	37.17	451.18	453.19		453.32	0.004846	1.59	24.29	23.13	0.45
Reach-1	35.755*	Max WS	10-Pre-OP2	28.75	451.18	452.99		453.10	0.005040	1.47	19.89	20.74	0.45
Reach-1	35.755*	Max WS	5yr-Pre- Op2	22.56	451.18	452.83		452.92	0.005241	1.36	16.64	18.78	0.45
Reach-1	35.755*	Max WS	2yr-Pre- Op2	14.11	451.18	452.54		452.61	0.005446	1.20	11.74	15.56	0.44
Reach-1	35.745*	Max WS	REG_POST_OP2	157.59	451.11	454.99		455.23	0.003591	2.29	89.45	96.55	0.44
Reach-1	35.745*	Max WS	100-POST_OP2	51.22	451.11	453.42		453.58	0.005264	1.79	29.47	24.38	0.48
Reach-1	35.745*	Max WS	50-post-op2	43.99	451.11	453.28		453.43	0.005391	1.71	26.19	22.81	0.48
Reach-1	35.745*	Max WS	10-Post-Op2	28.74	451.11	452.93		453.05	0.005977	1.52	18.95	18.90	0.48
Reach-1	35.745*	Max WS	5-Post-OP2	22.56	451.11	452.76		452.87	0.005804	1.42	15.93	17.22	0.47
Reach-1	35.745*	Max WS	2-Post-Op2	14.11	451.11	452.48		452.56	0.005517	1.23	11.47	14.76	0.45
Reach-1	35.745*	Max WS	Reg-Pre-Op2	157.59	451.11	454.99		455.23	0.003591	2.29	89.45	96.55	0.44
Reach-1	35.745*	Max WS	100-Pre-Op2	51.22	451.11	453.42		453.58	0.005264	1.79	29.47	24.38	0.48
Reach-1	35.745*	Max WS	50-PRE-OP2	43.99	451.11	453.28		453.43	0.005391	1.71	26.19	22.81	0.48
Reach-1	35.745*	Max WS	25-Pre-OP2	37.17	451.11	453.13		453.27	0.005611	1.63	22.98	21.15	0.48
Reach-1	35.745*	Max WS	10-Pre-OP2	28.74	451.11	452.93		453.05	0.005977	1.52	18.95	18.90	0.48
Reach-1	35.745*	Max WS	5yr-Pre- Op2	22.56	451.11	452.76		452.87	0.005804	1.42	15.93	17.22	0.47
Reach-1	35.745*	Max WS	2yr-Pre- Op2	14.11	451.11	452.48		452.56	0.005517	1.23	11.47	14.76	0.45
Reach-1	35.735*	Max WS	REG_POST_OP2	157.59	451.04	454.95		455.19	0.003663	2.27	86.56	88.98	0.44
Reach-1	35.735*	Max WS	100-POST_OP2	51.22	451.04	453.35		453.52	0.005959	1.82	28.30	22.67	0.50
Reach-1	35.735*	Max WS	50-post-op2	43.99	451.04	453.21		453.37	0.006245	1.74	25.22	21.14	0.51
Reach-1	35.735*	Max WS	10-Post-Op2	28.75	451.04	452.87		452.99	0.006068	1.56	18.45	17.81	0.49
Reach-1	35.735*	Max WS	5-Post-OP2	22.56	451.04	452.70		452.81	0.005795	1.44	15.64	16.38	0.47
Reach-1	35.735*	Max WS	2-Post-Op2	14.11	451.04	452.43		452.50	0.005738	1.24	11.34	14.74	0.45
Reach-1	35.735*	Max WS	Reg-Pre-Op2	157.59	451.04	454.95		455.19	0.003663	2.27	86.56	88.98	0.44
Reach-1	35.735*	Max WS	100-Pre-Op2	51.22	451.04	453.35		453.52	0.005959	1.82	28.30	22.67	0.50
Reach-1	35.735*	Max WS	50-PRE-OP2	43.99	451.04	453.21		453.37	0.006245	1.74	25.22	21.14	0.51
Reach-1	35.735*	Max WS	25-Pre-OP2	37.17	451.04	453.07		453.21	0.006268	1.67	22.19	19.71	0.50
Reach-1	35.735*	Max WS	10-Pre-OP2	28.75	451.04	452.87		452.99	0.006068	1.56	18.45	17.81	0.49
Reach-1	35.735*	Max WS	5yr-Pre- Op2	22.56	451.04	452.70		452.81	0.005795	1.44	15.64	16.38	0.47
Reach-1	35.735*	Max WS	2yr-Pre- Op2	14.11	451.04	452.43		452.50	0.005738	1.24	11.34	14.74	0.45
Reach-1	35.725*	Max WS	REG_POST_OP2	157.59	450.97	454.91		455.15	0.003689	2.25	84.77	83.89	0.44
Reach-1	35.725*	Max WS	100-POST_OP2	51.22	450.97	453.29		453.46	0.006501	1.86	27.56	21.47	0.52
Reach-1	35.725*	Max WS	50-post-op2	43.99	450.97	453.15		453.31	0.006419	1.79	24.64	20.17	0.52

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.725*	Max WS	10-Post-Op2	28.74	450.97	452.80		452.93	0.006089	1.57	18.27	17.37	0.49
Reach-1	35.725*	Max WS	5-Post-OP2	22.56	450.97	452.64		452.75	0.005963	1.45	15.54	16.42	0.48
Reach-1	35.725*	Max WS	2-Post-Op2	14.11	450.97	452.37		452.45	0.005960	1.26	11.24	14.80	0.46
Reach-1	35.725*	Max WS	Reg-Pre-Op2	157.59	450.97	454.91		455.15	0.003689	2.25	84.77	83.89	0.44
Reach-1	35.725*	Max WS	100-Pre-Op2	51.22	450.97	453.29		453.46	0.006501	1.86	27.56	21.47	0.52
Reach-1	35.725*	Max WS	50-PRE-OP2	43.99	450.97	453.15		453.31	0.006420	1.79	24.64	20.17	0.52
Reach-1	35.725*	Max WS	25-Pre-OP2	37.17	450.97	453.00		453.15	0.006292	1.70	21.80	18.82	0.51
Reach-1	35.725*	Max WS	10-Pre-OP2	28.74	450.97	452.80		452.93	0.006089	1.57	18.27	17.37	0.49
Reach-1	35.725*	Max WS	5yr-Pre- Op2	22.56	450.97	452.64		452.75	0.005963	1.45	15.54	16.42	0.48
Reach-1	35.725*	Max WS	2yr-Pre- Op2	14.11	450.97	452.37		452.45	0.005960	1.26	11.24	14.80	0.46
Reach-1	35.715*	Max WS	REG_POST_OP2	157.59	450.90	454.87		455.11	0.003663	2.20	84.09	79.80	0.44
Reach-1	35.715*	Max WS	100-POST_OP2	51.22	450.90	453.22		453.40	0.006539	1.89	27.17	20.73	0.53
Reach-1	35.715*	Max WS	50-post-op2	43.99	450.90	453.08		453.24	0.006386	1.80	24.39	19.51	0.52
Reach-1	35.715*	Max WS	10-Post-Op2	28.74	450.90	452.74		452.87	0.006260	1.58	18.17	17.47	0.50
Reach-1	35.715*	Max WS	5-Post-OP2	22.56	450.90	452.58		452.69	0.006158	1.46	15.43	16.51	0.48
Reach-1	35.715*	Max WS	2-Post-Op2	14.11	450.90	452.31		452.39	0.006240	1.27	11.12	14.88	0.47
Reach-1	35.715*	Max WS	Reg-Pre-Op2	157.59	450.90	454.87		455.11	0.003663	2.20	84.09	79.80	0.44
Reach-1	35.715*	Max WS	100-Pre-Op2	51.22	450.90	453.22		453.40	0.006538	1.89	27.17	20.73	0.53
Reach-1	35.715*	Max WS	50-PRE-OP2	43.99	450.90	453.08		453.24	0.006386	1.80	24.39	19.51	0.52
Reach-1	35.715*	Max WS	25-Pre-OP2	37.17	450.90	452.93		453.08	0.006359	1.72	21.65	18.62	0.51
Reach-1	35.715*	Max WS	10-Pre-OP2	28.74	450.90	452.74		452.87	0.006260	1.58	18.17	17.47	0.50
Reach-1	35.715*	Max WS	5yr-Pre- Op2	22.56	450.90	452.58		452.69	0.006158	1.46	15.43	16.51	0.48
Reach-1	35.715*	Max WS	2yr-Pre- Op2	14.11	450.90	452.31		452.39	0.006240	1.27	11.12	14.88	0.47
Reach-1	35.705*	Max WS	REG_POST_OP2	157.59	450.82	454.84		455.08	0.003603	2.15	84.48	76.83	0.43
Reach-1	35.705*	Max WS	100-POST_OP2	51.22	450.82	453.15		453.33	0.006542	1.89	27.05	20.46	0.53
Reach-1	35.705*	Max WS	50-post-op2	43.99	450.82	453.01		453.18	0.006524	1.81	24.30	19.63	0.52
Reach-1	35.705*	Max WS	10-Post-Op2	28.74	450.82	452.68		452.81	0.006450	1.59	18.07	17.59	0.50
Reach-1	35.705*	Max WS	5-Post-OP2	22.56	450.82	452.52		452.63	0.006378	1.47	15.32	16.61	0.49
Reach-1	35.705*	Max WS	2-Post-Op2	14.11	450.82	452.24		452.33	0.006548	1.29	10.98	14.90	0.48
Reach-1	35.705*	Max WS	Reg-Pre-Op2	157.59	450.82	454.84		455.08	0.003603	2.15	84.48	76.83	0.43
Reach-1	35.705*	Max WS	100-Pre-Op2	51.22	450.82	453.15		453.33	0.006542	1.89	27.05	20.46	0.53
Reach-1	35.705*	Max WS	50-PRE-OP2	43.99	450.82	453.01		453.18	0.006524	1.81	24.30	19.63	0.52
Reach-1	35.705*	Max WS	25-Pre-OP2	37.17	450.82	452.87		453.02	0.006531	1.72	21.56	18.76	0.51
Reach-1	35.705*	Max WS	10-Pre-OP2	28.74	450.82	452.68		452.81	0.006450	1.59	18.07	17.59	0.50
Reach-1	35.705*	Max WS	5yr-Pre- Op2	22.56	450.82	452.52		452.63	0.006378	1.47	15.32	16.61	0.49
Reach-1	35.705*	Max WS	2yr-Pre- Op2	14.11	450.82	452.24		452.33	0.006548	1.29	10.98	14.90	0.48
Reach-1	35.695*	Max WS	REG_POST_OP2	157.59	450.75	454.82		455.04	0.003521	2.10	85.73	74.76	0.43
Reach-1	35.695*	Max WS	100-POST_OP2	51.22	450.75	453.08		453.27	0.006693	1.90	26.99	20.67	0.53
Reach-1	35.695*	Max WS	50-post-op2	43.99	450.75	452.95		453.11	0.006701	1.82	24.21	19.81	0.52
Reach-1	35.695*	Max WS	10-Post-Op2	28.74	450.75	452.61		452.74	0.006690	1.60	17.93	17.71	0.51
Reach-1	35.695*	Max WS	5-Post-OP2	22.56	450.75	452.45		452.56	0.006653	1.49	15.17	16.70	0.50
Reach-1	35.695*	Max WS	2-Post-Op2	14.11	450.75	452.18		452.26	0.006802	1.30	10.82	14.74	0.49
Reach-1	35.695*	Max WS	Reg-Pre-Op2	157.59	450.75	454.82		455.04	0.003523	2.10	85.71	74.74	0.43
Reach-1	35.695*	Max WS	100-Pre-Op2	51.22	450.75	453.08		453.27	0.006693	1.90	26.99	20.67	0.53
Reach-1	35.695*	Max WS	50-PRE-OP2	43.99	450.75	452.95		453.11	0.006702	1.82	24.21	19.81	0.52
Reach-1	35.695*	Max WS	25-Pre-OP2	37.17	450.75	452.80		452.96	0.006742	1.73	21.43	18.91	0.52
Reach-1	35.695*	Max WS	10-Pre-OP2	28.74	450.75	452.61		452.74	0.006690	1.60	17.93	17.71	0.51
Reach-1	35.695*	Max WS	5yr-Pre- Op2	22.56	450.75	452.45		452.56	0.006653	1.49	15.17	16.70	0.50
Reach-1	35.695*	Max WS	2yr-Pre- Op2	14.11	450.75	452.18		452.26	0.006802	1.30	10.82	14.74	0.49
Reach-1	35.685*	Max WS	REG_POST_OP2	157.59	450.68	454.80		455.00	0.003432	2.04	87.60	73.25	0.42
Reach-1	35.685*	Max WS	100-POST_OP2	51.22	450.68	453.01		453.20	0.006885	1.91	26.88	20.88	0.54
Reach-1	35.685*	Max WS	50-post-op2	43.99	450.68	452.88		453.05	0.006937	1.83	24.05	19.97	0.53
Reach-1	35.685*	Max WS	10-Post-Op2	28.74	450.68	452.54		452.68	0.007005	1.62	17.73	17.78	0.52
Reach-1	35.685*	Max WS	5-Post-OP2	22.56	450.68	452.38		452.50	0.007022	1.51	14.95	16.72	0.51
Reach-1	35.685*	Max WS	2-Post-Op2	14.11	450.68	452.10		452.19	0.007167	1.33	10.63	14.61	0.50
Reach-1	35.685*	Max WS	Reg-Pre-Op2	157.59	450.68	454.80		455.00	0.003432	2.04	87.60	73.25	0.42
Reach-1	35.685*	Max WS	100-Pre-Op2	51.22	450.68	453.01		453.20	0.006884	1.91	26.88	20.88	0.54
Reach-1	35.685*	Max WS	50-PRE-OP2	43.99	450.68	452.88		453.05	0.006937	1.83	24.05	19.97	0.53
Reach-1	35.685*	Max WS	25-Pre-OP2	37.17	450.68	452.73		452.89	0.007020	1.75	21.24	19.03	0.53
Reach-1	35.685*	Max WS	10-Pre-OP2	28.74	450.68	452.54		452.68	0.007005	1.62	17.73	17.78	0.52
Reach-1	35.685*	Max WS	5yr-Pre- Op2	22.56	450.68	452.38		452.50	0.007022	1.51	14.95	16.72	0.51
Reach-1	35.685*	Max WS	2yr-Pre- Op2	14.11	450.68	452.10		452.19	0.007167	1.33	10.63	14.61	0.50
Reach-1	35.675*	Max WS	REG_POST_OP2	157.59	450.61	454.77		454.97	0.003358	1.99	89.73	71.99	0.42
Reach-1	35.675*	Max WS	100-POST_OP2	51.22	450.61	452.94		453.13	0.007132	1.92	26.70	21.06	0.54
Reach-1	35.675*	Max WS	50-post-op2	43.99	450.61	452.80		452.98	0.007242	1.85	23.81	20.09	0.54
Reach-1	35.675*	Max WS	10-Post-Op2	28.74	450.61	452.47		452.60	0.007418	1.65	17.44	17.78	0.53
Reach-1	35.675*	Max WS	5-Post-OP2	22.56	450.61	452.30		452.42	0.007474	1.54	14.65	16.62	0.52
Reach-1	35.675*	Max WS	2-Post-Op2	14.11	450.61	452.03		452.12	0.007726	1.36	10.36	14.48	0.51
Reach-1	35.675*	Max WS	Reg-Pre-Op2	157.59	450.61	454.77		454.97	0.003358	1.99	89.73	71.99	0.42
Reach-1	35.675*	Max WS	100-Pre-Op2	51.22	450.61	452.94		453.13	0.007132	1.92	26.70	21.06	0.54
Reach-1	35.675*	Max WS	50-PRE-OP2	43.99	450.61	452.80		452.98	0.007242	1.85	23.81	20.09	0.54
Reach-1	35.675*	Max WS	25-Pre-OP2	37.17	450.61	452.66		452.82	0.007388	1.77	20.96	19.09	0.54
Reach-1	35.675*	Max WS	10-Pre-OP2	28.74	450.61	452.47		452.60	0.007418	1.65	17.44	17.78	0.53
Reach-1	35.675*	Max WS	5yr-Pre- Op2	22.56	450.61	452.30		452.42	0.007474	1.54	14.65	16.62	0.52
Reach-1	35.675*	Max WS	2yr-Pre- Op2	14.11	450.61	452.03		452.12	0.007726	1.36	10.36	14.48	0.51
Reach-1	35.665*	Max WS	REG_POST_OP2	157.59	450.54	454.75		454.94	0.003211	1.95	92.11	71.01	0.41
Reach-1	35.665*	Max WS	100-POST_OP2	51.22	450.54	452.87		453.06	0.007466	1.94	26.41	21.17	0.55
Reach-1	35.665*	Max WS	50-post-op2	43.99	450.54	452.72		452.90	0.007661	1.88	23.44	20.13	0.56
Reach-1	35.665*	Max WS	10-Post-Op2	28.74	450.54	452.39		452.53	0.007955	1.69	17.05	17.67	0.55
Reach-1	35.665*	Max WS	5-Post-OP2	22.56	450.54	452.22		452.35	0.008108	1.58	14.24	16.42	0.54
Reach-1	35.665*	Max WS	2-Post-Op2	14.11	450.54	451.94		452.05	0.008481	1.41	10.00	14.17	0.54

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.665*	Max WS	Reg-Pre-Op2	157.59	450.54	454.75		454.94	0.003211	1.95	92.11	71.01	0.41
Reach-1	35.665*	Max WS	100-Pre-Op2	51.22	450.54	452.87		453.06	0.007466	1.94	26.41	21.17	0.55
Reach-1	35.665*	Max WS	50-PRE-OP2	43.99	450.54	452.72		452.90	0.007661	1.88	23.44	20.13	0.56
Reach-1	35.665*	Max WS	25-Pre-OP2	37.17	450.54	452.58		452.74	0.007887	1.81	20.55	19.06	0.56
Reach-1	35.665*	Max WS	10-Pre-OP2	28.74	450.54	452.39		452.53	0.007955	1.69	17.05	17.67	0.55
Reach-1	35.665*	Max WS	5yr-Pre- Op2	22.56	450.54	452.22		452.35	0.008108	1.58	14.24	16.42	0.54
Reach-1	35.665*	Max WS	2yr-Pre- Op2	14.11	450.54	451.94		452.05	0.008481	1.41	10.00	14.17	0.54
Reach-1	35.66	Max WS	REG_POST_OP2	157.59	450.50	454.74		454.92	0.003097	1.92	93.38	70.60	0.40
Reach-1	35.66	Max WS	100-POST_OP2	51.22	450.50	452.83		453.02	0.007681	1.95	26.20	21.20	0.56
Reach-1	35.66	Max WS	50-post-op2	43.99	450.50	452.68		452.86	0.007923	1.90	23.20	20.11	0.56
Reach-1	35.66	Max WS	10-Post-Op2	28.74	450.50	452.34		452.49	0.008303	1.71	16.80	17.56	0.56
Reach-1	35.66	Max WS	5-Post-OP2	22.56	450.50	452.17		452.31	0.008574	1.61	13.97	16.30	0.56
Reach-1	35.66	Max WS	2-Post-Op2	14.11	450.50	451.90		452.00	0.009019	1.45	9.75	13.96	0.55
Reach-1	35.66	Max WS	Reg-Pre-Op2	157.59	450.50	454.74		454.92	0.003097	1.92	93.38	70.60	0.40
Reach-1	35.66	Max WS	100-Pre-Op2	51.22	450.50	452.83		453.02	0.007681	1.95	26.20	21.20	0.56
Reach-1	35.66	Max WS	50-PRE-OP2	43.99	450.50	452.68		452.86	0.007923	1.90	23.20	20.11	0.56
Reach-1	35.66	Max WS	25-Pre-OP2	37.17	450.50	452.53		452.70	0.008209	1.83	20.29	18.99	0.57
Reach-1	35.66	Max WS	10-Pre-OP2	28.74	450.50	452.34		452.49	0.008303	1.71	16.80	17.56	0.56
Reach-1	35.66	Max WS	5yr-Pre- Op2	22.56	450.50	452.17		452.31	0.008574	1.61	13.97	16.30	0.56
Reach-1	35.66	Max WS	2yr-Pre- Op2	14.11	450.50	451.90		452.00	0.009019	1.45	9.75	13.96	0.55
Reach-1	35.649*	Max WS	REG_POST_OP2	157.59	450.34	454.70		454.90	0.002413	2.04	94.39	60.70	0.37
Reach-1	35.649*	Max WS	100-POST_OP2	51.22	450.34	452.79		452.95	0.005785	1.79	28.65	22.00	0.50
Reach-1	35.649*	Max WS	50-post-op2	43.99	450.34	452.64		452.80	0.005930	1.73	25.49	20.71	0.50
Reach-1	35.649*	Max WS	10-Post-Op2	28.74	450.34	452.30		452.42	0.005487	1.51	19.00	17.70	0.47
Reach-1	35.649*	Max WS	5-Post-OP2	22.56	450.34	452.14		452.24	0.005212	1.39	16.20	16.44	0.45
Reach-1	35.649*	Max WS	2-Post-Op2	14.11	450.34	451.87		451.94	0.004685	1.18	11.96	14.37	0.41
Reach-1	35.649*	Max WS	Reg-Pre-Op2	157.59	450.34	454.70		454.90	0.002413	2.04	94.39	60.70	0.37
Reach-1	35.649*	Max WS	100-Pre-Op2	51.22	450.34	452.79		452.95	0.005785	1.79	28.65	22.00	0.50
Reach-1	35.649*	Max WS	50-PRE-OP2	43.99	450.34	452.64		452.80	0.005930	1.73	25.49	20.71	0.50
Reach-1	35.649*	Max WS	25-Pre-OP2	37.17	450.34	452.49		452.63	0.005834	1.65	22.51	19.27	0.49
Reach-1	35.649*	Max WS	10-Pre-OP2	28.74	450.34	452.30		452.42	0.005487	1.51	19.00	17.70	0.47
Reach-1	35.649*	Max WS	5yr-Pre- Op2	22.56	450.34	452.14		452.24	0.005213	1.39	16.20	16.44	0.45
Reach-1	35.649*	Max WS	2yr-Pre- Op2	14.11	450.34	451.87		451.94	0.004685	1.18	11.96	14.37	0.41
Reach-1	35.64	Max WS	REG_POST_OP2	157.59	450.20	454.33	453.25	454.92	0.005506	3.40	46.38	43.93	0.58
Reach-1	35.64	Max WS	100-POST_OP2	51.22	450.20	452.69	451.95	452.91	0.004616	2.06	24.91	24.23	0.48
Reach-1	35.64	Max WS	50-post-op2	43.99	450.20	452.57	451.84	452.75	0.004267	1.89	23.28	23.11	0.45
Reach-1	35.64	Max WS	10-Post-Op2	28.74	450.20	452.27	451.58	452.38	0.003366	1.48	19.36	20.42	0.39
Reach-1	35.64	Max WS	5-Post-OP2	22.56	450.20	452.12	451.45	452.20	0.002985	1.30	17.36	19.04	0.36
Reach-1	35.64	Max WS	2-Post-Op2	14.11	450.20	451.85	451.21	451.90	0.002453	1.02	13.89	16.54	0.31
Reach-1	35.64	Max WS	Reg-Pre-Op2	157.59	450.20	454.33	453.25	454.92	0.005506	3.40	46.38	43.93	0.58
Reach-1	35.64	Max WS	100-Pre-Op2	51.22	450.20	452.69	451.95	452.91	0.004616	2.06	24.91	24.23	0.48
Reach-1	35.64	Max WS	50-PRE-OP2	43.99	450.20	452.57	451.84	452.75	0.004267	1.89	23.28	23.11	0.45
Reach-1	35.64	Max WS	25-Pre-OP2	37.17	450.20	452.44	451.73	452.59	0.003927	1.72	21.57	21.94	0.43
Reach-1	35.64	Max WS	10-Pre-OP2	28.74	450.20	452.27	451.58	452.38	0.003367	1.48	19.36	20.42	0.39
Reach-1	35.64	Max WS	5yr-Pre- Op2	22.56	450.20	452.12	451.45	452.20	0.002984	1.30	17.36	19.04	0.36
Reach-1	35.64	Max WS	2yr-Pre- Op2	14.11	450.20	451.85	451.21	451.90	0.002453	1.02	13.89	16.54	0.31
Reach-1	35.635			Bridge									
Reach-1	35.63	Max WS	REG_POST_OP2	116.25	450.20	453.16		453.87	0.011463	3.75	31.01	28.03	0.78
Reach-1	35.63	Max WS	100-POST_OP2	51.22	450.20	452.51		452.77	0.006506	2.28	22.47	22.56	0.56
Reach-1	35.63	Max WS	50-post-op2	43.99	450.20	452.42		452.64	0.005654	2.06	21.40	21.82	0.51
Reach-1	35.63	Max WS	10-Post-Op2	28.74	450.20	452.19		452.31	0.004054	1.57	18.31	19.70	0.42
Reach-1	35.63	Max WS	5-Post-OP2	22.56	450.20	452.05		452.15	0.003512	1.36	16.53	18.48	0.39
Reach-1	35.63	Max WS	2-Post-Op2	14.11	450.20	451.81		451.86	0.002841	1.06	13.29	16.10	0.34
Reach-1	35.63	Max WS	Reg-Pre-Op2	116.24	450.20	453.16		453.87	0.011462	3.75	31.01	28.03	0.78
Reach-1	35.63	Max WS	100-Pre-Op2	51.22	450.20	452.51		452.77	0.006506	2.28	22.47	22.56	0.56
Reach-1	35.63	Max WS	50-PRE-OP2	43.99	450.20	452.42		452.64	0.005653	2.06	21.40	21.82	0.51
Reach-1	35.63	Max WS	25-Pre-OP2	37.17	450.20	452.33		452.50	0.004945	1.85	20.13	20.95	0.48
Reach-1	35.63	Max WS	10-Pre-OP2	28.74	450.20	452.19		452.31	0.004054	1.57	18.31	19.70	0.42
Reach-1	35.63	Max WS	5yr-Pre- Op2	22.56	450.20	452.05		452.15	0.003512	1.36	16.53	18.48	0.39
Reach-1	35.63	Max WS	2yr-Pre- Op2	14.11	450.20	451.81		451.86	0.002841	1.06	13.29	16.10	0.34
Reach-1	35.62	Max WS	REG_POST_OP2	156.09	450.10	453.80		454.14	0.006872	2.60	59.92	31.79	0.58
Reach-1	35.62	Max WS	100-POST_OP2	51.22	450.10	452.48		452.70	0.009996	2.09	24.51	22.29	0.64
Reach-1	35.62	Max WS	50-post-op2	43.99	450.10	452.37		452.57	0.009661	1.98	22.20	21.34	0.62
Reach-1	35.62	Max WS	10-Post-Op2	28.74	450.10	452.11		452.26	0.008567	1.69	17.01	19.03	0.57
Reach-1	35.62	Max WS	5-Post-OP2	22.56	450.10	451.97		452.10	0.008232	1.56	14.44	17.66	0.55
Reach-1	35.62	Max WS	2-Post-Op2	14.11	450.10	451.73		451.82	0.007115	1.34	10.50	14.37	0.50
Reach-1	35.62	Max WS	Reg-Pre-Op2	156.06	450.10	453.80		454.14	0.006870	2.60	59.92	31.79	0.58
Reach-1	35.62	Max WS	100-Pre-Op2	51.22	450.10	452.48		452.70	0.009996	2.09	24.51	22.29	0.64
Reach-1	35.62	Max WS	50-PRE-OP2	43.99	450.10	452.37		452.57	0.009661	1.98	22.20	21.34	0.62
Reach-1	35.62	Max WS	25-Pre-OP2	37.16	450.10	452.26		452.44	0.009254	1.86	19.94	20.37	0.60
Reach-1	35.62	Max WS	10-Pre-OP2	28.74	450.10	452.11		452.26	0.008567	1.69	17.01	19.03	0.57
Reach-1	35.62	Max WS	5yr-Pre- Op2	22.56	450.10	451.97		452.10	0.008232	1.56	14.44	17.66	0.55
Reach-1	35.62	Max WS	2yr-Pre- Op2	14.11	450.10	451.73		451.82	0.007115	1.34	10.50	14.37	0.50
Reach-1	35.610*	Max WS	REG_POST_OP2	156.09	450.10	453.82		454.09	0.004953	2.28	69.72	35.26	0.50
Reach-1	35.610*	Max WS	100-POST_OP2	51.21	450.10	452.42		452.61	0.008899	1.92	26.73	25.57	0.60
Reach-1	35.610*	Max WS	50-post-op2	43.99	450.10	452.31		452.48	0.009031	1.84	23.92	24.63	0.60
Reach-1	35.610*	Max WS	10-Post-Op2	28.74	450.10	452.04		452.17	0.009192	1.64	17.57	21.91	0.58
Reach-1	35.610*	Max WS	5-Post-OP2	22.56	450.10	451.90		452.02	0.008684	1.53	14.77	19.55	0.56
Reach-1	35.610*	Max WS	2-Post-Op2	14.11	450.10	451.66		451.75	0.007380	1.33	10.64	15.36	0.51
Reach-1	35.610*	Max WS	Reg-Pre-Op2	156.16	450.10	453.82		454.09	0.004957	2.28	69.72	35.26	0.50

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.610*	Max WS	100-Pre-Op2	51.21	450.10	452.42		452.61	0.008900	1.92	26.73	25.57	0.60
Reach-1	35.610*	Max WS	50-PRE-OP2	43.99	450.10	452.31		452.48	0.009030	1.84	23.92	24.63	0.60
Reach-1	35.610*	Max WS	25-Pre-OP2	37.16	450.10	452.19		452.35	0.009084	1.75	21.20	23.59	0.59
Reach-1	35.610*	Max WS	10-Pre-OP2	28.74	450.10	452.04		452.17	0.009192	1.64	17.57	21.91	0.58
Reach-1	35.610*	Max WS	5yr-Pre- Op2	22.56	450.10	451.90		452.02	0.008683	1.53	14.77	19.55	0.56
Reach-1	35.610*	Max WS	2yr-Pre- Op2	14.11	450.10	451.66		451.75	0.007380	1.33	10.64	15.36	0.51
Reach-1	35.600*	Max WS	REG_POST_OP2	156.13	450.10	453.84		454.04	0.003633	2.02	79.10	41.09	0.43
Reach-1	35.600*	Max WS	100-POST_OP2	51.21	450.10	452.37		452.53	0.007257	1.73	29.66	28.58	0.54
Reach-1	35.600*	Max WS	50-post-op2	43.99	450.10	452.26		452.40	0.007569	1.67	26.37	27.65	0.55
Reach-1	35.600*	Max WS	10-Post-Op2	28.74	450.10	451.97		452.09	0.008346	1.53	18.82	24.26	0.55
Reach-1	35.600*	Max WS	5-Post-OP2	22.56	450.10	451.83		451.94	0.008560	1.45	15.61	22.27	0.55
Reach-1	35.600*	Max WS	2-Post-Op2	14.11	450.10	451.60		451.68	0.007171	1.28	11.01	16.42	0.50
Reach-1	35.600*	Max WS	Reg-Pre-Op2	156.18	450.10	453.84		454.04	0.003635	2.02	79.10	41.09	0.43
Reach-1	35.600*	Max WS	100-Pre-Op2	51.22	450.10	452.37		452.53	0.007257	1.73	29.66	28.58	0.54
Reach-1	35.600*	Max WS	50-PRE-OP2	43.99	450.10	452.26		452.40	0.007569	1.67	26.37	27.65	0.55
Reach-1	35.600*	Max WS	25-Pre-OP2	37.16	450.10	452.14		452.27	0.007947	1.61	23.10	26.56	0.55
Reach-1	35.600*	Max WS	10-Pre-OP2	28.74	450.10	451.97		452.09	0.008347	1.53	18.82	24.26	0.55
Reach-1	35.600*	Max WS	5yr-Pre- Op2	22.56	450.10	451.83		451.94	0.008560	1.45	15.61	22.27	0.55
Reach-1	35.600*	Max WS	2yr-Pre- Op2	14.11	450.10	451.60		451.68	0.007171	1.28	11.01	16.42	0.50
Reach-1	35.590*	Max WS	REG_POST_OP2	156.13	450.10	453.85		454.01	0.002714	1.80	89.29	45.59	0.38
Reach-1	35.590*	Max WS	100-POST_OP2	51.21	450.10	452.34		452.46	0.005523	1.53	33.41	31.45	0.47
Reach-1	35.590*	Max WS	50-post-op2	43.99	450.10	452.22		452.33	0.005755	1.48	29.70	30.38	0.48
Reach-1	35.590*	Max WS	10-Post-Op2	28.74	450.10	451.92		452.02	0.006291	1.36	21.19	26.41	0.48
Reach-1	35.590*	Max WS	5-Post-OP2	22.56	450.10	451.78		451.86	0.006631	1.29	17.49	24.45	0.49
Reach-1	35.590*	Max WS	2-Post-Op2	14.11	450.10	451.54		451.61	0.007230	1.16	12.17	21.29	0.49
Reach-1	35.590*	Max WS	Reg-Pre-Op2	156.20	450.10	453.85		454.01	0.002716	1.81	89.29	45.59	0.38
Reach-1	35.590*	Max WS	100-Pre-Op2	51.21	450.10	452.34		452.46	0.005523	1.53	33.41	31.45	0.47
Reach-1	35.590*	Max WS	50-PRE-OP2	43.99	450.10	452.22		452.33	0.005755	1.48	29.70	30.38	0.48
Reach-1	35.590*	Max WS	25-Pre-OP2	37.16	450.10	452.10		452.20	0.005952	1.43	25.98	28.71	0.48
Reach-1	35.590*	Max WS	10-Pre-OP2	28.74	450.10	451.92		452.02	0.006291	1.36	21.19	26.41	0.48
Reach-1	35.590*	Max WS	5yr-Pre- Op2	22.56	450.10	451.78		451.86	0.006631	1.29	17.49	24.45	0.49
Reach-1	35.590*	Max WS	2yr-Pre- Op2	14.11	450.10	451.54		451.61	0.007231	1.16	12.17	21.29	0.49
Reach-1	35.580*	Max WS	REG_POST_OP2	156.18	450.10	453.85		453.99	0.002069	1.62	100.00	49.37	0.33
Reach-1	35.580*	Max WS	100-POST_OP2	51.21	450.10	452.32		452.41	0.004012	1.35	37.99	34.15	0.41
Reach-1	35.580*	Max WS	50-post-op2	43.98	450.10	452.20		452.29	0.004022	1.30	33.96	32.46	0.40
Reach-1	35.580*	Max WS	10-Post-Op2	28.74	450.10	451.90		451.96	0.004111	1.16	24.72	28.23	0.40
Reach-1	35.580*	Max WS	5-Post-OP2	22.56	450.10	451.75		451.81	0.004192	1.09	20.65	26.26	0.39
Reach-1	35.580*	Max WS	2-Post-Op2	14.11	450.10	451.51		451.56	0.004606	0.96	14.65	24.19	0.40
Reach-1	35.580*	Max WS	Reg-Pre-Op2	156.17	450.10	453.85		453.99	0.002069	1.62	100.00	49.37	0.33
Reach-1	35.580*	Max WS	100-Pre-Op2	51.21	450.10	452.32		452.41	0.004012	1.35	37.99	34.15	0.41
Reach-1	35.580*	Max WS	50-PRE-OP2	43.98	450.10	452.20		452.29	0.004021	1.30	33.96	32.46	0.40
Reach-1	35.580*	Max WS	25-Pre-OP2	37.16	450.10	452.07		452.15	0.004074	1.24	29.89	30.67	0.40
Reach-1	35.580*	Max WS	10-Pre-OP2	28.74	450.10	451.90		451.96	0.004111	1.16	24.72	28.23	0.40
Reach-1	35.580*	Max WS	5yr-Pre- Op2	22.56	450.10	451.75		451.81	0.004193	1.09	20.65	26.26	0.39
Reach-1	35.580*	Max WS	2yr-Pre- Op2	14.11	450.10	451.51		451.56	0.004607	0.96	14.65	24.19	0.40
Reach-1	35.570*	Max WS	REG_POST_OP2	156.21	450.10	453.86		453.97	0.001603	1.47	111.27	52.86	0.30
Reach-1	35.570*	Max WS	100-POST_OP2	51.21	450.10	452.31		452.38	0.002722	1.18	43.32	35.80	0.34
Reach-1	35.570*	Max WS	50-post-op2	43.99	450.10	452.19		452.25	0.002703	1.13	39.09	34.27	0.34
Reach-1	35.570*	Max WS	10-Post-Op2	28.74	450.10	451.88		451.93	0.002520	0.98	29.29	29.86	0.32
Reach-1	35.570*	Max WS	5-Post-OP2	22.56	450.10	451.73		451.77	0.002519	0.91	24.88	28.57	0.31
Reach-1	35.570*	Max WS	2-Post-Op2	14.11	450.10	451.49		451.52	0.002536	0.77	18.22	26.68	0.30
Reach-1	35.570*	Max WS	Reg-Pre-Op2	156.21	450.10	453.86		453.97	0.001603	1.47	111.27	52.86	0.30
Reach-1	35.570*	Max WS	100-Pre-Op2	51.21	450.10	452.31		452.38	0.002722	1.18	43.32	35.80	0.34
Reach-1	35.570*	Max WS	50-PRE-OP2	43.99	450.10	452.19		452.25	0.002703	1.13	39.09	34.27	0.34
Reach-1	35.570*	Max WS	25-Pre-OP2	37.16	450.10	452.06		452.12	0.002657	1.07	34.74	32.39	0.33
Reach-1	35.570*	Max WS	10-Pre-OP2	28.74	450.10	451.88		451.93	0.002520	0.98	29.29	29.86	0.32
Reach-1	35.570*	Max WS	5yr-Pre- Op2	22.56	450.10	451.73		451.77	0.002519	0.91	24.88	28.57	0.31
Reach-1	35.570*	Max WS	2yr-Pre- Op2	14.11	450.10	451.49		451.52	0.002537	0.77	18.22	26.68	0.30
Reach-1	35.56	Max WS	REG_POST_OP2	156.19	450.10	453.86		453.95	0.001254	1.33	123.41	56.48	0.26
Reach-1	35.56	Max WS	100-POST_OP2	51.21	450.10	452.30		452.36	0.001830	1.04	49.44	37.24	0.28
Reach-1	35.56	Max WS	50-post-op2	43.99	450.10	452.18		452.23	0.001745	0.98	45.04	35.55	0.28
Reach-1	35.56	Max WS	10-Post-Op2	28.74	450.10	451.88		451.91	0.001564	0.83	34.78	32.07	0.25
Reach-1	35.56	Max WS	5-Post-OP2	22.56	450.10	451.72		451.75	0.001502	0.75	30.00	30.93	0.24
Reach-1	35.56	Max WS	2-Post-Op2	14.11	450.10	451.48		451.50	0.001367	0.62	22.71	29.11	0.22
Reach-1	35.56	Max WS	Reg-Pre-Op2	156.18	450.10	453.86		453.95	0.001254	1.33	123.41	56.48	0.26
Reach-1	35.56	Max WS	100-Pre-Op2	51.21	450.10	452.30		452.36	0.001830	1.04	49.44	37.24	0.28
Reach-1	35.56	Max WS	50-PRE-OP2	43.99	450.10	452.18		452.23	0.001745	0.98	45.04	35.55	0.28
Reach-1	35.56	Max WS	25-Pre-OP2	37.16	450.10	452.05		452.09	0.001670	0.92	40.53	33.73	0.27
Reach-1	35.56	Max WS	10-Pre-OP2	28.74	450.10	451.88		451.91	0.001564	0.83	34.78	32.07	0.25
Reach-1	35.56	Max WS	5yr-Pre- Op2	22.56	450.10	451.72		451.75	0.001502	0.75	30.00	30.93	0.24
Reach-1	35.56	Max WS	2yr-Pre- Op2	14.11	450.10	451.48		451.50	0.001367	0.62	22.71	29.11	0.22
Reach-1	35.550*	Max WS	REG_POST_OP2	156.17	450.08	453.84		453.94	0.001373	1.42	118.12	55.03	0.28
Reach-1	35.550*	Max WS	100-POST_OP2	51.21	450.08	452.27		452.34	0.002348	1.12	45.77	37.18	0.32
Reach-1	35.550*	Max WS	50-post-op2	43.99	450.08	452.15		452.21	0.002295	1.06	41.41	35.50	0.31
Reach-1	35.550*	Max WS	10-Post-Op2	28.74	450.08	451.85		451.89	0.002109	0.92	31.34	30.96	0.29
Reach-1	35.550*	Max WS	5-Post-OP2	22.56	450.08	451.70		451.74	0.001970	0.84	26.85	28.76	0.28
Reach-1	35.550*	Max WS	2-Post-Op2	14.11	450.08	451.46		451.49	0.001817	0.70	20.20	26.90	0.26
Reach-1	35.550*	Max WS	Reg-Pre-Op2	156.14	450.08	453.84		453.94	0.001372	1.42	118.12	55.03	0.28
Reach-1	35.550*	Max WS	100-Pre-Op2	51.21	450.08	452.27		452.34	0.002348	1.12	45.77	37.18	0.32
Reach-1	35.550*	Max WS	50-PRE-OP2	43.99	450.08	452.15		452.21	0.002295	1.06	41.41	35.50	0.31
Reach-1	35.550*	Max WS	25-Pre-OP2	37.16	450.08	452.02		452.08	0.002270	1.01	36.93	33.64	0.31

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.550*	Max WS	10-Pre-OP2	28.74	450.08	451.85		451.89	0.002109	0.92	31.34	30.96	0.29
Reach-1	35.550*	Max WS	5yr-Pre- Op2	22.56	450.08	451.70		451.74	0.001970	0.84	26.85	28.76	0.28
Reach-1	35.550*	Max WS	2yr-Pre- Op2	14.11	450.08	451.46		451.49	0.001817	0.70	20.20	26.90	0.26
Reach-1	35.540*	Max WS	REG_POST_OP2	156.11	450.07	453.81		453.93	0.001536	1.52	112.98	55.16	0.29
Reach-1	35.540*	Max WS	100-POST_OP2	51.21	450.07	452.24		452.31	0.002939	1.21	42.42	36.56	0.35
Reach-1	35.540*	Max WS	50-post-op2	43.98	450.07	452.12		452.19	0.002934	1.15	38.17	34.89	0.35
Reach-1	35.540*	Max WS	10-Post-Op2	28.74	450.07	451.82		451.87	0.002888	1.01	28.33	30.51	0.34
Reach-1	35.540*	Max WS	5-Post-OP2	22.56	450.07	451.67		451.71	0.002809	0.94	23.94	28.22	0.33
Reach-1	35.540*	Max WS	2-Post-Op2	14.11	450.07	451.43		451.46	0.002502	0.80	17.72	24.66	0.30
Reach-1	35.540*	Max WS	Reg-Pre-Op2	156.15	450.07	453.81		453.93	0.001537	1.52	112.98	55.16	0.29
Reach-1	35.540*	Max WS	100-Pre-Op2	51.21	450.07	452.24		452.31	0.002939	1.21	42.42	36.56	0.35
Reach-1	35.540*	Max WS	50-PRE-OP2	43.99	450.07	452.12		452.19	0.002934	1.15	38.17	34.89	0.35
Reach-1	35.540*	Max WS	25-Pre-OP2	37.16	450.07	451.99		452.05	0.002996	1.10	33.74	33.04	0.35
Reach-1	35.540*	Max WS	10-Pre-OP2	28.74	450.07	451.82		451.87	0.002888	1.01	28.33	30.51	0.34
Reach-1	35.540*	Max WS	5yr-Pre- Op2	22.56	450.07	451.67		451.71	0.002809	0.94	23.94	28.22	0.33
Reach-1	35.540*	Max WS	2yr-Pre- Op2	14.11	450.07	451.43		451.46	0.002502	0.80	17.72	24.66	0.30
Reach-1	35.530*	Max WS	REG_POST_OP2	156.07	450.05	453.78		453.91	0.001765	1.65	108.15	56.20	0.32
Reach-1	35.530*	Max WS	100-POST_OP2	51.21	450.05	452.19		452.28	0.003473	1.32	38.99	34.06	0.38
Reach-1	35.530*	Max WS	50-post-op2	43.98	450.05	452.07		452.15	0.003635	1.26	35.00	33.09	0.39
Reach-1	35.530*	Max WS	10-Post-Op2	28.74	450.05	451.77		451.84	0.003840	1.12	25.58	29.32	0.38
Reach-1	35.530*	Max WS	5-Post-OP2	22.56	450.05	451.62		451.68	0.003894	1.05	21.39	27.26	0.38
Reach-1	35.530*	Max WS	2-Post-Op2	14.11	450.05	451.39		451.43	0.003791	0.91	15.43	23.85	0.36
Reach-1	35.530*	Max WS	Reg-Pre-Op2	156.06	450.05	453.78		453.91	0.001764	1.65	108.15	56.20	0.32
Reach-1	35.530*	Max WS	100-Pre-Op2	51.21	450.05	452.19		452.28	0.003473	1.32	38.99	34.06	0.38
Reach-1	35.530*	Max WS	50-PRE-OP2	43.98	450.05	452.07		452.15	0.003635	1.26	35.00	33.09	0.39
Reach-1	35.530*	Max WS	25-Pre-OP2	37.16	450.05	451.94		452.02	0.003857	1.21	30.74	31.68	0.39
Reach-1	35.530*	Max WS	10-Pre-OP2	28.74	450.05	451.77		451.84	0.003839	1.12	25.58	29.32	0.38
Reach-1	35.530*	Max WS	5yr-Pre- Op2	22.56	450.05	451.62		451.68	0.003894	1.05	21.39	27.26	0.38
Reach-1	35.530*	Max WS	2yr-Pre- Op2	14.11	450.05	451.39		451.43	0.003791	0.91	15.43	23.85	0.36
Reach-1	35.520*	Max WS	REG_POST_OP2	156.05	450.03	453.74		453.90	0.002068	1.80	103.68	55.07	0.34
Reach-1	35.520*	Max WS	100-POST_OP2	51.21	450.03	452.13		452.24	0.004331	1.48	34.80	30.59	0.43
Reach-1	35.520*	Max WS	50-post-op2	43.98	450.03	452.01		452.11	0.004522	1.41	31.24	29.35	0.43
Reach-1	35.520*	Max WS	10-Post-Op2	28.74	450.03	451.71		451.79	0.005044	1.26	22.79	27.05	0.44
Reach-1	35.520*	Max WS	5-Post-OP2	22.56	450.03	451.56		451.64	0.005316	1.19	18.92	25.35	0.44
Reach-1	35.520*	Max WS	2-Post-Op2	14.11	450.03	451.33		451.39	0.005493	1.05	13.40	22.17	0.43
Reach-1	35.520*	Max WS	Reg-Pre-Op2	156.03	450.03	453.74		453.90	0.002068	1.80	103.68	55.07	0.34
Reach-1	35.520*	Max WS	100-Pre-Op2	51.21	450.03	452.13		452.24	0.004331	1.48	34.80	30.59	0.43
Reach-1	35.520*	Max WS	50-PRE-OP2	43.99	450.03	452.01		452.11	0.004522	1.41	31.24	29.35	0.43
Reach-1	35.520*	Max WS	25-Pre-OP2	37.16	450.03	451.88		451.97	0.004780	1.36	27.45	28.32	0.44
Reach-1	35.520*	Max WS	10-Pre-OP2	28.74	450.03	451.71		451.79	0.005044	1.26	22.79	27.05	0.44
Reach-1	35.520*	Max WS	5yr-Pre- Op2	22.56	450.03	451.56		451.64	0.005316	1.19	18.92	25.35	0.44
Reach-1	35.520*	Max WS	2yr-Pre- Op2	14.11	450.03	451.33		451.39	0.005493	1.05	13.40	22.17	0.43
Reach-1	35.510*	Max WS	REG_POST_OP2	155.98	450.02	453.70		453.89	0.002504	1.99	98.95	53.22	0.38
Reach-1	35.510*	Max WS	100-POST_OP2	51.21	450.02	452.03		452.19	0.006354	1.76	29.44	26.39	0.52
Reach-1	35.510*	Max WS	50-post-op2	43.98	450.02	451.92		452.06	0.006471	1.68	26.42	25.23	0.52
Reach-1	35.510*	Max WS	10-Post-Op2	28.74	450.02	451.62		451.73	0.006928	1.49	19.30	22.89	0.51
Reach-1	35.510*	Max WS	5-Post-OP2	22.56	450.02	451.48		451.58	0.007372	1.41	16.07	21.71	0.52
Reach-1	35.510*	Max WS	2-Post-Op2	14.11	450.02	451.25		451.33	0.007817	1.24	11.41	19.34	0.51
Reach-1	35.510*	Max WS	Reg-Pre-Op2	155.96	450.02	453.70		453.88	0.002503	1.99	98.95	53.22	0.38
Reach-1	35.510*	Max WS	100-Pre-Op2	51.21	450.02	452.03		452.19	0.006354	1.76	29.44	26.39	0.52
Reach-1	35.510*	Max WS	50-PRE-OP2	43.98	450.02	451.92		452.06	0.006471	1.68	26.42	25.23	0.52
Reach-1	35.510*	Max WS	25-Pre-OP2	37.16	450.02	451.79		451.92	0.006738	1.61	23.20	24.20	0.52
Reach-1	35.510*	Max WS	10-Pre-OP2	28.74	450.02	451.62		451.73	0.006927	1.49	19.30	22.89	0.51
Reach-1	35.510*	Max WS	5yr-Pre- Op2	22.56	450.02	451.48		451.58	0.007372	1.41	16.07	21.71	0.52
Reach-1	35.510*	Max WS	2yr-Pre- Op2	14.11	450.02	451.25		451.33	0.007817	1.24	11.41	19.34	0.51
Reach-1	35.5	Max WS	REG_POST_OP2	155.78	450.00	453.65		453.87	0.003165	2.24	93.83	51.27	0.42
Reach-1	35.5	Max WS	100-POST_OP2	50.92	450.00	451.78		452.09	0.014890	2.49	20.75	20.61	0.78
Reach-1	35.5	Max WS	50-post-op2	43.81	450.00	451.65		451.95	0.015629	2.43	18.29	19.56	0.79
Reach-1	35.5	Max WS	10-Post-Op2	28.74	450.00	451.39		451.63	0.016091	2.16	13.39	17.31	0.77
Reach-1	35.5	Max WS	5-Post-OP2	22.56	450.00	451.26		451.47	0.016274	2.01	11.25	16.22	0.76
Reach-1	35.5	Max WS	2-Post-Op2	14.11	450.00	451.07		451.22	0.015322	1.70	8.32	14.60	0.72
Reach-1	35.5	Max WS	Reg-Pre-Op2	155.73	450.00	453.65		453.87	0.003163	2.23	93.83	51.27	0.42
Reach-1	35.5	Max WS	100-Pre-Op2	50.92	450.00	451.78		452.09	0.014890	2.49	20.75	20.61	0.78
Reach-1	35.5	Max WS	50-PRE-OP2	43.81	450.00	451.65		451.95	0.015629	2.43	18.29	19.56	0.79
Reach-1	35.5	Max WS	25-Pre-OP2	37.13	450.00	451.54		451.81	0.016269	2.34	16.01	18.55	0.79
Reach-1	35.5	Max WS	10-Pre-OP2	28.74	450.00	451.39		451.63	0.016092	2.16	13.39	17.31	0.77
Reach-1	35.5	Max WS	5yr-Pre- Op2	22.55	450.00	451.26		451.47	0.016273	2.01	11.25	16.22	0.76
Reach-1	35.5	Max WS	2yr-Pre- Op2	14.11	450.00	451.07		451.22	0.015322	1.70	8.32	14.60	0.72
Reach-1	35.490*	Max WS	REG_POST_OP2	155.62	449.97	453.64		453.83	0.002593	2.09	96.53	49.65	0.39
Reach-1	35.490*	Max WS	100-POST_OP2	50.91	449.97	451.74		451.97	0.009831	2.13	24.24	22.34	0.64
Reach-1	35.490*	Max WS	50-post-op2	43.79	449.97	451.60		451.82	0.010502	2.08	21.26	21.21	0.65
Reach-1	35.490*	Max WS	10-Post-Op2	28.74	449.97	451.31		451.49	0.011193	1.87	15.45	18.83	0.65
Reach-1	35.490*	Max WS	5-Post-OP2	22.55	449.97	451.18		451.33	0.011192	1.73	13.07	17.77	0.64
Reach-1	35.490*	Max WS	2-Post-Op2	14.11	449.97	450.99		451.09	0.010432	1.45	9.73	16.10	0.60
Reach-1	35.490*	Max WS	Reg-Pre-Op2	155.75	449.97	453.64		453.83	0.002597	2.09	96.53	49.65	0.39
Reach-1	35.490*	Max WS	100-Pre-Op2	50.91	449.97	451.74		451.97	0.009831	2.13	24.24	22.34	0.64
Reach-1	35.490*	Max WS	50-PRE-OP2	43.79	449.97	451.60		451.82	0.010502	2.08	21.26	21.21	0.65
Reach-1	35.490*	Max WS	25-Pre-OP2	37.12	449.97	451.47		451.68	0.010995	2.01	18.60	20.16	0.66
Reach-1	35.490*	Max WS	10-Pre-OP2	28.74	449.97	451.31		451.49	0.011192	1.87	15.45	18.83	0.65
Reach-1	35.490*	Max WS	5yr-Pre- Op2	22.55	449.97	451.18		451.33	0.011192	1.73	13.07	17.77	0.64
Reach-1	35.490*	Max WS	2yr-Pre- Op2	14.11	449.97	450.99		451.09	0.010432	1.45	9.73	16.10	0.60

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.480*	Max WS	REG_POST_OP2	155.69	449.94	453.63		453.81	0.002184	1.97	99.15	48.05	0.36
Reach-1	35.480*	Max WS	100-POST_OP2	50.87	449.94	451.71		451.89	0.007092	1.87	27.52	24.06	0.55
Reach-1	35.480*	Max WS	50-post-op2	43.79	449.94	451.56		451.73	0.007724	1.84	24.03	22.89	0.56
Reach-1	35.480*	Max WS	10-Post-Op2	28.74	449.94	451.25		451.39	0.008494	1.66	17.37	20.47	0.57
Reach-1	35.480*	Max WS	5-Post-OP2	22.55	449.94	451.12		451.24	0.008538	1.53	14.71	19.42	0.56
Reach-1	35.480*	Max WS	2-Post-Op2	14.11	449.94	450.92		451.01	0.007714	1.28	11.04	17.63	0.52
Reach-1	35.480*	Max WS	Reg-Pre-Op2	155.66	449.94	453.63		453.81	0.002184	1.97	99.15	48.05	0.36
Reach-1	35.480*	Max WS	100-Pre-Op2	50.87	449.94	451.71		451.89	0.007093	1.87	27.52	24.06	0.55
Reach-1	35.480*	Max WS	50-PRE-OP2	43.79	449.94	451.56		451.73	0.007724	1.84	24.03	22.89	0.56
Reach-1	35.480*	Max WS	25-Pre-OP2	37.11	449.94	451.42		451.59	0.008157	1.78	21.00	21.83	0.57
Reach-1	35.480*	Max WS	10-Pre-OP2	28.74	449.94	451.25		451.39	0.008494	1.66	17.37	20.47	0.57
Reach-1	35.480*	Max WS	5yr-Pre- Op2	22.55	449.94	451.12		451.24	0.008538	1.53	14.71	19.42	0.56
Reach-1	35.480*	Max WS	2yr-Pre- Op2	14.11	449.94	450.92		451.01	0.007714	1.28	11.04	17.63	0.52
Reach-1	35.470*	Max WS	REG_POST_OP2	155.69	449.91	453.62		453.78	0.001881	1.87	101.64	46.50	0.33
Reach-1	35.470*	Max WS	100-POST_OP2	50.88	449.91	451.68		451.83	0.005310	1.68	30.56	26.11	0.48
Reach-1	35.470*	Max WS	50-post-op2	43.74	449.91	451.52		451.66	0.006062	1.66	26.56	24.55	0.50
Reach-1	35.470*	Max WS	10-Post-Op2	28.73	449.91	451.20		451.32	0.006956	1.51	19.04	22.13	0.52
Reach-1	35.470*	Max WS	5-Post-OP2	22.55	449.91	451.06		451.16	0.007130	1.40	16.08	21.10	0.51
Reach-1	35.470*	Max WS	2-Post-Op2	14.11	449.91	450.87		450.94	0.006332	1.16	12.15	19.28	0.47
Reach-1	35.470*	Max WS	Reg-Pre-Op2	155.66	449.91	453.62		453.78	0.001881	1.87	101.64	46.50	0.33
Reach-1	35.470*	Max WS	100-Pre-Op2	50.88	449.91	451.68		451.83	0.005310	1.68	30.56	26.11	0.48
Reach-1	35.470*	Max WS	50-PRE-OP2	43.75	449.91	451.52		451.66	0.006064	1.66	26.56	24.55	0.50
Reach-1	35.470*	Max WS	25-Pre-OP2	37.07	449.91	451.38		451.51	0.006489	1.61	23.16	23.48	0.51
Reach-1	35.470*	Max WS	10-Pre-OP2	28.73	449.91	451.20		451.32	0.006956	1.51	19.04	22.13	0.52
Reach-1	35.470*	Max WS	5yr-Pre- Op2	22.55	449.91	451.06		451.16	0.007130	1.40	16.08	21.10	0.51
Reach-1	35.470*	Max WS	2yr-Pre- Op2	14.11	449.91	450.87		450.94	0.006332	1.16	12.15	19.28	0.47
Reach-1	35.460*	Max WS	REG_POST_OP2	155.61	449.89	453.61		453.76	0.001655	1.78	104.06	45.40	0.31
Reach-1	35.460*	Max WS	100-POST_OP2	50.86	449.89	451.66		451.78	0.004245	1.55	33.29	27.67	0.43
Reach-1	35.460*	Max WS	50-post-op2	43.72	449.89	451.49		451.61	0.004970	1.53	28.77	26.22	0.46
Reach-1	35.460*	Max WS	10-Post-Op2	28.72	449.89	451.15		451.25	0.006134	1.41	20.35	23.74	0.48
Reach-1	35.460*	Max WS	5-Post-OP2	22.55	449.89	451.01		451.10	0.006489	1.32	17.07	22.74	0.49
Reach-1	35.460*	Max WS	2-Post-Op2	14.11	449.89	450.82		450.88	0.005773	1.09	12.91	20.96	0.44
Reach-1	35.460*	Max WS	Reg-Pre-Op2	155.56	449.89	453.61		453.76	0.001654	1.78	104.06	45.40	0.31
Reach-1	35.460*	Max WS	100-Pre-Op2	50.86	449.89	451.66		451.78	0.004245	1.55	33.29	27.67	0.43
Reach-1	35.460*	Max WS	50-PRE-OP2	43.72	449.89	451.49		451.61	0.004970	1.53	28.77	26.22	0.46
Reach-1	35.460*	Max WS	25-Pre-OP2	36.84	449.89	451.34		451.45	0.005423	1.48	25.02	25.09	0.47
Reach-1	35.460*	Max WS	10-Pre-OP2	28.72	449.89	451.15		451.25	0.006134	1.41	20.35	23.74	0.48
Reach-1	35.460*	Max WS	5yr-Pre- Op2	22.55	449.89	451.01		451.10	0.006489	1.32	17.07	22.74	0.49
Reach-1	35.460*	Max WS	2yr-Pre- Op2	14.11	449.89	450.82		450.88	0.005772	1.09	12.91	20.96	0.44
Reach-1	35.450*	Max WS	REG_POST_OP2	155.57	449.86	453.61		453.74	0.001474	1.70	107.26	45.35	0.30
Reach-1	35.450*	Max WS	100-POST_OP2	50.85	449.86	451.63		451.74	0.003587	1.45	35.66	28.91	0.40
Reach-1	35.450*	Max WS	50-post-op2	43.38	449.86	451.46		451.56	0.004176	1.42	30.69	27.69	0.42
Reach-1	35.450*	Max WS	10-Post-Op2	28.58	449.86	451.10		451.19	0.005728	1.34	21.27	25.28	0.47
Reach-1	35.450*	Max WS	5-Post-OP2	22.55	449.86	450.95		451.04	0.006343	1.28	17.63	24.21	0.48
Reach-1	35.450*	Max WS	2-Post-Op2	14.11	449.86	450.77		450.82	0.005855	1.06	13.25	22.59	0.44
Reach-1	35.450*	Max WS	Reg-Pre-Op2	155.54	449.86	453.61		453.74	0.001473	1.69	107.26	45.35	0.30
Reach-1	35.450*	Max WS	100-Pre-Op2	50.85	449.86	451.63		451.74	0.003587	1.45	35.66	28.91	0.40
Reach-1	35.450*	Max WS	50-PRE-OP2	43.38	449.86	451.46		451.56	0.004177	1.42	30.69	27.69	0.42
Reach-1	35.450*	Max WS	25-Pre-OP2	36.84	449.86	451.30		451.40	0.004797	1.39	26.56	26.63	0.44
Reach-1	35.450*	Max WS	10-Pre-OP2	28.58	449.86	451.10		451.19	0.005728	1.34	21.27	25.28	0.47
Reach-1	35.450*	Max WS	5yr-Pre- Op2	22.55	449.86	450.95		451.04	0.006343	1.28	17.63	24.21	0.48
Reach-1	35.450*	Max WS	2yr-Pre- Op2	14.11	449.86	450.77		450.82	0.005855	1.06	13.25	22.59	0.44
Reach-1	35.440*	Max WS	REG_POST_OP2	155.54	449.83	453.60		453.73	0.001332	1.62	110.43	44.38	0.28
Reach-1	35.440*	Max WS	100-POST_OP2	50.82	449.83	451.61		451.70	0.003187	1.38	37.57	29.96	0.38
Reach-1	35.440*	Max WS	50-post-op2	43.33	449.83	451.43		451.52	0.003753	1.36	32.21	28.91	0.40
Reach-1	35.440*	Max WS	10-Post-Op2	28.57	449.83	451.05		451.14	0.005841	1.32	21.63	26.69	0.47
Reach-1	35.440*	Max WS	5-Post-OP2	22.53	449.83	450.89		450.97	0.006943	1.29	17.52	25.54	0.50
Reach-1	35.440*	Max WS	2-Post-Op2	14.11	449.83	450.70		450.76	0.007005	1.09	12.88	24.10	0.48
Reach-1	35.440*	Max WS	Reg-Pre-Op2	155.48	449.83	453.60		453.73	0.001331	1.62	110.43	44.38	0.28
Reach-1	35.440*	Max WS	100-Pre-Op2	50.82	449.83	451.61		451.70	0.003187	1.38	37.57	29.96	0.38
Reach-1	35.440*	Max WS	50-PRE-OP2	43.34	449.83	451.43		451.52	0.003753	1.36	32.21	28.91	0.40
Reach-1	35.440*	Max WS	25-Pre-OP2	36.83	449.83	451.27		451.36	0.004406	1.33	27.68	27.99	0.42
Reach-1	35.440*	Max WS	10-Pre-OP2	28.57	449.83	451.05		451.14	0.005841	1.32	21.63	26.69	0.47
Reach-1	35.440*	Max WS	5yr-Pre- Op2	22.53	449.83	450.89		450.97	0.006943	1.29	17.52	25.54	0.50
Reach-1	35.440*	Max WS	2yr-Pre- Op2	14.11	449.83	450.70		450.76	0.007005	1.09	12.88	24.10	0.48
Reach-1	35.43	Max WS	REG_POST_OP2	155.57	449.80	453.60		453.72	0.001235	1.57	112.52	43.50	0.27
Reach-1	35.43	Max WS	100-POST_OP2	50.77	449.80	451.59		451.67	0.002951	1.32	39.07	31.02	0.36
Reach-1	35.43	Max WS	50-post-op2	43.33	449.80	451.40		451.48	0.003548	1.31	33.31	30.05	0.39
Reach-1	35.43	Max WS	10-Post-Op2	28.54	449.80	450.98		451.07	0.006527	1.34	21.33	27.89	0.49
Reach-1	35.43	Max WS	5-Post-OP2	22.45	449.80	450.80		450.90	0.009335	1.38	16.28	26.65	0.56
Reach-1	35.43	Max WS	2-Post-Op2	14.10	449.80	450.56		450.66	0.016404	1.39	10.14	25.07	0.70
Reach-1	35.43	Max WS	Reg-Pre-Op2	155.57	449.80	453.60		453.72	0.001235	1.57	112.52	43.50	0.27
Reach-1	35.43	Max WS	100-Pre-Op2	50.77	449.80	451.59		451.67	0.002951	1.32	39.07	31.02	0.36
Reach-1	35.43	Max WS	50-PRE-OP2	43.33	449.80	451.40		451.48	0.003548	1.31	33.31	30.05	0.39
Reach-1	35.43	Max WS	25-Pre-OP2	36.80	449.80	451.23		451.31	0.004301	1.31	28.32	29.18	0.42
Reach-1	35.43	Max WS	10-Pre-OP2	28.54	449.80	450.98		451.07	0.006526	1.34	21.33	27.89	0.49
Reach-1	35.43	Max WS	5yr-Pre- Op2	22.45	449.80	450.80		450.90	0.009336	1.38	16.28	26.65	0.56
Reach-1	35.43	Max WS	2yr-Pre- Op2	14.11	449.80	450.56		450.66	0.016414	1.39	10.14	25.07	0.70
Reach-1	35.420*	Max WS	REG_POST_OP2	155.37	449.66	453.59		453.70	0.001095	1.51	117.28	44.37	0.26
Reach-1	35.420*	Max WS	100-POST_OP2	50.70	449.66	451.57		451.65	0.002239	1.22	42.32	31.15	0.32

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.420*	Max WS	50-post-op2	43.31	449.66	451.38		451.45	0.002603	1.20	36.45	30.04	0.34
Reach-1	35.420*	Max WS	10-Post-Op2	28.52	449.66	450.95		451.02	0.004308	1.19	24.00	27.72	0.41
Reach-1	35.420*	Max WS	5-Post-OP2	22.44	449.66	450.75		450.82	0.005921	1.21	18.52	26.21	0.46
Reach-1	35.420*	Max WS	2-Post-Op2	14.04	449.66	450.46		450.54	0.010723	1.25	11.27	23.90	0.58
Reach-1	35.420*	Max WS	Reg-Pre-Op2	155.54	449.66	453.59		453.70	0.001097	1.52	117.26	44.37	0.26
Reach-1	35.420*	Max WS	100-Pre-Op2	50.70	449.66	451.57		451.65	0.002239	1.22	42.32	31.15	0.32
Reach-1	35.420*	Max WS	50-PRE-OP2	43.30	449.66	451.38		451.45	0.002601	1.20	36.45	30.04	0.34
Reach-1	35.420*	Max WS	25-Pre-OP2	36.80	449.66	451.21		451.28	0.003034	1.18	31.35	29.11	0.36
Reach-1	35.420*	Max WS	10-Pre-OP2	28.52	449.66	450.95		451.02	0.004308	1.19	24.00	27.72	0.41
Reach-1	35.420*	Max WS	5yr-Pre- Op2	22.44	449.66	450.75		450.82	0.005921	1.21	18.52	26.21	0.46
Reach-1	35.420*	Max WS	2yr-Pre- Op2	14.04	449.66	450.46		450.54	0.010723	1.25	11.27	23.90	0.58
Reach-1	35.410*	Max WS	REG_POST_OP2	155.45	449.51	453.59		453.69	0.000996	1.48	121.55	45.26	0.25
Reach-1	35.410*	Max WS	100-POST_OP2	50.32	449.51	451.56		451.63	0.001783	1.14	45.06	31.32	0.29
Reach-1	35.410*	Max WS	50-post-op2	43.30	449.51	451.37		451.43	0.002048	1.12	39.09	30.08	0.30
Reach-1	35.410*	Max WS	10-Post-Op2	28.47	449.51	450.93		450.99	0.003066	1.08	26.40	27.53	0.35
Reach-1	35.410*	Max WS	5-Post-OP2	22.42	449.51	450.71		450.77	0.004023	1.08	20.70	25.93	0.39
Reach-1	35.410*	Max WS	2-Post-Op2	14.03	449.51	450.40		450.46	0.006452	1.09	12.92	23.03	0.46
Reach-1	35.410*	Max WS	Reg-Pre-Op2	155.43	449.51	453.59		453.69	0.000995	1.48	121.55	45.26	0.25
Reach-1	35.410*	Max WS	100-Pre-Op2	50.31	449.51	451.56		451.63	0.001782	1.14	45.06	31.32	0.29
Reach-1	35.410*	Max WS	50-PRE-OP2	43.30	449.51	451.37		451.43	0.002048	1.12	39.09	30.08	0.30
Reach-1	35.410*	Max WS	25-Pre-OP2	36.78	449.51	451.19		451.25	0.002310	1.09	33.93	29.04	0.32
Reach-1	35.410*	Max WS	10-Pre-OP2	28.45	449.51	450.93		450.99	0.003063	1.08	26.40	27.53	0.35
Reach-1	35.410*	Max WS	5yr-Pre- Op2	22.43	449.51	450.71		450.77	0.004024	1.08	20.70	25.93	0.39
Reach-1	35.410*	Max WS	2yr-Pre- Op2	14.03	449.51	450.40		450.46	0.006452	1.09	12.92	23.03	0.46
Reach-1	35.400*	Max WS	REG_POST_OP2	155.41	449.37	453.58		453.68	0.000924	1.45	125.34	46.19	0.24
Reach-1	35.400*	Max WS	100-POST_OP2	50.35	449.37	451.55		451.61	0.001523	1.10	47.24	31.55	0.27
Reach-1	35.400*	Max WS	50-post-op2	43.30	449.37	451.35		451.41	0.001712	1.07	41.19	30.17	0.28
Reach-1	35.400*	Max WS	10-Post-Op2	28.24	449.37	450.91		450.96	0.002342	1.00	28.35	27.34	0.31
Reach-1	35.400*	Max WS	5-Post-OP2	22.42	449.37	450.69		450.74	0.002926	0.99	22.55	25.55	0.34
Reach-1	35.400*	Max WS	2-Post-Op2	14.02	449.37	450.36		450.40	0.004165	0.96	14.57	22.43	0.38
Reach-1	35.400*	Max WS	Reg-Pre-Op2	155.38	449.37	453.58		453.68	0.000923	1.45	125.34	46.19	0.24
Reach-1	35.400*	Max WS	100-Pre-Op2	50.35	449.37	451.55		451.61	0.001523	1.10	47.24	31.55	0.27
Reach-1	35.400*	Max WS	50-PRE-OP2	43.29	449.37	451.35		451.41	0.001712	1.07	41.19	30.17	0.28
Reach-1	35.400*	Max WS	25-Pre-OP2	36.77	449.37	451.18		451.23	0.001888	1.03	35.98	28.97	0.29
Reach-1	35.400*	Max WS	10-Pre-OP2	28.24	449.37	450.91		450.96	0.002342	1.00	28.35	27.34	0.31
Reach-1	35.400*	Max WS	5yr-Pre- Op2	22.40	449.37	450.69		450.74	0.002921	0.99	22.55	25.55	0.34
Reach-1	35.400*	Max WS	2yr-Pre- Op2	14.02	449.37	450.36		450.40	0.004165	0.96	14.57	22.43	0.38
Reach-1	35.390*	Max WS	REG_POST_OP2	155.39	449.23	453.58		453.67	0.000875	1.43	128.65	47.40	0.23
Reach-1	35.390*	Max WS	100-POST_OP2	50.29	449.23	451.54		451.60	0.001361	1.06	48.86	31.83	0.26
Reach-1	35.390*	Max WS	50-post-op2	43.30	449.23	451.34		451.40	0.001515	1.04	42.72	30.30	0.27
Reach-1	35.390*	Max WS	10-Post-Op2	28.24	449.23	450.89		450.94	0.001958	0.95	29.79	27.13	0.29
Reach-1	35.390*	Max WS	5-Post-OP2	22.38	449.23	450.67		450.71	0.002321	0.94	23.95	25.19	0.30
Reach-1	35.390*	Max WS	2-Post-Op2	14.00	449.23	450.33		450.37	0.003008	0.88	15.94	22.03	0.33
Reach-1	35.390*	Max WS	Reg-Pre-Op2	155.33	449.23	453.58		453.67	0.000874	1.43	128.65	47.40	0.23
Reach-1	35.390*	Max WS	100-Pre-Op2	50.29	449.23	451.54		451.60	0.001361	1.06	48.86	31.83	0.26
Reach-1	35.390*	Max WS	50-PRE-OP2	43.30	449.23	451.34		451.40	0.001515	1.04	42.72	30.30	0.27
Reach-1	35.390*	Max WS	25-Pre-OP2	36.76	449.23	451.16		451.21	0.001644	0.99	37.46	28.92	0.27
Reach-1	35.390*	Max WS	10-Pre-OP2	28.24	449.23	450.89		450.94	0.001958	0.95	29.79	27.13	0.29
Reach-1	35.390*	Max WS	5yr-Pre- Op2	22.38	449.23	450.67		450.71	0.002321	0.94	23.95	25.19	0.30
Reach-1	35.390*	Max WS	2yr-Pre- Op2	14.00	449.23	450.33		450.37	0.003008	0.88	15.94	22.03	0.33
Reach-1	35.380*	Max WS	REG_POST_OP2	155.27	449.09	453.57		453.66	0.000843	1.41	131.49	48.82	0.23
Reach-1	35.380*	Max WS	100-POST_OP2	50.29	449.09	451.53		451.58	0.001274	1.05	49.93	32.17	0.25
Reach-1	35.380*	Max WS	50-post-op2	43.29	449.09	451.33		451.38	0.001406	1.02	43.70	30.49	0.26
Reach-1	35.380*	Max WS	10-Post-Op2	28.23	449.09	450.88		450.92	0.001752	0.93	30.68	26.91	0.27
Reach-1	35.380*	Max WS	5-Post-OP2	22.24	449.09	450.65		450.69	0.001981	0.90	24.84	24.84	0.28
Reach-1	35.380*	Max WS	2-Post-Op2	13.90	449.09	450.31		450.34	0.002389	0.82	16.90	21.71	0.30
Reach-1	35.380*	Max WS	Reg-Pre-Op2	155.22	449.09	453.57		453.66	0.000843	1.41	131.49	48.82	0.23
Reach-1	35.380*	Max WS	100-Pre-Op2	50.30	449.09	451.53		451.58	0.001274	1.05	49.93	32.17	0.25
Reach-1	35.380*	Max WS	50-PRE-OP2	43.29	449.09	451.33		451.38	0.001406	1.02	43.70	30.49	0.26
Reach-1	35.380*	Max WS	25-Pre-OP2	36.73	449.09	451.15		451.20	0.001512	0.97	38.38	28.98	0.26
Reach-1	35.380*	Max WS	10-Pre-OP2	28.22	449.09	450.88		450.92	0.001752	0.93	30.68	26.91	0.27
Reach-1	35.380*	Max WS	5yr-Pre- Op2	22.24	449.09	450.65		450.69	0.001981	0.90	24.84	24.84	0.28
Reach-1	35.380*	Max WS	2yr-Pre- Op2	13.90	449.09	450.31		450.34	0.002390	0.82	16.90	21.71	0.30
Reach-1	35.370*	Max WS	REG_POST_OP2	155.22	448.94	453.56		453.66	0.000830	1.41	133.85	50.47	0.23
Reach-1	35.370*	Max WS	100-POST_OP2	50.30	448.94	451.52		451.57	0.001245	1.04	50.43	32.57	0.25
Reach-1	35.370*	Max WS	50-post-op2	43.28	448.94	451.32		451.37	0.001371	1.01	44.10	30.73	0.25
Reach-1	35.370*	Max WS	10-Post-Op2	28.22	448.94	450.86		450.90	0.001676	0.92	30.98	26.67	0.27
Reach-1	35.370*	Max WS	5-Post-OP2	22.23	448.94	450.63		450.67	0.001855	0.89	25.17	24.49	0.28
Reach-1	35.370*	Max WS	2-Post-Op2	13.90	448.94	450.29		450.32	0.002104	0.80	17.32	21.18	0.28
Reach-1	35.370*	Max WS	Reg-Pre-Op2	155.19	448.94	453.56		453.66	0.000829	1.41	133.85	50.47	0.23
Reach-1	35.370*	Max WS	100-Pre-Op2	50.30	448.94	451.52		451.57	0.001245	1.04	50.43	32.57	0.25
Reach-1	35.370*	Max WS	50-PRE-OP2	43.24	448.94	451.32		451.37	0.001368	1.01	44.10	30.73	0.25
Reach-1	35.370*	Max WS	25-Pre-OP2	36.65	448.94	451.14		451.18	0.001464	0.97	38.72	29.07	0.26
Reach-1	35.370*	Max WS	10-Pre-OP2	28.22	448.94	450.86		450.90	0.001676	0.92	30.98	26.67	0.27
Reach-1	35.370*	Max WS	5yr-Pre- Op2	22.23	448.94	450.63		450.67	0.001856	0.89	25.17	24.49	0.28
Reach-1	35.370*	Max WS	2yr-Pre- Op2	13.90	448.94	450.29		450.32	0.002104	0.80	17.32	21.18	0.28
Reach-1	35.36	Max WS	REG_POST_OP2	155.11	448.80	453.55		453.65	0.000831	1.41	135.73	52.33	0.23
Reach-1	35.36	Max WS	100-POST_OP2	50.30	448.80	451.50		451.56	0.001271	1.05	50.34	33.03	0.25
Reach-1	35.36	Max WS	50-post-op2	43.23	448.80	451.30		451.35	0.001403	1.02	43.89	31.01	0.26
Reach-1	35.36	Max WS	10-Post-Op2	28.20	448.80	450.84		450.89	0.001715	0.94	30.67	26.41	0.27
Reach-1	35.36	Max WS	5-Post-OP2	22.22	448.80	450.61		450.65	0.001887	0.90	24.89	24.12	0.28

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.36	Max WS	2-Post-Op2	13.89	448.80	450.27		450.30	0.002083	0.81	17.15	20.66	0.28
Reach-1	35.36	Max WS	Reg-Pre-Op2	155.26	448.80	453.55		453.65	0.000833	1.41	135.73	52.33	0.23
Reach-1	35.36	Max WS	100-Pre-Op2	50.30	448.80	451.50		451.56	0.001271	1.05	50.34	33.03	0.25
Reach-1	35.36	Max WS	50-PRE-OP2	43.22	448.80	451.30		451.35	0.001403	1.02	43.89	31.01	0.26
Reach-1	35.36	Max WS	25-Pre-OP2	36.38	448.80	451.12		451.17	0.001484	0.97	38.45	29.21	0.26
Reach-1	35.36	Max WS	10-Pre-OP2	28.19	448.80	450.84		450.89	0.001714	0.94	30.67	26.41	0.27
Reach-1	35.36	Max WS	5yr-Pre- Op2	22.22	448.80	450.61		450.65	0.001887	0.90	24.89	24.12	0.28
Reach-1	35.36	Max WS	2yr-Pre- Op2	13.89	448.80	450.27		450.30	0.002083	0.81	17.15	20.66	0.28
Reach-1	35.350*	Max WS	REG_POST_OP2	275.23	448.73	453.09		453.48	0.003821	2.86	113.78	47.18	0.48
Reach-1	35.350*	Max WS	100-POST_OP2	82.08	448.73	451.27		451.44	0.004151	1.85	45.59	28.97	0.45
Reach-1	35.350*	Max WS	50-post-op2	69.33	448.73	451.09		451.24	0.004272	1.74	40.50	28.12	0.45
Reach-1	35.350*	Max WS	10-Post-Op2	43.91	448.73	450.67		450.79	0.004736	1.51	29.23	25.87	0.45
Reach-1	35.350*	Max WS	5-Post-OP2	33.79	448.73	450.46		450.57	0.004973	1.41	24.01	24.15	0.45
Reach-1	35.350*	Max WS	2-Post-Op2	20.72	448.73	450.14		450.22	0.005386	1.24	16.72	21.33	0.45
Reach-1	35.350*	Max WS	Reg-Pre-Op2	275.22	448.73	453.09		453.48	0.003821	2.86	113.78	47.18	0.48
Reach-1	35.350*	Max WS	100-Pre-Op2	82.08	448.73	451.27		451.44	0.004151	1.85	45.59	28.97	0.45
Reach-1	35.350*	Max WS	50-PRE-OP2	69.33	448.73	451.09		451.24	0.004272	1.74	40.50	28.12	0.45
Reach-1	35.350*	Max WS	25-Pre-OP2	58.50	448.73	450.93		451.06	0.004407	1.64	36.00	27.34	0.44
Reach-1	35.350*	Max WS	10-Pre-OP2	43.91	448.73	450.67		450.79	0.004736	1.51	29.23	25.87	0.45
Reach-1	35.350*	Max WS	5yr-Pre- Op2	33.79	448.73	450.46		450.57	0.004973	1.41	24.01	24.15	0.45
Reach-1	35.350*	Max WS	2yr-Pre- Op2	20.72	448.73	450.14		450.22	0.005387	1.24	16.72	21.33	0.45
Reach-1	35.340*	Max WS	REG_POST_OP2	275.22	448.65	453.02		453.44	0.003962	2.93	108.58	45.49	0.49
Reach-1	35.340*	Max WS	100-POST_OP2	82.08	448.65	451.23		451.40	0.003789	1.81	46.40	28.46	0.43
Reach-1	35.340*	Max WS	50-post-op2	69.33	448.65	451.06		451.20	0.003840	1.70	41.40	27.62	0.43
Reach-1	35.340*	Max WS	10-Post-Op2	43.91	448.65	450.64		450.74	0.004174	1.45	30.25	25.65	0.42
Reach-1	35.340*	Max WS	5-Post-OP2	33.79	448.65	450.43		450.52	0.004522	1.35	24.96	24.40	0.43
Reach-1	35.340*	Max WS	2-Post-Op2	20.72	448.65	450.10		450.17	0.004776	1.19	17.48	21.78	0.42
Reach-1	35.340*	Max WS	Reg-Pre-Op2	275.22	448.65	453.02		453.44	0.003962	2.93	108.58	45.49	0.49
Reach-1	35.340*	Max WS	100-Pre-Op2	82.08	448.65	451.23		451.40	0.003789	1.81	46.40	28.46	0.43
Reach-1	35.340*	Max WS	50-PRE-OP2	69.33	448.65	451.06		451.20	0.003840	1.70	41.40	27.62	0.43
Reach-1	35.340*	Max WS	25-Pre-OP2	58.50	448.65	450.89		451.02	0.003897	1.60	36.96	26.85	0.42
Reach-1	35.340*	Max WS	10-Pre-OP2	43.91	448.65	450.64		450.74	0.004174	1.45	30.25	25.65	0.42
Reach-1	35.340*	Max WS	5yr-Pre- Op2	33.79	448.65	450.43		450.52	0.004522	1.35	24.96	24.40	0.43
Reach-1	35.340*	Max WS	2yr-Pre- Op2	20.72	448.65	450.10		450.17	0.004776	1.19	17.48	21.78	0.42
Reach-1	35.330*	Max WS	REG_POST_OP2	275.22	448.58	452.96		453.40	0.004238	3.02	103.26	40.16	0.51
Reach-1	35.330*	Max WS	100-POST_OP2	82.08	448.58	451.19		451.36	0.003896	1.84	45.79	27.91	0.44
Reach-1	35.330*	Max WS	50-post-op2	69.33	448.58	451.01		451.16	0.003940	1.72	40.89	27.07	0.43
Reach-1	35.330*	Max WS	10-Post-Op2	43.91	448.58	450.59		450.70	0.004143	1.47	29.96	24.93	0.42
Reach-1	35.330*	Max WS	5-Post-OP2	33.79	448.58	450.38		450.48	0.004368	1.36	24.81	23.69	0.42
Reach-1	35.330*	Max WS	2-Post-Op2	20.72	448.58	450.05		450.13	0.004822	1.19	17.39	21.65	0.42
Reach-1	35.330*	Max WS	Reg-Pre-Op2	275.22	448.58	452.96		453.40	0.004238	3.01	103.26	40.16	0.51
Reach-1	35.330*	Max WS	100-Pre-Op2	82.08	448.58	451.19		451.36	0.003896	1.84	45.79	27.91	0.44
Reach-1	35.330*	Max WS	50-PRE-OP2	69.33	448.58	451.01		451.16	0.003940	1.72	40.89	27.07	0.43
Reach-1	35.330*	Max WS	25-Pre-OP2	58.50	448.58	450.85		450.98	0.003999	1.62	36.53	26.31	0.43
Reach-1	35.330*	Max WS	10-Pre-OP2	43.91	448.58	450.59		450.70	0.004143	1.47	29.96	24.93	0.42
Reach-1	35.330*	Max WS	5yr-Pre- Op2	33.79	448.58	450.38		450.48	0.004368	1.36	24.81	23.69	0.42
Reach-1	35.330*	Max WS	2yr-Pre- Op2	20.72	448.58	450.05		450.13	0.004822	1.19	17.39	21.65	0.42
Reach-1	35.32	Max WS	REG_POST_OP2	275.22	448.50	452.89		453.36	0.004723	3.13	98.61	35.47	0.53
Reach-1	35.32	Max WS	100-POST_OP2	82.08	448.50	451.13		451.32	0.004617	1.94	43.55	27.27	0.47
Reach-1	35.32	Max WS	50-post-op2	69.33	448.50	450.95		451.12	0.004697	1.83	38.77	26.40	0.47
Reach-1	35.32	Max WS	10-Post-Op2	43.91	448.50	450.53		450.66	0.004787	1.57	28.24	24.03	0.45
Reach-1	35.32	Max WS	5-Post-OP2	33.79	448.50	450.32		450.43	0.005103	1.46	23.24	22.82	0.46
Reach-1	35.32	Max WS	2-Post-Op2	20.72	448.50	449.99		450.08	0.006080	1.29	16.01	20.88	0.47
Reach-1	35.32	Max WS	Reg-Pre-Op2	275.22	448.50	452.89		453.36	0.004723	3.13	98.61	35.47	0.53
Reach-1	35.32	Max WS	100-Pre-Op2	82.08	448.50	451.13		451.32	0.004617	1.94	43.55	27.27	0.47
Reach-1	35.32	Max WS	50-PRE-OP2	69.33	448.50	450.95		451.12	0.004697	1.83	38.77	26.40	0.47
Reach-1	35.32	Max WS	25-Pre-OP2	58.50	448.50	450.79		450.94	0.004677	1.72	34.56	25.48	0.46
Reach-1	35.32	Max WS	10-Pre-OP2	43.91	448.50	450.53		450.66	0.004787	1.57	28.24	24.03	0.45
Reach-1	35.32	Max WS	5yr-Pre- Op2	33.79	448.50	450.32		450.43	0.005103	1.46	23.24	22.82	0.46
Reach-1	35.32	Max WS	2yr-Pre- Op2	20.72	448.50	449.99		450.08	0.006081	1.29	16.01	20.88	0.47
Reach-1	35.310*	Max WS	REG_POST_OP2	275.22	448.45	452.82		453.32	0.004862	3.18	96.75	35.42	0.54
Reach-1	35.310*	Max WS	100-POST_OP2	82.08	448.45	451.08		451.27	0.004546	1.95	43.12	26.69	0.47
Reach-1	35.310*	Max WS	50-post-op2	69.33	448.45	450.91		451.08	0.004627	1.83	38.46	25.85	0.46
Reach-1	35.310*	Max WS	10-Post-Op2	43.91	448.45	450.49		450.61	0.004737	1.57	28.14	23.52	0.45
Reach-1	35.310*	Max WS	5-Post-OP2	33.79	448.45	450.27		450.38	0.005062	1.46	23.20	22.27	0.45
Reach-1	35.310*	Max WS	2-Post-Op2	20.72	448.45	449.94		450.02	0.005864	1.29	16.02	20.36	0.47
Reach-1	35.310*	Max WS	Reg-Pre-Op2	275.22	448.45	452.82		453.32	0.004862	3.18	96.75	35.42	0.54
Reach-1	35.310*	Max WS	100-Pre-Op2	82.08	448.45	451.08		451.27	0.004546	1.95	43.12	26.69	0.47
Reach-1	35.310*	Max WS	50-PRE-OP2	69.33	448.45	450.91		451.08	0.004627	1.83	38.46	25.85	0.46
Reach-1	35.310*	Max WS	25-Pre-OP2	58.50	448.45	450.74		450.89	0.004648	1.72	34.34	24.99	0.46
Reach-1	35.310*	Max WS	10-Pre-OP2	43.91	448.45	450.49		450.61	0.004737	1.57	28.14	23.52	0.45
Reach-1	35.310*	Max WS	5yr-Pre- Op2	33.79	448.45	450.27		450.38	0.005062	1.46	23.20	22.27	0.45
Reach-1	35.310*	Max WS	2yr-Pre- Op2	20.72	448.45	449.94		450.02	0.005865	1.29	16.02	20.36	0.47
Reach-1	35.300*	Max WS	REG_POST_OP2	275.22	448.40	452.75		453.27	0.005120	3.25	94.58	35.88	0.55
Reach-1	35.300*	Max WS	100-POST_OP2	82.08	448.40	451.03		451.23	0.004632	1.97	42.36	26.07	0.47
Reach-1	35.300*	Max WS	50-post-op2	69.33	448.40	450.86		451.03	0.004695	1.85	37.83	25.21	0.47
Reach-1	35.300*	Max WS	10-Post-Op2	43.91	448.40	450.44		450.57	0.004917	1.58	27.75	22.95	0.46
Reach-1	35.300*	Max WS	5-Post-OP2	33.79	448.40	450.22		450.33	0.005190	1.48	22.89	21.64	0.46
Reach-1	35.300*	Max WS	2-Post-Op2	20.72	448.40	449.88		449.97	0.005774	1.31	15.85	19.57	0.46
Reach-1	35.300*	Max WS	Reg-Pre-Op2	275.22	448.40	452.75		453.27	0.005121	3.25	94.57	35.88	0.55
Reach-1	35.300*	Max WS	100-Pre-Op2	82.08	448.40	451.03		451.23	0.004632	1.97	42.36	26.07	0.47

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.300*	Max WS	50-PRE-OP2	69.32	448.40	450.86		451.03	0.004695	1.85	37.83	25.21	0.47
Reach-1	35.300*	Max WS	25-Pre-OP2	58.50	448.40	450.69		450.85	0.004778	1.74	33.81	24.42	0.46
Reach-1	35.300*	Max WS	10-Pre-OP2	43.91	448.40	450.44		450.57	0.004917	1.58	27.75	22.95	0.46
Reach-1	35.300*	Max WS	5yr-Pre- Op2	33.79	448.40	450.22		450.33	0.005190	1.48	22.89	21.64	0.46
Reach-1	35.300*	Max WS	2yr-Pre- Op2	20.72	448.40	449.88		449.97	0.005768	1.31	15.86	19.57	0.46
Reach-1	35.290*	Max WS	REG_POST_OP2	275.22	448.35	452.67		453.22	0.005510	3.34	91.98	36.21	0.57
Reach-1	35.290*	Max WS	100-POST_OP2	82.08	448.35	450.97		451.18	0.004911	2.02	41.21	25.39	0.48
Reach-1	35.290*	Max WS	50-post-op2	69.32	448.35	450.80		450.98	0.004981	1.89	36.82	24.50	0.48
Reach-1	35.290*	Max WS	10-Post-Op2	43.91	448.35	450.38		450.52	0.005242	1.62	27.03	22.22	0.47
Reach-1	35.290*	Max WS	5-Post-OP2	33.79	448.35	450.16		450.28	0.005366	1.51	22.32	20.79	0.47
Reach-1	35.290*	Max WS	2-Post-Op2	20.72	448.35	449.82		449.91	0.005718	1.33	15.59	18.56	0.46
Reach-1	35.290*	Max WS	Reg-Pre-Op2	275.22	448.35	452.67		453.22	0.005510	3.34	91.98	36.21	0.57
Reach-1	35.290*	Max WS	100-Pre-Op2	82.08	448.35	450.97		451.18	0.004911	2.02	41.21	25.39	0.48
Reach-1	35.290*	Max WS	50-PRE-OP2	69.33	448.35	450.80		450.98	0.004981	1.89	36.82	24.50	0.48
Reach-1	35.290*	Max WS	25-Pre-OP2	58.50	448.35	450.64		450.80	0.005081	1.78	32.91	23.69	0.48
Reach-1	35.290*	Max WS	10-Pre-OP2	43.91	448.35	450.38		450.52	0.005242	1.62	27.03	22.22	0.47
Reach-1	35.290*	Max WS	5yr-Pre- Op2	33.79	448.35	450.16		450.28	0.005366	1.51	22.32	20.79	0.47
Reach-1	35.290*	Max WS	2yr-Pre- Op2	20.72	448.35	449.82		449.91	0.005718	1.33	15.59	18.56	0.46
Reach-1	35.280*	Max WS	REG_POST_OP2	275.22	448.30	452.57		453.16	0.006088	3.46	88.62	35.57	0.60
Reach-1	35.280*	Max WS	100-POST_OP2	82.08	448.30	450.91		451.13	0.005481	2.09	39.57	24.59	0.51
Reach-1	35.280*	Max WS	50-post-op2	69.33	448.30	450.73		450.93	0.005588	1.97	35.36	23.68	0.50
Reach-1	35.280*	Max WS	10-Post-Op2	43.91	448.30	450.32		450.46	0.005609	1.69	26.04	21.22	0.49
Reach-1	35.280*	Max WS	5-Post-OP2	33.79	448.30	450.10		450.23	0.005605	1.56	21.60	19.71	0.48
Reach-1	35.280*	Max WS	2-Post-Op2	20.72	448.30	449.76		449.86	0.005501	1.35	15.35	17.25	0.46
Reach-1	35.280*	Max WS	Reg-Pre-Op2	275.22	448.30	452.57		453.16	0.006088	3.46	88.62	35.57	0.60
Reach-1	35.280*	Max WS	100-Pre-Op2	82.08	448.30	450.91		451.13	0.005481	2.09	39.57	24.59	0.51
Reach-1	35.280*	Max WS	50-PRE-OP2	69.33	448.30	450.73		450.93	0.005588	1.97	35.36	23.68	0.50
Reach-1	35.280*	Max WS	25-Pre-OP2	58.50	448.30	450.57		450.75	0.005615	1.86	31.58	22.75	0.50
Reach-1	35.280*	Max WS	10-Pre-OP2	43.91	448.30	450.32		450.46	0.005609	1.69	26.04	21.22	0.49
Reach-1	35.280*	Max WS	5yr-Pre- Op2	33.79	448.30	450.10		450.23	0.005605	1.56	21.60	19.71	0.48
Reach-1	35.280*	Max WS	2yr-Pre- Op2	20.72	448.30	449.76		449.86	0.005501	1.35	15.35	17.25	0.46
Reach-1	35.270*	Max WS	REG_POST_OP2	275.22	448.25	452.44		453.10	0.007110	3.64	83.38	34.00	0.64
Reach-1	35.270*	Max WS	100-POST_OP2	82.08	448.25	450.82		451.07	0.006572	2.22	37.28	23.57	0.55
Reach-1	35.270*	Max WS	50-post-op2	69.32	448.25	450.65		450.87	0.006392	2.09	33.37	22.47	0.54
Reach-1	35.270*	Max WS	10-Post-Op2	43.91	448.25	450.25		450.41	0.005979	1.77	24.85	19.85	0.50
Reach-1	35.270*	Max WS	5-Post-OP2	33.79	448.25	450.04		450.17	0.005809	1.62	20.82	18.35	0.49
Reach-1	35.270*	Max WS	2-Post-Op2	20.72	448.25	449.71		449.80	0.005255	1.36	15.21	16.24	0.45
Reach-1	35.270*	Max WS	Reg-Pre-Op2	275.22	448.25	452.44		453.10	0.007110	3.64	83.38	34.00	0.64
Reach-1	35.270*	Max WS	100-Pre-Op2	82.08	448.25	450.82		451.07	0.006572	2.22	37.28	23.57	0.55
Reach-1	35.270*	Max WS	50-PRE-OP2	69.32	448.25	450.65		450.87	0.006392	2.09	33.37	22.47	0.54
Reach-1	35.270*	Max WS	25-Pre-OP2	58.50	448.25	450.49		450.69	0.006231	1.96	29.88	21.44	0.52
Reach-1	35.270*	Max WS	10-Pre-OP2	43.91	448.25	450.25		450.41	0.005979	1.77	24.85	19.85	0.50
Reach-1	35.270*	Max WS	5yr-Pre- Op2	33.79	448.25	450.04		450.17	0.005809	1.62	20.82	18.35	0.49
Reach-1	35.270*	Max WS	2yr-Pre- Op2	20.72	448.25	449.71		449.80	0.005255	1.36	15.21	16.24	0.45
Reach-1	35.26	Max WS	REG_POST_OP2	275.21	448.20	452.23		453.03	0.009388	3.99	74.70	31.34	0.73
Reach-1	35.26	Max WS	100-POST_OP2	82.08	448.20	450.70		451.00	0.007907	2.42	34.29	21.91	0.60
Reach-1	35.26	Max WS	50-post-op2	69.33	448.20	450.54		450.80	0.007460	2.26	30.92	20.80	0.58
Reach-1	35.26	Max WS	10-Post-Op2	43.91	448.20	450.17		450.34	0.006307	1.86	23.59	18.17	0.52
Reach-1	35.26	Max WS	5-Post-OP2	33.79	448.20	449.97		450.11	0.005886	1.68	20.11	16.87	0.49
Reach-1	35.26	Max WS	2-Post-Op2	20.72	448.20	449.65		449.75	0.005235	1.38	15.01	15.62	0.45
Reach-1	35.26	Max WS	Reg-Pre-Op2	275.20	448.20	452.23		453.03	0.009387	3.99	74.70	31.34	0.73
Reach-1	35.26	Max WS	100-Pre-Op2	82.08	448.20	450.70		451.00	0.007907	2.42	34.29	21.91	0.60
Reach-1	35.26	Max WS	50-PRE-OP2	69.33	448.20	450.54		450.80	0.007460	2.26	30.92	20.80	0.58
Reach-1	35.26	Max WS	25-Pre-OP2	58.50	448.20	450.40		450.62	0.007022	2.11	27.91	19.76	0.56
Reach-1	35.26	Max WS	10-Pre-OP2	43.91	448.20	450.17		450.34	0.006307	1.86	23.59	18.17	0.52
Reach-1	35.26	Max WS	5yr-Pre- Op2	33.79	448.20	449.97		450.11	0.005886	1.68	20.11	16.87	0.49
Reach-1	35.26	Max WS	2yr-Pre- Op2	20.72	448.20	449.65		449.75	0.005235	1.38	15.01	15.62	0.45
Reach-1	35.250*	Max WS	REG_POST_OP2	275.21	448.15	452.18		452.93	0.008774	3.89	76.78	31.84	0.71
Reach-1	35.250*	Max WS	100-POST_OP2	82.08	448.15	450.63		450.92	0.007853	2.38	34.89	22.86	0.60
Reach-1	35.250*	Max WS	50-post-op2	69.32	448.15	450.48		450.73	0.007586	2.22	31.37	21.92	0.58
Reach-1	35.250*	Max WS	10-Post-Op2	43.91	448.15	450.10		450.28	0.006680	1.85	23.68	19.19	0.53
Reach-1	35.250*	Max WS	5-Post-OP2	33.79	448.15	449.91		450.05	0.006181	1.68	20.10	17.61	0.50
Reach-1	35.250*	Max WS	2-Post-Op2	20.72	448.15	449.60		449.70	0.005307	1.38	15.02	15.86	0.45
Reach-1	35.250*	Max WS	Reg-Pre-Op2	275.20	448.15	452.18		452.93	0.008774	3.89	76.78	31.84	0.71
Reach-1	35.250*	Max WS	100-Pre-Op2	82.08	448.15	450.63		450.92	0.007853	2.38	34.89	22.86	0.60
Reach-1	35.250*	Max WS	50-PRE-OP2	69.32	448.15	450.48		450.73	0.007586	2.22	31.37	21.92	0.58
Reach-1	35.250*	Max WS	25-Pre-OP2	58.50	448.15	450.33		450.55	0.007292	2.08	28.22	20.95	0.56
Reach-1	35.250*	Max WS	10-Pre-OP2	43.91	448.15	450.10		450.28	0.006680	1.85	23.68	19.19	0.53
Reach-1	35.250*	Max WS	5yr-Pre- Op2	33.79	448.15	449.91		450.05	0.006181	1.68	20.10	17.61	0.50
Reach-1	35.250*	Max WS	2yr-Pre- Op2	20.72	448.15	449.60		449.70	0.005307	1.38	15.02	15.86	0.45
Reach-1	35.240*	Max WS	REG_POST_OP2	275.20	448.10	452.13		452.85	0.008116	3.78	79.29	32.57	0.68
Reach-1	35.240*	Max WS	100-POST_OP2	82.08	448.10	450.57		450.84	0.007527	2.32	35.74	23.57	0.59
Reach-1	35.240*	Max WS	50-post-op2	69.32	448.10	450.41		450.65	0.007363	2.17	32.09	22.73	0.57
Reach-1	35.240*	Max WS	10-Post-Op2	43.91	448.10	450.04		450.21	0.007007	1.83	23.97	20.50	0.54
Reach-1	35.240*	Max WS	5-Post-OP2	33.79	448.10	449.85		449.99	0.006523	1.67	20.23	18.76	0.51
Reach-1	35.240*	Max WS	2-Post-Op2	20.72	448.10	449.55		449.65	0.005409	1.38	15.03	16.18	0.46
Reach-1	35.240*	Max WS	Reg-Pre-Op2	275.20	448.10	452.13		452.85	0.008116	3.78	79.29	32.57	0.68
Reach-1	35.240*	Max WS	100-Pre-Op2	82.08	448.10	450.57		450.84	0.007527	2.32	35.74	23.57	0.59
Reach-1	35.240*	Max WS	50-PRE-OP2	69.32	448.10	450.41		450.65	0.007363	2.17	32.09	22.73	0.57
Reach-1	35.240*	Max WS	25-Pre-OP2	58.50	448.10	450.27		450.48	0.007215	2.03	28.82	21.95	0.56
Reach-1	35.240*	Max WS	10-Pre-OP2	43.91	448.10	450.04		450.21	0.007007	1.83	23.97	20.50	0.54

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.240*	Max WS	5yr-Pre- Op2	33.79	448.10	449.85		449.99	0.006523	1.67	20.23	18.76	0.51
Reach-1	35.240*	Max WS	2yr-Pre- Op2	20.72	448.10	449.55		449.65	0.005409	1.38	15.03	16.18	0.46
Reach-1	35.230*	Max WS	REG_POST_OP2	275.20	448.05	452.10		452.76	0.007447	3.67	82.19	33.43	0.66
Reach-1	35.230*	Max WS	100-POST_OP2	82.08	448.05	450.52		450.77	0.007008	2.24	36.84	24.18	0.57
Reach-1	35.230*	Max WS	50-post-op2	69.32	448.05	450.36		450.58	0.006917	2.10	33.07	23.38	0.56
Reach-1	35.230*	Max WS	10-Post-Op2	43.91	448.05	449.98		450.14	0.006868	1.79	24.59	21.51	0.53
Reach-1	35.230*	Max WS	5-Post-OP2	33.79	448.05	449.79		449.93	0.006785	1.64	20.60	20.32	0.52
Reach-1	35.230*	Max WS	2-Post-Op2	20.72	448.05	449.50		449.59	0.005810	1.37	15.08	17.29	0.47
Reach-1	35.230*	Max WS	Reg-Pre-Op2	275.20	448.05	452.10		452.76	0.007447	3.67	82.19	33.43	0.66
Reach-1	35.230*	Max WS	100-Pre-Op2	82.08	448.05	450.52		450.77	0.007008	2.24	36.84	24.18	0.57
Reach-1	35.230*	Max WS	50-PRE-OP2	69.32	448.05	450.36		450.58	0.006917	2.10	33.07	23.38	0.56
Reach-1	35.230*	Max WS	25-Pre-OP2	58.50	448.05	450.21		450.41	0.006834	1.97	29.68	22.66	0.55
Reach-1	35.230*	Max WS	10-Pre-OP2	43.91	448.05	449.98		450.14	0.006868	1.79	24.59	21.51	0.53
Reach-1	35.230*	Max WS	5yr-Pre- Op2	33.79	448.05	449.79		449.93	0.006785	1.64	20.60	20.32	0.52
Reach-1	35.230*	Max WS	2yr-Pre- Op2	20.72	448.05	449.50		449.59	0.005810	1.37	15.08	17.29	0.47
Reach-1	35.220*	Max WS	REG_POST_OP2	275.19	448.00	452.07		452.69	0.006782	3.54	85.49	34.35	0.63
Reach-1	35.220*	Max WS	100-POST_OP2	82.08	448.00	450.47		450.71	0.006295	2.16	38.23	24.89	0.54
Reach-1	35.220*	Max WS	50-post-op2	69.32	448.00	450.31		450.52	0.006326	2.03	34.33	23.97	0.53
Reach-1	35.220*	Max WS	10-Post-Op2	43.91	448.00	449.92		450.08	0.006335	1.72	25.48	22.17	0.51
Reach-1	35.220*	Max WS	5-Post-OP2	33.79	448.00	449.73		449.86	0.006389	1.58	21.34	21.27	0.50
Reach-1	35.220*	Max WS	2-Post-Op2	20.72	448.00	449.44		449.53	0.006193	1.35	15.37	19.11	0.48
Reach-1	35.220*	Max WS	Reg-Pre-Op2	275.20	448.00	452.07		452.69	0.006782	3.54	85.49	34.35	0.63
Reach-1	35.220*	Max WS	100-Pre-Op2	82.08	448.00	450.47		450.71	0.006295	2.16	38.23	24.89	0.54
Reach-1	35.220*	Max WS	50-PRE-OP2	69.32	448.00	450.31		450.52	0.006326	2.03	34.33	23.97	0.53
Reach-1	35.220*	Max WS	25-Pre-OP2	58.50	448.00	450.16		450.34	0.006269	1.90	30.82	23.27	0.52
Reach-1	35.220*	Max WS	10-Pre-OP2	43.91	448.00	449.92		450.08	0.006335	1.72	25.48	22.17	0.51
Reach-1	35.220*	Max WS	5yr-Pre- Op2	33.79	448.00	449.73		449.86	0.006389	1.58	21.34	21.27	0.50
Reach-1	35.220*	Max WS	2yr-Pre- Op2	20.72	448.00	449.44		449.53	0.006193	1.35	15.37	19.11	0.48
Reach-1	35.210*	Max WS	REG_POST_OP2	275.19	447.95	452.05		452.62	0.006147	3.41	89.14	35.32	0.60
Reach-1	35.210*	Max WS	100-POST_OP2	82.08	447.95	450.43		450.65	0.005572	2.07	39.93	25.63	0.51
Reach-1	35.210*	Max WS	50-post-op2	69.32	447.95	450.27		450.46	0.005589	1.94	35.86	24.66	0.50
Reach-1	35.210*	Max WS	10-Post-Op2	43.91	447.95	449.88		450.02	0.005638	1.65	26.68	22.78	0.49
Reach-1	35.210*	Max WS	5-Post-OP2	33.79	447.95	449.69		449.80	0.005683	1.51	22.38	21.95	0.48
Reach-1	35.210*	Max WS	2-Post-Op2	20.72	447.95	449.39		449.48	0.005891	1.29	16.09	20.68	0.47
Reach-1	35.210*	Max WS	Reg-Pre-Op2	275.20	447.95	452.05		452.62	0.006148	3.41	89.14	35.32	0.60
Reach-1	35.210*	Max WS	100-Pre-Op2	82.08	447.95	450.43		450.65	0.005572	2.07	39.93	25.63	0.51
Reach-1	35.210*	Max WS	50-PRE-OP2	69.32	447.95	450.27		450.46	0.005589	1.94	35.86	24.66	0.50
Reach-1	35.210*	Max WS	25-Pre-OP2	58.50	447.95	450.12		450.29	0.005598	1.82	32.24	23.83	0.50
Reach-1	35.210*	Max WS	10-Pre-OP2	43.91	447.95	449.88		450.02	0.005638	1.65	26.68	22.78	0.49
Reach-1	35.210*	Max WS	5yr-Pre- Op2	33.79	447.95	449.69		449.80	0.005683	1.51	22.38	21.95	0.48
Reach-1	35.210*	Max WS	2yr-Pre- Op2	20.72	447.95	449.39		449.48	0.005891	1.29	16.09	20.68	0.47
Reach-1	35.2	Max WS	REG_POST_OP2	275.20	447.90	452.03		452.56	0.005556	3.29	93.10	36.30	0.57
Reach-1	35.2	Max WS	100-POST_OP2	82.08	447.90	450.40		450.59	0.004880	1.98	41.92	26.40	0.48
Reach-1	35.2	Max WS	50-post-op2	69.32	447.90	450.23		450.41	0.004855	1.85	37.70	25.41	0.47
Reach-1	35.2	Max WS	10-Post-Op2	43.91	447.90	449.84		449.96	0.004882	1.56	28.16	23.36	0.45
Reach-1	35.2	Max WS	5-Post-OP2	33.79	447.90	449.65		449.75	0.004869	1.42	23.73	22.59	0.44
Reach-1	35.2	Max WS	2-Post-Op2	20.72	447.90	449.35		449.42	0.004978	1.21	17.17	21.39	0.43
Reach-1	35.2	Max WS	Reg-Pre-Op2	275.19	447.90	452.03		452.56	0.005556	3.29	93.10	36.30	0.57
Reach-1	35.2	Max WS	100-Pre-Op2	82.08	447.90	450.40		450.59	0.004880	1.98	41.92	26.40	0.48
Reach-1	35.2	Max WS	50-PRE-OP2	69.32	447.90	450.23		450.41	0.004855	1.85	37.70	25.41	0.47
Reach-1	35.2	Max WS	25-Pre-OP2	58.50	447.90	450.08		450.23	0.004849	1.72	33.94	24.50	0.46
Reach-1	35.2	Max WS	10-Pre-OP2	43.91	447.90	449.84		449.96	0.004882	1.56	28.16	23.36	0.45
Reach-1	35.2	Max WS	5yr-Pre- Op2	33.79	447.90	449.65		449.75	0.004869	1.42	23.73	22.59	0.44
Reach-1	35.2	Max WS	2yr-Pre- Op2	20.72	447.90	449.35		449.42	0.004978	1.21	17.17	21.39	0.43
Reach-1	35.190*	Max WS	REG_POST_OP2	275.20	447.81	452.00		452.51	0.005309	3.21	97.09	39.82	0.56
Reach-1	35.190*	Max WS	100-POST_OP2	82.08	447.81	450.35		450.55	0.004918	1.97	42.07	26.98	0.48
Reach-1	35.190*	Max WS	50-post-op2	69.32	447.81	450.19		450.36	0.004917	1.84	37.76	25.77	0.47
Reach-1	35.190*	Max WS	10-Post-Op2	43.91	447.81	449.79		449.92	0.004957	1.56	28.10	23.53	0.46
Reach-1	35.190*	Max WS	5-Post-OP2	33.79	447.81	449.60		449.70	0.004954	1.43	23.66	22.73	0.45
Reach-1	35.190*	Max WS	2-Post-Op2	20.72	447.81	449.30		449.37	0.005132	1.22	17.03	21.47	0.44
Reach-1	35.190*	Max WS	Reg-Pre-Op2	275.19	447.81	452.00		452.51	0.005308	3.21	97.09	39.82	0.56
Reach-1	35.190*	Max WS	100-Pre-Op2	82.08	447.81	450.35		450.55	0.004918	1.97	42.07	26.98	0.48
Reach-1	35.190*	Max WS	50-PRE-OP2	69.32	447.81	450.19		450.36	0.004917	1.84	37.76	25.77	0.47
Reach-1	35.190*	Max WS	25-Pre-OP2	58.50	447.81	450.03		450.19	0.004941	1.72	33.95	24.65	0.47
Reach-1	35.190*	Max WS	10-Pre-OP2	43.91	447.81	449.79		449.92	0.004957	1.56	28.10	23.53	0.46
Reach-1	35.190*	Max WS	5yr-Pre- Op2	33.79	447.81	449.60		449.70	0.004954	1.43	23.66	22.73	0.45
Reach-1	35.190*	Max WS	2yr-Pre- Op2	20.72	447.81	449.30		449.37	0.005131	1.22	17.03	21.47	0.44
Reach-1	35.180*	Max WS	REG_POST_OP2	275.20	447.73	451.97		452.45	0.005131	3.16	100.25	42.93	0.55
Reach-1	35.180*	Max WS	100-POST_OP2	82.08	447.73	450.30		450.50	0.004973	1.96	42.13	27.34	0.48
Reach-1	35.180*	Max WS	50-post-op2	69.32	447.73	450.14		450.31	0.004994	1.84	37.78	25.96	0.48
Reach-1	35.180*	Max WS	10-Post-Op2	43.91	447.73	449.74		449.87	0.005037	1.57	28.02	23.67	0.46
Reach-1	35.180*	Max WS	5-Post-OP2	33.79	447.73	449.55		449.65	0.005048	1.43	23.56	22.84	0.45
Reach-1	35.180*	Max WS	2-Post-Op2	20.72	447.73	449.25		449.32	0.005314	1.23	16.86	21.53	0.44
Reach-1	35.180*	Max WS	Reg-Pre-Op2	275.20	447.73	451.97		452.45	0.005131	3.16	100.25	42.93	0.55
Reach-1	35.180*	Max WS	100-Pre-Op2	82.08	447.73	450.30		450.50	0.004973	1.96	42.13	27.34	0.48
Reach-1	35.180*	Max WS	50-PRE-OP2	69.32	447.73	450.14		450.31	0.004994	1.84	37.78	25.96	0.48
Reach-1	35.180*	Max WS	25-Pre-OP2	58.50	447.73	449.98		450.14	0.005043	1.73	33.91	24.73	0.47
Reach-1	35.180*	Max WS	10-Pre-OP2	43.91	447.73	449.74		449.87	0.005037	1.57	28.02	23.67	0.46
Reach-1	35.180*	Max WS	5yr-Pre- Op2	33.79	447.73	449.55		449.65	0.005049	1.43	23.56	22.84	0.45
Reach-1	35.180*	Max WS	2yr-Pre- Op2	20.72	447.73	449.25		449.32	0.005314	1.23	16.86	21.53	0.44

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.170*	Max WS	REG_POST_OP2	275.20	447.64	451.93		452.40	0.005002	3.11	102.66	45.59	0.54
Reach-1	35.170*	Max WS	100-POST_OP2	82.08	447.64	450.25		450.45	0.005037	1.96	42.15	27.55	0.49
Reach-1	35.170*	Max WS	50-post-op2	69.32	447.64	450.09		450.26	0.005088	1.84	37.76	26.01	0.48
Reach-1	35.170*	Max WS	10-Post-Op2	43.91	447.64	449.69		449.82	0.005124	1.57	27.93	23.79	0.46
Reach-1	35.170*	Max WS	5-Post-OP2	33.79	447.64	449.50		449.60	0.005158	1.44	23.44	22.92	0.46
Reach-1	35.170*	Max WS	2-Post-Op2	20.72	447.64	449.19		449.27	0.005524	1.24	16.67	21.54	0.45
Reach-1	35.170*	Max WS	Reg-Pre-Op2	275.19	447.64	451.93		452.40	0.005002	3.11	102.66	45.59	0.54
Reach-1	35.170*	Max WS	100-Pre-Op2	82.08	447.64	450.25		450.45	0.005037	1.96	42.15	27.55	0.49
Reach-1	35.170*	Max WS	50-PRE-OP2	69.32	447.64	450.09		450.26	0.005088	1.84	37.76	26.01	0.48
Reach-1	35.170*	Max WS	25-Pre-OP2	58.50	447.64	449.93		450.09	0.005112	1.73	33.85	24.90	0.47
Reach-1	35.170*	Max WS	10-Pre-OP2	43.91	447.64	449.69		449.82	0.005124	1.57	27.93	23.79	0.46
Reach-1	35.170*	Max WS	5yr-Pre- Op2	33.79	447.64	449.50		449.60	0.005158	1.44	23.44	22.92	0.46
Reach-1	35.170*	Max WS	2yr-Pre- Op2	20.72	447.64	449.19		449.27	0.005524	1.24	16.67	21.54	0.45
Reach-1	35.160*	Max WS	REG_POST_OP2	275.20	447.55	451.89		452.35	0.004914	3.07	104.38	47.77	0.54
Reach-1	35.160*	Max WS	100-POST_OP2	82.08	447.55	450.20		450.40	0.005122	1.96	42.12	27.62	0.49
Reach-1	35.160*	Max WS	50-post-op2	69.32	447.55	450.04		450.21	0.005208	1.84	37.70	25.96	0.48
Reach-1	35.160*	Max WS	10-Post-Op2	43.91	447.55	449.64		449.77	0.005223	1.58	27.81	23.89	0.47
Reach-1	35.160*	Max WS	5-Post-OP2	33.79	447.55	449.44		449.55	0.005293	1.45	23.28	22.98	0.46
Reach-1	35.160*	Max WS	2-Post-Op2	20.72	447.55	449.14		449.22	0.005778	1.26	16.44	21.53	0.46
Reach-1	35.160*	Max WS	Reg-Pre-Op2	275.20	447.55	451.89		452.35	0.004914	3.07	104.38	47.77	0.54
Reach-1	35.160*	Max WS	100-Pre-Op2	82.08	447.55	450.20		450.40	0.005122	1.96	42.12	27.62	0.49
Reach-1	35.160*	Max WS	50-PRE-OP2	69.32	447.55	450.04		450.21	0.005208	1.84	37.70	25.96	0.48
Reach-1	35.160*	Max WS	25-Pre-OP2	58.50	447.55	449.88		450.03	0.005182	1.73	33.78	25.04	0.48
Reach-1	35.160*	Max WS	10-Pre-OP2	43.91	447.55	449.64		449.77	0.005223	1.58	27.81	23.89	0.47
Reach-1	35.160*	Max WS	5yr-Pre- Op2	33.79	447.55	449.44		449.55	0.005293	1.45	23.28	22.98	0.46
Reach-1	35.160*	Max WS	2yr-Pre- Op2	20.72	447.55	449.14		449.22	0.005778	1.26	16.44	21.53	0.46
Reach-1	35.150*	Max WS	REG_POST_OP2	275.19	447.47	451.85		452.30	0.004842	3.04	105.61	49.46	0.53
Reach-1	35.150*	Max WS	100-POST_OP2	82.08	447.47	450.15		450.35	0.005220	1.96	42.07	27.60	0.49
Reach-1	35.150*	Max WS	50-post-op2	69.32	447.47	449.98		450.16	0.005331	1.84	37.62	25.92	0.49
Reach-1	35.150*	Max WS	10-Post-Op2	43.91	447.47	449.58		449.71	0.005329	1.59	27.67	23.96	0.47
Reach-1	35.150*	Max WS	5-Post-OP2	33.79	447.47	449.39		449.50	0.005442	1.46	23.10	23.00	0.47
Reach-1	35.150*	Max WS	2-Post-Op2	20.72	447.47	449.08		449.16	0.005882	1.28	16.19	20.97	0.47
Reach-1	35.150*	Max WS	Reg-Pre-Op2	275.20	447.47	451.85		452.30	0.004842	3.04	105.61	49.46	0.53
Reach-1	35.150*	Max WS	100-Pre-Op2	82.08	447.47	450.15		450.35	0.005220	1.96	42.07	27.60	0.49
Reach-1	35.150*	Max WS	50-PRE-OP2	69.32	447.47	449.98		450.16	0.005331	1.84	37.62	25.92	0.49
Reach-1	35.150*	Max WS	25-Pre-OP2	58.50	447.47	449.83		449.98	0.005258	1.74	33.70	25.16	0.48
Reach-1	35.150*	Max WS	10-Pre-OP2	43.91	447.47	449.58		449.71	0.005329	1.59	27.67	23.96	0.47
Reach-1	35.150*	Max WS	5yr-Pre- Op2	33.79	447.47	449.39		449.50	0.005442	1.46	23.10	23.00	0.47
Reach-1	35.150*	Max WS	2yr-Pre- Op2	20.72	447.47	449.08		449.16	0.005881	1.28	16.19	20.97	0.47
Reach-1	35.140*	Max WS	REG_POST_OP2	275.19	447.38	451.81		452.25	0.004786	3.02	106.42	50.64	0.53
Reach-1	35.140*	Max WS	100-POST_OP2	82.08	447.38	450.10		450.29	0.005342	1.96	41.97	27.49	0.50
Reach-1	35.140*	Max WS	50-post-op2	69.32	447.38	449.93		450.10	0.005434	1.85	37.47	26.03	0.49
Reach-1	35.140*	Max WS	10-Post-Op2	43.91	447.38	449.53		449.66	0.005449	1.60	27.50	23.99	0.48
Reach-1	35.140*	Max WS	5-Post-OP2	33.79	447.38	449.33		449.44	0.005630	1.48	22.85	22.98	0.47
Reach-1	35.140*	Max WS	2-Post-Op2	20.72	447.38	449.02		449.10	0.006005	1.30	15.94	20.46	0.47
Reach-1	35.140*	Max WS	Reg-Pre-Op2	275.20	447.38	451.81		452.25	0.004786	3.02	106.42	50.64	0.53
Reach-1	35.140*	Max WS	100-Pre-Op2	82.08	447.38	450.10		450.29	0.005342	1.96	41.97	27.49	0.50
Reach-1	35.140*	Max WS	50-PRE-OP2	69.32	447.38	449.93		450.10	0.005434	1.85	37.47	26.03	0.49
Reach-1	35.140*	Max WS	25-Pre-OP2	58.50	447.38	449.78		449.93	0.005346	1.74	33.57	25.26	0.48
Reach-1	35.140*	Max WS	10-Pre-OP2	43.91	447.38	449.53		449.66	0.005449	1.60	27.50	23.99	0.48
Reach-1	35.140*	Max WS	5yr-Pre- Op2	33.79	447.38	449.33		449.44	0.005630	1.48	22.85	22.98	0.47
Reach-1	35.140*	Max WS	2yr-Pre- Op2	20.72	447.38	449.02		449.10	0.006006	1.30	15.94	20.46	0.47
Reach-1	35.130*	Max WS	REG_POST_OP2	275.20	447.29	451.76		452.20	0.004742	2.99	106.88	51.27	0.53
Reach-1	35.130*	Max WS	100-POST_OP2	82.08	447.29	450.04		450.24	0.005489	1.96	41.85	27.31	0.50
Reach-1	35.130*	Max WS	50-post-op2	69.32	447.29	449.87		450.05	0.005547	1.86	37.28	26.12	0.50
Reach-1	35.130*	Max WS	10-Post-Op2	43.91	447.29	449.47		449.61	0.005587	1.61	27.30	23.99	0.48
Reach-1	35.130*	Max WS	5-Post-OP2	33.79	447.29	449.27		449.39	0.005844	1.50	22.58	22.92	0.48
Reach-1	35.130*	Max WS	2-Post-Op2	20.72	447.29	448.95		449.04	0.006109	1.32	15.71	19.97	0.47
Reach-1	35.130*	Max WS	Reg-Pre-Op2	275.19	447.29	451.76		452.20	0.004742	2.99	106.88	51.27	0.53
Reach-1	35.130*	Max WS	100-Pre-Op2	82.08	447.29	450.04		450.24	0.005489	1.96	41.85	27.31	0.50
Reach-1	35.130*	Max WS	50-PRE-OP2	69.32	447.29	449.87		450.05	0.005547	1.86	37.28	26.12	0.50
Reach-1	35.130*	Max WS	25-Pre-OP2	58.50	447.29	449.72		449.88	0.005444	1.75	33.42	25.32	0.49
Reach-1	35.130*	Max WS	10-Pre-OP2	43.91	447.29	449.47		449.61	0.005587	1.61	27.30	23.99	0.48
Reach-1	35.130*	Max WS	5yr-Pre- Op2	33.79	447.29	449.27		449.39	0.005844	1.50	22.58	22.92	0.48
Reach-1	35.130*	Max WS	2yr-Pre- Op2	20.72	447.29	448.95		449.04	0.006109	1.32	15.71	19.97	0.47
Reach-1	35.120*	Max WS	REG_POST_OP2	275.20	447.21	451.72		452.15	0.004699	2.97	107.16	51.34	0.52
Reach-1	35.120*	Max WS	100-POST_OP2	82.08	447.21	449.99		450.19	0.005650	1.97	41.68	27.13	0.51
Reach-1	35.120*	Max WS	50-post-op2	69.32	447.21	449.81		449.99	0.005669	1.87	37.07	26.17	0.50
Reach-1	35.120*	Max WS	10-Post-Op2	43.91	447.21	449.42		449.55	0.005745	1.62	27.05	23.95	0.49
Reach-1	35.120*	Max WS	5-Post-OP2	33.79	447.21	449.21		449.33	0.005995	1.52	22.30	22.63	0.49
Reach-1	35.120*	Max WS	2-Post-Op2	20.72	447.21	448.89		448.98	0.006206	1.33	15.52	19.57	0.48
Reach-1	35.120*	Max WS	Reg-Pre-Op2	275.19	447.21	451.72		452.15	0.004699	2.97	107.16	51.34	0.52
Reach-1	35.120*	Max WS	100-Pre-Op2	82.08	447.21	449.99		450.19	0.005650	1.97	41.68	27.13	0.51
Reach-1	35.120*	Max WS	50-PRE-OP2	69.32	447.21	449.81		449.99	0.005669	1.87	37.07	26.17	0.50
Reach-1	35.120*	Max WS	25-Pre-OP2	58.50	447.21	449.67		449.82	0.005559	1.76	33.23	25.34	0.49
Reach-1	35.120*	Max WS	10-Pre-OP2	43.91	447.21	449.42		449.55	0.005745	1.62	27.05	23.95	0.49
Reach-1	35.120*	Max WS	5yr-Pre- Op2	33.79	447.21	449.21		449.33	0.005994	1.52	22.30	22.63	0.49
Reach-1	35.120*	Max WS	2yr-Pre- Op2	20.72	447.21	448.89		448.98	0.006206	1.33	15.52	19.57	0.48
Reach-1	35.110*	Max WS	REG_POST_OP2	275.19	447.12	451.68		452.10	0.004653	2.94	107.36	50.81	0.52
Reach-1	35.110*	Max WS	100-POST_OP2	82.08	447.12	449.93		450.13	0.005776	1.98	41.45	27.19	0.51
Reach-1	35.110*	Max WS	50-post-op2	69.32	447.12	449.76		449.94	0.005805	1.88	36.82	26.19	0.51

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.110*	Max WS	10-Post-Op2	43.91	447.12	449.35		449.49	0.005920	1.64	26.78	23.87	0.49
Reach-1	35.110*	Max WS	5-Post-OP2	33.79	447.12	449.15		449.27	0.006094	1.53	22.06	22.27	0.49
Reach-1	35.110*	Max WS	2-Post-Op2	20.72	447.12	448.83		448.92	0.006289	1.35	15.37	19.26	0.48
Reach-1	35.110*	Max WS	Reg-Pre-Op2	275.19	447.12	451.68		452.10	0.004653	2.94	107.36	50.81	0.52
Reach-1	35.110*	Max WS	100-Pre-Op2	82.08	447.12	449.93		450.13	0.005776	1.98	41.45	27.19	0.51
Reach-1	35.110*	Max WS	50-PRE-OP2	69.32	447.12	449.76		449.94	0.005805	1.88	36.82	26.19	0.51
Reach-1	35.110*	Max WS	25-Pre-OP2	58.50	447.12	449.61		449.77	0.005678	1.77	33.02	25.33	0.50
Reach-1	35.110*	Max WS	10-Pre-OP2	43.91	447.12	449.35		449.49	0.005921	1.64	26.78	23.87	0.49
Reach-1	35.110*	Max WS	5yr-Pre- Op2	33.79	447.12	449.15		449.27	0.006094	1.53	22.06	22.27	0.49
Reach-1	35.110*	Max WS	2yr-Pre- Op2	20.72	447.12	448.83		448.92	0.006289	1.35	15.37	19.26	0.48
Reach-1	35.100*	Max WS	REG_POST_OP2	275.20	447.03	451.64		452.06	0.004600	2.92	107.60	49.65	0.52
Reach-1	35.100*	Max WS	100-POST_OP2	82.08	447.03	449.87		450.07	0.005930	2.00	41.13	27.20	0.52
Reach-1	35.100*	Max WS	50-post-op2	69.32	447.03	449.69		449.88	0.005959	1.90	36.52	26.16	0.51
Reach-1	35.100*	Max WS	10-Post-Op2	43.91	447.03	449.29		449.43	0.006087	1.66	26.46	23.62	0.50
Reach-1	35.100*	Max WS	5-Post-OP2	33.79	447.03	449.09		449.21	0.006205	1.55	21.83	21.95	0.50
Reach-1	35.100*	Max WS	2-Post-Op2	20.72	447.03	448.77		448.86	0.006393	1.36	15.22	19.00	0.49
Reach-1	35.100*	Max WS	Reg-Pre-Op2	275.19	447.03	451.64		452.06	0.004600	2.92	107.60	49.65	0.52
Reach-1	35.100*	Max WS	100-Pre-Op2	82.08	447.03	449.87		450.07	0.005930	2.00	41.13	27.20	0.52
Reach-1	35.100*	Max WS	50-PRE-OP2	69.32	447.03	449.69		449.88	0.005959	1.90	36.52	26.16	0.51
Reach-1	35.100*	Max WS	25-Pre-OP2	58.50	447.03	449.55		449.71	0.005817	1.79	32.76	25.28	0.50
Reach-1	35.100*	Max WS	10-Pre-OP2	43.91	447.03	449.29		449.43	0.006087	1.66	26.46	23.62	0.50
Reach-1	35.100*	Max WS	5yr-Pre- Op2	33.79	447.03	449.09		449.21	0.006205	1.55	21.83	21.95	0.50
Reach-1	35.100*	Max WS	2yr-Pre- Op2	20.72	447.03	448.77		448.86	0.006394	1.36	15.22	19.00	0.49
Reach-1	35.090*	Max WS	REG_POST_OP2	275.19	446.95	451.60		452.01	0.004538	2.89	108.06	49.00	0.51
Reach-1	35.090*	Max WS	100-POST_OP2	82.08	446.95	449.80		450.01	0.006101	2.01	40.77	27.17	0.52
Reach-1	35.090*	Max WS	50-post-op2	69.32	446.95	449.63		449.82	0.006127	1.92	36.19	26.08	0.52
Reach-1	35.090*	Max WS	10-Post-Op2	43.91	446.95	449.23		449.37	0.006209	1.68	26.17	23.29	0.51
Reach-1	35.090*	Max WS	5-Post-OP2	33.79	446.95	449.02		449.15	0.006302	1.56	21.61	21.63	0.50
Reach-1	35.090*	Max WS	2-Post-Op2	20.72	446.95	448.70		448.80	0.006517	1.37	15.08	18.79	0.49
Reach-1	35.090*	Max WS	Reg-Pre-Op2	275.19	446.95	451.60		452.01	0.004538	2.89	108.06	49.00	0.51
Reach-1	35.090*	Max WS	100-Pre-Op2	82.08	446.95	449.80		450.01	0.006101	2.01	40.77	27.17	0.52
Reach-1	35.090*	Max WS	50-PRE-OP2	69.32	446.95	449.63		449.82	0.006127	1.92	36.19	26.08	0.52
Reach-1	35.090*	Max WS	25-Pre-OP2	58.50	446.95	449.49		449.65	0.005966	1.80	32.47	25.17	0.51
Reach-1	35.090*	Max WS	10-Pre-OP2	43.91	446.95	449.23		449.37	0.006209	1.68	26.17	23.29	0.51
Reach-1	35.090*	Max WS	5yr-Pre- Op2	33.79	446.95	449.02		449.15	0.006302	1.56	21.61	21.63	0.50
Reach-1	35.090*	Max WS	2yr-Pre- Op2	20.72	446.95	448.70		448.80	0.006517	1.37	15.08	18.79	0.49
Reach-1	35.080*	Max WS	REG_POST_OP2	275.19	446.86	451.56		451.96	0.004496	2.87	108.43	49.23	0.51
Reach-1	35.080*	Max WS	100-POST_OP2	82.08	446.86	449.74		449.95	0.006297	2.03	40.35	27.08	0.53
Reach-1	35.080*	Max WS	50-post-op2	69.32	446.86	449.57		449.76	0.006318	1.94	35.80	25.95	0.53
Reach-1	35.080*	Max WS	10-Post-Op2	43.91	446.86	449.16		449.31	0.006342	1.70	25.89	23.00	0.51
Reach-1	35.080*	Max WS	5-Post-OP2	33.79	446.86	448.96		449.09	0.006407	1.58	21.40	21.34	0.50
Reach-1	35.080*	Max WS	2-Post-Op2	20.72	446.86	448.64		448.73	0.006684	1.39	14.91	18.61	0.50
Reach-1	35.080*	Max WS	Reg-Pre-Op2	275.19	446.86	451.56		451.96	0.004496	2.87	108.43	49.23	0.51
Reach-1	35.080*	Max WS	100-Pre-Op2	82.08	446.86	449.74		449.95	0.006297	2.03	40.35	27.08	0.53
Reach-1	35.080*	Max WS	50-PRE-OP2	69.32	446.86	449.57		449.76	0.006318	1.94	35.80	25.95	0.53
Reach-1	35.080*	Max WS	25-Pre-OP2	58.50	446.86	449.42		449.59	0.006121	1.82	32.15	25.02	0.51
Reach-1	35.080*	Max WS	10-Pre-OP2	43.91	446.86	449.16		449.31	0.006342	1.70	25.89	23.00	0.51
Reach-1	35.080*	Max WS	5yr-Pre- Op2	33.79	446.86	448.96		449.09	0.006407	1.58	21.40	21.34	0.50
Reach-1	35.080*	Max WS	2yr-Pre- Op2	20.72	446.86	448.64		448.73	0.006684	1.39	14.91	18.61	0.50
Reach-1	35.070*	Max WS	REG_POST_OP2	275.19	446.77	451.52		451.92	0.004449	2.84	108.83	49.42	0.51
Reach-1	35.070*	Max WS	100-POST_OP2	82.08	446.77	449.67		449.89	0.006513	2.06	39.87	26.93	0.54
Reach-1	35.070*	Max WS	50-post-op2	69.32	446.77	449.50		449.69	0.006525	1.96	35.36	25.76	0.53
Reach-1	35.070*	Max WS	10-Post-Op2	43.91	446.77	449.10		449.25	0.006487	1.71	25.60	22.72	0.52
Reach-1	35.070*	Max WS	5-Post-OP2	33.79	446.77	448.89		449.02	0.006537	1.59	21.19	21.09	0.51
Reach-1	35.070*	Max WS	2-Post-Op2	20.72	446.77	448.57		448.67	0.006922	1.41	14.72	18.45	0.50
Reach-1	35.070*	Max WS	Reg-Pre-Op2	275.19	446.77	451.52		451.92	0.004449	2.84	108.83	49.42	0.51
Reach-1	35.070*	Max WS	100-Pre-Op2	82.08	446.77	449.67		449.89	0.006513	2.06	39.87	26.93	0.54
Reach-1	35.070*	Max WS	50-PRE-OP2	69.32	446.77	449.50		449.69	0.006525	1.96	35.36	25.76	0.53
Reach-1	35.070*	Max WS	25-Pre-OP2	58.50	446.77	449.36		449.53	0.006248	1.84	31.83	24.73	0.52
Reach-1	35.070*	Max WS	10-Pre-OP2	43.91	446.77	449.10		449.25	0.006486	1.71	25.60	22.72	0.52
Reach-1	35.070*	Max WS	5yr-Pre- Op2	33.79	446.77	448.89		449.02	0.006537	1.59	21.19	21.09	0.51
Reach-1	35.070*	Max WS	2yr-Pre- Op2	20.72	446.77	448.57		448.67	0.006922	1.41	14.72	18.45	0.50
Reach-1	35.060*	Max WS	REG_POST_OP2	275.19	446.69	451.48		451.87	0.004408	2.82	109.16	49.56	0.50
Reach-1	35.060*	Max WS	100-POST_OP2	82.08	446.69	449.60		449.82	0.006755	2.09	39.33	26.72	0.55
Reach-1	35.060*	Max WS	50-post-op2	69.32	446.69	449.43		449.63	0.006739	1.99	34.89	25.48	0.54
Reach-1	35.060*	Max WS	10-Post-Op2	43.91	446.69	449.03		449.18	0.006649	1.74	25.30	22.43	0.52
Reach-1	35.060*	Max WS	5-Post-OP2	33.79	446.69	448.83		448.96	0.006704	1.61	20.95	20.87	0.51
Reach-1	35.060*	Max WS	2-Post-Op2	20.72	446.69	448.49		448.60	0.007273	1.43	14.46	18.29	0.51
Reach-1	35.060*	Max WS	Reg-Pre-Op2	275.19	446.69	451.48		451.87	0.004408	2.82	109.16	49.56	0.50
Reach-1	35.060*	Max WS	100-Pre-Op2	82.08	446.69	449.60		449.82	0.006755	2.09	39.33	26.72	0.55
Reach-1	35.060*	Max WS	50-PRE-OP2	69.32	446.69	449.43		449.63	0.006739	1.99	34.89	25.48	0.54
Reach-1	35.060*	Max WS	25-Pre-OP2	58.50	446.69	449.29		449.47	0.006370	1.86	31.52	24.46	0.52
Reach-1	35.060*	Max WS	10-Pre-OP2	43.91	446.69	449.03		449.18	0.006649	1.74	25.30	22.43	0.52
Reach-1	35.060*	Max WS	5yr-Pre- Op2	33.79	446.69	448.83		448.96	0.006704	1.61	20.95	20.87	0.51
Reach-1	35.060*	Max WS	2yr-Pre- Op2	20.72	446.69	448.49		448.60	0.007273	1.43	14.46	18.29	0.51
Reach-1	35.05	Max WS	REG_POST_OP2	275.19	446.60	451.44		451.83	0.004366	2.80	109.49	49.66	0.50
Reach-1	35.05	Max WS	100-POST_OP2	82.08	446.60	449.52		449.75	0.007020	2.12	38.72	26.42	0.56
Reach-1	35.05	Max WS	50-post-op2	69.32	446.60	449.35		449.56	0.006978	2.02	34.37	25.15	0.55
Reach-1	35.05	Max WS	10-Post-Op2	43.91	446.60	448.96		449.11	0.006831	1.76	25.00	22.18	0.53
Reach-1	35.05	Max WS	5-Post-OP2	33.79	446.60	448.76		448.89	0.006916	1.63	20.69	20.67	0.52
Reach-1	35.05	Max WS	2-Post-Op2	20.72	446.60	448.42		448.53	0.007820	1.47	14.11	18.13	0.53

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	35.05	Max WS	Reg-Pre-Op2	275.19	446.60	451.44		451.83	0.004366	2.80	109.49	49.66	0.50
Reach-1	35.05	Max WS	100-Pre-Op2	82.08	446.60	449.52		449.75	0.007021	2.12	38.72	26.42	0.56
Reach-1	35.05	Max WS	50-PRE-OP2	69.32	446.60	449.35		449.56	0.006978	2.02	34.37	25.15	0.55
Reach-1	35.05	Max WS	25-Pre-OP2	58.50	446.60	449.23		449.40	0.006500	1.87	31.22	24.19	0.53
Reach-1	35.05	Max WS	10-Pre-OP2	43.91	446.60	448.96		449.11	0.006831	1.76	25.00	22.18	0.53
Reach-1	35.05	Max WS	5yr-Pre- Op2	33.79	446.60	448.76		448.89	0.006917	1.63	20.69	20.67	0.52
Reach-1	35.05	Max WS	2yr-Pre- Op2	20.72	446.60	448.42		448.53	0.007820	1.47	14.11	18.13	0.53
Reach-1	35.039*	Max WS	REG_POST_OP2	275.19	446.52	451.43		451.79	0.002899	2.74	127.78	56.16	0.43
Reach-1	35.039*	Max WS	100-POST_OP2	82.08	446.52	449.57		449.70	0.002174	1.59	53.78	29.57	0.34
Reach-1	35.039*	Max WS	50-post-op2	69.32	446.52	449.40		449.51	0.002019	1.46	48.92	27.97	0.32
Reach-1	35.039*	Max WS	10-Post-Op2	43.91	446.52	449.00		449.07	0.001652	1.15	38.44	24.15	0.28
Reach-1	35.039*	Max WS	5-Post-OP2	33.79	446.52	448.79		448.85	0.001493	1.00	33.65	22.26	0.26
Reach-1	35.039*	Max WS	2-Post-Op2	20.72	446.52	448.44		448.48	0.001182	0.79	26.12	20.67	0.23
Reach-1	35.039*	Max WS	Reg-Pre-Op2	275.19	446.52	451.43		451.79	0.002899	2.74	127.78	56.16	0.43
Reach-1	35.039*	Max WS	100-Pre-Op2	82.08	446.52	449.57		449.70	0.002174	1.59	53.78	29.57	0.34
Reach-1	35.039*	Max WS	50-PRE-OP2	69.32	446.52	449.40		449.51	0.002019	1.46	48.92	27.97	0.32
Reach-1	35.039*	Max WS	25-Pre-OP2	58.50	446.52	449.27		449.36	0.001790	1.32	45.31	26.71	0.30
Reach-1	35.039*	Max WS	10-Pre-OP2	43.91	446.52	449.00		449.07	0.001652	1.15	38.44	24.15	0.28
Reach-1	35.039*	Max WS	5yr-Pre- Op2	33.79	446.52	448.79		448.85	0.001493	1.00	33.65	22.26	0.26
Reach-1	35.039*	Max WS	2yr-Pre- Op2	20.72	446.52	448.44		448.48	0.001182	0.79	26.12	20.67	0.23
Reach-1	35.032	Max WS	REG_POST_OP2	275.19	446.47	451.04	449.83	451.80	0.005505	3.84	71.65	79.53	0.60
Reach-1	35.032	Max WS	100-POST_OP2	82.08	446.47	449.52	448.18	449.68	0.002200	1.80	45.65	29.96	0.35
Reach-1	35.032	Max WS	50-post-op2	69.32	446.47	449.36	448.04	449.50	0.001916	1.61	43.00	28.65	0.32
Reach-1	35.032	Max WS	10-Post-Op2	43.91	446.47	448.98	447.67	449.06	0.001327	1.20	36.50	25.45	0.26
Reach-1	35.032	Max WS	5-Post-OP2	33.79	446.47	448.78	447.50	448.84	0.001091	1.02	33.08	23.76	0.23
Reach-1	35.032	Max WS	2-Post-Op2	20.72	446.47	448.44	447.23	448.47	0.000787	0.76	27.21	20.86	0.19
Reach-1	35.032	Max WS	Reg-Pre-Op2	275.19	446.47	451.04	449.82	451.80	0.005505	3.84	71.65	79.53	0.60
Reach-1	35.032	Max WS	100-Pre-Op2	82.08	446.47	449.52	448.18	449.68	0.002200	1.80	45.65	29.96	0.35
Reach-1	35.032	Max WS	50-PRE-OP2	69.32	446.47	449.36	448.04	449.50	0.001916	1.61	43.00	28.65	0.32
Reach-1	35.032	Max WS	25-Pre-OP2	58.50	446.47	449.24	447.89	449.35	0.001610	1.43	40.92	27.63	0.29
Reach-1	35.032	Max WS	10-Pre-OP2	43.91	446.47	448.98	447.67	449.06	0.001327	1.20	36.50	25.45	0.26
Reach-1	35.032	Max WS	5yr-Pre- Op2	33.79	446.47	448.78	447.50	448.84	0.001091	1.02	33.08	23.76	0.23
Reach-1	35.032	Max WS	2yr-Pre- Op2	20.72	446.47	448.44	447.23	448.47	0.000787	0.76	27.21	20.86	0.19
Reach-1	35.026			Bridge									
Reach-1	35.02	Max WS	REG_POST_OP2	265.92	446.47	450.45		451.40	0.008560	4.33	61.48	53.38	0.73
Reach-1	35.02	Max WS	100-POST_OP2	82.08	446.47	449.48		449.65	0.002326	1.83	44.90	29.59	0.36
Reach-1	35.02	Max WS	50-post-op2	69.32	446.47	449.33		449.46	0.002011	1.64	42.38	28.35	0.33
Reach-1	35.02	Max WS	10-Post-Op2	43.91	446.47	448.96		449.04	0.001376	1.22	36.11	25.25	0.27
Reach-1	35.02	Max WS	5-Post-OP2	33.79	446.47	448.77		448.82	0.001126	1.03	32.77	23.61	0.24
Reach-1	35.02	Max WS	2-Post-Op2	20.72	446.47	448.42		448.45	0.000811	0.77	26.96	20.74	0.20
Reach-1	35.02	Max WS	Reg-Pre-Op2	265.94	446.47	450.45		451.40	0.008561	4.33	61.48	53.38	0.73
Reach-1	35.02	Max WS	100-Pre-Op2	82.08	446.47	449.48		449.65	0.002326	1.83	44.90	29.59	0.36
Reach-1	35.02	Max WS	50-PRE-OP2	69.32	446.47	449.33		449.46	0.002011	1.64	42.38	28.35	0.33
Reach-1	35.02	Max WS	25-Pre-OP2	58.50	446.47	449.21		449.32	0.001675	1.45	40.43	27.39	0.30
Reach-1	35.02	Max WS	10-Pre-OP2	43.91	446.47	448.96		449.04	0.001376	1.22	36.11	25.25	0.27
Reach-1	35.02	Max WS	5yr-Pre- Op2	33.79	446.47	448.77		448.82	0.001126	1.03	32.77	23.61	0.24
Reach-1	35.02	Max WS	2yr-Pre- Op2	20.72	446.47	448.42		448.45	0.000811	0.77	26.96	20.74	0.20
Reach-1	35.01	Max WS	REG_POST_OP2	275.17	446.50	450.82		451.39	0.006842	3.33	82.52	70.66	0.62
Reach-1	35.01	Max WS	100-POST_OP2	82.08	446.50	449.45		449.62	0.003951	1.82	45.01	28.59	0.43
Reach-1	35.01	Max WS	50-post-op2	69.32	446.50	449.30		449.44	0.003604	1.68	41.24	27.36	0.41
Reach-1	35.01	Max WS	10-Post-Op2	43.91	446.50	448.93		449.02	0.002793	1.34	32.70	24.41	0.35
Reach-1	35.01	Max WS	5-Post-OP2	33.79	446.50	448.73		448.80	0.002449	1.19	28.51	22.85	0.33
Reach-1	35.01	Max WS	2-Post-Op2	20.72	446.50	448.40		448.44	0.002006	0.95	21.77	20.17	0.29
Reach-1	35.01	Max WS	Reg-Pre-Op2	275.17	446.50	450.82		451.39	0.006842	3.33	82.52	70.66	0.62
Reach-1	35.01	Max WS	100-Pre-Op2	82.08	446.50	449.45		449.62	0.003951	1.82	45.01	28.59	0.43
Reach-1	35.01	Max WS	50-PRE-OP2	69.32	446.50	449.30		449.44	0.003604	1.68	41.24	27.36	0.41
Reach-1	35.01	Max WS	25-Pre-OP2	58.50	446.50	449.18		449.30	0.003108	1.52	38.54	26.46	0.38
Reach-1	35.01	Max WS	10-Pre-OP2	43.91	446.50	448.93		449.02	0.002793	1.34	32.70	24.41	0.35
Reach-1	35.01	Max WS	5yr-Pre- Op2	33.79	446.50	448.73		448.80	0.002449	1.19	28.51	22.85	0.33
Reach-1	35.01	Max WS	2yr-Pre- Op2	20.72	446.50	448.40		448.44	0.002006	0.95	21.77	20.17	0.29
Reach-1	35.000*	Max WS	REG_POST_OP2	275.19	446.57	450.97		451.32	0.003994	2.74	131.93	80.14	0.49
Reach-1	35.000*	Max WS	100-POST_OP2	82.08	446.57	449.44		449.58	0.003308	1.68	50.23	30.27	0.40
Reach-1	35.000*	Max WS	50-post-op2	69.32	446.57	449.28		449.41	0.003067	1.56	45.63	29.03	0.38
Reach-1	35.000*	Max WS	10-Post-Op2	43.91	446.57	448.91		448.99	0.002500	1.26	35.36	26.07	0.34
Reach-1	35.000*	Max WS	5-Post-OP2	33.79	446.57	448.72		448.78	0.002269	1.12	30.42	24.52	0.31
Reach-1	35.000*	Max WS	2-Post-Op2	20.72	446.57	448.38		448.42	0.002031	0.92	22.62	21.84	0.29
Reach-1	35.000*	Max WS	Reg-Pre-Op2	275.18	446.57	450.97		451.32	0.003993	2.74	131.93	80.14	0.49
Reach-1	35.000*	Max WS	100-Pre-Op2	82.08	446.57	449.44		449.58	0.003308	1.68	50.23	30.27	0.40
Reach-1	35.000*	Max WS	50-PRE-OP2	69.32	446.57	449.28		449.41	0.003067	1.56	45.63	29.03	0.38
Reach-1	35.000*	Max WS	25-Pre-OP2	58.50	446.57	449.17		449.27	0.002679	1.41	42.38	28.13	0.35
Reach-1	35.000*	Max WS	10-Pre-OP2	43.91	446.57	448.91		448.99	0.002500	1.26	35.36	26.07	0.34
Reach-1	35.000*	Max WS	5yr-Pre- Op2	33.79	446.57	448.72		448.78	0.002269	1.12	30.42	24.52	0.31
Reach-1	35.000*	Max WS	2yr-Pre- Op2	20.72	446.57	448.38		448.42	0.002031	0.92	22.62	21.84	0.29
Reach-1	34.990*	Max WS	REG_POST_OP2	275.18	446.63	450.96		451.28	0.003751	2.67	138.98	81.66	0.47
Reach-1	34.990*	Max WS	100-POST_OP2	82.08	446.63	449.40		449.55	0.003623	1.70	49.17	31.78	0.42
Reach-1	34.990*	Max WS	50-post-op2	69.32	446.63	449.25		449.37	0.003484	1.58	44.41	30.30	0.40
Reach-1	34.990*	Max WS	10-Post-Op2	43.91	446.63	448.88		448.96	0.003086	1.30	33.80	27.09	0.37
Reach-1	34.990*	Max WS	5-Post-OP2	33.79	446.63	448.68		448.75	0.002987	1.18	28.72	25.41	0.35
Reach-1	34.990*	Max WS	2-Post-Op2	20.72	446.63	448.35		448.40	0.002671	0.99	20.83	21.75	0.32
Reach-1	34.990*	Max WS	Reg-Pre-Op2	275.18	446.63	450.96		451.28	0.003751	2.67	138.98	81.66	0.47

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	34.990*	Max WS	100-Pre-Op2	82.08	446.63	449.40		449.55	0.003623	1.70	49.17	31.78	0.42
Reach-1	34.990*	Max WS	50-PRE-OP2	69.32	446.63	449.25		449.37	0.003484	1.58	44.41	30.30	0.40
Reach-1	34.990*	Max WS	25-Pre-OP2	58.50	446.63	449.14		449.24	0.003086	1.44	41.14	29.35	0.38
Reach-1	34.990*	Max WS	10-Pre-OP2	43.91	446.63	448.88		448.96	0.003086	1.30	33.80	27.09	0.37
Reach-1	34.990*	Max WS	5yr-Pre- Op2	33.79	446.63	448.68		448.75	0.002987	1.18	28.72	25.41	0.35
Reach-1	34.990*	Max WS	2yr-Pre- Op2	20.72	446.63	448.35		448.40	0.002671	0.99	20.83	21.75	0.32
Reach-1	34.98	Max WS	REG_POST_OP2	275.18	446.70	450.92		451.25	0.004078	2.70	137.71	75.49	0.49
Reach-1	34.98	Max WS	100-POST_OP2	82.08	446.70	449.32		449.51	0.005213	1.90	44.54	37.40	0.49
Reach-1	34.98	Max WS	50-post-op2	69.32	446.70	449.17		449.33	0.005339	1.79	39.09	32.90	0.49
Reach-1	34.98	Max WS	10-Post-Op2	43.91	446.70	448.81		448.92	0.005151	1.53	28.72	25.66	0.46
Reach-1	34.98	Max WS	5-Post-OP2	33.79	446.70	448.62		448.72	0.004853	1.40	24.08	23.39	0.44
Reach-1	34.98	Max WS	2-Post-Op2	20.72	446.70	448.29		448.37	0.004472	1.21	17.11	19.49	0.41
Reach-1	34.98	Max WS	Reg-Pre-Op2	275.18	446.70	450.92		451.25	0.004078	2.70	137.71	75.49	0.49
Reach-1	34.98	Max WS	100-Pre-Op2	82.08	446.70	449.32		449.51	0.005213	1.90	44.54	37.40	0.49
Reach-1	34.98	Max WS	50-PRE-OP2	69.32	446.70	449.17		449.33	0.005339	1.79	39.09	32.90	0.49
Reach-1	34.98	Max WS	25-Pre-OP2	58.50	446.70	449.07		449.20	0.004896	1.63	35.94	29.99	0.46
Reach-1	34.98	Max WS	10-Pre-OP2	43.91	446.70	448.81		448.92	0.005151	1.53	28.72	25.66	0.46
Reach-1	34.98	Max WS	5yr-Pre- Op2	33.79	446.70	448.62		448.72	0.004853	1.40	24.08	23.39	0.44
Reach-1	34.98	Max WS	2yr-Pre- Op2	20.72	446.70	448.29		448.37	0.004472	1.21	17.11	19.49	0.41
Reach-1	34.970*	Max WS	REG_POST_OP2	275.18	446.67	450.85		451.22	0.004484	2.84	130.27	77.98	0.51
Reach-1	34.970*	Max WS	100-POST_OP2	82.08	446.67	449.27		449.46	0.005074	1.90	44.36	33.53	0.48
Reach-1	34.970*	Max WS	50-post-op2	69.32	446.67	449.12		449.28	0.005140	1.79	39.32	32.14	0.48
Reach-1	34.970*	Max WS	10-Post-Op2	43.91	446.67	448.76		448.87	0.005068	1.52	28.95	25.90	0.46
Reach-1	34.970*	Max WS	5-Post-OP2	33.79	446.67	448.57		448.67	0.004770	1.39	24.32	23.72	0.44
Reach-1	34.970*	Max WS	2-Post-Op2	20.72	446.67	448.25		448.32	0.004434	1.20	17.30	19.96	0.41
Reach-1	34.970*	Max WS	Reg-Pre-Op2	275.18	446.67	450.85		451.22	0.004484	2.84	130.27	77.98	0.51
Reach-1	34.970*	Max WS	100-Pre-Op2	82.08	446.67	449.27		449.46	0.005074	1.90	44.36	33.53	0.48
Reach-1	34.970*	Max WS	50-PRE-OP2	69.32	446.67	449.12		449.28	0.005140	1.79	39.32	32.14	0.48
Reach-1	34.970*	Max WS	25-Pre-OP2	58.49	446.67	449.02		449.16	0.004613	1.62	36.39	30.28	0.45
Reach-1	34.970*	Max WS	10-Pre-OP2	43.91	446.67	448.76		448.87	0.005068	1.52	28.95	25.90	0.46
Reach-1	34.970*	Max WS	5yr-Pre- Op2	33.79	446.67	448.57		448.67	0.004770	1.39	24.32	23.72	0.44
Reach-1	34.970*	Max WS	2yr-Pre- Op2	20.72	446.67	448.25		448.32	0.004434	1.20	17.30	19.96	0.41
Reach-1	34.960*	Max WS	REG_POST_OP2	275.18	446.63	450.78		451.18	0.004744	2.93	123.58	72.75	0.53
Reach-1	34.960*	Max WS	100-POST_OP2	82.08	446.63	449.22		449.41	0.004929	1.90	44.65	33.57	0.48
Reach-1	34.960*	Max WS	50-post-op2	69.32	446.63	449.07		449.23	0.004965	1.78	39.59	32.20	0.47
Reach-1	34.960*	Max WS	10-Post-Op2	43.91	446.63	448.71		448.83	0.004988	1.51	29.17	26.11	0.45
Reach-1	34.960*	Max WS	5-Post-OP2	33.79	446.63	448.53		448.62	0.004690	1.38	24.55	24.00	0.43
Reach-1	34.960*	Max WS	2-Post-Op2	20.72	446.63	448.21		448.28	0.004379	1.18	17.49	20.35	0.41
Reach-1	34.960*	Max WS	Reg-Pre-Op2	275.17	446.63	450.78		451.18	0.004743	2.93	123.58	72.75	0.53
Reach-1	34.960*	Max WS	100-Pre-Op2	82.08	446.63	449.22		449.41	0.004929	1.90	44.65	33.57	0.48
Reach-1	34.960*	Max WS	50-PRE-OP2	69.32	446.63	449.07		449.23	0.004965	1.78	39.59	32.20	0.47
Reach-1	34.960*	Max WS	25-Pre-OP2	58.49	446.63	448.98		449.11	0.004361	1.60	36.86	30.62	0.44
Reach-1	34.960*	Max WS	10-Pre-OP2	43.91	446.63	448.71		448.83	0.004988	1.51	29.17	26.11	0.45
Reach-1	34.960*	Max WS	5yr-Pre- Op2	33.79	446.63	448.53		448.62	0.004690	1.38	24.55	24.00	0.43
Reach-1	34.960*	Max WS	2yr-Pre- Op2	20.72	446.63	448.21		448.28	0.004379	1.18	17.49	20.35	0.41
Reach-1	34.950*	Max WS	REG_POST_OP2	275.17	446.60	450.73		451.13	0.004708	2.94	123.88	70.71	0.53
Reach-1	34.950*	Max WS	100-POST_OP2	82.08	446.60	449.18		449.36	0.004815	1.90	44.97	34.08	0.48
Reach-1	34.950*	Max WS	50-post-op2	69.32	446.60	449.02		449.18	0.004822	1.78	39.86	32.41	0.47
Reach-1	34.950*	Max WS	10-Post-Op2	43.91	446.60	448.66		448.78	0.004922	1.50	29.36	26.30	0.45
Reach-1	34.950*	Max WS	5-Post-OP2	33.79	446.60	448.48		448.58	0.004629	1.37	24.73	24.23	0.43
Reach-1	34.950*	Max WS	2-Post-Op2	20.72	446.60	448.17		448.24	0.004324	1.17	17.66	20.68	0.41
Reach-1	34.950*	Max WS	Reg-Pre-Op2	275.17	446.60	450.73		451.13	0.004708	2.94	123.88	70.71	0.53
Reach-1	34.950*	Max WS	100-Pre-Op2	82.08	446.60	449.18		449.36	0.004815	1.90	44.97	34.08	0.48
Reach-1	34.950*	Max WS	50-PRE-OP2	69.32	446.60	449.02		449.18	0.004822	1.78	39.86	32.41	0.47
Reach-1	34.950*	Max WS	25-Pre-OP2	58.49	446.60	448.94		449.07	0.004142	1.59	37.34	31.06	0.43
Reach-1	34.950*	Max WS	10-Pre-OP2	43.91	446.60	448.66		448.78	0.004922	1.50	29.36	26.30	0.45
Reach-1	34.950*	Max WS	5yr-Pre- Op2	33.79	446.60	448.48		448.58	0.004629	1.37	24.73	24.23	0.43
Reach-1	34.950*	Max WS	2yr-Pre- Op2	20.72	446.60	448.17		448.24	0.004324	1.17	17.66	20.68	0.41
Reach-1	34.940*	Max WS	REG_POST_OP2	275.17	446.57	450.68		451.09	0.004843	3.00	123.45	74.83	0.53
Reach-1	34.940*	Max WS	100-POST_OP2	82.08	446.57	449.13		449.31	0.004731	1.91	45.31	34.84	0.47
Reach-1	34.940*	Max WS	50-post-op2	69.32	446.57	448.98		449.14	0.004707	1.78	40.15	32.85	0.46
Reach-1	34.940*	Max WS	10-Post-Op2	43.91	446.57	448.62		448.73	0.004716	1.49	29.52	26.85	0.44
Reach-1	34.940*	Max WS	5-Post-OP2	33.79	446.57	448.44		448.53	0.004592	1.36	24.86	24.44	0.43
Reach-1	34.940*	Max WS	2-Post-Op2	20.72	446.57	448.13		448.19	0.004282	1.16	17.79	20.94	0.40
Reach-1	34.940*	Max WS	Reg-Pre-Op2	275.17	446.57	450.68		451.09	0.004843	3.00	123.45	74.83	0.53
Reach-1	34.940*	Max WS	100-Pre-Op2	82.08	446.57	449.13		449.31	0.004731	1.91	45.31	34.84	0.47
Reach-1	34.940*	Max WS	50-PRE-OP2	69.32	446.57	448.98		449.14	0.004707	1.78	40.15	32.85	0.46
Reach-1	34.940*	Max WS	25-Pre-OP2	58.49	446.57	448.91		449.03	0.003949	1.58	37.88	31.66	0.42
Reach-1	34.940*	Max WS	10-Pre-OP2	43.91	446.57	448.62		448.73	0.004716	1.49	29.52	26.85	0.44
Reach-1	34.940*	Max WS	5yr-Pre- Op2	33.79	446.57	448.44		448.53	0.004592	1.36	24.86	24.44	0.43
Reach-1	34.940*	Max WS	2yr-Pre- Op2	20.72	446.57	448.13		448.19	0.004282	1.16	17.79	20.94	0.40
Reach-1	34.930*	Max WS	REG_POST_OP2	275.17	446.53	450.63		451.04	0.004788	3.00	124.35	72.20	0.53
Reach-1	34.930*	Max WS	100-POST_OP2	82.08	446.53	449.08		449.26	0.004667	1.91	45.74	36.06	0.47
Reach-1	34.930*	Max WS	50-post-op2	69.32	446.53	448.93		449.09	0.004615	1.79	40.50	33.54	0.46
Reach-1	34.930*	Max WS	10-Post-Op2	43.91	446.53	448.57		448.69	0.004555	1.49	29.66	27.46	0.44
Reach-1	34.930*	Max WS	5-Post-OP2	33.79	446.53	448.39		448.49	0.004581	1.35	24.96	24.65	0.43
Reach-1	34.930*	Max WS	2-Post-Op2	20.72	446.53	448.08		448.15	0.004261	1.16	17.89	21.17	0.40
Reach-1	34.930*	Max WS	Reg-Pre-Op2	275.17	446.53	450.63		451.04	0.004788	3.00	124.35	72.20	0.53
Reach-1	34.930*	Max WS	100-Pre-Op2	82.08	446.53	449.08		449.26	0.004667	1.91	45.74	36.06	0.47
Reach-1	34.930*	Max WS	50-PRE-OP2	69.32	446.53	448.93		449.09	0.004615	1.79	40.50	33.54	0.46
Reach-1	34.930*	Max WS	25-Pre-OP2	58.49	446.53	448.87		448.99	0.003780	1.57	38.49	32.49	0.42

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	34.930*	Max WS	10-Pre-OP2	43.91	446.53	448.57		448.69	0.004555	1.49	29.66	27.46	0.44
Reach-1	34.930*	Max WS	5yr-Pre- Op2	33.79	446.53	448.39		448.49	0.004581	1.35	24.96	24.65	0.43
Reach-1	34.930*	Max WS	2yr-Pre- Op2	20.72	446.53	448.08		448.15	0.004261	1.16	17.89	21.17	0.40
Reach-1	34.920*	Max WS	REG_POST_OP2	275.17	446.50	450.61		450.99	0.004551	2.95	128.23	68.85	0.52
Reach-1	34.920*	Max WS	100-POST_OP2	82.08	446.50	449.03		449.22	0.004623	1.92	46.39	38.40	0.47
Reach-1	34.920*	Max WS	50-post-op2	69.32	446.50	448.88		449.05	0.004549	1.79	40.93	34.65	0.46
Reach-1	34.920*	Max WS	10-Post-Op2	43.91	446.50	448.53		448.64	0.004439	1.49	29.81	28.20	0.43
Reach-1	34.920*	Max WS	5-Post-OP2	33.79	446.50	448.35		448.44	0.004550	1.35	25.01	24.97	0.43
Reach-1	34.920*	Max WS	2-Post-Op2	20.72	446.50	448.04		448.11	0.004271	1.15	17.94	21.36	0.40
Reach-1	34.920*	Max WS	Reg-Pre-Op2	275.17	446.50	450.61		450.99	0.004551	2.95	128.23	68.85	0.52
Reach-1	34.920*	Max WS	100-Pre-Op2	82.08	446.50	449.03		449.22	0.004623	1.92	46.39	38.40	0.47
Reach-1	34.920*	Max WS	50-PRE-OP2	69.32	446.50	448.88		449.05	0.004549	1.79	40.93	34.65	0.46
Reach-1	34.920*	Max WS	25-Pre-OP2	58.49	446.50	448.83		448.96	0.003636	1.57	39.20	33.64	0.41
Reach-1	34.920*	Max WS	10-Pre-OP2	43.91	446.50	448.53		448.64	0.004438	1.49	29.81	28.20	0.43
Reach-1	34.920*	Max WS	5yr-Pre- Op2	33.79	446.50	448.35		448.44	0.004550	1.35	25.01	24.97	0.43
Reach-1	34.920*	Max WS	2yr-Pre- Op2	20.72	446.50	448.04		448.11	0.004271	1.15	17.94	21.36	0.40
Reach-1	34.910*	Max WS	REG_POST_OP2	275.17	446.47	450.59		450.94	0.004170	2.85	134.66	65.96	0.50
Reach-1	34.910*	Max WS	100-POST_OP2	82.08	446.47	448.99		449.17	0.004570	1.93	47.41	40.69	0.47
Reach-1	34.910*	Max WS	50-post-op2	69.32	446.47	448.84		449.00	0.004502	1.80	41.61	36.96	0.46
Reach-1	34.910*	Max WS	10-Post-Op2	43.91	446.47	448.49		448.60	0.004367	1.49	29.98	29.22	0.43
Reach-1	34.910*	Max WS	5-Post-OP2	33.79	446.47	448.31		448.40	0.004434	1.35	25.04	25.75	0.42
Reach-1	34.910*	Max WS	2-Post-Op2	20.72	446.47	448.00		448.07	0.004347	1.16	17.90	21.52	0.41
Reach-1	34.910*	Max WS	Reg-Pre-Op2	275.17	446.47	450.59		450.94	0.004170	2.85	134.66	65.96	0.50
Reach-1	34.910*	Max WS	100-Pre-Op2	82.08	446.47	448.99		449.17	0.004570	1.93	47.41	40.69	0.47
Reach-1	34.910*	Max WS	50-PRE-OP2	69.32	446.47	448.84		449.00	0.004502	1.80	41.61	36.96	0.46
Reach-1	34.910*	Max WS	25-Pre-OP2	58.49	446.47	448.80		448.92	0.003509	1.56	40.15	35.96	0.40
Reach-1	34.910*	Max WS	10-Pre-OP2	43.91	446.47	448.49		448.60	0.004366	1.49	29.98	29.22	0.43
Reach-1	34.910*	Max WS	5yr-Pre- Op2	33.79	446.47	448.31		448.40	0.004434	1.35	25.04	25.75	0.42
Reach-1	34.910*	Max WS	2yr-Pre- Op2	20.72	446.47	448.00		448.07	0.004347	1.16	17.90	21.52	0.41
Reach-1	34.900*	Max WS	REG_POST_OP2	275.18	446.43	450.58		450.90	0.003888	2.78	142.25	68.27	0.48
Reach-1	34.900*	Max WS	100-POST_OP2	82.08	446.43	448.95		449.13	0.004499	1.93	48.85	43.13	0.47
Reach-1	34.900*	Max WS	50-post-op2	69.32	446.43	448.80		448.96	0.004443	1.80	42.68	39.39	0.46
Reach-1	34.900*	Max WS	10-Post-Op2	43.91	446.43	448.44		448.56	0.004324	1.50	30.25	30.70	0.43
Reach-1	34.900*	Max WS	5-Post-OP2	33.79	446.43	448.26		448.36	0.004369	1.36	25.08	26.84	0.42
Reach-1	34.900*	Max WS	2-Post-Op2	20.72	446.43	447.96		448.03	0.004493	1.17	17.77	21.69	0.41
Reach-1	34.900*	Max WS	Reg-Pre-Op2	275.17	446.43	450.58		450.90	0.003888	2.78	142.25	68.27	0.48
Reach-1	34.900*	Max WS	100-Pre-Op2	82.08	446.43	448.95		449.13	0.004499	1.93	48.85	43.13	0.47
Reach-1	34.900*	Max WS	50-PRE-OP2	69.32	446.43	448.80		448.96	0.004443	1.80	42.68	39.39	0.46
Reach-1	34.900*	Max WS	25-Pre-OP2	58.49	446.43	448.77		448.89	0.003376	1.55	41.56	38.68	0.40
Reach-1	34.900*	Max WS	10-Pre-OP2	43.91	446.43	448.44		448.56	0.004324	1.50	30.25	30.70	0.43
Reach-1	34.900*	Max WS	5yr-Pre- Op2	33.79	446.43	448.26		448.36	0.004369	1.36	25.08	26.84	0.42
Reach-1	34.900*	Max WS	2yr-Pre- Op2	20.72	446.43	447.96		448.03	0.004493	1.17	17.77	21.69	0.41
Reach-1	34.89	Max WS	REG_POST_OP2	275.17	446.40	450.56		450.86	0.003614	2.70	150.42	70.61	0.47
Reach-1	34.89	Max WS	100-POST_OP2	82.08	446.40	448.91		449.09	0.004406	1.92	50.76	45.74	0.46
Reach-1	34.89	Max WS	50-post-op2	69.32	446.40	448.76		448.92	0.004371	1.80	44.16	41.97	0.45
Reach-1	34.89	Max WS	10-Post-Op2	43.91	446.40	448.40		448.52	0.004310	1.51	30.73	33.02	0.43
Reach-1	34.89	Max WS	5-Post-OP2	33.79	446.40	448.22		448.32	0.004364	1.37	25.18	28.52	0.42
Reach-1	34.89	Max WS	2-Post-Op2	20.72	446.40	447.91		447.98	0.004750	1.18	17.54	21.86	0.42
Reach-1	34.89	Max WS	Reg-Pre-Op2	275.17	446.40	450.56		450.86	0.003614	2.70	150.42	70.61	0.47
Reach-1	34.89	Max WS	100-Pre-Op2	82.08	446.40	448.91		449.09	0.004407	1.92	50.76	45.74	0.46
Reach-1	34.89	Max WS	50-PRE-OP2	69.32	446.40	448.76		448.92	0.004371	1.80	44.16	41.97	0.45
Reach-1	34.89	Max WS	25-Pre-OP2	58.49	446.40	448.74		448.86	0.003234	1.54	43.45	41.55	0.39
Reach-1	34.89	Max WS	10-Pre-OP2	43.91	446.40	448.40		448.52	0.004310	1.51	30.73	33.02	0.43
Reach-1	34.89	Max WS	5yr-Pre- Op2	33.79	446.40	448.22		448.32	0.004363	1.37	25.18	28.52	0.42
Reach-1	34.89	Max WS	2yr-Pre- Op2	20.72	446.40	447.91		447.98	0.004750	1.18	17.54	21.86	0.42
Reach-1	34.880*	Max WS	REG_POST_OP2	275.17	446.33	450.54		450.82	0.003345	2.59	153.59	72.84	0.45
Reach-1	34.880*	Max WS	100-POST_OP2	82.08	446.33	448.88		449.04	0.004122	1.83	51.99	46.62	0.45
Reach-1	34.880*	Max WS	50-post-op2	69.32	446.33	448.73		448.87	0.004104	1.71	45.28	42.74	0.44
Reach-1	34.880*	Max WS	10-Post-Op2	43.91	446.33	448.37		448.47	0.004154	1.45	31.51	33.39	0.42
Reach-1	34.880*	Max WS	5-Post-OP2	33.79	446.33	448.18		448.27	0.004314	1.32	25.84	28.67	0.42
Reach-1	34.880*	Max WS	2-Post-Op2	20.72	446.33	447.87		447.94	0.004697	1.16	17.87	22.74	0.42
Reach-1	34.880*	Max WS	Reg-Pre-Op2	275.17	446.33	450.54		450.82	0.003345	2.59	153.59	72.84	0.45
Reach-1	34.880*	Max WS	100-Pre-Op2	82.08	446.33	448.88		449.04	0.004122	1.83	51.99	46.62	0.45
Reach-1	34.880*	Max WS	50-PRE-OP2	69.32	446.33	448.73		448.87	0.004104	1.71	45.28	42.74	0.44
Reach-1	34.880*	Max WS	25-Pre-OP2	58.49	446.33	448.72		448.83	0.002974	1.45	44.95	42.54	0.37
Reach-1	34.880*	Max WS	10-Pre-OP2	43.91	446.33	448.37		448.47	0.004154	1.45	31.51	33.39	0.42
Reach-1	34.880*	Max WS	5yr-Pre- Op2	33.79	446.33	448.18		448.27	0.004314	1.32	25.84	28.67	0.42
Reach-1	34.880*	Max WS	2yr-Pre- Op2	20.72	446.33	447.87		447.94	0.004697	1.16	17.87	22.74	0.42
Reach-1	34.870*	Max WS	REG_POST_OP2	275.18	446.26	450.52		450.78	0.003114	2.48	156.66	74.90	0.43
Reach-1	34.870*	Max WS	100-POST_OP2	82.08	446.26	448.85		449.00	0.003905	1.75	53.20	47.47	0.43
Reach-1	34.870*	Max WS	50-post-op2	69.32	446.26	448.70		448.83	0.003922	1.64	46.30	43.41	0.43
Reach-1	34.870*	Max WS	10-Post-Op2	43.91	446.26	448.33		448.43	0.004109	1.40	32.21	33.64	0.42
Reach-1	34.870*	Max WS	5-Post-OP2	33.79	446.26	448.15		448.23	0.004327	1.29	26.36	29.10	0.42
Reach-1	34.870*	Max WS	2-Post-Op2	20.72	446.26	447.83		447.89	0.004745	1.15	18.01	23.38	0.42
Reach-1	34.870*	Max WS	Reg-Pre-Op2	275.16	446.26	450.52		450.78	0.003114	2.48	156.66	74.90	0.43
Reach-1	34.870*	Max WS	100-Pre-Op2	82.08	446.26	448.85		449.00	0.003905	1.75	53.20	47.47	0.43
Reach-1	34.870*	Max WS	50-PRE-OP2	69.32	446.26	448.70		448.83	0.003922	1.64	46.30	43.41	0.43
Reach-1	34.870*	Max WS	25-Pre-OP2	58.49	446.26	448.70		448.80	0.002779	1.38	46.39	43.47	0.36
Reach-1	34.870*	Max WS	10-Pre-OP2	43.91	446.26	448.33		448.43	0.004109	1.40	32.21	33.64	0.42
Reach-1	34.870*	Max WS	5yr-Pre- Op2	33.79	446.26	448.15		448.23	0.004327	1.29	26.36	29.10	0.42
Reach-1	34.870*	Max WS	2yr-Pre- Op2	20.72	446.26	447.83		447.89	0.004745	1.15	18.01	23.38	0.42

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	34.860*	Max WS	REG_POST_OP2	275.17	446.19	450.51		450.75	0.002897	2.37	159.73	75.59	0.42
Reach-1	34.860*	Max WS	100-POST_OP2	82.08	446.19	448.82		448.96	0.003764	1.68	54.25	48.18	0.42
Reach-1	34.860*	Max WS	50-post-op2	69.32	446.19	448.67		448.80	0.003827	1.59	47.16	43.93	0.42
Reach-1	34.860*	Max WS	10-Post-Op2	43.91	446.19	448.30		448.39	0.004139	1.37	32.76	33.94	0.42
Reach-1	34.860*	Max WS	5-Post-OP2	33.79	446.19	448.11		448.19	0.004356	1.27	26.66	29.63	0.42
Reach-1	34.860*	Max WS	2-Post-Op2	20.72	446.19	447.78		447.85	0.004868	1.15	17.98	23.75	0.42
Reach-1	34.860*	Max WS	Reg-Pre-Op2	275.16	446.19	450.51		450.75	0.002897	2.37	159.73	75.59	0.42
Reach-1	34.860*	Max WS	100-Pre-Op2	82.08	446.19	448.82		448.96	0.003765	1.68	54.25	48.18	0.42
Reach-1	34.860*	Max WS	50-PRE-OP2	69.32	446.19	448.67		448.80	0.003827	1.59	47.16	43.93	0.42
Reach-1	34.860*	Max WS	25-Pre-OP2	58.49	446.19	448.68		448.77	0.002644	1.33	47.71	44.27	0.35
Reach-1	34.860*	Max WS	10-Pre-OP2	43.91	446.19	448.30		448.39	0.004139	1.37	32.76	33.94	0.42
Reach-1	34.860*	Max WS	5yr-Pre- Op2	33.79	446.19	448.11		448.19	0.004357	1.27	26.66	29.63	0.42
Reach-1	34.860*	Max WS	2yr-Pre- Op2	20.72	446.19	447.78		447.85	0.004868	1.15	17.98	23.75	0.42
Reach-1	34.850*	Max WS	REG_POST_OP2	275.17	446.12	450.49		450.72	0.002672	2.26	163.46	75.02	0.40
Reach-1	34.850*	Max WS	100-POST_OP2	82.08	446.12	448.79		448.93	0.003683	1.63	55.18	48.75	0.42
Reach-1	34.850*	Max WS	50-post-op2	69.32	446.12	448.64		448.76	0.003805	1.54	47.88	44.29	0.41
Reach-1	34.850*	Max WS	10-Post-Op2	43.91	446.12	448.26		448.35	0.004116	1.35	33.14	34.54	0.41
Reach-1	34.850*	Max WS	5-Post-OP2	33.79	446.12	448.06		448.15	0.004445	1.26	26.79	29.86	0.42
Reach-1	34.850*	Max WS	2-Post-Op2	20.72	446.12	447.73		447.80	0.005017	1.16	17.85	23.85	0.43
Reach-1	34.850*	Max WS	Reg-Pre-Op2	275.16	446.12	450.49		450.72	0.002672	2.26	163.46	75.02	0.40
Reach-1	34.850*	Max WS	100-Pre-Op2	82.07	446.12	448.79		448.93	0.003683	1.63	55.18	48.75	0.42
Reach-1	34.850*	Max WS	50-PRE-OP2	69.32	446.12	448.64		448.76	0.003805	1.54	47.88	44.29	0.41
Reach-1	34.850*	Max WS	25-Pre-OP2	58.49	446.12	448.66		448.74	0.002554	1.28	48.95	44.97	0.34
Reach-1	34.850*	Max WS	10-Pre-OP2	43.91	446.12	448.26		448.35	0.004116	1.35	33.14	34.54	0.41
Reach-1	34.850*	Max WS	5yr-Pre- Op2	33.79	446.12	448.06		448.15	0.004445	1.26	26.79	29.86	0.42
Reach-1	34.850*	Max WS	2yr-Pre- Op2	20.72	446.12	447.73		447.80	0.005017	1.16	17.85	23.85	0.43
Reach-1	34.840*	Max WS	REG_POST_OP2	275.17	446.05	450.48		450.69	0.002474	2.16	167.66	75.08	0.38
Reach-1	34.840*	Max WS	100-POST_OP2	82.07	446.05	448.76		448.89	0.003665	1.59	55.97	49.17	0.41
Reach-1	34.840*	Max WS	50-post-op2	69.31	446.05	448.60		448.72	0.003864	1.51	48.45	44.46	0.41
Reach-1	34.840*	Max WS	10-Post-Op2	43.91	446.05	448.22		448.31	0.004124	1.33	33.36	34.86	0.41
Reach-1	34.840*	Max WS	5-Post-OP2	33.79	446.05	448.02		448.10	0.004562	1.26	26.80	29.80	0.42
Reach-1	34.840*	Max WS	2-Post-Op2	20.72	446.05	447.68		447.75	0.005133	1.17	17.68	23.68	0.43
Reach-1	34.840*	Max WS	Reg-Pre-Op2	275.17	446.05	450.48		450.69	0.002474	2.16	167.66	75.08	0.38
Reach-1	34.840*	Max WS	100-Pre-Op2	82.07	446.05	448.76		448.89	0.003665	1.59	55.97	49.17	0.41
Reach-1	34.840*	Max WS	50-PRE-OP2	69.31	446.05	448.60		448.72	0.003864	1.51	48.45	44.46	0.41
Reach-1	34.840*	Max WS	25-Pre-OP2	58.49	446.05	448.64		448.72	0.002501	1.24	50.15	45.57	0.34
Reach-1	34.840*	Max WS	10-Pre-OP2	43.91	446.05	448.22		448.31	0.004124	1.33	33.36	34.86	0.41
Reach-1	34.840*	Max WS	5yr-Pre- Op2	33.79	446.05	448.02		448.10	0.004563	1.26	26.80	29.80	0.42
Reach-1	34.840*	Max WS	2yr-Pre- Op2	20.72	446.05	447.68		447.75	0.005133	1.17	17.68	23.68	0.43
Reach-1	34.830*	Max WS	REG_POST_OP2	275.17	445.98	450.47		450.66	0.002322	2.08	171.89	76.77	0.37
Reach-1	34.830*	Max WS	100-POST_OP2	82.08	445.98	448.73		448.85	0.003711	1.56	56.62	49.43	0.41
Reach-1	34.830*	Max WS	50-post-op2	69.32	445.98	448.57		448.68	0.003845	1.49	48.89	44.99	0.41
Reach-1	34.830*	Max WS	10-Post-Op2	43.91	445.98	448.18		448.27	0.004136	1.32	33.49	34.90	0.41
Reach-1	34.830*	Max WS	5-Post-OP2	33.79	445.98	447.97		448.06	0.004612	1.26	26.79	29.66	0.42
Reach-1	34.830*	Max WS	2-Post-Op2	20.72	445.98	447.63		447.70	0.004935	1.18	17.63	22.78	0.43
Reach-1	34.830*	Max WS	Reg-Pre-Op2	275.17	445.98	450.47		450.66	0.002322	2.08	171.89	76.77	0.37
Reach-1	34.830*	Max WS	100-Pre-Op2	82.07	445.98	448.73		448.85	0.003711	1.56	56.62	49.43	0.41
Reach-1	34.830*	Max WS	50-PRE-OP2	69.32	445.98	448.57		448.68	0.003845	1.49	48.89	44.99	0.41
Reach-1	34.830*	Max WS	25-Pre-OP2	58.49	445.98	448.62		448.69	0.002429	1.21	51.30	46.37	0.33
Reach-1	34.830*	Max WS	10-Pre-OP2	43.91	445.98	448.18		448.27	0.004135	1.32	33.49	34.90	0.41
Reach-1	34.830*	Max WS	5yr-Pre- Op2	33.79	445.98	447.97		448.06	0.004612	1.26	26.79	29.66	0.42
Reach-1	34.830*	Max WS	2yr-Pre- Op2	20.72	445.98	447.63		447.70	0.004935	1.18	17.63	22.78	0.43
Reach-1	34.820*	Max WS	REG_POST_OP2	275.17	445.91	450.46		450.64	0.002192	2.00	176.01	78.60	0.36
Reach-1	34.820*	Max WS	100-POST_OP2	82.08	445.91	448.70		448.82	0.003687	1.53	57.15	49.93	0.41
Reach-1	34.820*	Max WS	50-post-op2	69.31	445.91	448.53		448.64	0.003792	1.47	49.25	45.39	0.41
Reach-1	34.820*	Max WS	10-Post-Op2	43.91	445.91	448.14		448.23	0.004118	1.31	33.61	34.70	0.41
Reach-1	34.820*	Max WS	5-Post-OP2	33.79	445.91	447.93		448.01	0.004530	1.26	26.87	29.46	0.42
Reach-1	34.820*	Max WS	2-Post-Op2	20.72	445.91	447.58		447.65	0.004813	1.17	17.77	22.80	0.42
Reach-1	34.820*	Max WS	Reg-Pre-Op2	275.17	445.91	450.46		450.64	0.002192	2.00	176.01	78.60	0.36
Reach-1	34.820*	Max WS	100-Pre-Op2	82.08	445.91	448.70		448.82	0.003687	1.53	57.15	49.93	0.41
Reach-1	34.820*	Max WS	50-PRE-OP2	69.31	445.91	448.53		448.64	0.003792	1.47	49.25	45.39	0.41
Reach-1	34.820*	Max WS	25-Pre-OP2	58.49	445.91	448.60		448.67	0.002318	1.18	52.38	47.24	0.32
Reach-1	34.820*	Max WS	10-Pre-OP2	43.91	445.91	448.14		448.23	0.004118	1.31	33.61	34.70	0.41
Reach-1	34.820*	Max WS	5yr-Pre- Op2	33.79	445.91	447.93		448.01	0.004530	1.26	26.87	29.46	0.42
Reach-1	34.820*	Max WS	2yr-Pre- Op2	20.72	445.91	447.58		447.65	0.004813	1.17	17.77	22.80	0.42
Reach-1	34.810*	Max WS	REG_POST_OP2	275.17	445.85	450.44		450.61	0.002083	1.93	179.96	80.53	0.35
Reach-1	34.810*	Max WS	100-POST_OP2	82.07	445.85	448.67		448.78	0.003628	1.52	57.53	50.31	0.41
Reach-1	34.810*	Max WS	50-post-op2	69.32	445.85	448.50		448.61	0.003725	1.46	49.57	45.56	0.41
Reach-1	34.810*	Max WS	10-Post-Op2	43.91	445.85	448.10		448.19	0.004056	1.30	33.78	34.23	0.41
Reach-1	34.810*	Max WS	5-Post-OP2	33.79	445.85	447.89		447.97	0.004214	1.25	27.13	28.56	0.41
Reach-1	34.810*	Max WS	2-Post-Op2	20.72	445.85	447.54		447.60	0.004646	1.15	17.98	22.88	0.41
Reach-1	34.810*	Max WS	Reg-Pre-Op2	275.17	445.85	450.44		450.61	0.002083	1.93	179.96	80.53	0.35
Reach-1	34.810*	Max WS	100-Pre-Op2	82.07	445.85	448.67		448.78	0.003628	1.52	57.53	50.31	0.41
Reach-1	34.810*	Max WS	50-PRE-OP2	69.31	445.85	448.50		448.61	0.003725	1.46	49.57	45.56	0.41
Reach-1	34.810*	Max WS	25-Pre-OP2	58.49	445.85	448.58		448.65	0.002204	1.15	53.44	47.93	0.31
Reach-1	34.810*	Max WS	10-Pre-OP2	43.91	445.85	448.10		448.19	0.004056	1.30	33.78	34.23	0.41
Reach-1	34.810*	Max WS	5yr-Pre- Op2	33.79	445.85	447.89		447.97	0.004214	1.25	27.13	28.56	0.41
Reach-1	34.810*	Max WS	2yr-Pre- Op2	20.72	445.85	447.54		447.60	0.004646	1.15	17.98	22.88	0.41
Reach-1	34.800*	Max WS	REG_POST_OP2	275.17	445.78	450.43		450.59	0.001988	1.87	183.78	82.60	0.34
Reach-1	34.800*	Max WS	100-POST_OP2	82.07	445.78	448.63		448.74	0.003551	1.50	57.88	50.46	0.40

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	34.800*	Max WS	50-post-op2	69.32	445.78	448.47		448.57	0.003627	1.44	49.92	45.50	0.40
Reach-1	34.800*	Max WS	10-Post-Op2	43.91	445.78	448.07		448.15	0.003856	1.29	34.17	33.36	0.40
Reach-1	34.800*	Max WS	5-Post-OP2	33.79	445.78	447.85		447.93	0.004006	1.22	27.64	28.79	0.40
Reach-1	34.800*	Max WS	2-Post-Op2	20.72	445.78	447.49		447.56	0.004431	1.13	18.29	23.04	0.41
Reach-1	34.800*	Max WS	Reg-Pre-Op2	275.16	445.78	450.43		450.59	0.001988	1.87	183.78	82.60	0.34
Reach-1	34.800*	Max WS	100-Pre-Op2	82.08	445.78	448.63		448.74	0.003552	1.50	57.88	50.46	0.40
Reach-1	34.800*	Max WS	50-PRE-OP2	69.32	445.78	448.47		448.57	0.003627	1.44	49.92	45.50	0.40
Reach-1	34.800*	Max WS	25-Pre-OP2	58.49	445.78	448.56		448.63	0.002083	1.13	54.53	48.43	0.31
Reach-1	34.800*	Max WS	10-Pre-OP2	43.91	445.78	448.07		448.15	0.003856	1.29	34.17	33.36	0.40
Reach-1	34.800*	Max WS	5yr-Pre- Op2	33.79	445.78	447.85		447.93	0.004006	1.22	27.64	28.79	0.40
Reach-1	34.800*	Max WS	2yr-Pre- Op2	20.72	445.78	447.49		447.56	0.004431	1.13	18.29	23.04	0.41
Reach-1	34.790*	Max WS	REG_POST_OP2	275.17	445.71	450.42		450.57	0.001907	1.82	187.42	84.68	0.33
Reach-1	34.790*	Max WS	100-POST_OP2	82.07	445.71	448.60		448.71	0.003433	1.48	58.36	50.43	0.39
Reach-1	34.790*	Max WS	50-post-op2	69.31	445.71	448.43		448.54	0.003482	1.42	50.38	45.23	0.39
Reach-1	34.790*	Max WS	10-Post-Op2	43.91	445.71	448.03		448.11	0.003622	1.26	34.86	32.86	0.39
Reach-1	34.790*	Max WS	5-Post-OP2	33.79	445.71	447.82		447.89	0.003787	1.20	28.23	29.11	0.39
Reach-1	34.790*	Max WS	2-Post-Op2	20.72	445.71	447.45		447.52	0.004177	1.11	18.69	23.25	0.39
Reach-1	34.790*	Max WS	Reg-Pre-Op2	275.16	445.71	450.42		450.57	0.001907	1.82	187.42	84.68	0.33
Reach-1	34.790*	Max WS	100-Pre-Op2	82.07	445.71	448.60		448.71	0.003433	1.48	58.36	50.43	0.39
Reach-1	34.790*	Max WS	50-PRE-OP2	69.31	445.71	448.43		448.54	0.003482	1.42	50.38	45.23	0.39
Reach-1	34.790*	Max WS	25-Pre-OP2	58.49	445.71	448.55		448.61	0.001948	1.10	55.70	48.76	0.30
Reach-1	34.790*	Max WS	10-Pre-OP2	43.91	445.71	448.03		448.11	0.003622	1.26	34.86	32.86	0.39
Reach-1	34.790*	Max WS	5yr-Pre- Op2	33.79	445.71	447.82		447.89	0.003787	1.20	28.23	29.11	0.39
Reach-1	34.790*	Max WS	2yr-Pre- Op2	20.72	445.71	447.45		447.52	0.004177	1.11	18.69	23.25	0.39
Reach-1	34.780*	Max WS	REG_POST_OP2	275.17	445.64	450.41		450.55	0.001838	1.77	190.86	86.74	0.33
Reach-1	34.780*	Max WS	100-POST_OP2	82.07	445.64	448.57		448.68	0.003275	1.46	58.97	50.20	0.39
Reach-1	34.780*	Max WS	50-post-op2	69.31	445.64	448.40		448.50	0.003286	1.40	51.02	44.76	0.38
Reach-1	34.780*	Max WS	10-Post-Op2	43.91	445.64	448.00		448.08	0.003459	1.23	35.67	33.01	0.38
Reach-1	34.780*	Max WS	5-Post-OP2	33.79	445.64	447.79		447.86	0.003562	1.17	28.90	29.47	0.38
Reach-1	34.780*	Max WS	2-Post-Op2	20.72	445.64	447.42		447.48	0.003908	1.08	19.16	23.52	0.38
Reach-1	34.780*	Max WS	Reg-Pre-Op2	275.16	445.64	450.41		450.55	0.001837	1.77	190.86	86.74	0.33
Reach-1	34.780*	Max WS	100-Pre-Op2	82.07	445.64	448.57		448.68	0.003275	1.46	58.97	50.20	0.39
Reach-1	34.780*	Max WS	50-PRE-OP2	69.31	445.64	448.40		448.50	0.003286	1.40	51.02	44.76	0.38
Reach-1	34.780*	Max WS	25-Pre-OP2	58.48	445.64	448.53		448.59	0.001799	1.07	57.02	48.92	0.29
Reach-1	34.780*	Max WS	10-Pre-OP2	43.91	445.64	448.00		448.08	0.003459	1.23	35.67	33.01	0.38
Reach-1	34.780*	Max WS	5yr-Pre- Op2	33.79	445.64	447.79		447.86	0.003562	1.17	28.90	29.47	0.38
Reach-1	34.780*	Max WS	2yr-Pre- Op2	20.72	445.64	447.42		447.48	0.003908	1.08	19.16	23.52	0.38
Reach-1	34.770*	Max WS	REG_POST_OP2	275.17	445.57	450.40		450.53	0.001777	1.72	194.13	88.74	0.32
Reach-1	34.770*	Max WS	100-POST_OP2	82.07	445.57	448.54		448.65	0.003068	1.44	59.82	49.80	0.38
Reach-1	34.770*	Max WS	50-post-op2	69.31	445.57	448.38		448.47	0.002985	1.37	51.98	43.78	0.37
Reach-1	34.770*	Max WS	10-Post-Op2	43.90	445.57	447.98		448.05	0.003238	1.20	36.61	33.46	0.37
Reach-1	34.770*	Max WS	5-Post-OP2	33.79	445.57	447.76		447.82	0.003331	1.14	29.65	29.88	0.37
Reach-1	34.770*	Max WS	2-Post-Op2	20.72	445.57	447.39		447.44	0.003624	1.05	19.71	23.84	0.37
Reach-1	34.770*	Max WS	Reg-Pre-Op2	275.16	445.57	450.40		450.53	0.001777	1.72	194.13	88.74	0.32
Reach-1	34.770*	Max WS	100-Pre-Op2	82.07	445.57	448.54		448.65	0.003068	1.44	59.82	49.80	0.38
Reach-1	34.770*	Max WS	50-PRE-OP2	69.31	445.57	448.38		448.47	0.002985	1.37	51.98	43.78	0.37
Reach-1	34.770*	Max WS	25-Pre-OP2	58.49	445.57	448.52		448.57	0.001635	1.04	58.57	48.94	0.27
Reach-1	34.770*	Max WS	10-Pre-OP2	43.90	445.57	447.98		448.05	0.003238	1.20	36.61	33.46	0.37
Reach-1	34.770*	Max WS	5yr-Pre- Op2	33.79	445.57	447.76		447.82	0.003331	1.14	29.65	29.88	0.37
Reach-1	34.770*	Max WS	2yr-Pre- Op2	20.72	445.57	447.39		447.44	0.003624	1.05	19.71	23.84	0.37
Reach-1	34.760*	Max WS	REG_POST_OP2	275.17	445.50	450.39		450.52	0.001725	1.68	197.21	90.62	0.31
Reach-1	34.760*	Max WS	100-POST_OP2	82.07	445.50	448.52		448.62	0.002789	1.40	60.96	48.98	0.36
Reach-1	34.760*	Max WS	50-post-op2	69.31	445.50	448.35		448.44	0.002806	1.33	53.20	44.16	0.36
Reach-1	34.760*	Max WS	10-Post-Op2	43.91	445.50	447.95		448.02	0.003019	1.17	37.62	33.98	0.35
Reach-1	34.760*	Max WS	5-Post-OP2	33.79	445.50	447.73		447.79	0.003099	1.11	30.49	30.33	0.35
Reach-1	34.760*	Max WS	2-Post-Op2	20.72	445.50	447.36		447.41	0.003329	1.02	20.34	24.22	0.35
Reach-1	34.760*	Max WS	Reg-Pre-Op2	275.16	445.50	450.39		450.52	0.001725	1.68	197.21	90.62	0.31
Reach-1	34.760*	Max WS	100-Pre-Op2	82.07	445.50	448.52		448.62	0.002789	1.40	60.96	48.98	0.36
Reach-1	34.760*	Max WS	50-PRE-OP2	69.31	445.50	448.35		448.44	0.002806	1.33	53.20	44.16	0.36
Reach-1	34.760*	Max WS	25-Pre-OP2	58.49	445.50	448.51		448.56	0.001447	1.01	60.35	48.51	0.26
Reach-1	34.760*	Max WS	10-Pre-OP2	43.91	445.50	447.95		448.02	0.003019	1.17	37.62	33.98	0.35
Reach-1	34.760*	Max WS	5yr-Pre- Op2	33.79	445.50	447.73		447.79	0.003099	1.11	30.49	30.33	0.35
Reach-1	34.760*	Max WS	2yr-Pre- Op2	20.72	445.50	447.36		447.41	0.003329	1.02	20.34	24.22	0.35
Reach-1	34.750*	Max WS	REG_POST_OP2	275.16	445.43	450.37		450.50	0.001679	1.64	200.21	91.67	0.31
Reach-1	34.750*	Max WS	100-POST_OP2	82.07	445.43	448.50		448.59	0.002593	1.37	62.41	49.26	0.35
Reach-1	34.750*	Max WS	50-post-op2	69.31	445.43	448.33		448.41	0.002634	1.30	54.57	44.72	0.35
Reach-1	34.750*	Max WS	10-Post-Op2	43.90	445.43	447.92		447.99	0.002806	1.13	38.71	34.52	0.34
Reach-1	34.750*	Max WS	5-Post-OP2	33.79	445.43	447.70		447.76	0.002868	1.08	31.41	30.82	0.34
Reach-1	34.750*	Max WS	2-Post-Op2	20.72	445.43	447.33		447.38	0.003044	0.98	21.04	24.63	0.34
Reach-1	34.750*	Max WS	Reg-Pre-Op2	275.16	445.43	450.37		450.50	0.001679	1.64	200.21	91.67	0.31
Reach-1	34.750*	Max WS	100-Pre-Op2	82.07	445.43	448.50		448.59	0.002593	1.37	62.41	49.26	0.35
Reach-1	34.750*	Max WS	50-PRE-OP2	69.31	445.43	448.33		448.41	0.002634	1.30	54.57	44.72	0.35
Reach-1	34.750*	Max WS	25-Pre-OP2	58.49	445.43	448.49		448.54	0.001319	0.97	62.36	49.23	0.25
Reach-1	34.750*	Max WS	10-Pre-OP2	43.91	445.43	447.92		447.99	0.002806	1.13	38.71	34.52	0.34
Reach-1	34.750*	Max WS	5yr-Pre- Op2	33.79	445.43	447.70		447.76	0.002868	1.08	31.41	30.82	0.34
Reach-1	34.750*	Max WS	2yr-Pre- Op2	20.72	445.43	447.33		447.38	0.003044	0.98	21.04	24.63	0.34
Reach-1	34.740*	Max WS	REG_POST_OP2	275.16	445.36	450.36		450.48	0.001640	1.60	203.17	92.47	0.31
Reach-1	34.740*	Max WS	100-POST_OP2	82.07	445.36	448.48		448.56	0.002432	1.33	63.99	49.93	0.34
Reach-1	34.740*	Max WS	50-post-op2	69.31	445.36	448.31		448.39	0.002467	1.26	56.03	45.29	0.33
Reach-1	34.740*	Max WS	10-Post-Op2	43.91	445.36	447.90		447.96	0.002603	1.10	39.85	35.09	0.33
Reach-1	34.740*	Max WS	5-Post-OP2	33.79	445.36	447.68		447.73	0.002637	1.04	32.43	31.37	0.33

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: Max WS (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	34.740*	Max WS	2-Post-Op2	20.72	445.36	447.30		447.35	0.002765	0.95	21.81	25.08	0.33
Reach-1	34.740*	Max WS	Reg-Pre-Op2	275.16	445.36	450.36		450.48	0.001640	1.60	203.17	92.47	0.31
Reach-1	34.740*	Max WS	100-Pre-Op2	82.07	445.36	448.48		448.56	0.002432	1.33	63.99	49.93	0.34
Reach-1	34.740*	Max WS	50-PRE-OP2	69.31	445.36	448.31		448.39	0.002467	1.26	56.03	45.29	0.33
Reach-1	34.740*	Max WS	25-Pre-OP2	58.49	445.36	448.48		448.53	0.001211	0.94	64.47	50.20	0.24
Reach-1	34.740*	Max WS	10-Pre-OP2	43.91	445.36	447.90		447.96	0.002603	1.10	39.85	35.09	0.33
Reach-1	34.740*	Max WS	5yr-Pre- Op2	33.79	445.36	447.68		447.73	0.002637	1.04	32.43	31.37	0.33
Reach-1	34.740*	Max WS	2yr-Pre- Op2	20.72	445.36	447.30		447.35	0.002766	0.95	21.81	25.08	0.33
Reach-1	34.730*	Max WS	REG_POST_OP2	275.16	445.29	450.35		450.46	0.001606	1.57	206.13	93.21	0.30
Reach-1	34.730*	Max WS	100-POST_OP2	82.07	445.29	448.46		448.54	0.002278	1.29	65.65	50.63	0.33
Reach-1	34.730*	Max WS	50-post-op2	69.31	445.29	448.29		448.37	0.002307	1.22	57.57	45.89	0.32
Reach-1	34.730*	Max WS	10-Post-Op2	43.90	445.29	447.88		447.94	0.002404	1.07	41.09	35.70	0.32
Reach-1	34.730*	Max WS	5-Post-OP2	33.79	445.29	447.66		447.71	0.002415	1.01	33.55	31.95	0.31
Reach-1	34.730*	Max WS	2-Post-Op2	20.72	445.29	447.28		447.32	0.002494	0.91	22.68	25.58	0.31
Reach-1	34.730*	Max WS	Reg-Pre-Op2	275.16	445.29	450.35		450.46	0.001606	1.57	206.13	93.21	0.30
Reach-1	34.730*	Max WS	100-Pre-Op2	82.07	445.29	448.46		448.54	0.002278	1.29	65.65	50.63	0.33
Reach-1	34.730*	Max WS	50-PRE-OP2	69.31	445.29	448.29		448.37	0.002307	1.22	57.57	45.89	0.32
Reach-1	34.730*	Max WS	25-Pre-OP2	58.49	445.29	448.48		448.52	0.001111	0.91	66.67	51.20	0.23
Reach-1	34.730*	Max WS	10-Pre-OP2	43.90	445.29	447.88		447.94	0.002404	1.07	41.09	35.70	0.32
Reach-1	34.730*	Max WS	5yr-Pre- Op2	33.79	445.29	447.66		447.71	0.002415	1.01	33.55	31.95	0.31
Reach-1	34.730*	Max WS	2yr-Pre- Op2	20.72	445.29	447.28		447.32	0.002494	0.91	22.68	25.58	0.31
Reach-1	34.720*	Max WS	REG_POST_OP2	275.16	445.22	450.34		450.45	0.001578	1.54	209.06	93.86	0.30
Reach-1	34.720*	Max WS	100-POST_OP2	82.07	445.22	448.44		448.52	0.002129	1.26	67.42	51.36	0.32
Reach-1	34.720*	Max WS	50-post-op2	69.31	445.22	448.27		448.34	0.002153	1.19	59.20	46.52	0.31
Reach-1	34.720*	Max WS	10-Post-Op2	43.91	445.22	447.86		447.92	0.002210	1.03	42.45	36.36	0.31
Reach-1	34.720*	Max WS	5-Post-OP2	33.79	445.22	447.64		447.69	0.002205	0.97	34.74	32.56	0.30
Reach-1	34.720*	Max WS	2-Post-Op2	20.72	445.22	447.26		447.30	0.002236	0.88	23.64	26.15	0.29
Reach-1	34.720*	Max WS	Reg-Pre-Op2	275.16	445.22	450.34		450.45	0.001578	1.54	209.06	93.86	0.30
Reach-1	34.720*	Max WS	100-Pre-Op2	82.07	445.22	448.44		448.52	0.002129	1.26	67.42	51.36	0.32
Reach-1	34.720*	Max WS	50-PRE-OP2	69.31	445.22	448.27		448.34	0.002152	1.19	59.20	46.52	0.31
Reach-1	34.720*	Max WS	25-Pre-OP2	58.48	445.22	448.47		448.51	0.001020	0.88	68.94	52.21	0.22
Reach-1	34.720*	Max WS	10-Pre-OP2	43.91	445.22	447.86		447.92	0.002210	1.03	42.45	36.36	0.31
Reach-1	34.720*	Max WS	5yr-Pre- Op2	33.79	445.22	447.64		447.69	0.002205	0.97	34.74	32.56	0.30
Reach-1	34.720*	Max WS	2yr-Pre- Op2	20.72	445.22	447.26		447.30	0.002236	0.88	23.64	26.15	0.29
Reach-1	34.717	Max WS	REG_POST_OP2	275.16	445.20	450.28	448.50	450.44	0.002107	1.75	157.10	93.05	0.34
Reach-1	34.717	Max WS	100-POST_OP2	82.07	445.20	448.43	447.36	448.51	0.002115	1.25	65.54	51.54	0.32
Reach-1	34.717	Max WS	50-post-op2	69.31	445.20	448.27	447.23	448.34	0.002118	1.18	58.79	46.70	0.31
Reach-1	34.717	Max WS	10-Post-Op2	43.91	445.20	447.86	446.91	447.91	0.002156	1.02	42.86	36.55	0.30
Reach-1	34.717	Max WS	5-Post-OP2	33.79	445.20	447.63	446.76	447.68	0.002145	0.96	35.11	32.75	0.30
Reach-1	34.717	Max WS	2-Post-Op2	20.72	445.20	447.25	446.49	447.29	0.002161	0.87	23.95	26.33	0.29
Reach-1	34.717	Max WS	Reg-Pre-Op2	275.16	445.20	450.28	448.50	450.44	0.002107	1.75	157.10	93.05	0.34
Reach-1	34.717	Max WS	100-Pre-Op2	82.07	445.20	448.43	447.36	448.51	0.002115	1.25	65.54	51.54	0.32
Reach-1	34.717	Max WS	50-PRE-OP2	69.31	445.20	448.27	447.23	448.34	0.002118	1.18	58.79	46.70	0.31
Reach-1	34.717	Max WS	25-Pre-OP2	58.49	445.20	448.47	447.11	448.50	0.001008	0.87	66.88	52.50	0.22
Reach-1	34.717	Max WS	10-Pre-OP2	43.91	445.20	447.86	446.91	447.91	0.002156	1.02	42.86	36.55	0.30
Reach-1	34.717	Max WS	5yr-Pre- Op2	33.79	445.20	447.63	446.76	447.68	0.002145	0.96	35.11	32.75	0.30
Reach-1	34.717	Max WS	2yr-Pre- Op2	20.72	445.20	447.25	446.49	447.29	0.002161	0.87	23.95	26.33	0.29

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix G
GEOSYSTEMS

PRESTO GEOSYSTEMS
670 North Perkins Street
Appleton, WI 54914 USA
Email: sam.justice@prestogeo.com

December 5, 2024

Sara Rastgou
RJ BURNSIDE

RE: PR24706 ELIZA (EAST OUTLET)
Channel Protection System

Dear Sara:

Presto Geosystems has completed the evaluation for the Eliza (East Outlet) Channel Protection System project, located in Arthur, ON. Our recommendations are provided and detailed in the attached cross section and calculation. The evaluation is copyrighted and based on the unique engineering properties of GEOWEB® system. Any use of this evaluation for any product other than that manufactured by Reynolds Presto Products, Inc makes this evaluation invalid.

The objective of this evaluation is to propose a GEOWEB geocell system for stabilization of the channel. It is assumed herein that the channel is stable against failure except for the problem of surface erosion.

As the originator and leader in geocell technology, Presto Geosystems offers the following advantages:

- Manufacturer Certificate of Analysis. Presto Geosystems manufactures GEOWEB, ATRA® keys and ATRA Stake clips in accordance with stringent ISO and CE quality standards. Our quality management system allows Presto Geosystems to provide Certificates of Compliance (COC) and Certificates of Analysis (COA) that allow traceability on all materials produced and supplied for this project. We do not provide geocell materials through private label manufacturers, which is often the case with our competitors. The ability for the Owner to receive COC and COA for geocell is critical to the integrity of the project.

- Manufacturer Calculations. The attached calculations are based specifically on GEOWEB material characteristics, research/testing and accessories. Our calculations are based on the site-specific characteristics and information contained in the request for project evaluation. The recommendations are based on GEOWEB panels, ATRA key connection device and ATRA stake

clips. The anchorage recommendations are specific to our product and do not apply to any other geocell manufacturers.

- ATRA Key connection device. ATRA keys provide a permanent and stronger panel connection compared to metal staples or zip ties. ATRA keys are made of high-density polyethylene and are the strongest method available for panel connection. ATRA keys will not corrode or degrade and provide a permanent connection. ATRA keys were used to determine the anchorage recommendations. If a different connection device is proposed, the Presto Geosystems recommendation does not apply. ATRA keys allow multiple panels to be installed concurrently decreasing installation time and preventing panel separation during installation and compaction. Panel separation may occur with metal staples or zip ties during installation, which can lead to long-term maintenance issues.

- Installation Assistance. Representatives of Presto Geosystems, or the local distributor, are available to be on-site at the beginning of construction to ensure that the GEOWEB panels and accessories are installed as intended. We are committed to train the Contractor based on our in-depth product knowledge and installation experience. Our past project successes will minimize installation time and issues. As with any material, there are advantageous techniques of installation, which we can offer during our visit.

Assumptions and Materials

It is our understanding that the relevant dimensions of the channel, for the purpose of this analysis, are as follows:

Parameters:

Flow, m^3/s	2.5
Velocity, m/s	5.6
Base Width, m	3
Side Slopes	3H:1V
Channel Depth, m	0.30
Bed Slope, %	35%
Friction Angle ϕ, degree:	28
Infill Type:	Soil
Infill Weight γ, kN/m^3	20

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Based on the evaluation, the following materials are recommended for the GEOWEB application at the site:

1. Prepare the channel to required grade and remove existing vegetation.
2. If required, provide a non-woven geotextile separation layer over the prepared sub grade. Install in accordance with Manufacturer recommendations including overlaps.
3. Provide GEOWEB GW30V6 (150 mm) panels.
4. Pre-shape the GEOWEB system before infill placement.
5. Connect the GEOWEB sections with ATRA Keys at each interleaf and end to end connection.
6. Provide 500 mm ATRA® Anchors in cells 1, 4 and 7 in the horizontal and every 3rd row down the slope (3 x 3 cell pattern).
7. GEOWEB infill shall be nutrient-rich, pulverized topsoil. Limit the drop of the infill into the GEOWEB panels to prevent distortion.
8. Provide surface protection (hydroseed, erosion control blanket or turf reinforcement mat) over the GEOWEB sized for hydraulic conditions to prevent soil washout prior to establishment of vegetation.
9. Refer to the GEOWEB Channel Protection Installation Guide for installation procedures.

For additional Channel Protection Resources, click here:
Channel Protection Engineering Resource Package
GEOWEB Channel Protection Installation Guide

If you have any questions or need any additional information, please call.

Sincerely,

Sam Justice

Sam Justice, P.E.
Civil Engineer
Presto Geosystems

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Product Specification - GEOWEB® GW30V6 Geocell

GENERAL

The GEOWEB A1geocell product is manufactured from textured, perforated strips of high density polyethylene that are bonded together to create a network of interconnected cells. The cells can be filled with topsoil, aggregate, concrete, recycled materials, or other infill material for geotechnical applications such as: 1) load support for unpaved and paved roads, railways, ports, heavy-duty pavements, container yard, and pads; 2) gravity and reinforced walls, reinforced slopes and fascia walls; and, 3) slope, channel, and geomembrane protection.

DIMENSIONS

Parameter	Units	Value
Cell Depth	Inches (mm)	6 (150)
Cell Size (Length x Width +/- 10%)	Inches (mm)	11.3 x 12.6 (287 x 320)
Expanded Section Width	Cells	8
	Feet (m)	Varies: 7.7 to 9.2 (2.3 to 2.8)
Expanded Section Length	Cells	18, 21, 25, 29, or 34
	Feet (m)	Varies: 15.4 to 35.1 (4.7 to 10.7)

STRUCTURAL INTEGRITY AND SYSTEM PERFORMANCE

Parameter	Units	Value
Minimum Short-Term Seam Peel Strength	lb (N)	480 (2,130)
Long-Term Seam Peel Strength (standard 4-inch sample width)[1]	lb (N)	160 (710)
Internal Junction Efficiency[2]	%	≥ 100
Mechanical Junction Efficiency (ATRA Key Connection)[2]	%	≥ 100
Peak Friction Angle Ratio (δ/Ø)[3]	Unitless	0.95

MATERIAL PROPERTIES

Parameter	Test Method	Units	Value
Polymer Density	ASTM D1505 or D792	lbs/ft^3 (g/cm^3)	58.4 - 60.2 (0.935 - 0.965)
Flexural Storage Modulus	ISO 6721	Mpa	≥ 800
Carbon Black Content[4]	ASTM D1603	%	1.5 - 2.0
Sheet Thickness Prior to Texture	ASTM D5199	mil (mm)	50 (1.27), -5% +10%
Sheet Thickness After Texture	ASTM D5199	mil (mm)	60 (1.52), -5% +10%
Texture Surface Density	--	per/in2 (per/m^2)	140 - 200 (22 - 31)

DURABILITY

Parameter	Test Method	Units	Value
Environmental Stress Crack Resistance	ASTM D1693	hrs	> 5,000
Environmental Stress Crack Resistance (Accelerated Test)	ASTM D5397	hrs	≥ 400
Resistance to Oxidation[5]	EN ISO 13438	yrs	≥ 100
Resistance to Weathering[6]	EN 12224	%	100

Notes:

1) A 4 in. (100-mm) wide seam sample shall support a 160 lb (72.5 kg) load for a period of 7 days minimum in a temperature-controlled environment undergoing a temperature change on a 10 hour cycle from ambient room to 130° F (54°). Ambient room temperature is per ASTM E 41.

2) Junction efficiency determined as a percentage of junction performance (EN ISO 13426-1) to perforated strip performance (EN ISO 10319).

3) Typical design value for granular infill material. Consult with manufacturer to confirm value for other types of infill materials.

4) Standard black HDPE strips. For tan/green GEOWEB, hindered amine light stabilizer (HALS) content will be 2.0% by weight of carrier.

5) Predicted to be durable for a minimum of 100 years in natural soil with a pH between 4 and 9 and at a soil temperature ≤ 25°C.

6) 100% of original tensile strength retained following exposure to 370 hours of ultraviolet light and accelerated weathering in accordance with EN 12224.

CE 2895 | 23 UKCA 0338 | 23
ISO 9001:2015 Certified

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ATRA® KEY
GEOWEB CONNECTION DEVICE
SPECIFICATION

Description:

The ATRA Key is a device to connect adjacent GEOWEB® Geocell sections end-to-end or side-to-side through the GEOWEB material slots (I-slots). The ATRA Key includes a structurally reinforced handle and frictional barbs for improved interlock with the GEOWEB surface texture. Together, these features provide added protection against the three primary modes of mechanical junction failure: shearing, splitting, and peeling. The ATRA Key shall be inserted through two adjoining GEOWEB sections with the I-slots aligned and turned 90 degrees to lock the key in position. If removal is required, the ATRA Key may be unlocked and removed by turning the key 90 degrees from the locked position and removing the device from the I-slots.

Material: Polymeric Composite Material

Construction: Injection Molded

Color: Black

Dimensions:

Length: 1.305 in. (33.15 mm)

Width: 2.05 in. (52.07 mm)

Thickness: 0.38 in. (9.65 mm)

Pull-Through Strength: 275 lbs. (1.3 kN)

Mechanical Junction Efficiency: 100%

Chemical Resistance: Comprised of nonreactive, chemically-inert material.

Other Properties: Mildew Resistant, Non-Corrosive

Conductivity: Non-Conductive



Figure 1 ATRA Key Unit

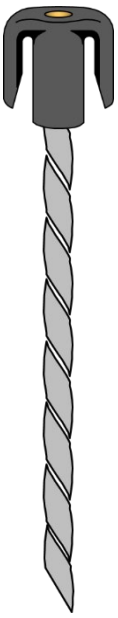
PRESTO GEOSYSTEMS 670 N PERKINS STREET, APPLETON, WISCONSIN, USA 54914
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ATRA® ANCHORS
GEOWEB® GEOCELL ANCHOR DEVICES
SPECIFICATION

ATRA ANCHORS
ATRA Stake Clip with #4 rebar and 10-12 mm dia. rods

Description:



The ATRA Stake Clip is a molded, high-strength polymeric device for use with #4 rebar and 10-12 mm diameter rods (metric), for forming ATRA Anchors. ATRA anchors are utilized for crest, toe, and internal anchoring of GEOWEB sections.

Both metal (common rebar) and non-metallic stakes may be used as determined by site soil conditions.

The flat head of the ATRA Stake Clip provides a level surface for driving anchors over the center of gravity.

The ATRA Stake Clip arm is slightly flanged, fitting securely over the GEOWEB cell wall and providing direct anchorage and resistance to sliding and uplift forces.

Material: Polymeric Composite Material
Construction: Injection Molded
Color: Black
UV Stability: 1-2% Carbon Black
Chemical Resistance: Unaffected by Most Acids. Good Resistance to Alkalis
Other Properties: Mildew Resistant, Non-Corrosive
Conductivity: Non-Conductive

ATRA SPEED STAKES

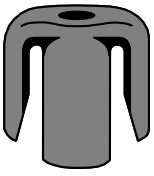
Description:



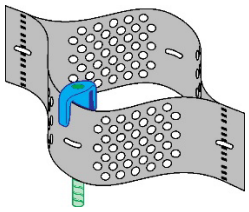
The ATRA Speed Stake provides additional anchorage and resistance to sliding and/or uplift forces to GEOWEB sections with or without tendons for crest, toe, and internal anchoring. ATRA Speed Stakes are a one-piece, non-metallic molded anchor used instead of traditional rebar or steel rods when long-term durability is desired in wet or corrosive environments.

ATRA Speed Stakes make a more secure connection with GEOWEB cell walls and allow for driving of anchors with powered ATRA Drivers with ATRA Gad attachment.

Material: Specialty HDPE based polymer alloy
Construction: One-piece injection molded design with integral flanged arms and barbs
Color: Black
Dimensions:
Length: 16 in (40.64 cm) and 20 in (50.8 cm)
Width: 1.92 in (48.77 mm)
Diameter: Tapered diameter from 0.875 in (22.23 mm) to 0.5 in (12.70 mm)
Min Tensile Strength (per ASTM D638): 14.5 kips (100 MPa)
Min Bending Strength: 575 lbf (2,550 N)
Chemical Resistance: Unaffected by Most Acids. Good Resistance to Alkalis.
Other Properties: Weather Resistant, Mildew Resistant, and Non-Corrosive
Conductivity: Non-Conductive



ATRA Stake Clip

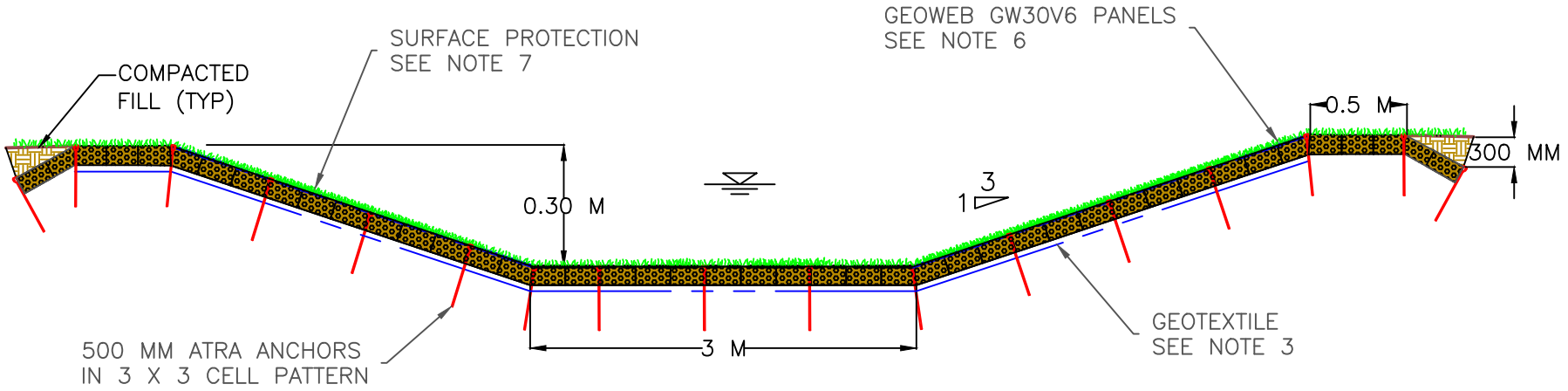


ATRA Anchor Over the GEOWEB Cell Wall

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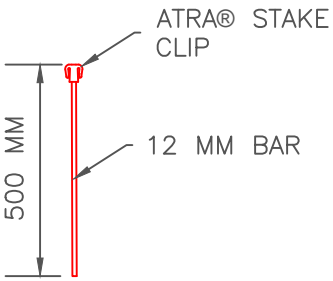
Notes:

1. This evaluation is copyrighted and is based on the use of GEOWEB® manufactured by Reynolds Presto Products, Inc. All rights reserved. Any use of this evaluation for any geocell product other than that manufactured by Reynolds Presto Products, Inc is strictly prohibited and makes this evaluation invalid.
2. The evaluation assumes that the channel side slopes and channel bed are globally stable.
3. If required. provide a non–woven geotextile separation layer and install per Manufacturer recommendations including overlaps.
4. The GEOWEB panels shall be connected with ATRA® keys at each interleaf and end to end connection.
5. Provide ATRA Anchors in the recommended anchorage pattern for stability.
6. GEOWEB infill shall be nutrient–rich, pulverized topsoil. Limit the drop of infill to prevent panel distortion.
7. Provide surface protection (hydroseed, ECB or TRM) sized for channel hydraulic and shear stress conditions to prevent cell wash–out prior to the establishment of vegetation.
8. Refer to the GEOWEB Channel Protection Installation Guide for installation procedures.

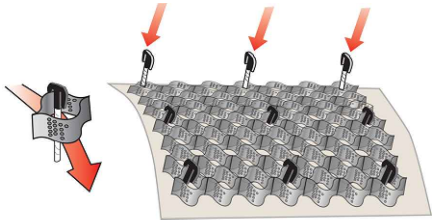




ATRA KEY



ATRA ANCHOR



ANCHOR INSTALLATION

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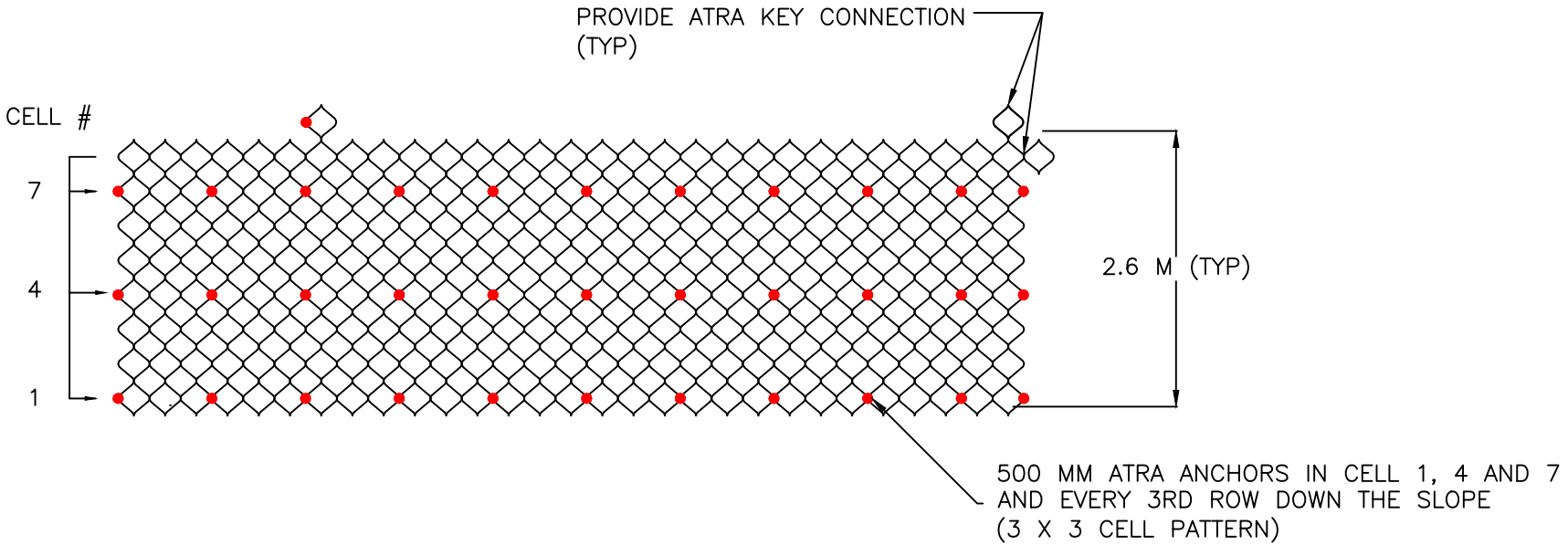
PR24706 ELIZA (EAST OUTLET)
GEOWEB CHANNEL PROTECTION

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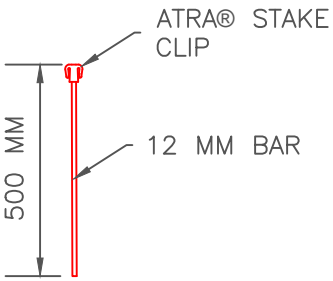
Notes:

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2. The evaluation assumes that the channel side slopes and channel bed are globally stable.
3. If required. provide a non–woven geotextile separation layer and install per Manufacturer recommendations including overlaps.
4. The GEOWEB panels shall be connected with ATRA® keys at each interleaf and end to end connection.
5. Provide ATRA Anchors in the recommended anchorage pattern for stability.
6. GEOWEB infill shall be nutrient–rich, pulverized topsoil. Limit the drop of infill to prevent panel distortion.
7. Provide surface protection (hydroseed, ECB or TRM) sized for channel hydraulic and shear stress conditions to prevent cell wash–out prior to the establishment of vegetation.
8. Refer to the GEOWEB Channel Protection Installation Guide for installation procedures.

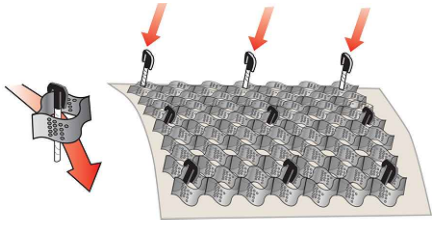




ATRA KEY



ATRA ANCHOR



ANCHOR INSTALLATION

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APPLETON, WI 54914
920–738–1342
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PR24706 ELIZA (EAST OUTLET) GEOWEB CHANNEL PROTECTION

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DATE	DECEMBER 5, 2024	FILE NAME	SHEET 2
SCALE	NTS	SHEET	2 OF 2

PRESTO GEOSYSTEMS
STRENGTH. FROM THE GROUND UP. Since 1979

CHANNEL PROTECTION
GEOWEB

Project Name: ELIZA (EAST OUTLET)
Presto Project Number: PR 24706
Date: 12/5/2024

INPUT PARAMETERS

English or Metric (E or M)	M		Coefficient, Cm	Gravity
			1.00	9.806
Channel Lining System			Typical Kb Values	
Invert:	Vegetation		Straight Reach: 1.0	
Sides:	Vegetation		Mild Meandors: 1.1 to 1.4	
Kb (Bend Coefficient)	1.20		Looping Meandors: 1.5 to 1.8	
Max Discharge (m3/s)	2.50		Sharp Turns: 1.9 to 2.1	
Bed Slope, %	35.00		Typical N Values for Lined Channel	
Depth (m)	0.30		Concrete Rough = 0.018 to 0.027	
Manning's Coefficient Invert	0.025		Aggregate Firm = 0.023 to 0.035	
Manning's Coefficient Side Slopes	0.025		Vegetated w/Grass & Weeds = 0.025	

Trial Channel Dimensions					
Base Width (m)	3.00	Flow Area	0.44		
Water Depth (m)	0.13	Wetted Perimeter	3.83		
Side Slope (**x**H:1V)	3.00	Hydraulic Radius	0.116		
Top Width 'T' of Flow line	3.79	R^2/3	0.238		
Velocity (m/s)	5.63				
Flow (m3/s)	2.50	Compare to Specified Flow Rate			
Froude No., F	5.13				
Channel Bottom - Stream Direction Stresses					
Geoweb Thickness (mm)	150	0.15 m			
Unit Weight of Infill (kN/m3)	20				
Interface Friction (Geoweb/Infill)	28	0.489			
Depth of Flow (m)	0.13				
Bedslope (%)	35.00	0.337 radians			
Unit Weight of Water (kN/m3)	9.81				
Coefficient of Friction (Infill/Soil)	0.53				
Tractive Shear Stress (kN/m2)	0.54				

PRESTO GEOSYSTEMS
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PRESTO

SLOPE PROTECTION SYSTEM
GEOWEB

Project Name: ELIZA (EAST OUTLET)
Presto Project Number: PR 24706
Date: 12/5/2024

INPUT PARAMETERS

English or Metric (E or M)	M		
Slope Angle	19.5		Slope (H:V)
Slope Length (m)	0.90		2.82
Vertical Height (m)	0.3		
Friction Angle (degrees)	28	Lowest Interface Angle	
Geoweb Cell Type	GW30V		
Web Thickness (mm)	150		
Infill type	Topsoil	Infill Weight (kN/m)	
Infill Unit Weight (kN/m3)	20	2.7	
Additional Cover (mm)	0	Cover Weight (kN/m)	
Cover Unit Weight (kN/m3)	0	0.0	
Overall Factor of Safety	1.4	Total Weight (kN/m)	
Tractive Force (kN/m)	0.03	2.7	
Passive Resistance at toe (Y or N)	No	Tractive force = 0.23 kN/m2 @ 0.13 m water depth	
Angle of internal friction of soil at toe	0		
Unit weight of soil at toe (kN/cu.m)	0		

Calculations

Factored Geoweb Seam Strength (kN/m)	5.13	Allowable Tensile
Driving Force (kN/m)	0.93	Weight+Toe Load
Factored Driving Force (kN/m)	1.26	Weight Only
Factored Driving Force (kN/m)	1.29	Weight+Toe Load
Resisting Force (kN/m)	1.35	Shear Only
Resisting Earth Force (kN/m)	0.00	
Available Resistance (kN/m)	5.13	Geoweb

ATRA® KEY

Connection Strength	275 lbs/ft	Note: Anchorage pattern is based on the use of ATRA keys for panel to panel connection. If staples or zip ties are used, the anchorge pattern will increase.
	4.05 kN/m	



ATRA Key
Clickable Spec

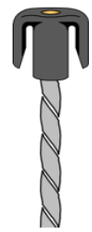
ATRA® ANCHOR DETAILS

Max. unrestrained GW length (m)	No Limit	Unrestrained

Input Parameters

Length (mm)	500	ATRA Anchor	Spacing
Diameter or Width (mm)	12	Downslope Cell Spacing	(mm)
Downslope spacing (# of cells)	3	No Limit	867.0
Horizontal spacing (# of cells)	3		960.0
Soil Friction Angle (degrees)	28		
Soil Cohesion (kN/sq.m)	5		
Slope Soil Type	Native		
Unit Weight (kN/m3)	20		
Kp (Coefficient)	2.77		
Buried Anchor Length (m)	0.35		
Anchor Resistance (kN)	0.11	Single Anchor	
Number of Rows of Anchors	2		
Anchor Resistance (kN/m)	0.2	Resultant	
Anchor Resistance (kN/m2)	0.26	Net Resultant	
Resisting Force (kN/m)	2	Shear plus Anchors	
ATRA Anchors density (anchors/sq.m)	2.57		
Factor of Safety	1.70	Shear and Atra Anchored Geoweb	

Note: Anchorage pattern is based on the use of ATRA keys for panel to panel connection. If staples or zip ties are used, the anchorge pattern will increase.



ATRA Anchors
Clickable Spec

PRESTO

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SLOPE PROTECTION SYSTEM
GEOWEB

CREST/SLOPE ANCHORAGE

Required Anchorage (kN/m)	-0.28	
Input Parameters		
Horizontal Embedment Length (m)	0.5	From Slope Face to Key Trench
Depth Below Crest (mm)	150	Crest to Bottom of Geoweb
Slope Angle of Key Trench (degrees)	45	
Depth of Key Trench (mm)	300	
Horiz. Length at Bottom of Trench (mm)	0	
Soil Unit Weight (kN/m2)	20	
Soil Friction (degrees)	28	
Available Resisting Force (kN/m)	1.93	OK
Factor of Safety	3.77	Crest Anchorage and Atra Anchors

Limitation of Use:

The Evaluation is copyrighted and based on the use of GEOWEB® and specifically designed accessories. The recommendations in this Evaluation are based on the specific characteristics, structural values and specifications of the complete GEOWEB system and all associated connection, load transfer and anchoring accessories as noted in the evaluation. All rights are reserved. Any use of the Evaluation for any geocell product and/or alternative accessories other than that provided by Reynolds Presto Products, Inc is strictly prohibited and makes this evaluation invalid. Reynolds Presto Products, Inc assumes no liability resulting from the unauthorized use of this evaluation.

PRESTO GEOSYSTEMS
670 North Perkins Street
Appleton, WI 54914 USA
Email: sam.justice@prestogeo.com

December 5, 2024

Sara Rastgou
RJ BURNSIDE

RE: PR24706 ELIZA (WEST OUTLET)
Channel Protection System

Dear Sara:

Presto Geosystems has completed the evaluation for the Eliza (West Outlet) Channel Protection System project, located in Arthur, ON. Our recommendations are provided and detailed in the attached cross section and calculation. The evaluation is copyrighted and based on the unique engineering properties of GEOWEB® system. Any use of this evaluation for any product other than that manufactured by Reynolds Presto Products, Inc makes this evaluation invalid.

The objective of this evaluation is to propose a GEOWEB geocell system for stabilization of the channel. It is assumed herein that the channel is stable against failure except for the problem of surface erosion.

As the originator and leader in geocell technology, Presto Geosystems offers the following advantages:

- Manufacturer Certificate of Analysis. Presto Geosystems manufactures GEOWEB, ATRA® keys and ATRA Stake clips in accordance with stringent ISO and CE quality standards. Our quality management system allows Presto Geosystems to provide Certificates of Compliance (COC) and Certificates of Analysis (COA) that allow traceability on all materials produced and supplied for this project. We do not provide geocell materials through private label manufacturers, which is often the case with our competitors. The ability for the Owner to receive COC and COA for geocell is critical to the integrity of the project.

- Manufacturer Calculations. The attached calculations are based specifically on GEOWEB material characteristics, research/testing and accessories. Our calculations are based on the site-specific characteristics and information contained in the request for project evaluation. The recommendations are based on GEOWEB panels, ATRA key connection device and ATRA stake

clips. The anchorage recommendations are specific to our product and do not apply to any other geocell manufacturers.

- ATRA Key connection device. ATRA keys provide a permanent and stronger panel connection compared to metal staples or zip ties. ATRA keys are made of high-density polyethylene and are the strongest method available for panel connection. ATRA keys will not corrode or degrade and provide a permanent connection. ATRA keys were used to determine the anchorage recommendations. If a different connection device is proposed, the Presto Geosystems recommendation does not apply. ATRA keys allow multiple panels to be installed concurrently decreasing installation time and preventing panel separation during installation and compaction. Panel separation may occur with metal staples or zip ties during installation, which can lead to long-term maintenance issues.

- Installation Assistance. Representatives of Presto Geosystems, or the local distributor, are available to be on-site at the beginning of construction to ensure that the GEOWEB panels and accessories are installed as intended. We are committed to train the Contractor based on our in-depth product knowledge and installation experience. Our past project successes will minimize installation time and issues. As with any material, there are advantageous techniques of installation, which we can offer during our visit.

Assumptions and Materials

It is our understanding that the relevant dimensions of the channel, for the purpose of this analysis, are as follows:

Parameters:

Flow, m^3/s	2.5
Velocity, m/s	3.7
Base Width, m	3
Side Slopes	3H:1V
Channel Depth, m	0.30
Bed Slope, %	15%
Friction Angle ϕ, degree:	28
Infill Type:	Soil
Infill Weight γ, kN/m^3	20

Based on the evaluation, the following materials are recommended for the GEOWEB application at the site:

1. Prepare the channel to required grade and remove existing vegetation.
2. If required, provide a non-woven geotextile separation layer over the prepared sub grade. Install in accordance with Manufacturer recommendations including overlaps.
3. Provide GEOWEB GW30V6 (150 mm) panels.
4. Pre-shape the GEOWEB system before infill placement.
5. Connect the GEOWEB sections with ATRA Keys at each interleaf and end to end connection.
6. Provide 500 mm ATRA® Anchors in cells 1, 4 and 7 in the horizontal and every 3rd row down the slope (3 x 3 cell pattern).
7. GEOWEB infill shall be nutrient-rich, pulverized topsoil. Limit the drop of the infill into the GEOWEB panels to prevent distortion.
8. Provide surface protection (hydroseed, erosion control blanket or turf reinforcement mat) over the GEOWEB sized for hydraulic conditions to prevent soil washout prior to establishment of vegetation.
9. Refer to the GEOWEB Channel Protection Installation Guide for installation procedures.

For additional Channel Protection Resources, click here:
Channel Protection Engineering Resource Package
GEOWEB Channel Protection Installation Guide

If you have any questions or need any additional information, please call.

Sincerely,

Sam Justice

Sam Justice, P.E.
Civil Engineer
Presto Geosystems

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Product Specification - GEOWEB® GW30V6 Geocell

GENERAL

The GEOWEB A1geocell product is manufactured from textured, perforated strips of high density polyethylene that are bonded together to create a network of interconnected cells. The cells can be filled with topsoil, aggregate, concrete, recycled materials, or other infill material for geotechnical applications such as: 1) load support for unpaved and paved roads, railways, ports, heavy-duty pavements, container yard, and pads; 2) gravity and reinforced walls, reinforced slopes and fascia walls; and, 3) slope, channel, and geomembrane protection.

DIMENSIONS

Parameter	Units	Value
Cell Depth	Inches (mm)	6 (150)
Cell Size (Length x Width +/- 10%)	Inches (mm)	11.3 x 12.6 (287 x 320)
Expanded Section Width	Cells	8
	Feet (m)	Varies: 7.7 to 9.2 (2.3 to 2.8)
Expanded Section Length	Cells	18, 21, 25, 29, or 34
	Feet (m)	Varies: 15.4 to 35.1 (4.7 to 10.7)

STRUCTURAL INTEGRITY AND SYSTEM PERFORMANCE

Parameter	Units	Value
Minimum Short-Term Seam Peel Strength	lb (N)	480 (2,130)
Long-Term Seam Peel Strength (standard 4-inch sample width)[1]	lb (N)	160 (710)
Internal Junction Efficiency[2]	%	≥ 100
Mechanical Junction Efficiency (ATRA Key Connection)[2]	%	≥ 100
Peak Friction Angle Ratio (δ/Ø)[3]	Unitless	0.95

MATERIAL PROPERTIES

Parameter	Test Method	Units	Value
Polymer Density	ASTM D1505 or D792	lbs/ft^3 (g/cm^3)	58.4 - 60.2 (0.935 - 0.965)
Flexural Storage Modulus	ISO 6721	Mpa	≥ 800
Carbon Black Content[4]	ASTM D1603	%	1.5 - 2.0
Sheet Thickness Prior to Texture	ASTM D5199	mil (mm)	50 (1.27), -5% +10%
Sheet Thickness After Texture	ASTM D5199	mil (mm)	60 (1.52), -5% +10%
Texture Surface Density	--	per/in2 (per/m^2)	140 - 200 (22 - 31)

DURABILITY

Parameter	Test Method	Units	Value
Environmental Stress Crack Resistance	ASTM D1693	hrs	> 5,000
Environmental Stress Crack Resistance (Accelerated Test)	ASTM D5397	hrs	≥ 400
Resistance to Oxidation[5]	EN ISO 13438	yrs	≥ 100
Resistance to Weathering[6]	EN 12224	%	100

Notes:

1) A 4 in. (100-mm) wide seam sample shall support a 160 lb (72.5 kg) load for a period of 7 days minimum in a temperature-controlled environment undergoing a temperature change on a 10 hour cycle from ambient room to 130° F (54°). Ambient room temperature is per ASTM E 41.

2) Junction efficiency determined as a percentage of junction performance (EN ISO 13426-1) to perforated strip performance (EN ISO 10319).

3) Typical design value for granular infill material. Consult with manufacturer to confirm value for other types of infill materials.

4) Standard black HDPE strips. For tan/green GEOWEB, hindered amine light stabilizer (HALS) content will be 2.0% by weight of carrier.

5) Predicted to be durable for a minimum of 100 years in natural soil with a pH between 4 and 9 and at a soil temperature ≤ 25°C.

6) 100% of original tensile strength retained following exposure to 370 hours of ultraviolet light and accelerated weathering in accordance with EN 12224.

CE 2895 | 23 UKCA 0338 | 23
ISO 9001:2015 Certified

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ATRA® KEY
GEOWEB CONNECTION DEVICE
SPECIFICATION

Description:

The ATRA Key is a device to connect adjacent GEOWEB® Geocell sections end-to-end or side-to-side through the GEOWEB material slots (I-slots). The ATRA Key includes a structurally reinforced handle and frictional barbs for improved interlock with the GEOWEB surface texture. Together, these features provide added protection against the three primary modes of mechanical junction failure: shearing, splitting, and peeling. The ATRA Key shall be inserted through two adjoining GEOWEB sections with the I-slots aligned and turned 90 degrees to lock the key in position. If removal is required, the ATRA Key may be unlocked and removed by turning the key 90 degrees from the locked position and removing the device from the I-slots.

Material: Polymeric Composite Material

Construction: Injection Molded

Color: Black

Dimensions:

Length: 1.305 in. (33.15 mm)

Width: 2.05 in. (52.07 mm)

Thickness: 0.38 in. (9.65 mm)

Pull-Through Strength: 275 lbs. (1.3 kN)

Mechanical Junction Efficiency: 100%

Chemical Resistance: Comprised of nonreactive, chemically-inert material.

Other Properties: Mildew Resistant, Non-Corrosive

Conductivity: Non-Conductive



Figure 1 ATRA Key Unit

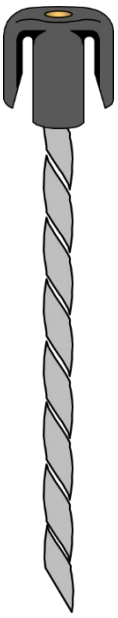
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Ph: 920-738-1328 or 800-548-3424
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ATRA® ANCHORS
GEOWEB® GEOCELL ANCHOR DEVICES
SPECIFICATION

ATRA ANCHORS
ATRA Stake Clip with #4 rebar and 10-12 mm dia. rods

Description:



The ATRA Stake Clip is a molded, high-strength polymeric device for use with #4 rebar and 10-12 mm diameter rods (metric), for forming ATRA Anchors. ATRA anchors are utilized for crest, toe, and internal anchoring of GEOWEB sections.

Both metal (common rebar) and non-metallic stakes may be used as determined by site soil conditions.

The flat head of the ATRA Stake Clip provides a level surface for driving anchors over the center of gravity.

The ATRA Stake Clip arm is slightly flanged, fitting securely over the GEOWEB cell wall and providing direct anchorage and resistance to sliding and uplift forces.

Material: Polymeric Composite Material
Construction: Injection Molded
Color: Black
UV Stability: 1-2% Carbon Black
Chemical Resistance: Unaffected by Most Acids. Good Resistance to Alkalis
Other Properties: Mildew Resistant, Non-Corrosive
Conductivity: Non-Conductive

ATRA SPEED STAKES

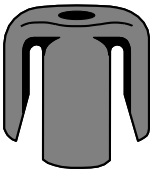
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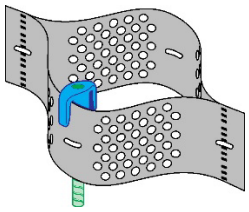
The ATRA Speed Stake provides additional anchorage and resistance to sliding and/or uplift forces to GEOWEB sections with or without tendons for crest, toe, and internal anchoring. ATRA Speed Stakes are a one-piece, non-metallic molded anchor used instead of traditional rebar or steel rods when long-term durability is desired in wet or corrosive environments.

ATRA Speed Stakes make a more secure connection with GEOWEB cell walls and allow for driving of anchors with powered ATRA Drivers with ATRA Gad attachment.

Material: Specialty HDPE based polymer alloy
Construction: One-piece injection molded design with integral flanged arms and barbs
Color: Black
Dimensions:
Length: 16 in (40.64 cm) and 20 in (50.8 cm)
Width: 1.92 in (48.77 mm)
Diameter: Tapered diameter from 0.875 in (22.23 mm) to 0.5 in (12.70 mm)
Min Tensile Strength (per ASTM D638): 14.5 kips (100 MPa)
Min Bending Strength: 575 lbf (2,550 N)
Chemical Resistance: Unaffected by Most Acids. Good Resistance to Alkalis.
Other Properties: Weather Resistant, Mildew Resistant, and Non-Corrosive
Conductivity: Non-Conductive



ATRA Stake Clip

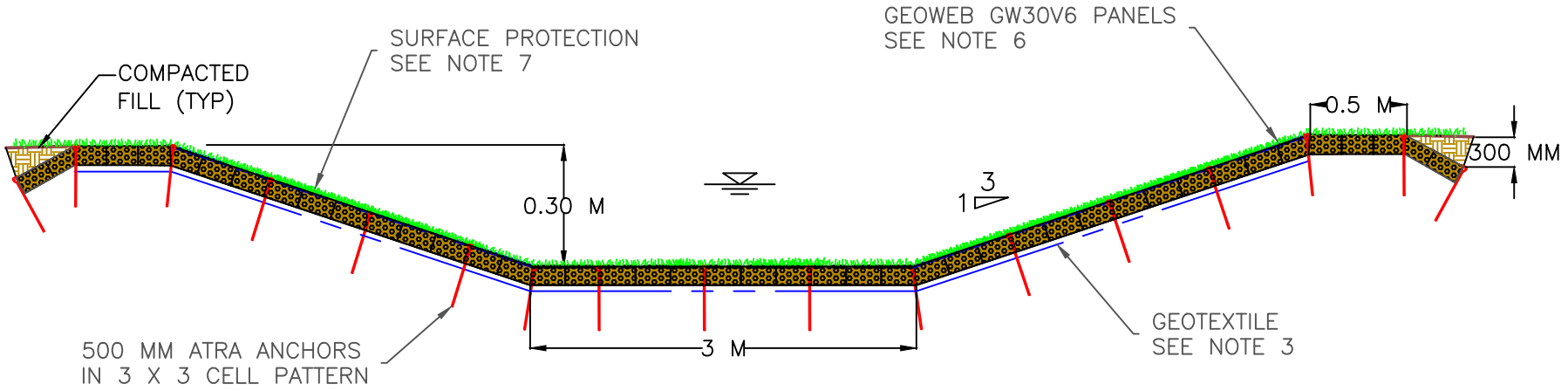


ATRA Anchor Over the GEOWEB Cell Wall

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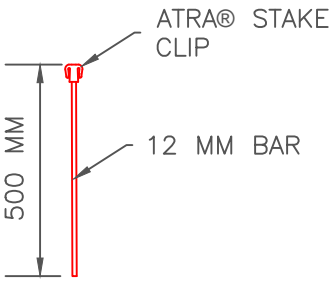
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7. Provide surface protection (hydroseed, ECB or TRM) sized for channel hydraulic and shear stress conditions to prevent cell wash–out prior to the establishment of vegetation.
8. Refer to the GEOWEB Channel Protection Installation Guide for installation procedures.

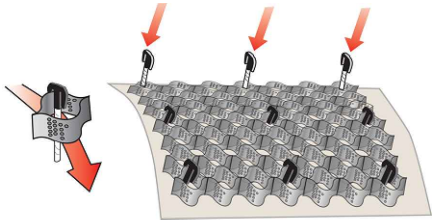




ATRA KEY



ATRA ANCHOR



ANCHOR INSTALLATION

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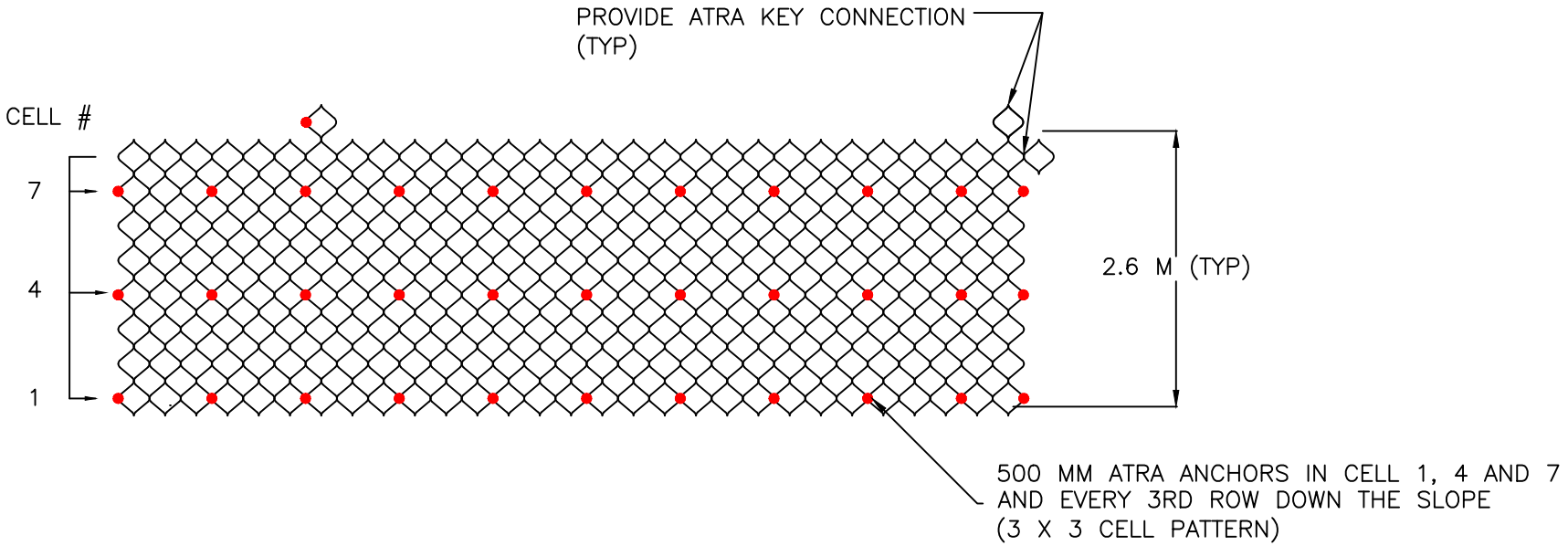
PR24706 ELIZA (WEST OUTLET)
GEOWEB CHANNEL PROTECTION

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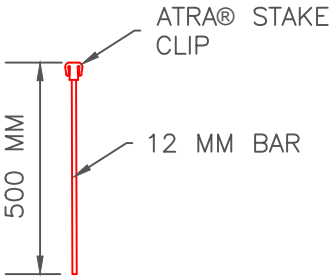
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2. The evaluation assumes that the channel side slopes and channel bed are globally stable.
3. If required. provide a non–woven geotextile separation layer and install per Manufacturer recommendations including overlaps.
4. The GEOWEB panels shall be connected with ATRA® keys at each interleaf and end to end connection.
5. Provide ATRA Anchors in the recommended anchorage pattern for stability.
6. GEOWEB infill shall be nutrient–rich, pulverized topsoil. Limit the drop of infill to prevent panel distortion.
7. Provide surface protection (hydroseed, ECB or TRM) sized for channel hydraulic and shear stress conditions to prevent cell wash–out prior to the establishment of vegetation.
8. Refer to the GEOWEB Channel Protection Installation Guide for installation procedures.

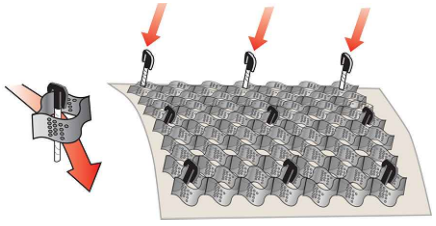




ATRA KEY



ATRA ANCHOR



ANCHOR INSTALLATION

REYNOLDS PRESTO PRODUCTS, INC
670 NORTH PERKINS STREET
APPLETON, WI 54914
920–738–1342
WWW.PRESTOGEO.COM

PRESTO GEOSYSTEMS® STRENGTH. FROM THE GROUND UP. Since 1979

PR24706 ELIZA (WEST OUTLET) GEOWEB CHANNEL PROTECTION

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DATE DECEMBER 5, 2024	FILE NAME SHEET 2
SCALE NTS	SHEET 2 OF 2

PRESTO GEOSYSTEMS
STRENGTH. FROM THE GROUND UP. Since 1979

CHANNEL PROTECTION
GEOWEB

Project Name: ELIZA (WEST OUTLET)
Presto Project Number: PR 24706
Date: 12/5/2024

INPUT PARAMETERS

English or Metric (E or M)	M		Coefficient, Cm	Gravity
			1.00	9.806
Channel Lining System			Typical Kb Values	
Invert:	Vegetation		Straight Reach: 1.0	
Sides:	Vegetation		Mild Meandors: 1.1 to 1.4	
Kb (Bend Coefficient)	1.20		Looping Meandors: 1.5 to 1.8	
Max Discharge (m3/s)	2.50		Sharp Turns: 1.9 to 2.1	
Bed Slope, %	15.00		Typical N Values for Lined Channel	
Depth (m)	0.30		Concrete Rough = 0.018 to 0.027	
Manning's Coefficient Invert	0.025		Aggregate Firm = 0.023 to 0.035	
Manning's Coefficient Side Slopes	0.025		Vegetated w/Grass & Weeds = 0.025	

Trial Channel Dimensions					
Base Width (m)	3.00	Flow Area	0.44		
Water Depth (m)	0.13	Wetted Perimeter	3.83		
Side Slope (**x**H:1V)	3.00	Hydraulic Radius	0.116		
Top Width 'T' of Flow line	3.79	R^2/3	0.238		
Velocity (m/s)	3.69				
Flow (m3/s)	1.64	Compare to Specified Flow Rate			
Froude No., F	3.27				
Channel Bottom - Stream Direction Stresses					
Geoweb Thickness (mm)	150	0.15 m			
Unit Weight of Infill (kN/m3)	20				
Interface Friction (Geoweb/Infill)	28	0.489			
Depth of Flow (m)	0.13				
Bedslope (%)	15.00	0.149 radians			
Unit Weight of Water (kN/m3)	9.81				
Coefficient of Friction (Infill/Soil)	0.53				
Tractive Shear Stress (kN/m2)	0.23				

PRESTO GEOSYSTEMS
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SLOPE PROTECTION SYSTEM
GEOWEB

Project Name: ELIZA (WEST OUTLET)
Presto Project Number: PR 24706
Date: 12/5/2024

INPUT PARAMETERS

English or Metric (E or M)	M		
Slope Angle	9		Slope (H:V)
Slope Length (m)	1.92		6.31
Vertical Height (m)	0.3		
Friction Angle (degrees)	28	Lowest Interface Angle	
Geoweb Cell Type	GW30V		
Web Thickness (mm)	150		
Infill type	Topsoil	Infill Weight (kN/m)	
Infill Unit Weight (kN/m3)	20	5.8	
Additional Cover (mm)	0	Cover Weight (kN/m)	
Cover Unit Weight (kN/m3)	0	0.0	
Overall Factor of Safety	1.4	Total Weight (kN/m)	
Tractive Force (kN/m)	0.03	5.8	
Passive Resistance at toe (Y or N)	No	Tractive force = 0.23 kN/m2 @ 0.13 m water depth	
Angle of internal friction of soil at toe	0		
Unit weight of soil at toe (kN/cu.m)	0		

Calculations

Factored Geoweb Seam Strength (kN/m)	5.13	Allowable Tensile
Driving Force (kN/m)	0.93	Weight+Toe Load
Factored Driving Force (kN/m)	1.26	Weight Only
Factored Driving Force (kN/m)	1.29	Weight+Toe Load
Resisting Force (kN/m)	3.02	Shear Only
Resisting Earth Force (kN/m)	0.00	
Available Resistance (kN/m)	5.13	Geoweb

ATRA® KEY

Connection Strength	275 lbs/ft	Note: Anchorage pattern is based on the use of ATRA keys for panel to panel connection. If staples or zip ties are used, the anchorge pattern will increase.
	4.05 kN/m	



ATRA Key
Clickable Spec

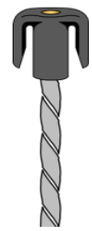
ATRA® ANCHOR DETAILS

Max. unrestrained GW length (m)	No Limit	Unrestrained

Input Parameters

Length (mm)	500	ATRA Anchor	Spacing
Diameter or Width (mm)	12	Downslope Cell Spacing	(mm)
Downslope spacing (# of cells)	3	No Limit	867.0
Horizontal spacing (# of cells)	3		960.0
Soil Friction Angle (degrees)	28		
Soil Cohesion (kN/sq.m)	5		
Slope Soil Type	Native		
Unit Weight (kN/m3)	20		
Kp (Coefficient)	2.77		
Buried Anchor Length (m)	0.35		
Anchor Resistance (kN)	0.11	Single Anchor	
Number of Rows of Anchors	3		
Anchor Resistance (kN/m)	0.3	Resultant	
Anchor Resistance (kN/m2)	0.18	Net Resultant	
Resisting Force (kN/m)	3	Shear plus Anchors	
ATRA Anchors density (anchors/sq.m)	1.81		
Factor of Safety	3.62	Shear and Atra Anchored Geoweb	

Note: Anchorage pattern is based on the use of ATRA keys for panel to panel connection. If staples or zip ties are used, the anchorge pattern will increase.



ATRA Anchors
Clickable Spec

PRESTO

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SLOPE PROTECTION SYSTEM
GEOWEB

CREST/SLOPE ANCHORAGE

Required Anchorage (kN/m)	-2.07	
Input Parameters		
Horizontal Embedment Length (m)	0.5	From Slope Face to Key Trench
Depth Below Crest (mm)	150	Crest to Bottom of Geoweb
Slope Angle of Key Trench (degrees)	45	
Depth of Key Trench (mm)	300	
Horiz. Length at Bottom of Trench (mm)	0	
Soil Unit Weight (kN/m2)	20	
Soil Friction (degrees)	28	
Available Resisting Force (kN/m)	2.09	OK
Factor of Safety	5.87	Crest Anchorage and Atra Anchors

Limitation of Use:

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PRODUCT SPECIFICATION (CSI-FORMAT)

SECTION 31 32 00
SOIL STABILIZATION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Work Included: This section includes providing all material, labor, tools, and equipment for installation of geocell system as shown in the Contract Documents and as specified in this section.

B. The geocell system shall be used for channel protection.

1.2 RELATED SECTIONS AND DIVISIONS

A. The applicable provisions of the General Conditions shall govern the work in this Section.

B. Section 013300 – Submittal Procedures.

C. Section 030000 – Concrete.

D. Section 311000 – Site Clearing.

E. Section 312000 – Earth Moving.

F. Section 312500 – Erosion and Sedimentation Control.

G. Section 313219 – Geosynthetic Stabilization and Separation Layer.

H. Section 323000 - Site Improvements.

I. Section 329200 –Turfs and Grasses.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO M288 – Geotextile Specification for Highway Applications.

B. American Society of Testing and Materials (ASTM)

1. ASTM D 1505 – Density of Plastics by the Density-Gradient Technique.
2. ASTM D 1603 – Standard Test for Carbon Black in Olefin Plastics.
3. ASTM D 1693 – Environmental Stress-Cracking of Ethylene Plastics.
4. ASTM D 5199 – Measuring Nominal Thickness of Geotextiles and Geomembranes.
5. ASTM D 5394 – Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.
6. ASTM D 5596 – Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.

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7. ASTM D 5721 – Standard Practice for Air-Oven Aging of Polyolefin Geomembranes.
8. ASTM D 5885 – Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry.
9. ASTM D 6693 (Type IV) – Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.
10. ASTM D 7328 – Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus
11. ASTM E 41 – Terminology Relating to Conditioning.

C. US Army Corps of Engineers (USACE)

1. Technical Report GL-86-19, Appendix A.

D. International Organization for Standardization (European Union) (EN-ISO)

1. ISO 6721 – Plastics – Determination of Dynamic Mechanical Properties
2. EN ISO 10319 – Geosynthetics – Wide-Width Tensile Test
3. EN 12224 – Geotextiles and geotextile-related products – Determination of the resistance to weathering
4. EN ISO 13426 – Geotextiles and geotextile-related products – Strength of Internal Structural Junctions – Part 1: Geocells
5. EN ISO 13438 – Screening Test Method for Determining the Resistance of Geotextiles and Geotextile-Related Products to Oxidation

1.4 SUBMITTALS

A. Submit manufacturer's shop drawings in accordance with Section 001300, Submittals including Manufacturer’s product data, calculations, drawings and field representative qualifications.

B. Manufacturer Calculations. Provide a complete set of project calculations including a description of the static analysis performed to determine the channel and crest anchorage requirements.

1. The calculations shall be submitted at the time of bid. The calculation shall be included in an evaluation containing a written summary, plan view, cross section, calculations, and research and testing documentation. The evaluation shall be based on site specific conditions. Standard graphs and table are not acceptable.
2. The calculations shall be based on computer software developed through research and testing at an accredited university or research facility based specifically on the product being submitted including geocell infill and panel connection device. Provide third party research summary for the calculation method specific to the manufacturer’s material values, infill type and panel connectors.
3. ATRA® Anchor Anchorage Calculations include the following:
   a. The channel stabilization calculations shall be based on channel dimensions, bed slope, channel depth, depth of flow, Manning’s coefficient, bend coefficient, minimum interface friction angle, infill type and weight, sub grade unit weight, cohesion and friction angle, and geocell size and depth.
   b. Standard anchor graphs and tables are not acceptable. Anchorage pattern shall be based on site specific conditions.

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c. The minimum overall factor of safety for crest anchorage, shear and anchors shall be at least 1.40.

d. Provide geocell size and depth, velocity and tractive force.

e. For vegetated infill, provide calculation based on research and testing summary to confirm the appropriate geocell size and depth.

f. If required, provide a description of the geotextile separation layer and include in calculations.

g. Provide anchor length, diameter, anchor resistance, anchor density and anchor pattern.

h. Provide crest anchorage embedment depth, depth below crest, slope angle, depth and resulting resisting force.

i. Provide factor of safety for the crest anchorage and shear.

j. Provide factor of safety for crest anchorage, shear and anchors.

k. Provide third party testing on panel connection device showing minimum pull through resistance of 275 lbs.

4. The stability calculations shall be in Microsoft Excel converted to Adobe PDF format.

5. Cross section and plan view drawings shall be in AutoCAD converted to Adobe PDF format.

C. Manufacturer's Certificate of Analysis: Manufacturer shall supply certificate of analysis containing the following test results for the geocell material used for project: Base Resin Lot Number(s), Resin Density per ASTM-1505, Production Lot Number(s), Material Thickness, Short Term Seam Peel Strength, and percentage of Carbon Black. Submit qualifications certifying the installer is experienced in the installation of the specified products.

D. Submit qualifications of Manufacturer's field representative certifying the field representative is experienced in the installation of the specified products.

E. Submit certificate of compliance that all materials and resins used to produce the specified materials are 100% made by plants located in the United States per public law Build America, Buy America (BABA) included in the Infrastructure Investment and Jobs Act under Title IX, Subtitle A, Part 1.

F. No material will be considered as an equivalent to the geocell material specified herein unless it meets all requirements of this specification, without exception. Alternates must be submitted prior to the bid. Manufacturers seeking to supply what they represent as equivalent material must submit records, data, independent test results, samples, certifications, and documentation deemed necessary by the Engineer to prove equivalency. The Engineer shall approve or disapprove other Manufacturers' materials in accordance with the General Conditions after all information is submitted and reviewed. Any substitute materials submitted shall be subject to independent lab testing at the contractor's expense.

1.5 QUALITY ASSURANCE AND CONTROL

A. The geocell system material shall be provided from a single Manufacturer for the entire project.

B. The Manufacturer's Quality Management System shall be certified and in accordance with ISO 9001:2015 and CE certification. Any substitute materials submitted shall provide a certification that their geocell manufacturing process is part of an ISO program and a certification will be required specifically stating that their testing facility is certified and in accordance with ISO. An ISO certification for the substitute material will not be acceptable unless it is proven it pertains specifically to the geocell manufacturing operations.

C. The Manufacturer shall provide certification of compliance to all applicable testing procedures and related

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specifications upon the customer's written request. Request for certification shall be submitted no later than the date of order placement. The Manufacturer shall have a minimum of 20 years' experience producing geocells and accessories.

D. Certified Installer Training Course

1. At a minimum, the certified installer training course shall be taken by the contractor's project manager and on-site project manager.
2. The certified training course is free of charge and consists of reviewing the Construction Resource Package. The training course is 2 hours in length.
3. The contractor shall take the certified training course addressing best practices for base preparation, geotextile installation, engineered base composition and installation, unit installation and orientation and unit fill.

E. Pre-Construction Meeting: Prior to construction, conduct a virtual or on-site meeting to review all the requirements and expectations to complete the work. The pre-construction meeting shall be attended by all parties involved in the installation of the geocell system.

1. Manufacturer shall provide a recommended list of all necessary tools and equipment required for installation. Installation videos and techniques shall be reviewed.
2. Discuss any special features and requirements for the installation of the geocell system to prevent any delays and conflicts in completing the work.

F. Pre-Installation Meeting: Prior to installation of any materials, conduct a pre-installation meeting to discuss the scope of work and review installation requirements. The pre-installation meeting shall be attended by all parties involved in the installation of the geocell system.

G. Manufacturer's Field Representative Qualifications:

1. Manufacturer shall provide a qualified field representative on-site at the start of construction to ensure the system is installed in accordance with the Contract Documents.
2. Manufacturer's field representative shall have a minimum 10 years' installation experience with the specified products in the specified application.
3. Manufacturer of any substitute materials to be used shall certify that a representative can meet the above criteria and will be on site for initial construction start up. Manufacturers other than Presto Geosystems will be required to provide proof the representative meets these qualifications.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and Manufacturer.

B. The materials shall be stored in accordance with Manufacturer's instructions. The materials shall be protected from damage and away from direct sunlight.

C. The materials shall be delivered, unloaded and installed in a manner to prevent and minimize damage.

1.7 WARRANTY

A. The Manufacturer shall warrant each section that it ships to be free from defects in materials and workmanship at the time of manufacture. The Manufacturer's exclusive liability under this warranty or otherwise will be to furnish without charge to the original f.o.b. point a replacement for any section which

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proves to be defective under normal use and service during the 10-year period which begins on the date of shipment. The Manufacturer reserves the right to inspect any allegedly defective section in order to verify the defect and ascertain its cause.

B. This warranty shall not cover defects attributable to causes or occurrences beyond the Manufacturer's control and unrelated to the manufacturing process, including, but not limited to, abuse, misuse, mishandling, neglect, improper storage, improper installation, improper alteration or improper application.

C. In no event shall the Manufacturer be liable for any special, indirect, incidental or consequential damages for the breach of any express or implied warranty or for any other reason, including negligence, in connection with the cellular confinement system.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. Presto Geosystems, PO Box 2399, Appleton, Wisconsin 54912-2399.

Phone: (920) 738-1328. Email: info@prestogeo.com. Website: www.prestogeo.com.

2.2 GEOWEB® GEOCELL

A. Manufacturing Certification

1. The Manufacturer shall have earned a certificate of registration, which demonstrates that its quality-management system for its geocell system is currently registered to the ISO 9001:2015 and CE quality standards.

B. Base Materials

1. Polyethylene Stabilized with Carbon Black

   a. Density shall be 58.4 to 60.2 pound/ft^3 (0.935 to 0.965 g/cm^3) in accordance with ASTM D 1505.

   b. Environmental Stress Crack Resistance (ESCR) shall be 5000 hours in accordance with ASTM D 1693.

   c. Resistance to Oxidation shall be minimum of 100 years in accordance with EN ISO 13438.

   d. 100% of original strip tensile strength shall be retained following exposure to accelerated weathering in in accordance with EN 12224.

   e. The Flexural Storage Modulus shall be a minimum of 800 MPa in accordance with ISO 6721.

   f. Ultra-Violet light stabilization with carbon black.

   g. Carbon Black content shall be 1.5 to 2 percent by weight, through addition of a carrier with certified carbon black content.

   h. Carbon black shall be homogeneously distributed throughout material.

   i. The manufacturer must have an in-place quality control to prevent irregularities in strip material.

C. Cell Properties

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1. Individual cells shall be uniform in shape and size when expanded.
2. Individual cell dimensions (nominal) shall be dimensions ± 10%.
3. GW30V Cell
    a. Length shall be 11.3 inches (287 mm).
    b. Width shall be 12.6 inches (320 mm).
    c. Nominal area shall be 71.3 in^2 (460 cm^2) plus or minus 1%.
    d. Nominal depth shall be 6 inches (150 mm).

D. Strip Properties and Assembly

1. Perforated Textured Strip/Cell
    a. Strip sheet thickness shall be 50 mil (1.27 mm), minus 5 percent, plus 10 percent in accordance with ASTM D 5199. Determine thickness flat, before surface disruption.
    b. Polyethylene strips shall be textured surface with a multitude of rhomboidal (diamond shape) indentations.
    c. Textured sheet thickness shall be 60 mil plus or minus 6 mil (1.52 mm plus or minus 0.15 mm).
    d. Indentation surface density shall be 140 to 200 per in^2 (22 to 31 per cm^2).
    e. Perforated with horizontal rows of 0.4-inch (10 mm) diameter holes.
    f. Perforations within each row shall be 0.75 inches (19 mm) on-center.
    g. Horizontal rows shall be staggered and separated 0.50 inches (12 mm) relative to hole centers.
    h. Edge of strip to nearest edge of perforation shall be a minimum of 0.3 inches (8 mm).
    i. Centerline of spot weld to nearest edge of perforation shall be a minimum of 0.7 inches (18 mm).
    j. A slot with a dimension of 3/8 inch x 1-3/8 inch (10 mm x 35 mm) is standard in the center of the non-perforated areas and at the center of each weld.
2. Assembly of Cell Sections
    a. Fabricate using strips of sheet polyethylene each with a length of 142 inches (3.61 m) and a width equal to cell depth.
    b. Connect strips using full depth ultrasonic spot-welds aligned perpendicular to the longitudinal axis of strip.
    c. Ultrasonic weld melt-pool width shall be 1.0-inch (25 mm) maximum.
    d. Weld spacing for GW30V cell sections shall be 17.5 inches plus or minus 0.10 inch (445 mm plus or minus 2.5 mm).

E. Cell Seam Strength Tests

1. Minimum seam strengths are required by design and shall be reported in test results. Materials submitted with average or typical values will not be accepted. Written certification of minimum

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strengths must be supplied to the engineer at the time of submittals.

2. Short-Term Seam Peel-Strength Test
   a. Cell seam strength shall be uniform over full depth of cell.
   b. Minimum seam peel strength shall be 480 lbf (2,130 N) for 6-inch (150 mm) deep panels.
3. Long-Term Seam Peel-Strength Test
   a. Conditions: Minimum of 7 days in a temperature-controlled environment that undergoes change on a 1-hour cycle from room temperature to 130 °F (54 °C).
   b. Room temperature shall be in accordance with ASTM E41.
   c. Test samples shall consist of two, four-inch (100 mm) wide strips welded together.
   d. Test sample consisting of two carbon black stabilized strips shall support a 160-pound (72.5 kg) load for test period.
4. Internal Junction Efficiency
   a. Internal junction efficiency (seams) shall be determined as a ratio of junction performance to perforated strip performance, as determined by EN ISO 10319 and EN ISO 13426-1.
   b. Internal junction efficiency (factor of safety) shall be calculated for peel, shear and separation.
   c. Minimum internal junction efficiency shall be ≥ 100 percent.
5. Mechanical Junction Efficiency
   a. Mechanical junction efficiency (panel to panel connection) shall be determined as a ratio of junction performance to perforated strip performance, as determined by EN ISO 10319 and EN ISO 13426-1.
   b. Mechanical junction efficiency (factor of safety) shall be calculated for peel, shear and separation.
   c. Minimum mechanical junction efficiency shall be ≥ 100 percent.
   d. Connection type shall be with integral components as designated by the Manufacturer.
6. 10,000-hour Seam Peel Strength Certification
   a. Provide data showing that the high-density polyethylene resin used to produce the geocell sections has been tested using an appropriate number of seam samples and varying loads to generate data indicating that the seam peel strength shall survive a loading of at least 209 lbf (95 kg) for a minimum of 10,000 hours.

2.3 INTEGRAL COMPONENTS

A. ATRA® Stake Clip
   1. The stake clip is a molded, high-strength polyethylene device available in standard (0.5 inch) and metric (10–12 mm) versions.
   2. Stake clips shall be installed as an end cap on standard (0.5 inch) and metric (10–12 mm) steel reinforcing rods to form ATRA® Anchors.

B. ATRA® Key

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1. The keys shall be constructed of polyethylene and provide a high strength connection with minimum pull-through resistance of 275 lbs (125 kg).
2. Keys shall be used to connect sections together at each interleaf and end-to-end connection.
3. The keys shall include a structurally reinforced handle and frictional barbs to enhance interlock with the textured wall surface to prevent mechanical joint failure including peel, shear and separation.
4. Metal staples, zip ties, and two-piece connectors are not an acceptable panel connection method.

2.4 STAKE ANCHORAGE

A. ATRA® Anchors

1. Anchors shall consist of standard (0.5 inch) or metric (10–12 mm) steel reinforcing rod with an ATRA® Stake Clip attached as an end cap.
2. Anchors shall be assembled by inserting the stake clip onto the reinforcing rod so that the end is flush with the top of the stake clip. Prior to attaching the stake clip, the reinforcing rod shall be beveled and free from all burrs.
3. The anchor length and placement shall be as shown in the Contract Documents.

2.5 INFILL MATERIALS

A. Infill material shall be topsoil for vegetated surfaces and shall have an SCS texture of loam, sandy loam or silty loam. Topsoil shall be neither excessively acidic nor alkaline.

B. Infill material shall be free of any foreign material.

C. Clays and silts are not acceptable infill material.

D. Infill material shall be free-flowing and not frozen when placed in the sections.

2.6 ADDITIONAL COMPONENTS

A. Surface Protection

1. Surface protection shall consist of [erosion control blanket] [turf reinforcement mat] [hydroseed] as specified in the Contract Documents.

B. Geotextile

1. The non-woven geotextile separation layer shall be as specified in the Contract Documents.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions are as indicated on the drawings. Notify the Engineer if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

B. Verify layout of structure is as indicated on the drawings. Notify the Engineer if layout of structure is not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

A. Prepare sub grade and install channel protection system in accordance with Contract Documents and manufacturer's installation guidelines.

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B. On-site time for installation assistance by the Manufacturer's field representative shall be a minimum of 1 day with one trip. All travel and expense costs for field representative installation observation shall be included in the base bid price.

C. Sub Grade Preparation:

1. Excavate and shape sub grade per the Contract Documents.
2. Install geotextile separation layer in accordance with the Contract Documents and manufacturer's recommendations including overlaps.

D. Section Anchorage

1. Anchorage requirements shall be as shown on the Contract Documents.
2. Anchorage with ATRA® Anchors
   a. Position collapsed sections at the crest of the channel.
   b. Excavate the anchor trench at the top of the channel to the depth as shown in the Contract Documents.
   c. Drive anchors at the crest of the channel to secure the sections and allow expansion of the sections into position.
   d. After the sections are expanded as desired, drive anchors so the arm of the stake clip engages with the top of the cell wall.
   e. Connect the sections with ATRA keys at each interleaf and end-to-end connection. Insert the key through the cell wall I-slot before inserting through the adjacent cell. Turn the key 90 degrees to lock the sections together.
   f. Fill the anchorage trench with the specified material and compact as required by the Contract Documents.

E. Topsoil Infill Placement

1. Place infill with suitable handling equipment.
2. Infill material shall be free-flowing and not frozen when placed in the sections.
3. Limit drop height to prevent panel distortion.
4. Fill sections from the crest of the channel to toe or in accordance with Contract Documents.
5. Evenly spread infill and tamp into place ensuring the infill is flush with top of cell walls per the Contract Documents.

F. Surface Treatment

1. Surface protection shall be installed in accordance with the Contract Documents.

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Appendix A
Short-Term Seam Strength Test Procedure

Frequency of Test

The short-term seam peel strength test (referred to as the 'test' in this section) shall be performed on a geocell section randomly taken directly from the production line each two hours.

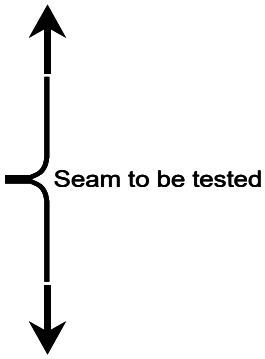


Figure A1

Test Sample Preparation

Randomly choose 10 welds within the selected section and cut those welds from the section such that 10 cm (4 in) of material exist on each side of the weld. The test sample shall have a general appearance as illustrated in Figure A1. Prior to testing, the test samples shall have air cool for a minimum of 30 minutes from the time the selected geocell section was manufactured.

Short-term Seam Peel Strength Test

The apparatus used for testing the short-term seam peel strength shall be of such configuration that the jaws of the clamp shall not over stress the sample during the test period. Load shall be applied at a rate of 12 in (300 mm) per minute and be applied for adequate time to determine the maximum load. The date, time and load shall be recorded.

Short-term seam peel strength shall be defined as the maximum load applied to the test sample. Minimum required short-term seam peel strength shall be:

- 640 lbf (2840 N) for the 8 in (200 mm) depth cell
- 480 lbf (2130 N) for the 6 in (150 mm) depth cell
- 320 lbf (1420 N) for the 4 in (100 mm) depth cell
- 240 lbf (1060 N) for the 3 in (75 mm) depth cell.

Definition of Pass / Failure

Two methods shall be used to determine acceptability of the manufactured geocell sections. The successful passing of the short-term seam peel test shall not be used to determine acceptable of the polyethylene for use in manufacturing of the geocell sections. Acceptability of the polyethylene shall be determined through tests conducted in Appendix B.

The Tested Value

If more than one of the tested seam samples fails to meet the minimum peel strength, all sections manufactured after the previously successful test shall be rejected.

If all tested seam samples meet the minimum peel strength, all geocell sections manufactured since the last successful test shall be considered to have passed the test.

When one of the tested seam samples fails to meet the minimum peel strength, another 10 samples shall be randomly selected and cut from the previously selected section. If more than one of these samples fails, all sections manufactured after the previously successful test shall be rejected. Otherwise, all geocell sections manufactured since the last successful test shall be considered to have passed the test.

Visual Failure Mode

After each sample is tested, the seam shall be examined to determine the failure mode. Two failure modes are possible.

- Material failure within and adjacent to the weld indicated by material strain and
- Weld failure resulting in complete separation of the seam and shows little or no material strain.

Upon examination, when the failure mode results in complete separation of the seam and indicates little or no material strain, product manufactured shall be rejected.

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Appendix B
Long-Term Seam-Strength Test Procedure

Frequency of Test

The long-term seam peel strength test (referred to as the 'test' in this section) shall be performed:

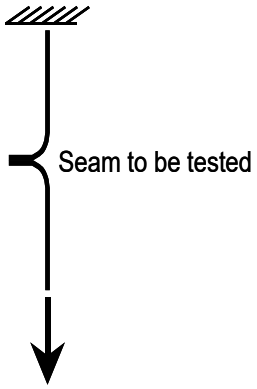


Figure B1

1. On each new resin lot number if the geocell manufacturer extrudes the sheet or strip used to produce the geocell material.
2. On each new order of sheet and/or strip if the geocell manufacturer does not extrude the sheet and/or strip used to produce the geocell material.

Test Sample Preparation

A test sample shall be made using two sets of two strips meeting all aspects of the material portion of this specification. Testing shall be done on non-perforated samples to obtain the true seam strength of the bond. One set of two strips are to be welded in welder position "A" and the other set of two strips are to be welded in welder position "B" producing two 1-cell long sections of geocell product. Welding should be done using a warm welder. The welded samples shall be labeled "A" and "B" and the weld seams of each sample shall be numbered consecutively from left to right starting with the number 1 (one) and corresponding to the welding head number.

The samples shall air cool for a minimum of 30 minutes. Randomly choose 10 welds from samples "A" and "B" and cut those welds from the geocell samples such that 4 in (10 cm) of material exist on each side of the weld. These samples shall be cut to a width of 4 in (10 cm). Properly identify each weld using the sample letter and weld seam number.

These samples are now ready to be tested.

Long-term Seam Peel Strength Test

The long-term seam peel strength test shall take place within an environmentally controlled chamber that undergoes temperature change on a 1-hour cycle from room temperature to 130°F (54°C). Room temperature shall be defined per ASTM E41.

Within the environmentally controlled chamber, one of the ends of the samples (10 samples in total) shall be secured to a stationary upper clamp. The jaws of the clamp shall be of such configuration that the grip does not over stress the sample during the test period. The sample shall be secured so that its axis is vertical and the welds being tested are horizontal as the sample hangs within the environmentally controlled chamber.

A weight of 160 lb (72.5 kg) shall be lifted via a hoist or lift platform and attached to the free lower end, of the sample. The weight shall be lowered in a way so that no impact load occurs on the sample being tested. The weight shall be sufficient distance from the floor of the chamber so that the weight will not touch the floor of the chamber as the sample undergoes creep during the test period. The date and hour the weight is applied shall be recorded.

The temperature cycle shall commence immediately within the environmentally controlled chamber. The test period for the applied load shall be 168 hours.

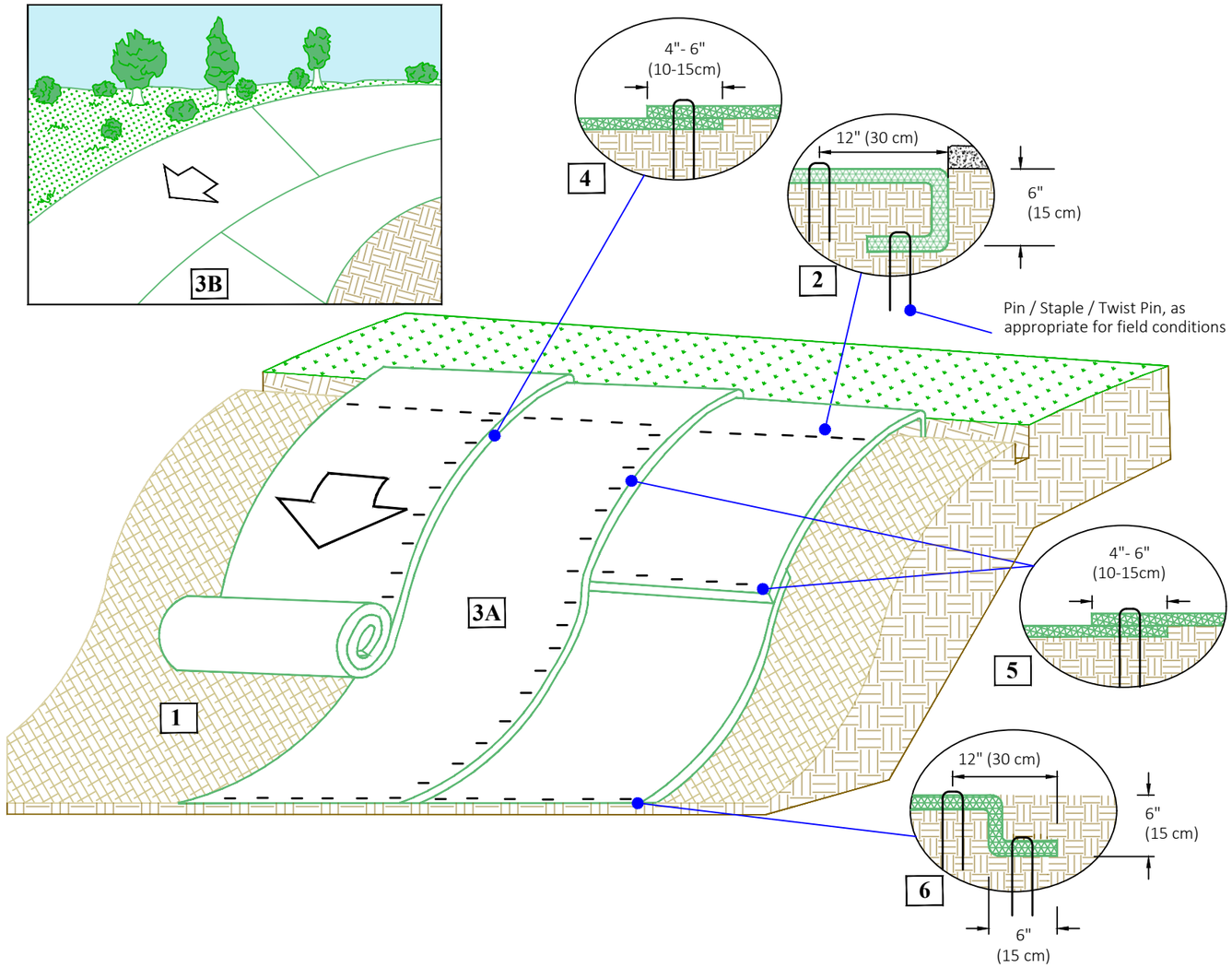
Definition of Pass / Failure

If any of the 10 seams fail prior to the end of the 168-hour (7-day) period, the date and hour of the failure shall be recorded and the polyethylene resin and strip material shall be considered unsuitable for geocell manufacturing.

END OF SECTION

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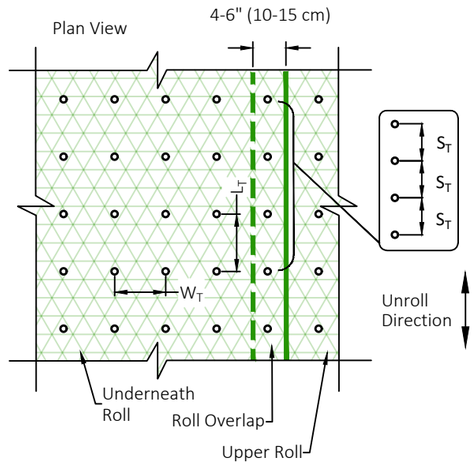
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Instructions

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation.
2. Begin at the top of the slope by anchoring the RECPs in a 6" (15 cm) deep X 6" (15 cm) wide trench. Anchor the RECPs with a row of staples/stakes/pins spaced at S_T apart in the bottom of the trench. Backfill and compact the trench after stapling and fold the roll over downslope. Secure RECPs over compacted soil with a row of staples/stakes/pins spaced at S_T apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. When laying RECPs horizontal, a maximum of two roll widths or 16 feet, whichever is less, may be applied up the slope. If two roll widths or 16 ft is insufficient to cover the slope, material shall be placed vertically. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes/pins in appropriate locations as shown in the staple pattern guide. RollMax RECPs and ECBs should utilize Staple Pattern C, TRMs and VMax materials should utilize Staple Pattern D.
4. The edges of parallel RECPs must be stapled with approximately 4" - 6" (10 - 15 cm) overlap.
5. Consecutive RECPs spliced down the slope must overlapped with the upstream mat atop the downstream mat (shingle style). The overlap should be 4" - 6" (10 - 15 cm).
6. At the terminal end, secure each mat across the width with a row of staples/stakes/pins spaced at S_T. If exposed to flow, foot traffic, wind uplift or other disruption, trench the terminal end in as shown in detail.
7. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins may by used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with TRM or HPTRM materials.

Staple Pattern Guide



- Pin / Staple / Twist Pin, as appropriate for field conditions

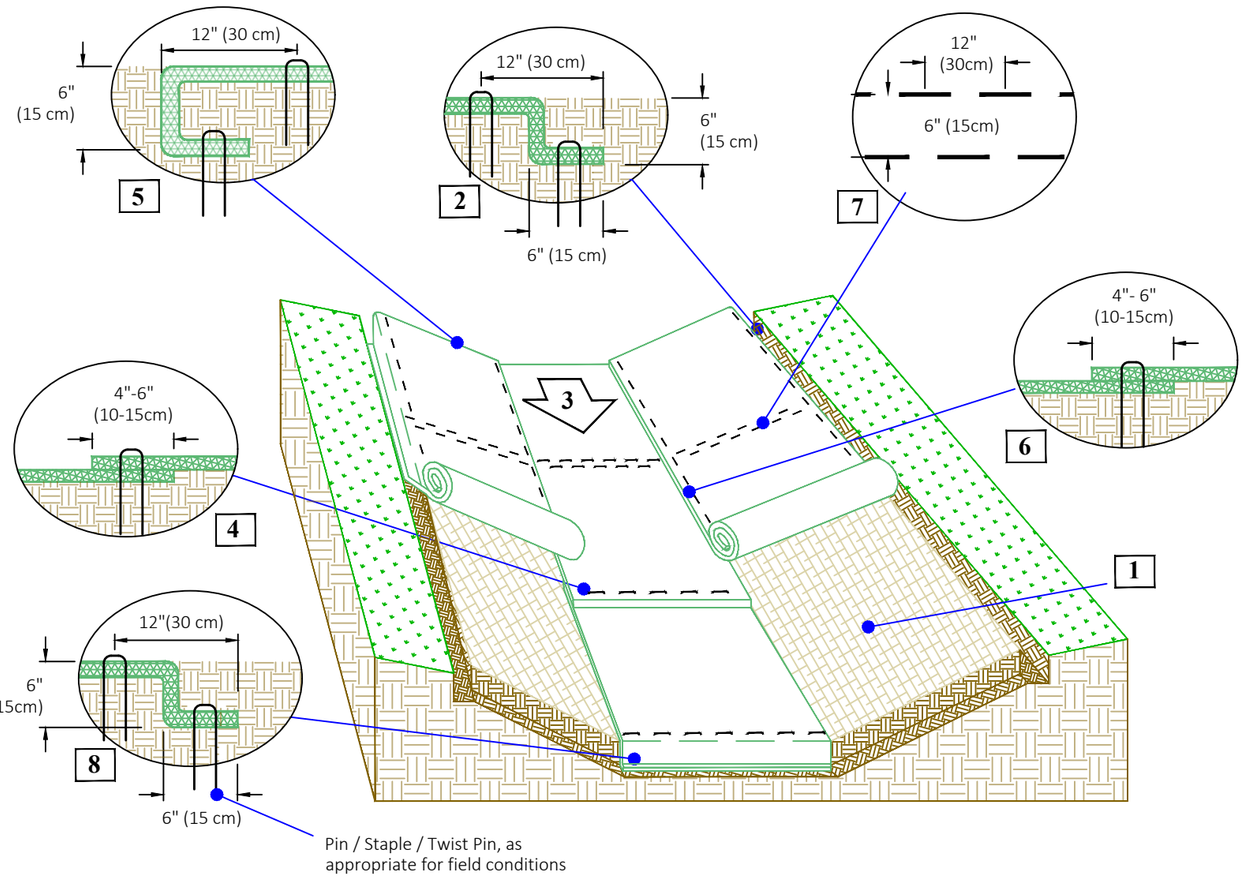
	Staple Pattern	
Dimension	C	D
W_T	30" (75 cm)	22" (55 cm)
L_T	30" (75 cm)	22" (55 cm)
S_T	18" (45 cm)	18" (45 cm)
Nominal Frequency	1.7 / SY	3.0 / SY
Application	ECB (Degradable)	TRM (Permanent)
Required Fastener	Min. 20# pullout	Min. 20# pullout
*Note: Staple Pattern A and B used prior to 8/2019 have been discontinued.		

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Project: Standard Slope/Rainfall Layout - RECP

Shown: Isometric View of Slope, Fastener Placement, Trenching and Overlap, Some Fasteners and Vegetation Omitted for Clarity, NTS

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CRITICAL POINTS
- A. Overlaps and Seams
- B. Projected Water Line
- C. Channel Bottom/Side Slope Vertices

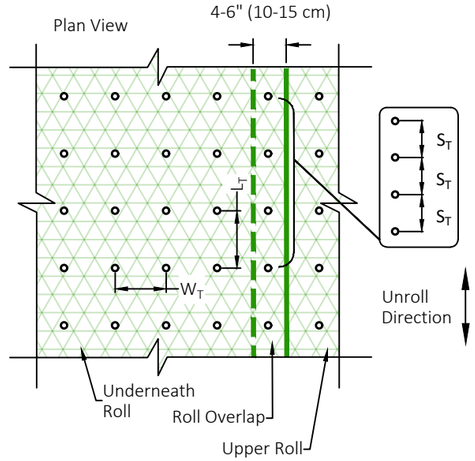


NOTES:
*Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

Instructions

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation.
2. Begin at the top of the channel by anchoring the RECPs in a 6" (15 cm) deep X 6" (15 cm) wide trench with approximately 12" (30 cm) of RECPs extended beyond the up-slope portion of the trench. Use ShoreMax mat at the channel/culvert outlet as supplemental scour protection as needed. Anchor the RECPs with a row of staples/stakes/pins approximately 12" (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12" (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes/pins spaced approximately 12" (30 cm) apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes/pins in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4"- 6" (10 - 15 cm) overlap. Use a double row of staples staggered 4" apart and 4" on center to secure RECPs.
5. Full length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes/pins spaced at S_T apart in a 6" (15 cm) deep X 6"(15 cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 4"- 6" (10 - 15 cm) and secured with staples/stakes/pins at S_T.
7. In high flow channel applications a staple check slot is recommended at 30 to 40 foot (9 -12m) intervals. Use a double row of staples staggered 6" (15 cm) apart and 12" (30 cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes/pins spaced at S_T apart in a 6" (15 cm) deep X 6" (15 cm) wide trench. Backfill and compact the trench after stapling.
9. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins may by used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with VMax (TRM) or TMax (HPTRM) materials.

Staple Pattern Guide



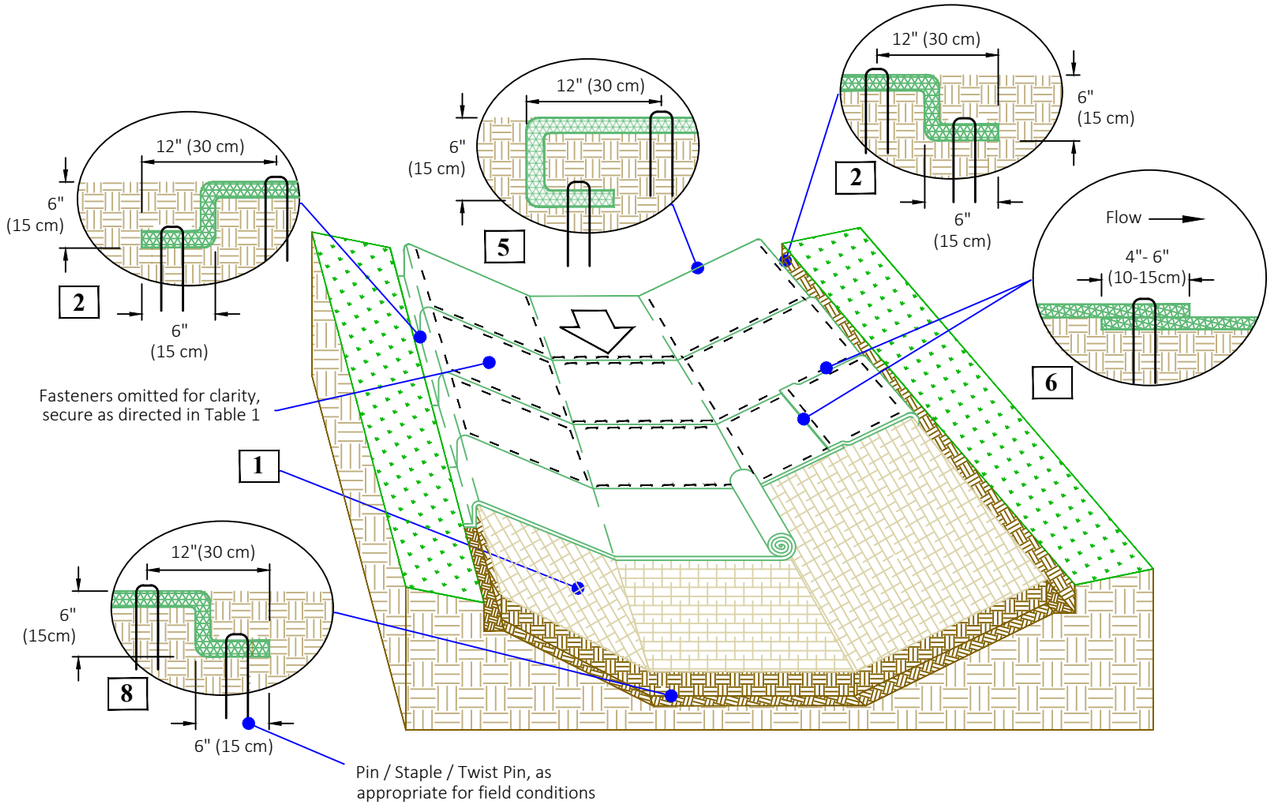
- Pin / Staple / Twist Pin, as appropriate for field conditions

	Staple Pattern
Dimension	E
W_T	20" (50 cm)
L_T	20" (50 cm)
S_T	18" (45 cm)
Nominal Frequency	3.8 / SY
Required Fastener	Min. 20# Pullout

Project: Standard Channel Layout, Unroll w/Flow - RECP

Shown: Isometric View of Channel, Fastener Placement, Trenching and Overlap, Some Fasteners and Vegetation Omitted for Clarity, NTS

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CRITICAL POINTS
- A. Overlaps and Seams
- B. Projected Water Line
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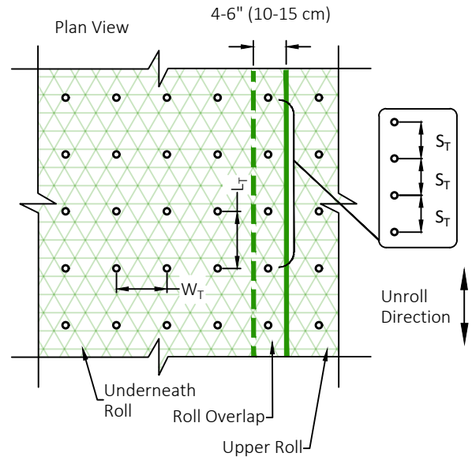


NOTES:
*Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

Instructions

1. Prepare soil (fig. 1) before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation. Apply seed and amendments to the compacted soil.
2. Dig anchor trench, 6" (15 cm) deep X 6" (15 cm) wide, at the upstream most edge of installation across the channel. Begin at the top of the channel by unrolling the RECP across the channel, perpendicular to the direction of flow, cut to fit. Carefully flip the RECP panel upstream, leaving it upside down. Place the upside down leading edge in the trench. Anchor the RECP panel with a row of fasteners spaced at S_T apart in the bottom of the trench. Backfill and compact the trench after fastening. With the RECP secured in the backfilled trench, flip the RECP panel over, right side up, over the backfill. The end result should mimic fig. 2. Secure RECP just downstream of trench with a row of fasteners located approximately 12" (30 cm) downstream from the trench, spaced at S_T.
3. Roll subsequent RECP panels across the channel, fitting the downstream panel under the upstream panel. RECPs shall be unrolled with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing twist pins in appropriate locations as shown in the pin pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4"- 6" (10 - 15 cm) overlap, see fig.6. Secure overlaps as shown.
5. Adjacent RECPs must be overlapped approximately 4"- 6" (10 - 15 cm) and secured with fasteners at S_T.
6. The terminal end of the RECPs must be anchored with a row of fasteners spaced at S_T apart in a 6" (15 cm) deep X 6" (15 cm) wide trench (minimum). Backfill and compact the trench after stapling.
7. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins may by used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with VMax (TRM) or TMax (HPTRM) materials.

Staple Pattern Guide



- Pin / Staple / Twist Pin, as appropriate for field conditions

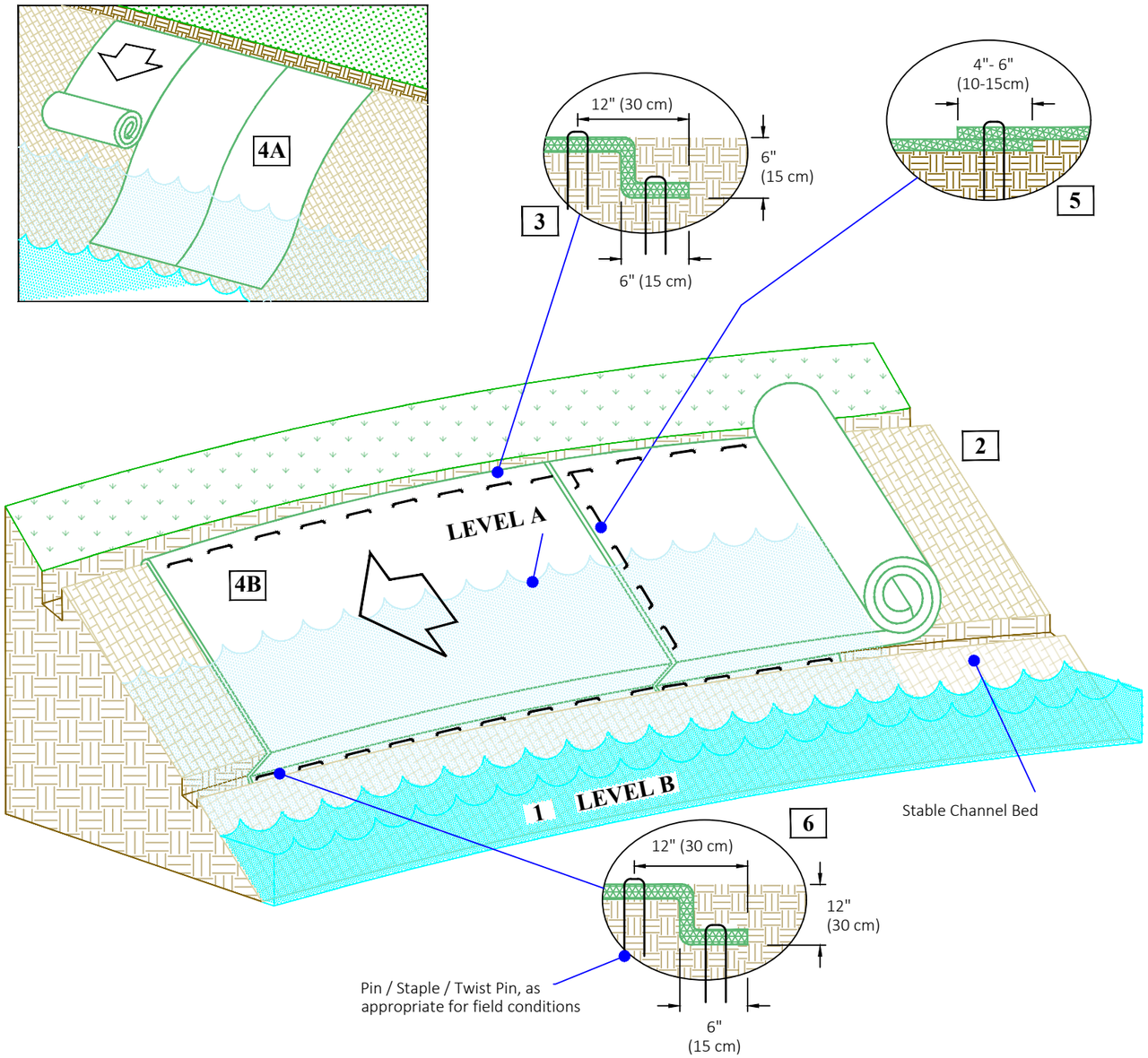
	Staple Pattern
Dimension	E
W_T	20" (50 cm)
L_T	20" (50 cm)
S_T	18" (45 cm)
Nominal Frequency	3.8 / SY
Required Fastener	Min. 20# Pullout

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Project: Standard Channel Layout, Unroll Cross Flow - RECP

Shown: Isometric View of Channel, Fastener Placement, Trenching and Overlap, Some Fasteners and Vegetation Omitted for Clarity, NTS

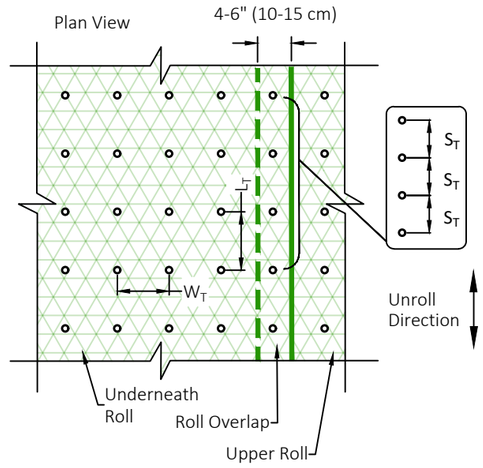
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Instructions

1. For easier installation, lower water level from Level A to Level B before installation.
2. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation.
3. Begin at the top of the shoreline by anchoring the RECPs in a 6" (15 cm) deep X 6" (15 cm) wide trench. Anchor the RECPs with a row of staples/stakes/pins spaced at S_T apart in the bottom of the trench. Backfill and compact the trench after stapling.
4. Roll RECPs either (A) down the shoreline for long banks (top to bottom) or (B) horizontally across the shoreline slope. RECPs will unroll with appropriate side against the soil surface. VMax TRMs should always be installed parallel to flow. All RECPs must be securely fastened to soil surface by placing staples/stakes/pins in appropriate locations as shown in the staple pattern guide.
5. The edges of all horizontal and vertical seams must be stapled with approximately 4" - 6" (10 - 15 cm) overlap. Note: *In streambank applications, seam overlaps should be shingled in the predominant flow direction.
6. The edges of the RECPs at or below normal water level must be anchored by placing the RECP's in a 12" (30 cm) deep X 6" (15 cm) wide anchor trench. Anchor the RECPs with a row of staples/stakes/pins spaced approximately 12"(30cm) apart in the trench. Backfill and compact the trench after stapling (stone or soil may be used as backfill). For installation at or below normal water level, use of ShoreMax mat on top of the RECP or geotextile underneath is likely required for sections below the normal water line.
7. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins may by used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with VMax (TRM) or TMax (HPTRM) materials.

Staple Pattern Guide



- Pin / Staple / Twist Pin, as appropriate for field conditions

	Staple Pattern
Dimension	E
W_T	20" (50 cm)
L_T	20" (50 cm)
S_T	18" (45 cm)
Nominal Frequency	3.8 / SY
Required Fastener	Min. 20# Pullout

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Project: Standard Channel Bank Layout - RECP

Shown: Isometric View of Channel, Fastener Placement, Trenching and Overlap, Some Fasteners and Vegetation Omitted for Clarity, NTS

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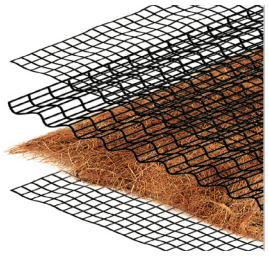
MATERIAL PROPERTY DATA SHEET

VMax® C350™

Permanent • Triple Net • Organic Fiber Matrix • Turf Reinforcement Mat

DESCRIPTION

C350 Turf Reinforcement Mat (TRM) is composed of 100% coconut fibers mechanically (stitch) bound between a three-dimensional UV stabilized, heavy duty synthetic net structure. Stitching is secured on two-inch centers using UV stabilized, synthetic thread. C350 is a permanent, three-dimensional TRM that provides immediate erosion protection and long-term turf reinforcement and is intended for applications requiring erosion protection for greater than thirty-six months.



Each roll of C350 is made in the USA and manufactured under Western Green's Quality Assurance Program to ensure a continuous distribution of fibers and consistent thickness.

Material Content	
Matrix	Coconut
Netting	Top Net: Heavyweight, UV stable Middle Net: Corrugated Ultra-Heavyweight, UV stable Bottom Net: Heavyweight, UV stable
Thread	Synthetic, UV Stable

Standard Roll Sizes				
Width	8 ft	(2.4 m)	6.5 ft	(2.0 m)
Length	90 ft	(27.4 m)	55.5 ft	(17.0 m)
Weight ± 10%	74 lb	(34.0 kg)	37 lb	(17.0 kg)
Area	80 sy	(66.9 m^2)	40 sy	(33.4 m^2)

Material available in custom roll sizes

Approvals & Classification	
Classification	FHWA: Type 5.C / ECTC: 5.D
TTI Approvals	Class 2 Type H
NTPEP Number	ECP-2020-01-14

Index Property	Test Method	Typical	
Thickness	ASTM D6525	0.58 in.	(15 mm)
Mass/Unit Area	ASTM D6566	15.0 oz/sy	(500 g/sm)
Tensile Strength – MD	ASTM D6818	750 lbs/ft	(10.9 kN/m)
Tensile Strength – TD	ASTM D6818	750 lbs/ft	(10.9 kN/m)
Elongation - MD	ASTM D6818	30%	
Elongation – TD	ASTM D6818	20%	
UV Stability	ASTM D4355	80% @1000 hr	
Light Penetration	ASTM D6567	10%	
Biomass Improvement	ASTM D7322	350%	
Specific Gravity	ASTM D792	57.4 lb/ft^3	(0.92 g/cm^3)
Porosity	ECTC	N/A	

Design Parameters		
Property	**Unvegetated**	**Vegetated[3]**
RUSLE C Factor[2]	0.05	N/A
Slope Maximum Gradient[1]	0.5H:1V	0.5H:1V
Permissible Shear Stress[2]	3.2 psf (155 Pa)	12.0 psf (575 Pa)
Permissible Velocity[2]	10.5 fps (3.2 m/s)	18.0 fps (5.5 m/s)
τ_{veg} / τ_{TRM} (HEC-15)	N/A	0.44

Manning's n Roughness (HEC-15)		
τ_{lower}	τ_{mid}	τ_{upper}
0.035	0.032	0.027

1 Maximum Gradient a recomendation for typical installations.
2 Hydraulic thresholds compliant with ASTM D6459/D6460 but generalized for typical applications.
3 Vegetated values dependent on established stand of vegetation

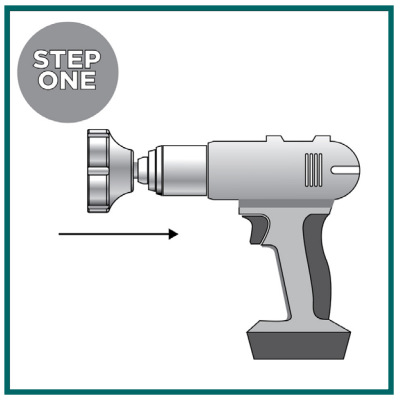
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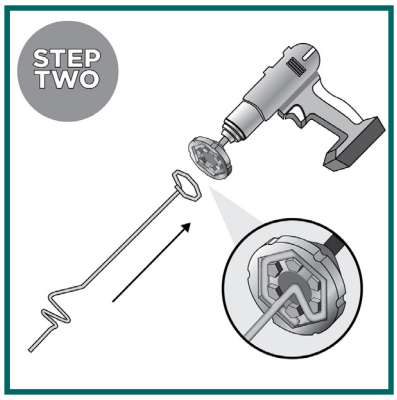
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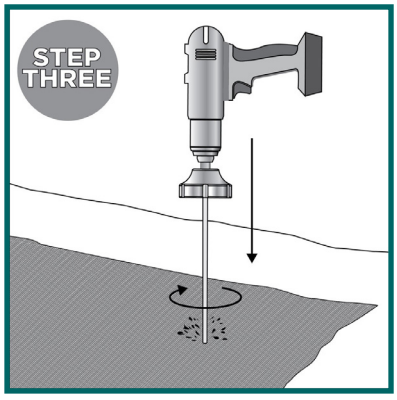
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FALCON PINS™









Installation Made Easy with Falcon Hex Pins™

The Falcon Hex Pins are an innovative fastener providing significantly greater pullout resistance than typical straight pins or staples. Available in configurations specialized for different soil types, the Falcon Hex Pins improve pullout performance in soft or sandy soils, as well as compact, cohesive soils.

Falcon Hex pins install using a cordless hand drill with our custom installation chuck or a standard 1.5” hex socket.

Step 1: Insert the custom chuck or a standard 1.5 inch hex socket into a hand drill.

Step 2: Place the Falcon Hex Pin into the hex socket. Ensure no debris is on the twist pin before installing.

Step 3: Place the end of the Falcon Hex Pin through the erosion control matting before engaging the drill. Install the pin with slight pressure until the pin is fully installed.

Step 4: A properly installed Hex pin will impart a slight depression on the erosion control matting. If using lightweight netted matting, edge installation

Which Falcon Hex Pin do I need?

It is easy to remember which Falcon Hex Pin to select based on your project soils. Each coil configuration is available in 8” and 12” lengths.

HS - Hex Pin for Soft, Sandy, Silty soils

HC - Hex Pin for Cohesive, Compact, Clay soils

HR - Hex Pin for Hard, Rocky soils



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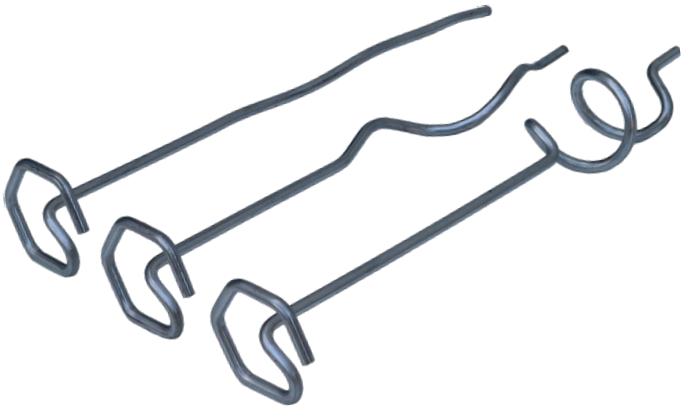
FALCON PINS™

Advancing Anchoring with Falcon Pins by Western Green

The Falcon Hex Pins are an innovative fastener providing significantly greater pullout resistance than typical straight pins or staples. Available in configurations specialized for different soil types, the Falcon Hex Pins improve pullout performance in soft or sandy soils, compact, cohesive soils and even hard, rocky soils. These specialized pin configurations allows for better tie down of seams, simple simulated check trench construction and replacement of more costly hardware in some instances.

Falcon Hex Pins can be used in conjunction with any RECP, however they are ideally suited to TRM tie down. The large diameter head gives ample catch without the need for additional washers. Falcon Hex Pins are more reliable and provide greater confidence in blanket or TRM tie down.

Start specifying with our complete line of hex twisted pins, to reach your erosion and slope stabilization goals.



The unique hexagonal head of the Falcon Pins allow for easy installation with a hand drill. The unique coil shapes are designed for optimum pull-out strength in varying soil types.



INSTALLATION FEATURES OF THE FALCON HEX PINS

- **Galvanized for longer life, and more durable that wire fasteners**
- **Falcon Hex Pins are installed using a hand drill with either a custom chuck or a standard 1.5” Hex socket. Installing the fasteners is quick and easy.**
- **Manufactured in the USA, can be used on ARRA projects.**



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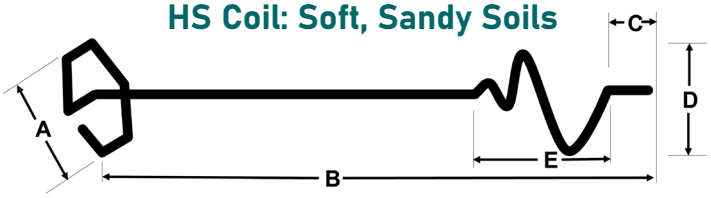
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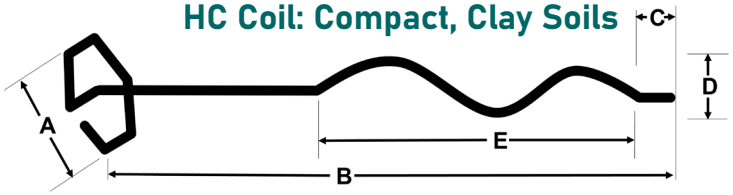
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Falcon Hex Pins Designed for Performance

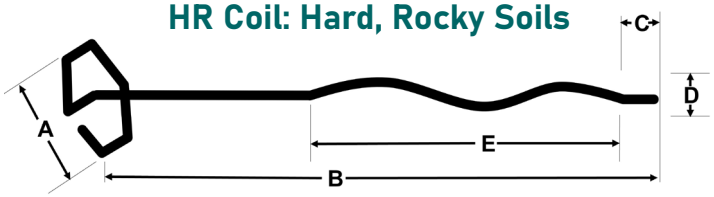
HS Coil: Soft, Sandy Soils



HC Coil: Compact, Clay Soils



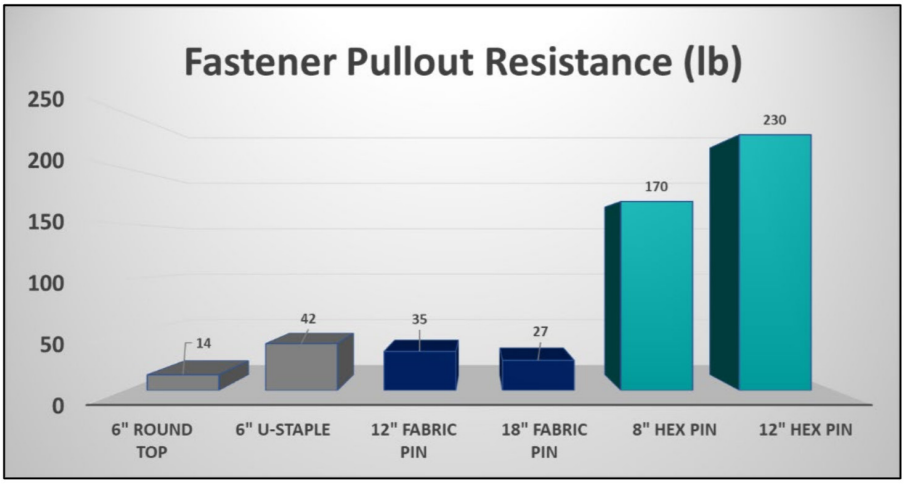
HR Coil: Hard, Rocky Soils

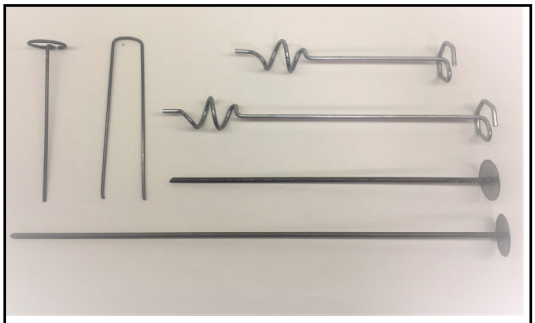


Dimensions		HS-8	HS-12	HC-8	HC-12	HR-8	HR-12
Hex Diameter (A)	in (cm)	1.5 (3.8)	1.5 (3.8)	1.5 (3.8)	1.5 (3.8)	1.5 (3.8)	1.5 (3.8)
Pin Length (B)	in (cm)	8.0 (20)	12.0 (30)	8.0 (20)	12.0 (30)	8.0 (20)	12.0 (30)
Tail Length(C)	in (cm)	0.5 (1.3)	0.5 (1.3)	0.5 (1.3)	0.5 (1.3)	0.5 (1.3)	0.5 (1.3)
Coil Diameter (D)	in (cm)	1.3 (3.2)	1.3 (3.2)	1.0 (2.6)	1.0 (2.6)	0.3 (0.7)	0.3 (0.7)
Coil Length (E)	in (cm)	2.5 (6.4)	2.5 (6.4)	3.0 (7.6)	3.0 (7.6)	3.0 (7.6)	3.0 (7.6)

Soil-Specific Pullout Resistance Performance

In comparison to other fasteners, Falcon Hex Pins provide up to ten times the pullout resistance of other fasteners. Typically, a minimum of 25-50 pounds of pullout resistance is required for a TRM installation. In soil soils, staples or straight pins may only provide 10-15. Falcon Hex Pins make these projects viable with greater than sufficient pullout in poor soils.





Falcon Hex pins show superior strength compared to other standard fasteners. Pullout resistance will vary based on soil type. A pullout test should be conducted to verify strength. A minimum 20 lbs pullout resistance is recommended for use with rolled erosion control products.

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Appendix H
Rip Rap Calculation

Riprap calculation for Outlet 4 channel:

Using the Geoweb channel:

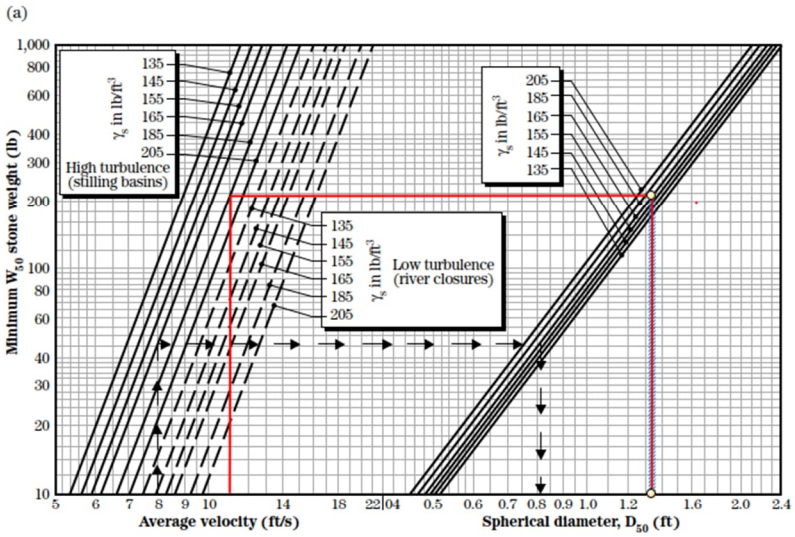
Selected manning: 0.025

INPUT PARAMETERS				
English or Metric (E or M)	M		Coefficient, Cm	Gravity
			1.00	9.806
Channel Lining System			Typical Kb Values	
Invert:	Vegetation		Straight Reach: 1.0	
Sides:	Vegetation		Mild Meandors: 1.1 to 1.4	
Kb (Bend Coefficient)	1.20		Looping Meandors: 1.5 to 1.8	
Max Discharge (m3/s)	2.50		Sharp Turns: 1.9 to 2.1	
Bed Slope, %	35.00		Typical N Values for Lined Channel	
Depth (m)	0.30		Concrete Rough = 0.018 to 0.027	
Manning's Coefficient Invert	0.025		Aggregate Firm = 0.023 to 0.035	
Manning's Coefficient Side Slopes	0.025		Vegetated w/Grass & Weeds = 0.025	

Max Channel Velocity for 100yr storm event: 3.2 m/s → 10.5 ft/sec

Using Graphical Solution for Isbash technique

Figure TS14C–6 Graphical solution for Isbash technique



Basic equations :

$$V_c = C\left[2g\left(\frac{\gamma_s - \gamma_w}{\gamma_w}\right)\right]^{\frac{1}{2}} (D_{50})^{\frac{1}{2}}$$

$$D_{50} = \left(\frac{8W_{50}}{\pi\gamma_s}\right)^{\frac{1}{3}}$$

where:
- V = Velocity, ft/s
- γ_s = Specific stone weight, lb/ft^3
- γ_w = Specific weight of water, 62.5 lb/ft^3
- W_{50} = Weight of stone, subscript denotes Percent of total weight of material containing stone of less weight
- D_{50} = Spherical diameter of stone having the same weight as W_{50}
- C = Isbash constant (0.86 for high turbulence level flow and 1.20 for low turbulence level flow)
- g = Acceleration of gravity, ft/s^2

Stone stability velocity vs. stone diameter

Hydraulic design chart 712–1 (Sheet 1 of 2)

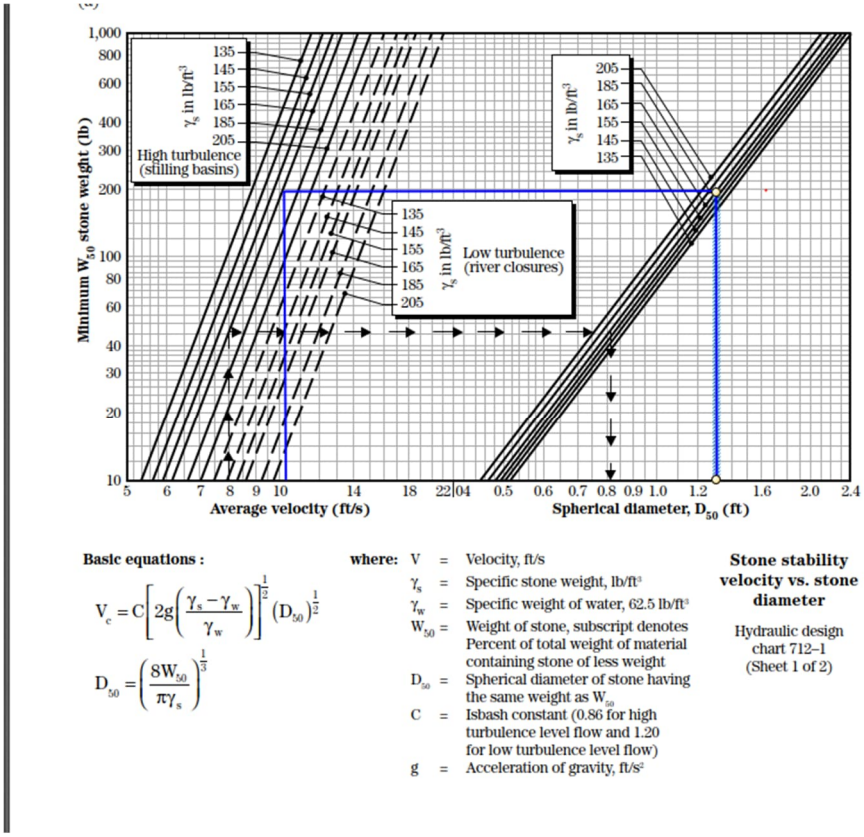
Assumption: specific gravity of stone 2.65 → converts to 165 1b/ft^3

D_{50} =1.4 ft→ 450 mm

D_{max}: 1.5 xD_{50}=600 mm

Depth: 2 xD_{max} = 600 x 2 = 1200 mm

Riprap calculation for Outlet 2 channel:



Basic equations :

$$V_c = C\left[2g\left(\frac{\gamma_s - \gamma_w}{\gamma_w}\right)\right]^{\frac{1}{2}} (D_{50})^{\frac{1}{2}}$$

$$D_{50} = \left(\frac{8W_{50}}{\pi\gamma_s}\right)^{\frac{1}{3}}$$

where: V = Velocity, ft/s
γ_s = Specific stone weight, lb/ft^3
γ_w = Specific weight of water, 62.5 lb/ft^3
W_{50} = Weight of stone, subscript denotes Percent of total weight of material containing stone of less weight
D_{50} = Spherical diameter of stone having the same weight as W_{50}
C = Isbash constant (0.86 for high turbulence level flow and 1.20 for low turbulence level flow)
g = Acceleration of gravity, ft/s^2

Stone stability velocity vs. stone diameter

Hydraulic design chart 712–1 (Sheet 1 of 2)

Max Velocity: 3.1 m/s → 10.2 ft/sec

D_{50}=1.3 ft → 400 mm→ used 450 mm

D_{max}=600mm

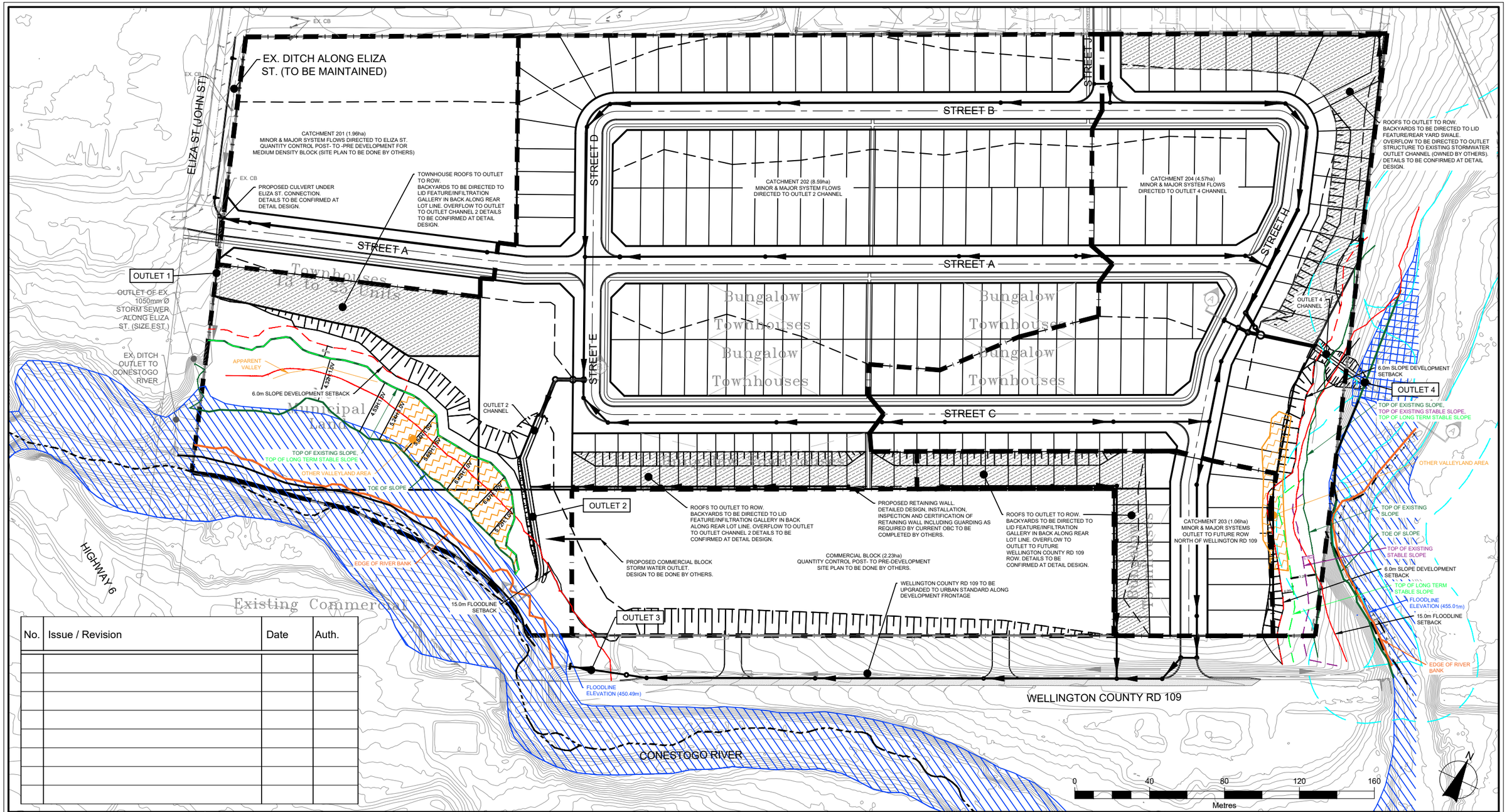
Depth: 2 xD_{max}= 600 x 2 = 1200 mm

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Drawings

Appendix D



No.	Issue / Revision	Date	Auth.

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LEGEND

- SITE PROPERTY LINE
- EDGE OF RIVERBANK (CMT)
- TOP/TOE OF EXISTING SLOPE (CMT)
- TOP OF EXISTING STABLE SLOPE (CMT)
- TOP OF LONG TERM STABLE SLOPE (CMT)
- 6.0 m SLOPE DEVELOPMENT SETBACK (CMT)
- FLOOD LINE LIMIT (GRCA)
- 15.0 m FLOOD LINE SETBACK (RJB)
- PROPOSED CATCHMENT BOUNDARY LINE
- WATERCOURSE (GRCA)
- WETLAND (NRSI)
- WETLAND BUFFER (NRSI)
- ENGINEERED REGULATED FLOODPLAIN (GRCA)
- ESTIMATED REGULATED FLOODPLAIN (GRCA)
- OTHER VALLEYLAND (CMT)
- 3:1 GRADING (MAX)
- PROPOSED STORM SEWER MANHOLE

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web www.rjburnside.com

Client

SARAH PROPERTIES LIMITED

211 ELIZA STREET TOWNSHIPE OF WELLINGTON NORTH (ARTHUR, ONTARIO)
ARTHUR, ON
N0G 1A0

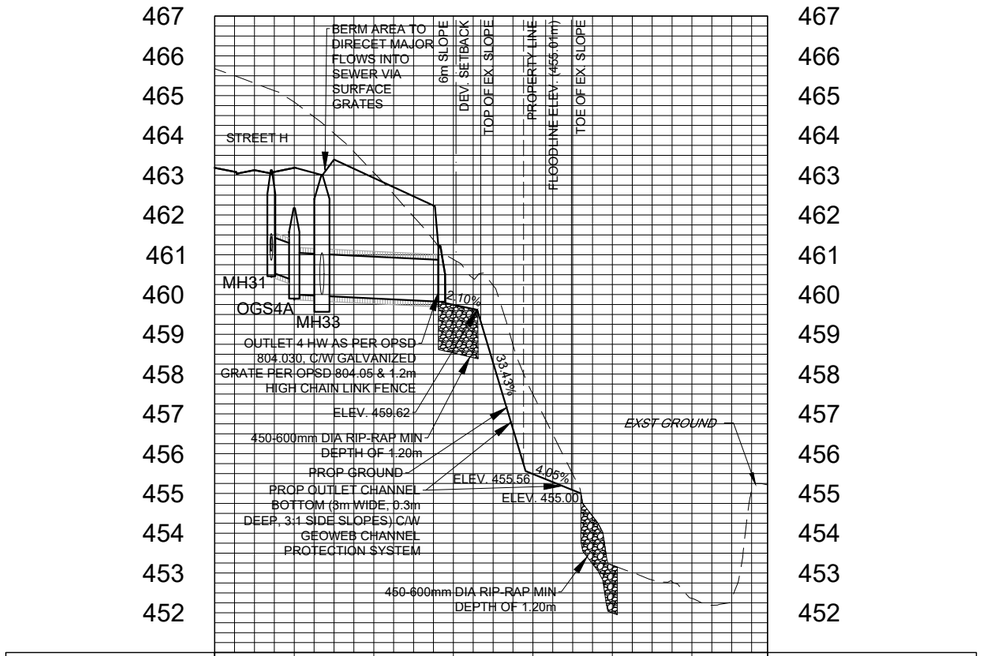
Drawing Title

211 ELIZA DEVELOPMENT TOWNSHIP OF WELLINGTON NORTH (ARTHUR, ONTARIO)

STORM WATER MANAGEMENT PLAN

Drawn	Checked	Date	Drawing No.
A.T.	S.R.	DECEMBER 2024	01
Scale		Project No.	
1:2000		042585	

File: U:\042585\2000\03-PRD\042585 - SWM.dwg Date Plotted: December 18, 2024 - 3:20 PM

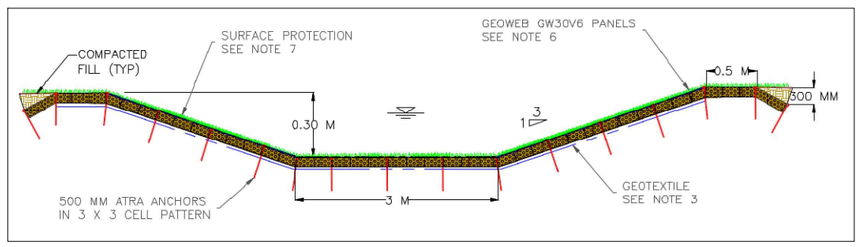


EXIST\PROP CENTERLINE ELEVATION	463.19	463.185	463.18	463.184	462.93	462.932	459.74	459.743	455.49	455.489			EXIST\PROP CENTERLINE ELEVATION
CHAINAGE		0+000		0+020		0+040		0+060		0+080	0+100	0+120	0+139.04 CHAINAGE

OUTLET 4 - SECTION A-A

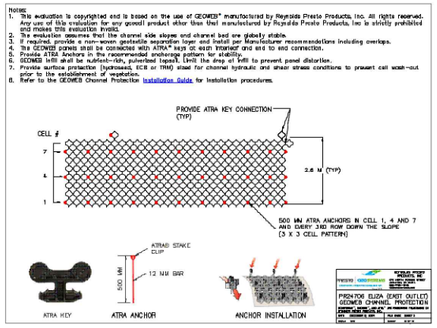
EXIST\PROP CENTERLINE ELEVATION	460.58	460.349	459.75	460.349	458.70	459.407	457.10	456.361	455.66	454.839	454.31	453.317	452.75	451.794	451.60	451.503	448.16		EXIST\PROP CENTERLINE ELEVATION
CHAINAGE		0+000		0+020		0+040		0+060		0+080		0+100		0+120		0+140		0+160	0+173.10 CHAINAGE

OUTLET 2 - SECTION B-B



CROSS-SECTION OF OUTLET CHANNEL 2 AND 4

SEE APPENDIX G OF STORMWATER MANAGEMENT REPORT (DEC 2024) FOR FURTHER SPECIFICATIONS



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Client
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ARTHUR, ON
N0G 1A0

Drawing Title
211 ELIZA DEVELOPMENT
TOWNSHIP OF WELLINGTON NORTH (ARTHUR, ONTARIO)
OUTLET 2 & 4 PROFILES AND DETAILS

Drawn	Checked	Date	Drawing No.
A.T.	S.R.	DECEMBER 2024	02
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1:1500		042585	

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