

# HYDRAULIC REPORT

VOLUME 2

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## IL ROUTE 47 Culvert/Bridge over Blackberry Creek IL ROUTE 47 AND MAIN ST. INTERSECTION IMPROVEMENTS

IDOT PROJECT NUMBER

**P-91-449-09**

PTB 152/14

**ELBURN**

**KANE COUNTY, IL**

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**STRUCTURE NUMBER:**

EXISTING SN: 045-2000

PROPOSED SN: 045-2050

**PREPARED FOR**



**Illinois Department  
of Transportation**

**DATE**

8/28/2014

**PREPARED BY**



**Globetrotters®**  
Engineering Corporation

300 S. Wacker Drive, Suite 400  
Chicago, IL 60606

# 15 Hydraulic Analysis

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The Waterway Information Tables and backup calculations for all of the models are included under their respective Group section. The HEC-RAS models enclosed in this section show the required output. The output included is a Plan View, Profile View, all Standard Output Tables, lists of errors and warnings, and the HEC-RAS Input report.

## **15.1 Group #1 Supporting Calculations (Design Models)**

## **15.2 Group #2 Supporting Calculations (Design Models)**

## **15.3 Group #3 Supporting Calculations (Permit Models)**

## **15.4 Group #4 Supporting Calculations (Permit Models)**

## Section 15 HEC\_RAS Model Development

The effective FEMA HEC-RAS model developed for the Blackberry Creek Watershed study was used as a base model to further examine the hydraulic properties of the Route 47 culvert. The base model was initially analyzed to insure that the Water Surface Elevations (WSE) generated matched those printed in the USGS report. The model was then trimmed down to include only those cross-sections within 2000 feet upstream or downstream of the Route 47 culvert and Main Street Bridge (Hydraulic Analysis 15.3.5 Duplicate Model). Due to the close proximity of the Main Street Bridge to the Route 47 culvert, several different models had to be generated to properly analyze the natural, existing, and proposed conditions. The WSE's at RS136804 and RS140600 of the effective model results were used for the boundary conditions in all of the models analyzed. Manning's coefficients were initially based on the effective model for consistency. A visual inspection in the field verified the continued use of those coefficients used in the FIS model. However, in the "design" models these coefficients were modified slightly in an attempt to match the effective model WSE's.

Group #1 and #2 models (Design Models) use the recently surveyed cross-sections and structure information. The starting and ending river stations (RS) (RS136804 and RS140600) from the FIS duplicate model were inserted into the model. Several attempts were made to modify the Group #1 existing model based on new survey data to match the WSE's of the FIS duplicate model within the acceptable difference of 0.1 feet for all frequencies. The model WSE's were close to matching upstream of the existing Main St. bridge and Route 47 culvert. However, significant differences in WSE's of -0.5 to -1.0 feet between the design and duplicate model downstream of the Main St. structure dictate that "design" and "permit" models need to be analyzed separately (See Hydraulic Analysis 15.1.AA).

Group #3 models (Permit Models) are based on the effective model and contain the original cross-sections surveyed for that study. In the effective model the Route 47 structure was originally modeled as a bridge. This "bridge" geometry was changed to reflect the current culvert geometry. The WSE's between Group #3 existing conditions and the FIS duplicate model closely matched (See Hydraulic Analysis 15.3.AA). In Group #3 River Station (RS) 139658 was changed to 139750 due to inconsistencies between RS and actual channel length. RS 139658 is located close to the culvert/bridge in Group #3, but was given a longer reach length to use it as an approach section for the Route 47 structure.

Group #4 models (Permit Models) follow the setup of the Group #3 models, except for the use of the proposed Main St bridge geometry and cross-sections. The proposed profile of Main St. is also used in the analysis (See Hydraulic Analysis 15.4).

Group #1 models analyze the stream system with the existing Main St. bridge geometry and a case for the proposed Route 47 3-sided Arch culvert/(Route 47 Bridge, Alternate option). Whereas, Group #2 models analyze the different conditions (natural, existing, proposed) with the proposed Main St. bridge geometry in place for each condition. In Group #2 models the proposed Main St. bridge geometry and bounding cross-sections were matched with the geometry provided by EXP (Formerly TENG and Associates) (Section 12 – Bridge Layout). Group #3 represents the permit condition where the Duplicate Model is corrected with the existing Route 47 culvert geometry for existing conditions and the

proposed Route 47 3-sided Arch culvert /(Bridge) geometry for proposed conditions. Group #4 represents the permit condition where the proposed Main St. bridge geometry is used for the natural, existing, and proposed conditions; showing the FIS results in using both proposed Main St. and Route 47 structures.

### **Section 15 HEC\_RAS Summary of Results**

The original Blackberry Creek model is included with the other models on the enclosed disk. However, the model only runs properly in HEC-RAS version 3.1.3 due to various methodologies that do not work with version 4.1.0. The original model is included for reference purposes only.

The four groups of WITs for the hydraulic report are as follows:

- Á Group #1 – Existing Main St geometry and updated Route 47 Culvert geometry (Natural, Existing, and Proposed Models).
- Á Group #2 – Proposed Main St. geometry and Route 47 Arch Culvert geometry (Natural, Existing, and Proposed Models).
- Á Group #3 – FIS survey data only with existing Route 47 Arch Culvert geometry (Natural, Existing, and Proposed Models).
- Á Group #4 – FIS survey data only with proposed Main St. Bridge and proposed Route 47 Arch Culvert geometry.
- Á (All of the groups listed above include an analysis for the Route 47 Bridge alternate)

The following summarizes the assumptions made in the HEC-RAS hydraulic modeling:

- Á Manning's Coefficients are consistent with those used in the USGS modeling
- Á Effective FEMA flows were used for the 10, 50, 100, and 500-year storm events
- Á Upstream and Downstream WSEs were taken from the USGS base HEC-RAS Model.
- Á Contraction Ratio 1:1 and Expansion Ratio of 3:1 were used for both structures (Route 47 Bridge and Main St. Bridge for Groups #1 and #2). Contraction/expansion coefficients used were 0.3/0.5 at the bounding cross-sections.
- Á Ineffective flow locations were located at the cones of contraction and expansion for both structures.
- Á The interpolated cross-section for 139757 in the Design models was modified using 2' contour data and interpolation of surveyed data.

The analysis of Group #1 model indicates that 0.32 feet of backwater was created on the existing Route 47 culvert for the base flood. The Group #2 model indicates that 0.51 feet backwater was created on the existing Route 47 culvert for the base flood. The difference in backwater of 0.19 feet for the base flood indicates that Route 47 culvert influences WSE upstream of the culvert. However, the natural HWE is greatly reduced with the proposed Main Street bridge in Group #2, suggesting that both structures negatively influence the upstream WSE. In Group #3 (permit model) the existing Route 47 culvert created 0.40 feet of backwater for the base flood and 0.44 feet of backwater for the design



flood. In Group #4 (permit model) the existing Route 47 culvert created 0.72 feet of backwater for the base flood and 0.44 feet for the design flood.

The replacement of the Route 47 culvert with the proposed 3-sided arch culvert structure effectively reduces the created headwater by 0.18 feet for the base flood event in Group #1. The 500-year event saw an increase in created headwater since the Route 47 profile was increased and no overtopping was allowed.

In Group #2 the analysis indicates that the 3-sided arch culvert increases the headwater by 0.42 feet for the base flood from the natural water elevation. However, the created head is much lower than the existing conditions. The overall BFE is 728.86 feet which is 0.17 feet lower than the FIS BFE of 729.03 feet. The Group #2 design flood event creates 0.24 feet of backwater on the proposed culvert. The 500-yr flood is above the soffit of the proposed culvert by 0.25 feet. The proposed culvert structure has 5.41 feet of freeboard in the design flood event.

There was also an analysis for Group #2 where the Main St bridge was removed for natural conditions (No WIT were made for this case, the results were tabulated after the G#2 WIT). The effect of removing the Main St bridge from the modeling showed that the created head for the 50-yr event proposed conditions was 0.28 feet. When compared with the model where the proposed Main St. bridge was used in the natural conditions the created head for the 50-yr event was 0.27 feet. These results show that the Main St. bridge does still influence the headwater at the Route 47 crossing in the proposed condition. However, overall created head is lower than the existing condition for all events except for the 500-yr. The 500-yr event shows higher created head due to a higher roadway profile than existing conditions. In existing conditions the 500-yr overtops both Route 47 and Main St. The results shown below are extracted from tables shown after the 15.2.A WIT tables.

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head
Main Before D	139757	Q10	726.07	726.20	0.13	726.26	0.19
Main Before D	139757	Q50	727.38	727.86	0.48	727.66	0.28
Main Before D	139757	Q100	727.88	728.63	0.75	728.21	0.33
Main Before D	139757	Q500	728.99	729.44	0.45	729.53	0.54
Main Before D	139757	Q10	726.33	726.45	0.12	726.50	0.18
Main Before D	139757	Q50	727.91	728.39	0.48	728.15	0.27
Main Before D	139757	Q100	728.44	728.95	0.51	728.86	0.42
Main Before D	139757	Q500	729.88	729.92	0.04	730.45	0.57

No Main St. Bridge modeled in Natural, Existing, and Proposed cond.

Pr. Main St. Bridge modeled in Natural, Existing, and Proposed cond.

In Group #3 the culvert created 0.24 feet of headwater with an elevation of 728.86 feet for the base flood and 0.18 feet for the design flood with an elevation of 728.18. The 500-year flood elevation is 731.02 feet which is higher than the soffit elevation of 730.2 feet. The proposed culvert structure has 5.38 feet of freeboard for the design flood event.

In Group #4 the culvert created 0.23 feet of headwater for the base flood with an elevation of 728.51 and 0.15 feet for the design flood from natural conditions with an elevation of 727.94. The 500-year flood elevation is 730.02 feet which is lower than the soffit elevation of 730.2 feet. The proposed culvert structure has 5.62 feet of freeboard for the design flood event.

### **Alternate Route 47 Bridge Option Analysis**

The alternate option that was analyzed in this report was the use of a single span open abutment bridge with steel beams. The geometry of this bridge would be 62 feet long with a span of 76 feet. The bridge structure is analyzed to assess the feasibility of a bridge structure in-lieu of an 3-sided arch culvert structure and what impacts it would have on the profile and flood waters of Blackberry Creek.

The replacement of the Route 47 culvert with the proposed bridge structure effectively reduces the created backwater to 0.10 feet and 0.08 feet for the 10 and 50-yr events in Group #1. The 100-yr created head was 0.04 feet. The base flood elevation upstream of the proposed structure is 728.76 feet, which is 0.34 feet lower than the FIS BFE of 729.10 feet. The proposed freeboard is calculated to be 4.18 feet and the clearance is 2.06 feet for the design (50-yr) flood.

In Group #2 the analysis indicates that the bridge increases the headwater by 0.27 feet for the base flood. However, the created head is much lower than the existing conditions (0.65 feet). The BFE is 728.76 feet which is 0.34 feet lower than the FIS BFE of 729.10 feet. The Group #2 design flood event creates 0.10 feet of headwater on the proposed bridge. The proposed freeboard for the design flood is 6.05 feet and the clearance is 2.19 feet. The 500-yr flood will create a pressure flow situation on the structure and may require the foundations to be set much lower than designed to account for possible scour. See scour analysis section for more information.

In Group #3 the bridge created 0.09 feet of headwater for the base flood and 0.08 feet for the design flood from natural conditions. The proposed bridge structure has 6.02 feet of freeboard and 2.10 feet of clearance for the design flood event.

In Group #4 the bridge created 0.13 feet of headwater for the base flood with an elevation of 728.41 and 0.10 feet for the design flood from natural conditions with an elevation of 727.89. The 500-year flood elevation is 729.68 feet which is lower than the low chord elevation of 730.1 feet. The proposed bridge structure has 6.21 feet of freeboard and 2.31 feet of clearance for the design flood event.

The replacement of the Route 47 structure is proposed to be with a 3-sided arch culvert. The primary benefit of using the 3-sided arch culvert structure instead of the open abutment bridge structure is that the required profile increase for Route 47 will be less than the bridge option. The result will be less fill inside floodway areas and will require there to be less compensatory storage provided. The former debris issues experienced with previous 4-cell box culvert will be reduced as the Arch provides an “open” channel that will not readily collect debris carried by Blackberry Creek during flood events. The cost of the 3-sided arch culvert is substantially lower and takes considerably less time to construct than the bridge. The time savings is important as Kane County wants the least amount of detour routing as possible because of the heavy traffic within this corridor. The potential issue with the 3-sided arch culvert could be related to the bearing capacity of the underlying soil and deeper spread foundation needs to prevent failure due to abutment scour (see results in Volume 1: Section 16 - Scour Analysis Section).

The Route 47 3-sided Arch Culvert (Group #2 Results):

- Á Clearance not required for culverts:
- Á Meets the freeboard criteria
  - Á Overtopping elevation = 733.56 (Lowest edge of pavement at floodplain limits)
  - Á 50-year headwater elevation = 728.15
  - Á Freeboard = 5.41 feet (greater than 3 feet)

The alternate bridge option analyzed with this report will have a positive effect on the hydraulics of Blackberry Creek. The proposed changes of this alternate design should allow the 100-year event to be safely conveyed through both structures without the inundation of the intersection of Route 47 and Main Street. One drawback to using the Route 47 bridge design is the significant increase of the profile grades for both Route 47 and Main Street. The increases in profile are driven by the required low chord elevation of the Route 47 Bridge (to provide 2' clearance) and the required thickness of bridge deck necessary to free span 76 feet. The other issues are substantial cost and construction time compared to the 3-sided arch culvert. The proposed open abutment bridge design will be able to service the future needs of the stream as upstream areas continue to urbanize. The former debris issues present with the existing culvert design should be non-existent as there are no proposed piers or obstructions to be placed in the channel of Blackberry Creek.

The Route 47 Bridge: (Group #2 results)

- Á Clearance requirement:
  - Á Low Chord Elevation = 730.10
  - Á 50-year natural headwater elevation = 727.81
  - Á Clearance =  $730.1 - 727.81 = 2.29$  feet (greater than 2 feet)
- Á Meets the freeboard criteria:
  - Á Overtopping elevation = 734.1 (Lowest edge of pavement at floodplain limits)
  - Á 50-year headwater elevation = 728.08
  - Á Freeboard = 6.05 feet (greater than 3 feet)

## **15.1 Group #1 Supporting Calculations (Design Models)**

- 15.1.A Group #1 WIT- Arch Culvert option, Backup Calculations, and Waterway opening Plot
- 15.1.i Group #1 WIT- Bridge option, Backup Calculations, and Waterway opening Plot
- 15.1.AA Water Surface Elevation Comparison Table between G#1 Existing and Duplicate FIS Model
- 15.1.1 Natural Condition HEC-RAS Model
- 15.1.2 Existing Condition HEC-RAS Model
- 15.1.3 Proposed IL47 Arch Condition HEC-RAS Model
- 15.1.4 Proposed IL47 Bridge Culvert Condition HEC-RAS Model

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #1 WIT (Existing Main Street Bridge Geometry in place, Existing Culvert and Proposed Arch under 47)

Route: IL Route 47	Existing S.N.: 045-2000
Waterway: Blackberry Creek - Main before D	Proposed S.N.: 045-2050
Section: 107B-I-1	Prepared By: SJS Date: Sep-14
County: Kane	Checked By: DH Date: Sep-14

Drainage Area =	11.3 sq mi	Existing Overtopping Elevation =	729.53 at Sta. 501+17								
		Proposed Overtopping Elevation =	733.97 at Sta. 501+17								
Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.		Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
	10	634	634	203.2	313.2	726.35	726.35	0.07	0.15	726.42	726.50
DESIGN	50	1120	1120	203.2	377.8	728.04	728.04	0.38	0.11	728.42	728.15
BASE	100	1376	1376	203.2	402.6	728.72	728.72	0.32	0.14	729.04	728.86
MAX. CALC.	500	2097	2097	957.0~	430.5	730.11	730.11	0.00	0.34	729.85	730.45

**Datum:** NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
 Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.14 ft/s  
 10 YEAR VELOCITY THROUGH PROPOSED ARCH = 2.02 ft/s  
 2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

### EXISTING STRUCTURE

**TYPE:** RC Box Culvert  
**LENGTH/WIDTH:** (2) 6.5' x 8.75' & (2) 6.5'x10.42'  
**# SPANS/CELLS:** 4  
**SKEW :** 0 (relative to road)  
**LOW EOP:** 728.59 @ 501+17 20' RT  
**FREEBOARD:** 0.17 ft  
**CULVERT INV.** 718.38 (U/S) 718.25 (D/S)

**NOTES:** Proposed structure details are preliminary. Subject to refinement in TS&L stage.

Waterway openings are based on the natural H.W.E.

Natural HWE taken from cross-section 139757 in Group #1 Natural Conditions model.

The existing head is the difference in water surface elevations between existing and natural conditions.

The proposed head is the difference in water surface elevations between proposed and natural conditions

The freeboard is calculated from the edge of the proposed shoulder at 500+17

Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.

~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

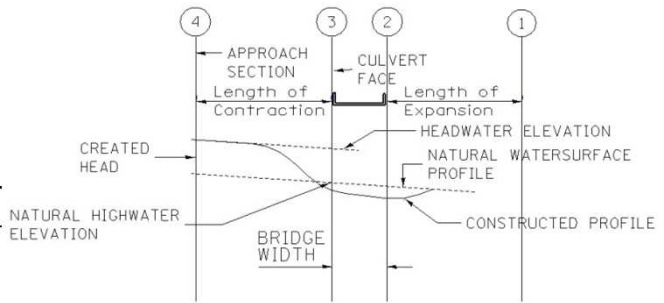
### PROPOSED STRUCTURE

**3-SIDED CULVERT TYPE:** Pre-Cast Concrete Arch  
**LENGTH OF SPAN:** 54'  
**# CELLS:** 1  
**TOP OF CROWN ELEVATION:** 731.36  
**SKEW :** 0 (relative to road)  
**FLOWLINE ELEV:** 718.63 (u/s) 718.52 (d/s)  
**LOW EOP:** 733.52 @ 501+17 60' RT  
**FREEBOARD:** 5.41 ft

**BACKUP CALCULATIONS: Group #1 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14  
 Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.3	726.35	726.35
50-year	727.96	728.04	728.04
100-year	728.52	728.72	728.72
500-year	730.00	730.11	730.11

Section #1 : 139512+  
 Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sup>3</sup>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	726.42	726.5	0.07	0.15
50-year	728.04	728.42	728.15	0.38	0.11
100-year	728.72	729.04	728.86	0.32	0.14
500-year	730.11	729.85	730.45	-0.26	0.34

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	0.07	0.15	726.42	726.50
50-year	728.04	0.38	0.11	728.42	728.15
100-year	728.72	0.32	0.14	729.04	728.86
500-year	730.11	-0.26	0.34	729.85	730.45

<sup>1</sup> Natural Condition - Group #1 - Natural Conditions HEC-RAS Model.  
<sup>2</sup> Existing Condition - Group #1 - Existing Conditions HEC-RAS Model.  
<sup>3</sup> Proposed Condition - Group #1 - Proposed Condition HEC-RAS Model.  
 + Section numbers listed at the top right represent stream stations in feet.

**BACK-UP CALCULATIONS FOR WIT: Group #1 (continued)**

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
7.06	5.41	4.70	3.11
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
N/A	N/A	N/A	N/A

CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25	718.63	718.52
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.2	313.2	
50-YR	203.2	377.8	
100-YR	203.2	402.6	
500-YR	957.0	430.5	

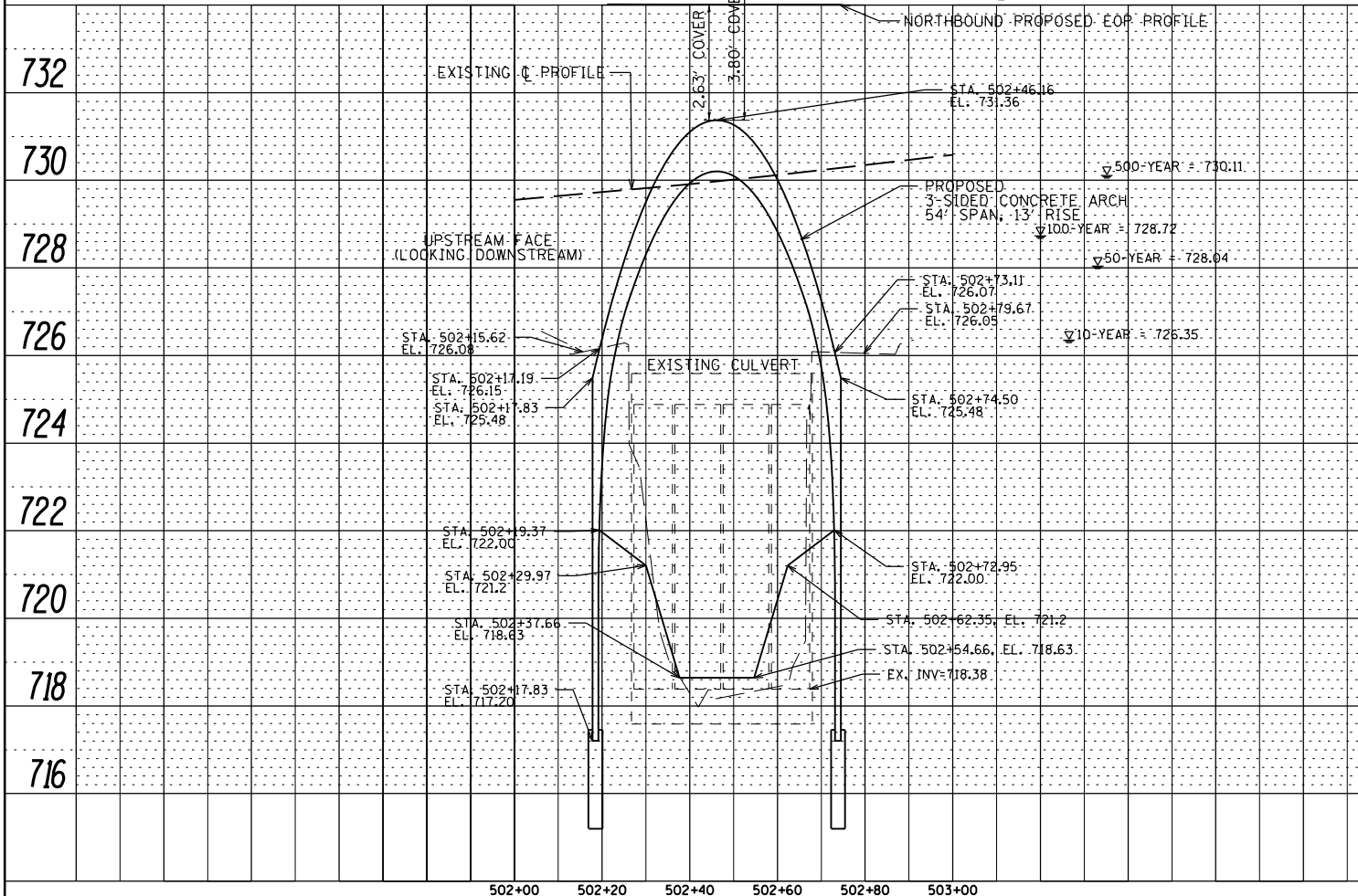
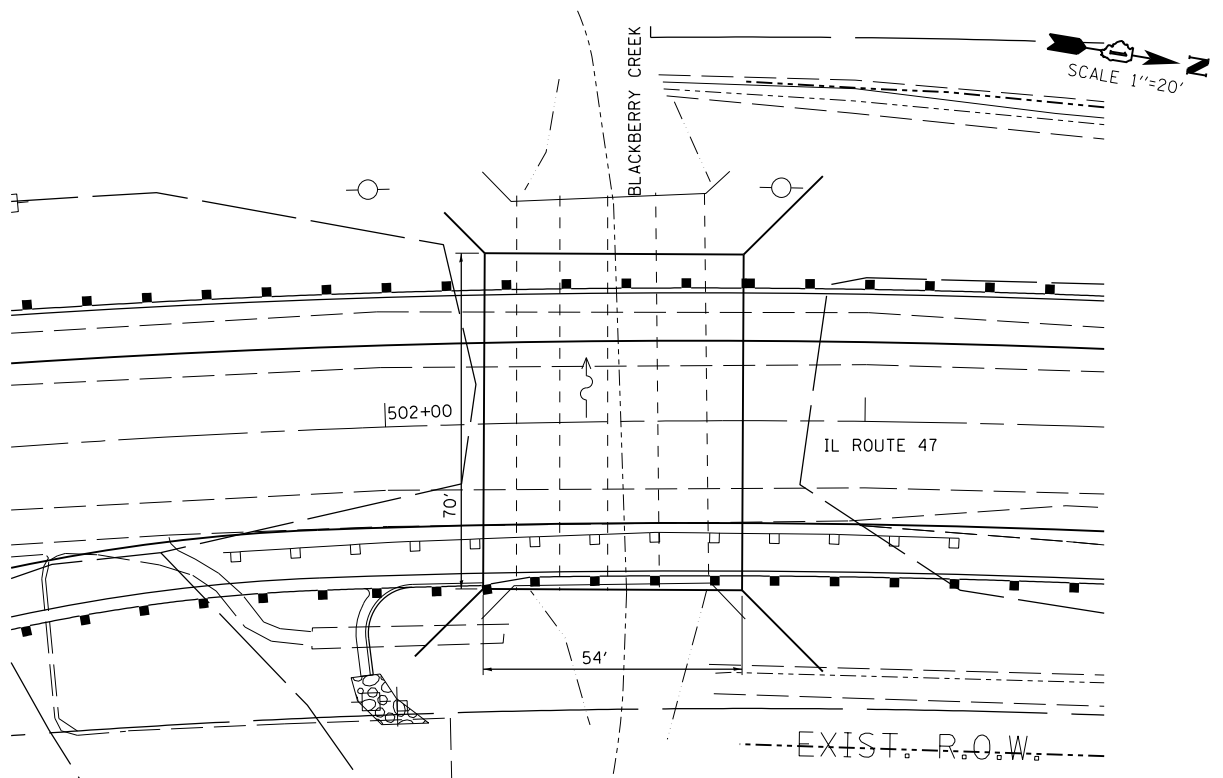
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.

Areas are measured in Microstation

PLAN	CHECKED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	

PROFILE	CHECKED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\0144909-sht-drain-struct-plnprf-EX-2-CONS		DRAWN -	REVISED -
		CHECKED -	REVISED -
		DATE -	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION



**Created Head - G#1 - Existing/Proposed Conditions - (Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.15	729.15	0.00	729.15	0.00
Main Before D	140616		727.71	727.73	0.02	727.74	0.03
Main Before D	140504		727.54	727.55	0.01	727.57	0.03
Main Before D	140133		727.07	727.1	0.03	727.14	0.07
Main Before D	139757		726.35	726.42	0.07	726.50	0.15
Main Before D	139653		726.38	726.4	0.02	726.50	0.12
Main Before D	139628				726.36		
<hr/>							
Main Before D	141476	50-yr	730.16	730.21	0.05	730.17	0.01
Main Before D	140616		729.01	729.18	0.17	729.05	0.04
Main Before D	140504		728.85	729.05	0.20	728.90	0.05
Main Before D	140133		728.47	728.75	0.28	728.55	0.08
Main Before D	139757		728.04	728.42	0.38	728.15	0.11
Main Before D	139653		728.04	728.34	0.30	728.10	0.06
Main Before D	139628				728.26		
<hr/>							
Main Before D	141476	100-yr	730.64	730.7	0.06	730.67	0.03
Main Before D	140616		729.58	729.75	0.17	729.66	0.08
Main Before D	140504		729.43	729.62	0.19	729.52	0.09
Main Before D	140133		729.09	729.33	0.24	729.20	0.11
Main Before D	139757		728.72	729.04	0.32	728.86	0.14
Main Before D	139653		728.72	729.04	0.32	728.79	0.07
Main Before D	139628						
<hr/>							
Main Before D	141476	500-yr	731.83	731.75	-0.08	731.95	0.12
Main Before D	140616		730.9	730.75	-0.15	731.14	0.24
Main Before D	140504		730.76	730.6	-0.16	731.01	0.25
Main Before D	140133		730.43	730.22	-0.21	730.72	0.29
Main Before D	139757		730.11	729.85	-0.26	730.45	0.34
Main Before D	139653		730.1	729.84	-0.26	730.32	0.22
Main Before D	139628						

Natural condition contains Existing Main St structure with 47 culvert removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

**Created Head - G#1 - Existing/Proposed Conditions - 10-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.15	729.15	0.00	729.15	0.00	729.15	0.00
Main Before D	140616	Q10	727.71	727.73	0.02	727.74	0.03	727.73	0.02
Main Before D	140504	Q10	727.54	727.55	0.01	727.57	0.03	727.56	0.02
Main Before D	140133	Q10	727.07	727.1	0.03	727.14	0.07	727.12	0.05
Main Before D	139757	Q10	726.35	726.42	0.07	726.50	0.15	726.45	0.10
Main Before D	139653	Q10	726.38	726.4	0.02	726.50	0.12	726.47	0.09
Main Before D	139628	Q10		726.36					
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.3	726.23	-0.07	726.27	-0.03	726.27	-0.03
Main Before D	139364	Q10	726.12	726.12	0.00	726.06	-0.06	726.09	-0.03
Main Before D	139277	Q10	726	725.96	-0.04	725.90	-0.10	725.97	-0.03
Main Before D	139242	Q10	725.99	725.95	0.04	725.94	-0.05	725.96	-0.03
Main Before D	139250		Main Street Bridge						
Main Before D	139201	Q10	725.86	725.83	-0.03	725.93	0.07	725.83	-0.03
Main Before D	139180	Q10	725.72	725.71	-0.01	725.90	0.18	725.71	-0.01
Main Before D	139153	Q10	725.71	725.7	-0.01	725.83	0.12	725.70	-0.01
Main Before D	138370	Q10	724.87	724.87	0.00	725.00	0.13	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.23	0.05	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.36	0.07	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.79	0.03	721.76	0.00

Natural condition contains Existing Main St structure with 47 culvert removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#1 - Existing/Proposed Conditions - 50-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.16	730.21	0.05	730.17	0.01	730.17	0.01
Main Before D	140616	Q50	729.01	729.18	0.17	729.05	0.04	729.04	0.03
Main Before D	140504	Q50	728.85	729.05	0.20	728.90	0.05	728.88	0.03
Main Before D	140133	Q50	728.47	728.75	0.28	728.55	0.08	728.53	0.06
Main Before D	139757	Q50	728.04	728.42	0.38	728.15	0.11	728.12	0.08
Main Before D	139653	Q50	728.04	728.34	0.30	728.10	0.06	728.08	0.04
Main Before D	139628	Q50							
Main Before D	139600	Q50	Rt 47 Bridge or Culvert						
Main Before D	139545	Q50							
Main Before D	139512	Q50	727.96	727.81	-0.15	727.80	-0.16	727.86	-0.10
Main Before D	139364	Q50	727.76	727.74	-0.02	727.55	-0.21	727.67	-0.09
Main Before D	139277	Q50	727.56	727.48	-0.08	727.22	-0.34	727.46	-0.10
Main Before D	139242	Q50	727.5	727.42	0.08	727.30	-0.20	727.41	-0.09
Main Before D	139250	Q50	Main Street Bridge						
Main Before D	139201	Q50	727.16	727.08	0.08	727.04	-0.12	727.08	-0.08
Main Before D	139180	Q50	726.97	726.95	-0.02	726.96	-0.01	726.95	-0.02
Main Before D	139153	Q50	726.99	726.97	-0.02	726.97	-0.02	726.97	-0.02
Main Before D	138370	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.08	0.00	724.08	0.00	724.08	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition contains Existing Main St structure with 47 culvert removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#1 - Existing/Proposed Conditions - 100-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.64	730.7	0.06	730.67	0.03	730.67	0.03
Main Before D	140616	Q100	729.58	729.75	0.17	729.66	0.08	729.68	0.10
Main Before D	140504	Q100	729.43	729.62	0.19	729.52	0.09	729.54	0.11
Main Before D	140133	Q100	729.09	729.33	0.24	729.20	0.11	729.23	0.14
Main Before D	139757	Q100	728.72	729.04	0.32	728.86	0.14	728.91	0.19
Main Before D	139653	Q100	728.72	729.04	0.32	728.79	0.07	728.86	0.14
Main Before D	139628	Q100							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q100							
Main Before D	139512	Q100	728.63	728.58	-0.05	728.45	-0.18	728.63	0.00
Main Before D	139364	Q100	728.42	728.54	0.12	728.17	-0.25	728.45	0.03
Main Before D	139277	Q100	728.18	728.25	0.07	727.77	-0.41	728.22	0.04
Main Before D	139242	Q100	728.08	728.15	0.07	727.86	-0.22	728.12	0.04
Main Before D	139250		Main Street Bridge						
Main Before D	139201	Q100	727.53	727.57	0.04	727.55	0.02	727.57	0.04
Main Before D	139180	Q100	727.29	727.45	0.16	727.47	0.18	727.45	0.16
Main Before D	139153	Q100	727.52	727.49	-0.03	727.49	-0.03	727.49	-0.03
Main Before D	138370	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition contains Existing Main St structure with 47 culvert removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#1 - Existing/Proposed Conditions - 500-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: CW Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.83	731.75	-0.08	731.95	0.12	731.8	-0.03
Main Before D	140616	Q500	730.9	730.75	-0.15	731.14	0.24	730.85	-0.05
Main Before D	140504	Q500	730.76	730.6	-0.16	731.01	0.25	730.71	-0.05
Main Before D	140133	Q500	730.43	730.22	-0.21	730.72	0.29	730.36	-0.07
Main Before D	139757	Q500	730.11	729.85	-0.26	730.45	0.34	730.02	-0.09
Main Before D	139653	Q500	730.1	729.84	-0.26	730.32	0.22	729.93	-0.17
Main Before D	139628								
Main Before D	139600	Q500	Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q500	730	729.66	-0.34	729.68	-0.32	729.61	-0.39
Main Before D	139364	Q500	729.91	729.56	-0.35	729.33	-0.58	729.54	-0.37
Main Before D	139277	Q500	729.89	729.53	-0.36	728.60	-1.29	729.52	-0.37
Main Before D	139242	Q500	729.33	729.18	0.15	728.76	-0.57	729.16	-0.17
Main Before D	139250	Q500	Main Street Bridge						
Main Before D	139201	Q500	728.3	728.41	-0.11	728.15	-0.15	728.41	0.11
Main Before D	139180	Q500	727.87	728.7	0.83	728.02	0.15	728.70	0.83
Main Before D	139153	Q500	728.4	728.66	0.26	728.40	0.00	728.66	0.26
Main Before D	138370	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition contains Existing Main St structure with 47 culvert removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#1 - Existing/Proposed Conditions - (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.67	727.69	0.02	727.70	0.03
Main Before D	140504		727.49	727.51	0.02	727.52	0.03
Main Before D	140133		726.98	727.02	0.04	727.04	0.06
Main Before D	139757		726.08	726.2	0.12	726.25	0.17
Main Before D	139653		726.13	726.18	0.05	726.25	0.12
Main Before D	139628						
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.12	728.88	0.06
Main Before D	140504		728.63	728.78	0.15	728.69	0.06
Main Before D	140133		728.14	728.37	0.23	728.25	0.11
Main Before D	139757		727.38	727.86	0.48	727.65	0.27
Main Before D	139653		727.41	727.78	0.37	727.58	0.17
Main Before D	139628						
Main Before D	141476	100-yr	730.55	730.63	0.08	730.58	0.03
Main Before D	140616		729.28	729.55	0.27	729.37	0.09
Main Before D	140504		729.08	729.39	0.31	729.19	0.11
Main Before D	140133		728.59	729.04	0.45	728.75	0.16
Main Before D	139757		727.88	728.63	0.75	728.20	0.32
Main Before D	139653		727.9	728.52	0.62	728.11	0.21
Main Before D	139628						
Main Before D	141476	500-yr	731.58	731.65	0.07	731.67	0.09
Main Before D	140616		730.35	730.53	0.18	730.59	0.24
Main Before D	140504		730.14	730.35	0.21	730.41	0.27
Main Before D	140133		729.63	729.92	0.29	729.99	0.36
Main Before D	139757		728.98	729.44	0.46	729.51	0.53
Main Before D	139653		728.98	729.43	0.45	729.35	0.37
Main Before D	139628					729.18	

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

**Created Head - G#1 - Existing/Proposed Conditions - 10-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.16	729.15	-0.01	729.15	-0.01	729.15	-0.01
Main Before D	140616	Q10	727.67	727.69	0.02	727.70	0.03	727.69	0.02
Main Before D	140504	Q10	727.49	727.51	0.02	727.52	0.03	727.51	0.02
Main Before D	140133	Q10	726.98	727.02	0.04	727.04	0.06	727.02	0.04
Main Before D	139757	Q10	726.08	726.2	0.12	726.25	0.17	726.21	0.13
Main Before D	139653	Q10	726.13	726.18	0.05	726.25	0.12	726.23	0.10
Main Before D	139628	Q10							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.03	726.02	-0.01	726.03	0.00	726.03	0.00
Main Before D	139364	Q10	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	139277	Q10	725.83	725.83	0.00	725.83	0.00	725.83	0.00
Main Before D	139250		Main Street Bridge						
Main Before D	139180	Q10	725.74	725.74	0.00	725.74	0.00	725.74	0.00
Main Before D	139153	Q10	725.67	725.67	0.00	725.67	0.00	725.67	0.00
Main Before D	138670	Q10	724.87	724.87	0.00	724.87	0.00	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.29	0.00	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition is with no Main St structure and proposed 47 - Bridge

**Created Head - G#1 - Existing/Proposed Conditions - 50-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.12	730.15	0.03	730.13	0.01	730.13	0.01
Main Before D	140616	Q50	728.82	728.94	0.12	728.88	0.06	728.85	0.03
Main Before D	140504	Q50	728.63	728.78	0.15	728.69	0.06	728.67	0.04
Main Before D	140133	Q50	728.14	728.37	0.23	728.25	0.11	728.21	0.07
Main Before D	139757	Q50	727.38	727.86	0.48	727.65	0.27	727.56	0.18
Main Before D	139653	Q50	727.41	727.78	0.37	727.58	0.17	727.52	0.11
Main Before D	139628								
Main Before D	139600	Q50	Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q50	727.28	727.25	-0.03	727.28	0.00	727.28	0.00
Main Before D	139364	Q50	727.13	727.13	0.00	727.13	0.00	727.13	0.00
Main Before D	139277	Q50	727.08	727.08	0.00	727.08	0.00	727.08	0.00
Main Before D	139264								
Main Before D	139250	Q50	Main Street Bridge						
Main Before D	139189								
Main Before D	139180	Q50	726.98	726.98	0.00	726.98	0.00	726.98	0.00
Main Before D	139153	Q50	726.9	726.9	0.00	726.90	0.00	726.90	0.00
Main Before D	138670	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.07	-0.01	724.07	-0.01	724.07	-0.01
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition is with no Main St structure and proposed 47 - Bridge



**Created Head - G#1 - Existing/Proposed Conditions - 100-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.55	730.63	0.08	730.58	0.03	730.57	0.02
Main Before D	140616	Q100	729.28	729.55	0.27	729.37	0.09	729.33	0.05
Main Before D	140504	Q100	729.08	729.39	0.31	729.19	0.11	729.14	0.06
Main Before D	140133	Q100	728.59	729.04	0.45	728.75	0.16	728.69	0.10
Main Before D	139757	Q100	727.88	728.63	0.75	728.20	0.32	728.09	0.21
Main Before D	139653	Q100	727.9	728.52	0.62	728.11	0.21	728.03	0.13
Main Before D	139628								
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q100	727.75	727.71	-0.04	727.75	0.00	727.75	0.00
Main Before D	139364	Q100	727.59	727.59	0.00	727.59	0.00	727.59	0.00
Main Before D	139277	Q100	727.54	727.54	0.00	727.54	0.00	727.54	0.00
Main Before D	139264								
Main Before D	139250		Main Street Bridge						
Main Before D	139189								
Main Before D	139180	Q100	727.45	727.45	0.00	727.45	0.00	727.45	0.00
Main Before D	139153	Q100	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	138670	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition is with no Main St structure and proposed 47 - Bridge

**Created Head - G#1 - Existing/Proposed Conditions - 500-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: CW Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.58	731.65	0.07	731.67	0.09	731.62	0.04
Main Before D	140616	Q500	730.35	730.53	0.18	730.59	0.24	730.46	0.11
Main Before D	140504	Q500	730.14	730.35	0.21	730.41	0.27	730.26	0.12
Main Before D	140133	Q500	729.63	729.92	0.29	729.99	0.36	729.80	0.17
Main Before D	139757	Q500	728.98	729.44	0.46	729.51	0.53	729.25	0.27
Main Before D	139653	Q500	728.98	729.43	0.45	729.35	0.37	729.15	0.17
Main Before D	139628								
Main Before D	139600	Q500	Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q500	728.78	728.69	-0.09	728.78	0.00	728.78	0.00
Main Before D	139364	Q500	728.6	728.6	0.00	728.60	0.00	728.60	0.00
Main Before D	139277	Q500	728.55	728.55	0.00	728.55	0.00	728.55	0.00
Main Before D	139264								
Main Before D	139250	Q500	Main Street Bridge						
Main Before D	139189								
Main Before D	139180	Q500	728.45	728.45	0.00	728.45	0.00	728.45	0.00
Main Before D	139153	Q500	728.4	728.4	0.00	728.40	0.00	728.40	0.00
Main Before D	138670	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition is with no Main St structure and proposed 47 - Bridge

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #1 WIT (Existing Main Street Bridge Geometry in place, Proposed 47 bridge and existing Culvert Conditions)

Route: IL Route 47  
 Waterway: Blackberry Creek - Main before D  
 Section: 107B-I-1  
 County: Kane

Existing S.N.: 045-2000  
 Proposed S.N.: 045-2050  
 Prepared By: SJS Date: Jul-14  
 Checked By: DH Date: Jul-14

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203	340	726.35	0.07	0.10	726.42	726.45
DESIGN	50	1120	1120	203	450	728.04	0.38	0.08	728.42	728.12
BASE	100	1376	1376	203	491	728.72	0.32	0.04	729.04	728.76
MAX. CALC.	500	2097	2097	957.0~	611.0	730.11	0.00	0.00	729.85	730.11

Drainage Area = 11.32 sq mi  
 Existing Overtopping Elevation = 729.53 at Sta. 501+17  
 Proposed Overtopping Elevation = 734.50 at Sta. 501+17

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
 Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s  
 10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.9 ft/s  
 2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

## EXISTING STRUCTURE

TYPE: RC Box Culvert  
 LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'  
 # SPANS/CELLS: 4  
 SKEW: 0 (relative to road)  
 LOW EOP: 728.59 @ 501+17 20' RT  
 FREEBOARD: 0.11 ft  
 CULVERT INV. 718.38 (U/S) 718.25 (D/S)

## PROPOSED STRUCTURE

TYPE: Open abutment with steel superstructure  
 LENGTH OF SPAN: 76 ft  
 # SPANS: 1  
 LOW CHORD: 730.10  
 SKEW: 0 (relative to road)  
 CLEARANCE: 2.06 ft  
 BRIDGE FLOW LINE: 718.7 (U/S) 718.62 (D/S)  
 LOW EOP: 734.1 @ 501+17 22' RT  
 FREEBOARD: 4.18 ft

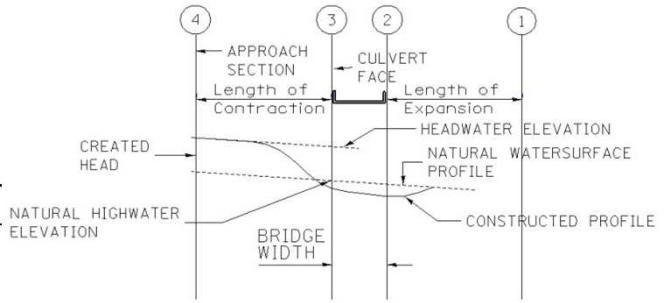
## NOTES:

- Proposed structure details are preliminary. Subject to refinement in TS&L stage.
- Waterway openings are based on the natural H.W.E.
- Natural HWE taken from cross-section 139653 in Group #1 Natural Conditions model.
- The existing head is the difference in water surface elevations between existing and natural conditions.
- The proposed head is the difference in water surface elevations between proposed and natural conditions
- The freeboard is calculated from the edge of the proposed shoulder at 501+17
- Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
- ~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

**BACKUP CALCULATIONS: Group #1 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14  
 Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.3	726.35	726.35
50-year	727.96	728.04	728.04
100-year	728.52	728.72	728.72
500-year	730.00	730.11	730.11

Section #1 : 139512<sup>+</sup>  
 Section #2 : 139545  
 Section #3 : 139653  
 Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sup>3</sup>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	726.42	726.45	0.07	0.10
50-year	728.04	728.42	728.12	0.38	0.08
100-year	728.72	729.04	728.76	0.32	0.04
500-year	730.11	729.85	730.02	-0.26	-0.09

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	0.07	0.10	726.42	726.45
50-year	728.04	0.38	0.08	728.42	728.12
100-year	728.72	0.32	0.04	729.04	728.76
500-year	730.11	-0.26	-0.09	729.85	730.02

<sup>1</sup> Natural Condition - Group #1 - Natural Conditions HEC-RAS Model.  
<sup>2</sup> Existing Condition - Group #1 - Existing Conditions HEC-RAS Model.  
<sup>3</sup> Proposed Condition - Group #1 - Proposed Condition HEC-RAS Model.  
<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.

**BACK-UP CALCULATIONS FOR WIT: Group #1 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+00	732.3	500+00
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
5.85	4.18	3.54	2.28
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
3.75	2.06	1.38	-0.01

*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

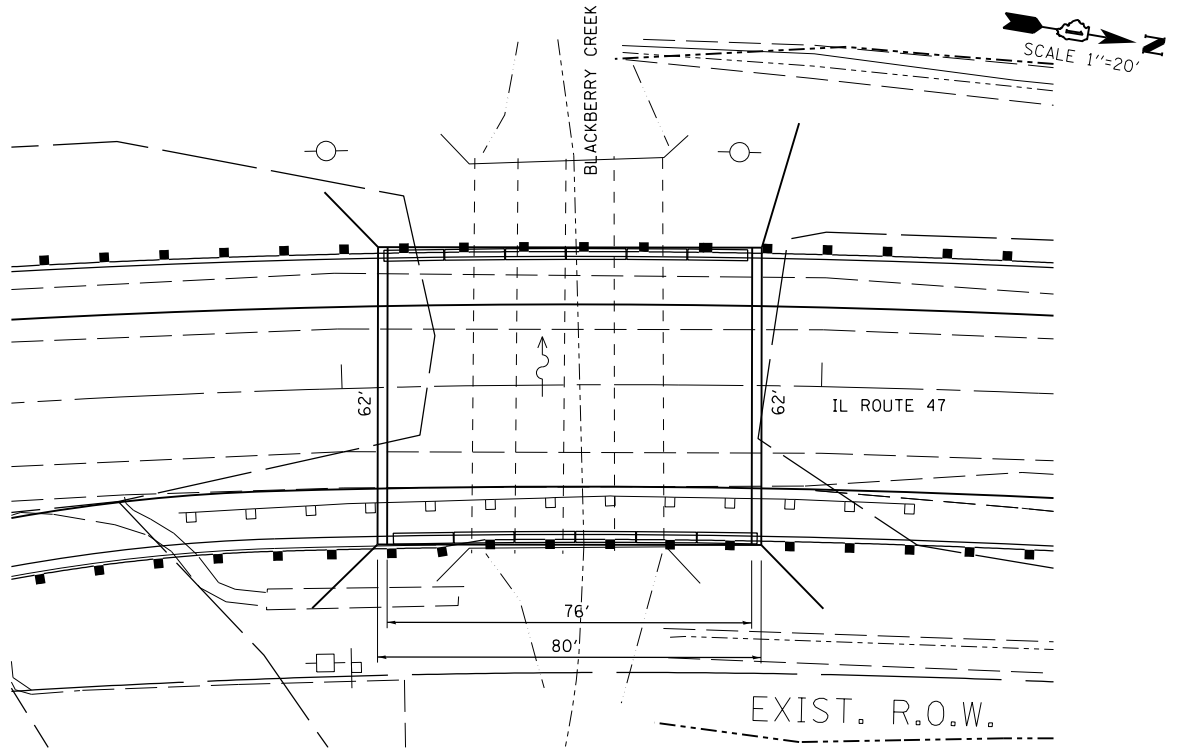
STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25		
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	340.00	
50-YR	203.20	450.00	
100-YR	203.20	490.70	
500-YR	957.00	611.00	

500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

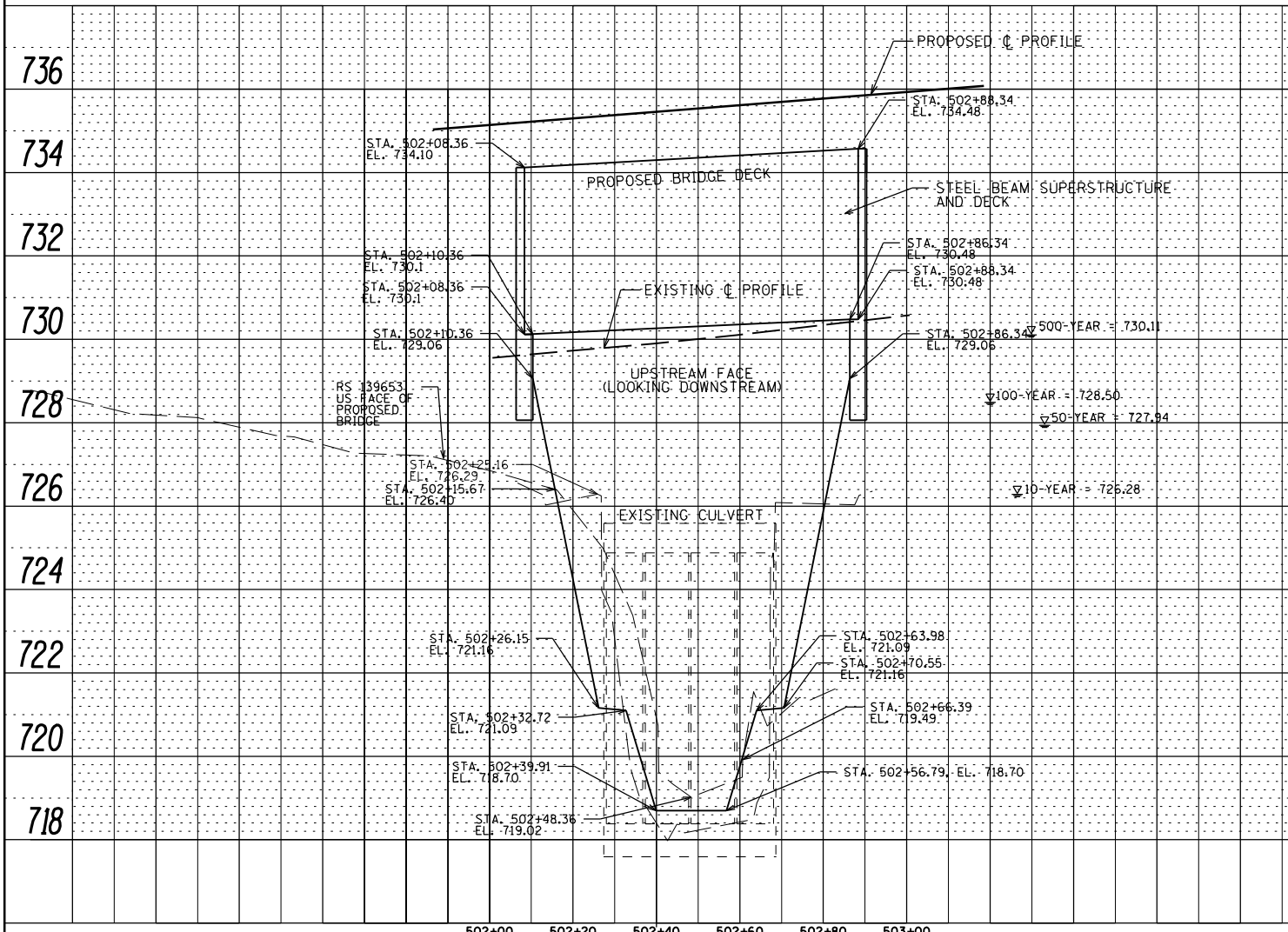
500-YR proposed Waterway Opening is contained within the proposed Bridge, no overtopping of pavement is expected.

Areas are measured in Microstation

PLAN	REVIEWED	DATE
NO.	BY	
	NOTED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	



PROFILE	REVIEWED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	B.M. NOTED	
	STRUCTURE NOTATIONS CHECKED	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\DI44909-sht-drain-struct-plnprf-bridge.dgn		DRAWN -	REVISED -
		CHECKED -	REVISED -
		DATE -	REVISED -

STATE OF  
DEPARTMENT OF

**Created Head - G#1 - Existing/Proposed Conditions - (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: July-14  
 Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.67	727.69	0.02	727.69	0.02
Main Before D	140504		727.49	727.51	0.02	727.51	0.02
Main Before D	140133		726.98	727.02	0.05	727.02	0.04
Main Before D	139757		726.08	726.2	0.14	726.21	0.13
Main Before D	139653		726.13	726.18	0.07	726.23	0.10
Main Before D	139628						0.00
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.14	728.85	0.03
Main Before D	140504		728.63	728.78	0.16	728.67	0.04
Main Before D	140133		728.14	728.37	0.25	728.21	0.07
Main Before D	139757		727.38	727.86	0.51	727.56	0.18
Main Before D	139653		727.41	727.78	0.40	727.52	0.11
Main Before D	139628				727.73		0.00
Main Before D	141476	100-yr	730.55	730.63	0.08	730.57	0.02
Main Before D	140616		729.28	729.55	0.29	729.33	0.05
Main Before D	140504		729.08	729.39	0.33	729.14	0.06
Main Before D	140133		728.59	729.04	0.47	728.69	0.10
Main Before D	139757		727.88	728.63	0.79	728.09	0.21
Main Before D	139653		727.9	728.52	0.66	728.03	0.13
Main Before D	139628						0.00
Main Before D	141476	500-yr	731.83	731.65	0.07	731.62	-0.21
Main Before D	140616		730.9	730.53	0.19	730.46	-0.44
Main Before D	140504		730.76	730.35	0.22	730.26	-0.50
Main Before D	140133		730.43	729.92	0.29	729.80	-0.63
Main Before D	139757		730.11	729.44	0.47	729.25	-0.86
Main Before D	139653		730.1	729.43	0.46	729.15	-0.95
Main Before D	139628			729.23		729.02	729.02

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing 47 culvert  
 Proposed is with no Main Street Structure and Proposed 47 bridge

**Created Head - G#1 - Existing/Proposed Conditions - (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: July-14  
 Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.15	729.15	0.00	729.15	0.00
Main Before D	140616		727.71	727.73	0.02	727.73	0.02
Main Before D	140504		727.54	727.55	0.01	727.56	0.02
Main Before D	140133		727.07	727.1	0.03	727.12	0.05
Main Before D	139757		726.35	726.42	0.07	726.45	0.10
Main Before D	139653		726.38	726.4	0.02	726.47	0.09
Main Before D	139628				726.36		
Main Before D	141476	50-yr	730.16	730.21	0.05	730.17	0.01
Main Before D	140616		729.01	729.18	0.17	729.04	0.03
Main Before D	140504		728.85	729.05	0.20	728.88	0.03
Main Before D	140133		728.47	728.75	0.28	728.53	0.06
Main Before D	139757		728.04	728.42	0.38	728.12	0.08
Main Before D	139653		728.04	728.34	0.30	728.08	0.04
Main Before D	139628				728.26		
Main Before D	141476	100-yr	730.64	730.7	0.06	730.67	0.03
Main Before D	140616		729.58	729.75	0.17	729.68	0.10
Main Before D	140504		729.43	729.62	0.19	729.54	0.11
Main Before D	140133		729.09	729.33	0.24	729.23	0.14
Main Before D	139757		728.72	729.04	0.32	728.91	0.19
Main Before D	139653		728.72	729.04	0.32	728.86	0.14
Main Before D	139628						
Main Before D	141476	500-yr	731.83	731.75	-0.08	731.8	-0.03
Main Before D	140616		730.9	730.75	-0.15	730.85	-0.05
Main Before D	140504		730.76	730.6	-0.16	730.71	-0.05
Main Before D	140133		730.43	730.22	-0.21	730.36	-0.07
Main Before D	139757		730.11	729.85	-0.26	730.02	-0.09
Main Before D	139653		730.1	729.84	-0.26	729.93	-0.17
Main Before D	139628						0.00

Natural condition contains Existing Main St structure with 47 bridge removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 bridge



WSEL Comparison between G#1 Existing Model and the Duplicate Model

Date: Jul-14

Profile	FIS River Sta	IDOT River Sta	IDOT W.S. Elev (ft)	FIS W.S. Elev (ft)	Δ IDOT - FIS WSEL	W.S. Elev taken from FIS profile (ft)	Δ IDOT - FIS Profile WSEL
Q10	140600	141476	729.15	729.32	-0.17		
Q50		141476	730.21	730.33	-0.12		
Q100		141476	730.7	730.78	-0.08		
Q500		141476	731.75	731.92	-0.17		
Q10	140504	140616	727.73	727.51	0.22	727.71	0.02
Q50		140616	729.18	729.13	0.05	729.26	-0.08
Q100		140616	729.75	729.63	0.12	729.72	0.03
Q500		140616	730.75	730.93	-0.18		
Q10		140133	727.1			727.1	0
Q50		140133	728.75			728.88	-0.13
Q100		140133	729.33			729.38	-0.05
Q500		140133	730.22				
Q10	139750	139757*	726.42	726.69	-0.27		
Q50		139757*	728.42	728.61	-0.19		
Q100		139757*	729.04	729.09	-0.05		
Q500		139757*	729.85	730.4	-0.55		
Q10	139620	139653	726.4	726.59	-0.19		
Q50		139653	728.34	728.46	-0.12		
Q100		139653	729.04	728.97	0.07		
Q500		139653	729.84	730.27	-0.43		
Q10	139620	139628	726.36	726.59	-0.23		
Q50		139628	728.26	728.46	-0.2		
Q100		139628	728.85	728.97	-0.12		
Q500		139628	729.7	730.27	-0.57		
		139602					
Q10	139536	139545	726.25	726.42	-0.17		
Q50		139545	727.81	727.85	-0.04		
Q100		139545	728.57	728.48	0.09		
Q500		139545	729.69	730.22	-0.53		
Q10		139512	726.23			726.4	-0.17
Q50		139512	727.81			727.83	-0.02
Q100		139512	728.58			728.46	0.12
Q500		139512	729.66				
Q10	139355	139364	726.12	726.3	-0.18		
Q50		139364	727.74	727.74	0		
Q100		139364	728.54	728.37	0.17		

Profile	FIS River Sta	IDOT River Sta	IDOT W.S. Elev (ft)	FIS W.S. Elev (ft)	$\Delta$ IDOT - FIS WSEL	W.S. Elev taken from FIS profile (ft)	$\Delta$ IDOT - FIS Profile WSEL
Q500	139355	139364	729.56	730.12	-0.56		
Q10	139297	139277	725.96	726.29	-0.33		
Q50		139277	727.48	727.74	-0.26		
Q100		139277	728.25	728.37	-0.12		
Q500		139277	729.53	730.13	-0.6		
Q10		139259	725.95	726.22	-0.27		
Q50		139259	727.42	727.58	-0.16		
Q100		139259	728.15	728.16	-0.01		
Q500		139259	729.18	729.76	-0.58		
		139220					
Q10	139208	139189	725.83	726.14	-0.31		
Q50		139189	727.08	727.27	-0.19		
Q100		139189	727.57	727.67	-0.1		
Q500		139189	728.41	728.59	-0.18		
Q10		139180	725.71				
Q50		139180	726.95				
Q100		139180	727.45				
Q500		139180	728.7				
Q10		139153	725.7	726.1	-0.4		
Q50		139153	726.97	727.22	-0.25		
Q100		139153	727.49	727.61	-0.12		
Q500		139153	728.66	728.5	0.16		
Q10		138670	724.87	725.26	-0.39		
Q50		138670	725.88	726.3	-0.42		
Q100		138670	726.3	726.63	-0.33		
Q500		138670	727.23	727.37	-0.14		
Q10		138180	724.18	725.26	-1.08		
Q50		138180	725.07	726.3	-1.23		
Q100		138180	725.44	726.63	-1.19		
Q500		138180	726.28	727.37	-1.09		
Q10		136804	721.76	721.76			
Q50		136804	722.47	722.47			
Q100		136804	722.78	722.78			
Q500		136804	723.54	723.54			

**INEFFECTIVE FLOW CONVEYANCE AREA OFFSETS FOR EXISTING STRUCTURES**

**IL-47 ( Ex 2-6.5' x 8.75' & 2-6.5'x10.42' RC Box Culvert )**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139757	109.6	167	127	276.6	-17.4	728.94	728.94
	139653	117.5	42	48	159.5	69.5	728.94	728.94
	139628	161.1	21	20	182.1	141.1	728.94	728.94
139602								
ER 2:1	139545	211.7	18	22	229.7	189.7	728.94	728.94
	139512	85.9	45	31	130.9	54.9	728.94	728.94

**Main St (Ex 2-18' span - 40' wide concrete closed abutment bridge with pier)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139364	102.34	92.5		194.84		728.57	
	139277	60.64	52.09	52.57	112.73	8.07	728.57	
	139242	234.04	9.8	27.34	243.84	206.7	728.57	
139220								
ER 2:1	139201	202.95	9.1	25.92	212.05	177.03	728.57	
	139180	96.36	25.24	29.36	121.6	67	728.57	
	139153	200.19	39	41.7	239.19	158.49	727.5	

**INEFFECTIVE FLOW CONVEYANCE AREA OFFSETS FOR PROPOSED STRUCTURES**

**IL-47 ( Proposed 54' span 3-sided arch culvert)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139757	109.6	178	133	287.6	-23.4	733.85	733.85
	139653	117.5	50.6	56.5	168.1	61.0	733.85	733.85
	139628	161.1	28	29.7	189.1	131.4	733.85	733.85
139602								
ER 2:1	139545	211.7	32	32	243.7	179.7	733.85	733.85
	139512	85.9	59	42	144.9	43.9	733.40	733.4

**IL-47 ( Proposed 76' span bridge)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139757	109.6	194	148	303.6	-38.4	734.37	734.37
	139653	117.5	65.6	71	183.1	46.5	734.37	734.37
	139628	161.1	43	43	204.1	118.1	734.37	734.37
139602								
ER 2:1	139545	211.7	47	47.7	258.7	164.0	733.40	733.40
	139512	85.9	58.4	74.5	144.3	11.4	733.40	733.40

**Main St (Proposed 44' span reinforced concrete bridge)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139364	102.34	62.78		165.12		733.1	733.1
	139277	60.64	29.9	43.7	90.54	16.94	733.1	733.1
	139264	6	16.66	30	22.66	-24	733.1	733.1
139220								
ER 2:1	139189	2	19.5	26.5	21.5	-24.5	730.9	730.9
	139180	96.36	28.8	29.2	125.16	67.16	730.9	730.9
	139153	200.19	39	41.5	239.19	158.69	727.5	727.5



E T S

139628

139653

139757

139512

139545

ALTERNATE BRIDGE  
STRUCTURE  
ARCH CULVERT  
STRUCTURE

EXPANSION ZONE 2:1

CONTRACTION ZONE 1:1

BLACKBERRY  
CREEK

"HEY  
WEENIE"  
HOT-DOGS

CONTRACTION ZONE 1:1

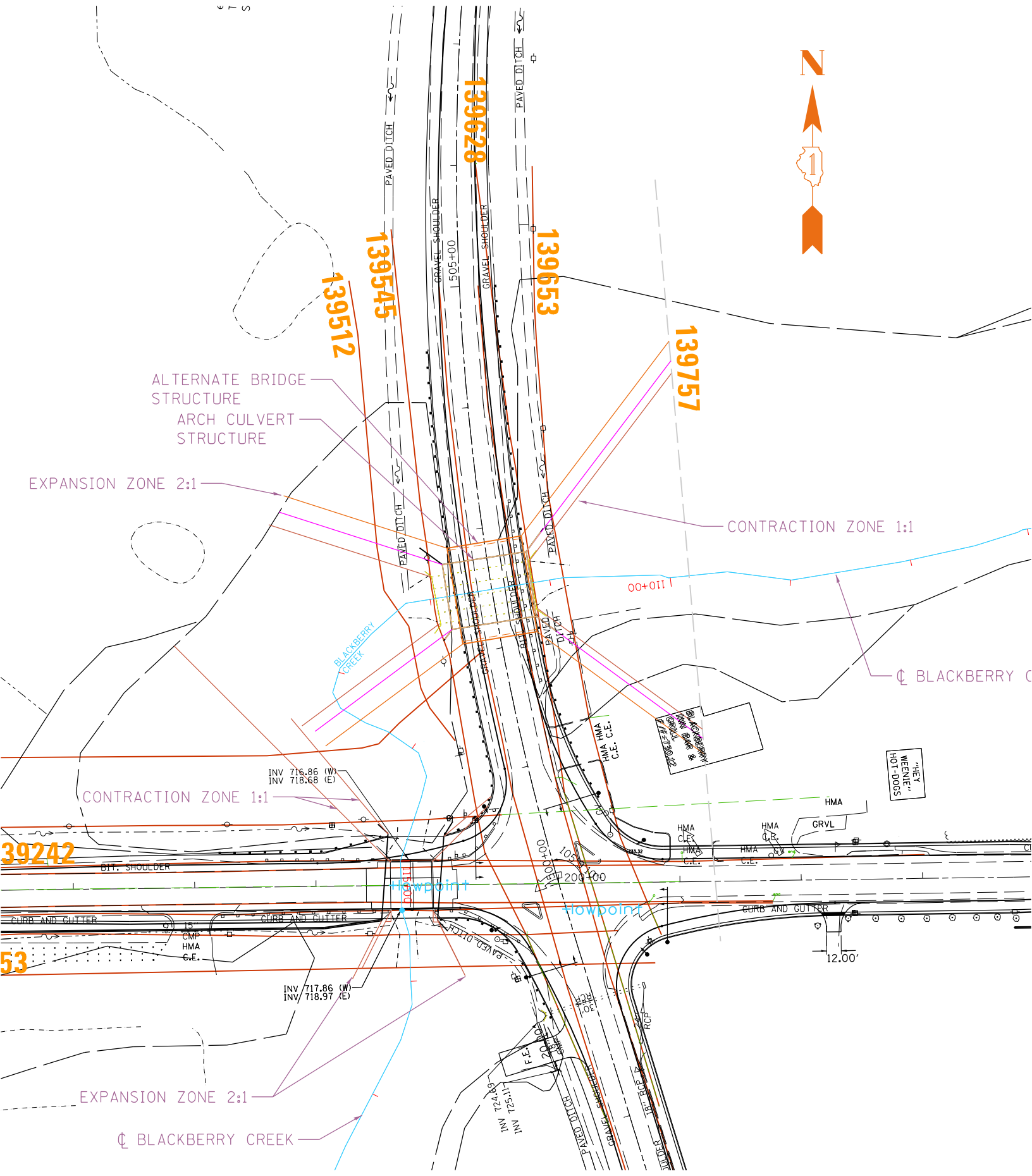
INV 716.86 (W)  
INV 718.68 (E)

39242

53

EXPANSION ZONE 2:1

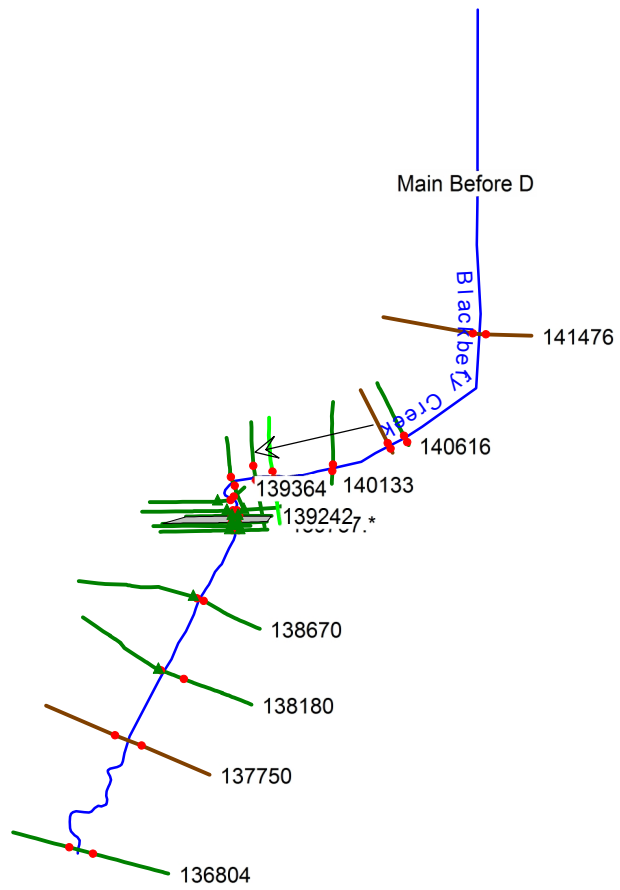
BLACKBERRY CREEK



HEC-RAS Model

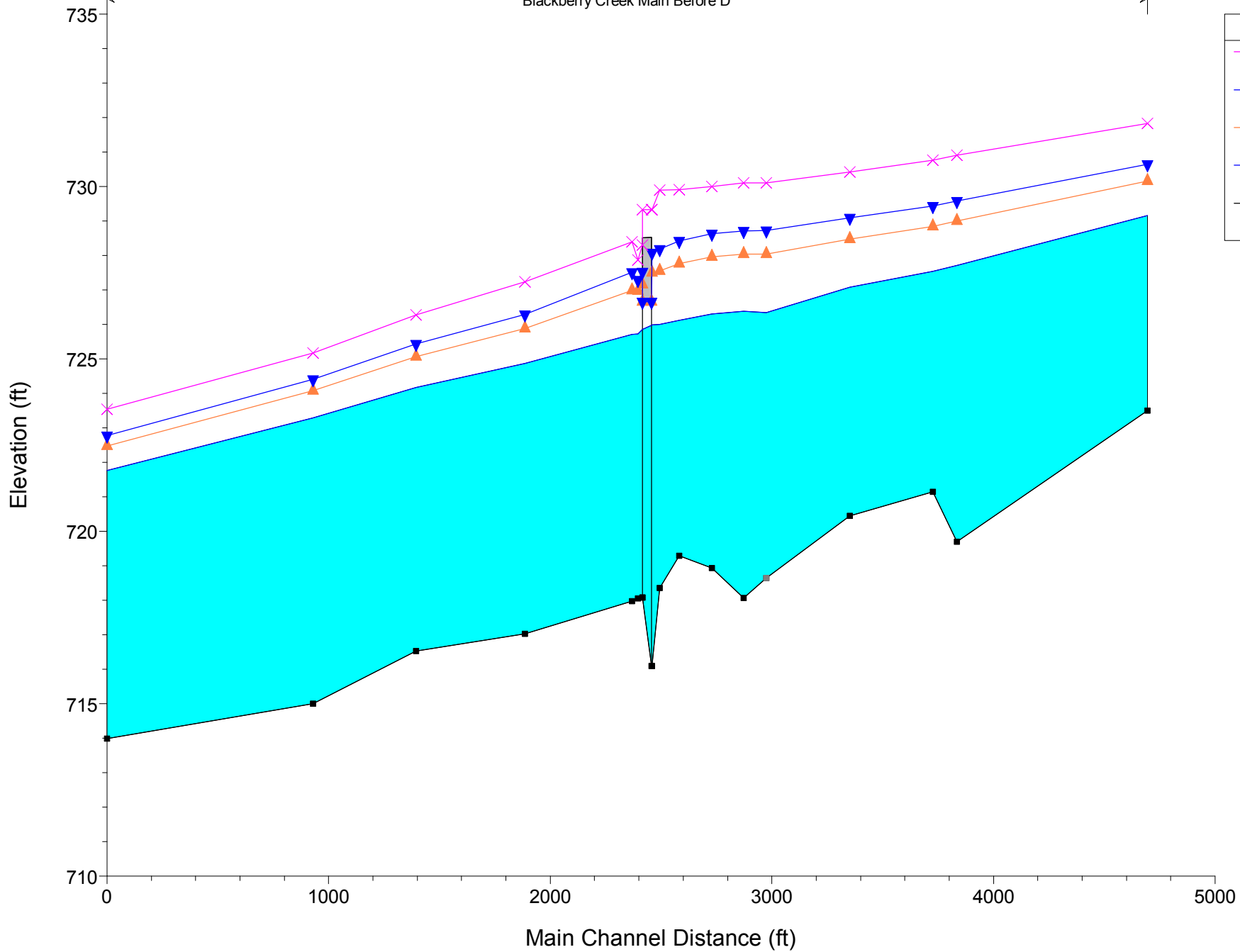
**GROUP #1 - NATURAL CONDITIONS**

**No Route 47 Culvert, Existing Main St. bridge**



3 of the 17 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D





HEC-RAS Plan: G#1 Natural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003309	2.68	391.97	300.81	0.31
Main Before D	141476	Q50	1128.00	723.50	730.16		730.25	0.002321	2.85	734.71	382.86	0.28
Main Before D	141476	Q100	1384.00	723.50	730.64		730.73	0.002003	2.90	930.05	432.27	0.26
Main Before D	141476	Q500	2108.00	723.50	731.83		731.91	0.001479	2.99	1515.97	557.78	0.24
Main Before D	140616	Q10	637.00	719.70	727.71		727.79	0.001016	2.48	435.36	231.67	0.21
Main Before D	140616	Q50	1126.00	719.70	729.01		729.08	0.000888	2.74	756.71	265.85	0.20
Main Before D	140616	Q100	1381.00	719.70	729.58		729.66	0.000849	2.86	915.36	287.44	0.20
Main Before D	140616	Q500	2104.00	719.70	730.90		730.99	0.000822	3.19	1331.94	352.61	0.20
Main Before D	140504	Q10	637.00	721.14	727.54		727.64	0.001697	3.03	393.91	205.69	0.26
Main Before D	140504	Q50	1126.00	721.14	728.85		728.96	0.001463	3.36	698.21	252.27	0.25
Main Before D	140504	Q100	1381.00	721.14	729.43		729.54	0.001358	3.46	849.32	265.90	0.25
Main Before D	140504	Q500	2104.00	721.14	730.76		730.88	0.001248	3.78	1224.25	297.05	0.24
Main Before D	140133	Q10	635.00	720.45	727.07		727.16	0.001200	2.69	394.13	187.32	0.23
Main Before D	140133	Q50	1122.00	720.45	728.47		728.57	0.001021	2.98	686.17	227.70	0.22
Main Before D	140133	Q100	1378.00	720.45	729.09		729.18	0.000962	3.10	830.57	243.40	0.22
Main Before D	140133	Q500	2098.00	720.45	730.43		730.54	0.001000	3.58	1189.67	314.90	0.23
Main Before D	139757.*	Q10	635.00	718.65	726.35		726.51	0.002569	3.43	280.25	186.33	0.31
Main Before D	139757.*	Q50	1122.00	718.65	728.04		728.13	0.001238	3.06	726.09	321.70	0.23
Main Before D	139757.*	Q100	1378.00	718.65	728.72		728.80	0.000990	2.96	957.61	356.84	0.21
Main Before D	139757.*	Q500	2098.00	718.65	730.11		730.19	0.000787	3.03	1517.10	516.67	0.19
Main Before D	139653	Q10	634.00	718.06	726.38		726.41	0.000234	1.27	653.88	270.92	0.10
Main Before D	139653	Q50	1120.00	718.06	728.04		728.07	0.000205	1.45	1202.01	393.53	0.10
Main Before D	139653	Q100	1376.00	718.06	728.72		728.74	0.000198	1.52	1485.96	448.54	0.10
Main Before D	139653	Q500	2097.00	718.06	730.10		730.14	0.000202	1.73	2234.23	621.84	0.10
Main Before D	139512	Q10	634.00	718.93	726.30		726.36	0.000466	1.99	448.65	204.72	0.16
Main Before D	139512	Q50	1120.00	718.93	727.96		728.02	0.000417	2.30	829.74	254.00	0.16
Main Before D	139512	Q100	1376.00	718.93	728.63		728.70	0.000420	2.46	1008.28	288.08	0.16
Main Before D	139512	Q500	2097.00	718.93	730.00		730.09	0.000446	2.86	1449.40	342.16	0.17
Main Before D	139364	Q10	634.00	719.29	726.12	722.82	726.22	0.000821	2.82	388.98	335.85	0.21
Main Before D	139364	Q50	1120.00	719.29	727.76	724.58	727.87	0.000792	3.28	633.82	394.99	0.21
Main Before D	139364	Q100	1376.00	719.29	728.42	724.96	728.54	0.000804	3.50	743.23	414.80	0.22
Main Before D	139364	Q500	2097.00	719.29	729.91	725.78	729.95	0.000288	2.34	2253.79	487.06	0.13
Main Before D	139277	Q10	634.00	718.35	726.00	722.40	726.14	0.000979	3.28	307.32	358.69	0.23
Main Before D	139277	Q50	1120.00	718.35	727.56	723.96	727.78	0.001282	4.34	442.84	428.10	0.27
Main Before D	139277	Q100	1376.00	718.35	728.18	724.42	728.44	0.001402	4.77	508.16	460.63	0.29
Main Before D	139277	Q500	2097.00	718.35	729.89	725.51	729.92	0.000304	2.51	2598.13	681.26	0.14
Main Before D	139242	Q10	634.00	716.09	725.99	720.90	726.09	0.001055	2.59	245.08	35.70	0.17
Main Before D	139242	Q50	1120.00	716.09	727.50	721.96	727.73	0.001876	3.77	297.31	61.04	0.23
Main Before D	139242	Q100	1376.00	716.09	728.08	722.44	728.38	0.002345	4.33	317.51	113.24	0.25
Main Before D	139242	Q500	2097.00	716.09	729.33	723.67	729.85	0.003630	5.79	362.19	408.65	0.32
Main Before D	139220		Bridge									
Main Before D	139201	Q10	634.00	718.08	725.86	721.18	725.99	0.001333	2.87	220.79	34.01	0.20
Main Before D	139201	Q50	1120.00	718.08	727.16	722.31	727.44	0.002438	4.22	265.51	44.65	0.27
Main Before D	139201	Q100	1376.00	718.08	727.53	722.83	727.91	0.003216	4.95	278.24	65.55	0.31
Main Before D	139201	Q500	2097.00	718.08	728.30	724.14	729.03	0.005912	6.87	305.36	255.46	0.42
Main Before D	139180	Q10	640.00	718.05	725.72	722.90	725.93	0.002672	3.70	188.17	210.85	0.30
Main Before D	139180	Q50	1132.00	718.05	726.97	724.32	727.35	0.003614	5.05	246.96	388.39	0.37
Main Before D	139180	Q100	1389.00	718.05	727.29	724.77	727.79	0.004527	5.85	261.90	403.33	0.41
Main Before D	139180	Q500	2117.00	718.05	727.87	725.85	728.82	0.007706	8.10	289.06	430.18	0.55
Main Before D	139153	Q10	640.00	717.97	725.71	722.52	725.85	0.001785	3.05	242.41	200.92	0.25
Main Before D	139153	Q50	1132.00	717.97	726.99	723.98	727.23	0.002322	4.09	325.71	429.55	0.30
Main Before D	139153	Q100	1389.00	717.97	727.52	724.42	727.61	0.001236	3.16	1039.89	503.61	0.22
Main Before D	139153	Q500	2117.00	717.97	728.40	725.38	728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.97	563.79	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22

HEC-RAS Plan: G#1 Natural River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.37	497.10	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.56	560.60	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.80	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002977	2.89	485.37	188.20	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003085	3.43	642.46	225.05	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	721.00	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#1 Natural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.45	0.00	110.00	505.28	22.72	300.81
Main Before D	141476	Q50	730.25	730.16	0.09	1.16	0.00	259.36	771.89	96.76	382.86
Main Before D	141476	Q100	730.73	730.64	0.09	1.07	0.00	336.70	897.47	149.83	432.27
Main Before D	141476	Q500	731.91	731.83	0.08	0.92	0.00	547.24	1211.70	349.06	557.78
Main Before D	140616	Q10	727.79	727.71	0.07	0.14	0.00	0.24	490.54	146.23	231.67
Main Before D	140616	Q50	729.08	729.01	0.08	0.12	0.00	2.45	699.64	423.92	265.85
Main Before D	140616	Q100	729.66	729.58	0.08	0.11	0.00	4.54	800.95	575.51	287.44
Main Before D	140616	Q500	730.99	730.90	0.09	0.11	0.00	13.09	1079.93	1010.98	352.61
Main Before D	140504	Q10	727.64	727.54	0.11	0.48	0.01	0.00	469.70	167.30	205.69
Main Before D	140504	Q50	728.96	728.85	0.11	0.39	0.01	0.39	679.24	446.37	252.27
Main Before D	140504	Q100	729.54	729.43	0.11	0.35	0.01	0.93	771.67	608.40	265.90
Main Before D	140504	Q500	730.88	730.76	0.12	0.34	0.00	3.40	1023.29	1077.31	297.05
Main Before D	140133	Q10	727.16	727.07	0.09	0.65	0.01	2.67	473.02	159.31	187.32
Main Before D	140133	Q50	728.57	728.47	0.09	0.43	0.00	10.50	691.12	420.39	227.70
Main Before D	140133	Q100	729.18	729.09	0.09	0.38	0.00	16.01	792.73	569.26	243.40
Main Before D	140133	Q500	730.54	730.43	0.11	0.34	0.01	35.76	1107.97	954.28	314.90
Main Before D	139757.*	Q10	726.51	726.35	0.16	0.06	0.04	8.27	545.47	81.26	186.33
Main Before D	139757.*	Q50	728.13	728.04	0.10	0.04	0.02	54.34	706.03	361.63	321.70
Main Before D	139757.*	Q100	728.80	728.72	0.08	0.04	0.02	90.35	769.58	518.07	356.84
Main Before D	139757.*	Q500	730.19	730.11	0.07	0.04	0.01	211.04	966.92	920.04	516.67
Main Before D	139653	Q10	726.41	726.38	0.02	0.05	0.00	1.55	579.31	53.14	270.92
Main Before D	139653	Q50	728.07	728.04	0.03	0.04	0.00	20.98	884.36	214.66	393.53
Main Before D	139653	Q100	728.74	728.72	0.03	0.04	0.00	44.97	1023.58	307.45	448.54
Main Before D	139653	Q500	730.14	730.10	0.03	0.04	0.01	150.76	1386.86	559.38	621.84
Main Before D	139512	Q10	726.36	726.30	0.06	0.14	0.00	4.95	563.96	65.09	204.72
Main Before D	139512	Q50	728.02	727.96	0.07	0.15	0.00	51.56	875.49	192.96	254.00
Main Before D	139512	Q100	728.70	728.63	0.07	0.15	0.00	80.98	1036.83	258.19	288.08
Main Before D	139512	Q500	730.09	730.00	0.09	0.12	0.02	175.71	1434.06	487.24	342.16
Main Before D	139364	Q10	726.22	726.12	0.09	0.07	0.00	22.36	462.36	149.28	335.85
Main Before D	139364	Q50	727.87	727.76	0.11	0.08	0.01	68.07	690.69	361.24	394.99
Main Before D	139364	Q100	728.54	728.42	0.12	0.09	0.01	101.10	803.09	471.82	414.80
Main Before D	139364	Q500	729.95	729.91	0.03	0.02	0.00	124.32	638.58	1334.10	487.06
Main Before D	139277	Q10	726.14	726.00	0.14	0.04	0.01	14.44	503.15	116.41	358.69
Main Before D	139277	Q50	727.78	727.56	0.22	0.05	0.00	35.61	827.59	256.80	428.10
Main Before D	139277	Q100	728.44	728.18	0.26	0.06	0.00	64.45	981.90	329.65	460.63
Main Before D	139277	Q500	729.92	729.89	0.03	0.03	0.05	69.79	618.93	1408.28	681.26
Main Before D	139242	Q10	726.09	725.99	0.10	0.00	0.00		634.00		35.70
Main Before D	139242	Q50	727.73	727.50	0.22				1120.00		61.04
Main Before D	139242	Q100	728.38	728.08	0.29				1376.00		113.24
Main Before D	139242	Q500	729.85	729.33	0.52				2097.00		408.65
Main Before D	139220		Bridge								
Main Before D	139201	Q10	725.99	725.86	0.13	0.04	0.02		634.00		34.01
Main Before D	139201	Q50	727.44	727.16	0.28	0.06	0.03		1120.00		44.65
Main Before D	139201	Q100	727.91	727.53	0.38	0.08	0.04		1376.00		65.55
Main Before D	139201	Q500	729.03	728.30	0.73	0.14	0.07		2097.00		255.46
Main Before D	139180	Q10	725.93	725.72	0.20	0.06	0.02	14.14	612.30	13.56	210.85
Main Before D	139180	Q50	727.35	726.97	0.37	0.08	0.04	36.59	1059.54	35.87	388.39
Main Before D	139180	Q100	727.79	727.29	0.50	0.06	0.12	47.77	1294.24	46.99	403.33
Main Before D	139180	Q500	728.82	727.87	0.95	0.07	0.26	79.87	1958.21	78.92	430.18
Main Before D	139153	Q10	725.85	725.71	0.14	0.84	0.00	6.56	592.30	41.15	200.92
Main Before D	139153	Q50	727.23	726.99	0.24	1.13	0.01	19.83	1012.04	100.13	429.55
Main Before D	139153	Q100	727.61	727.52	0.10	1.26	0.02	99.43	850.01	439.56	503.61
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64

HEC-RAS Plan: G#1 Natural River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.47	1146.30	11.24	563.79
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.10
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.51	2012.51	1.99	560.60
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.20
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.69	13.03	225.05
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#1 Natural

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Errors Warnings and Notes for Plan : G#1 Natural (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Warning:	The pressure flow/weir flow answer did not converge within the given number of iterations. However, the error was small enough that the solution was treated as valid.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Errors Warnings and Notes for Plan : G#1 Natural (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the downstream end, the energy is based on critical depth over the weir. The water surface has been projected.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Warning:	The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy

Errors Warnings and Notes for Plan : G#1 Natural (Continued)

	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.



HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X   XXXXXX   XXXX       XXXX       XX       XXXX
X   X   X       X   X       X   X       X   X       X
X   X   X       X       X       X   X       X   X       X
XXXXXXXX   XXXX   X       XXX   XXXX   XXXXXXX   XXXX
X   X   X       X       X   X       X   X       X
X   X   X       X   X       X   X       X   X       X
X   X   XXXXXX   XXXX       X   X       X   X       XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 1:40:44 PM

Project in English units

PLAN DATA

Plan Title: Goup#1 - Natural (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p03  
 Geometry Title: Group#1-Natural Conditions (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g09  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Group #1 - Natural Conditions, No Route 47 culvert or bounding cross-sections.  
 Existing Main Street Bridge Geometry remains.

Plan Summary Information:

Number of:	Cross Sections =	17	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry	CreekMain Before D	141476	638	1128	1384	2108
Blackberry	CreekMain Before D	140616	637	1126	1381	2104
Blackberry	CreekMain Before D	140133	635	1122	1378	2098
Blackberry	CreekMain Before D	139653	634	1120	1376	2097
Blackberry	CreekMain Before D	139364	634	1120	1376	2097
Blackberry	CreekMain Before D	139180	640	1132	1389	2117
Blackberry	CreekMain Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry	CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry	CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry	CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry	CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group#1-Natural Conditions (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g09

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 736 34.7 734 94.3 732 129.3 730 157 728
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2
671 732 763.7 732.8 825.4 734 914.1 736
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .13 277.6 .055 358.9 .13
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
277.6 358.9 1062 860 750 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010
Station Elevation Data num= 31
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 73418.14586 727.6120.01093 726.7831.69828 724.6539.43155 723.05
43.50174 721.4650.21955 719.7 54.4631 721.24 59.8615 722.8364.14489 726.39
80.94425 727.3290.14719 726.78103.0566 725.91145.4814 725.66150.6872 725.65
155.3922 725.67156.8725 725.7157.8967 725.74198.5372 726.77200.2545 726.8
236.8923 727.16238.7617 727.24276.4147 728.89277.0364 728.92330.2935 730.45
330.6023 730.46384.2168 731.23 390.704 731.32 398.281 731.35424.3695 731.43
424.8041 731.44
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .1120.01093 .0564.14489 .09
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
20.0109364.14489 111 109 107 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88
80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-186.58 .11 -158.42 .05 -122.47 .11
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-158.42 -122.47 412 374 230 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010
Station Elevation Data num= 29
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 746.59 .661211 746.4412.27355 744.8346.09943 734.775.93997 725.73

77.66348	724.88	89.8	721.5	94.87	720.45105.2784	721.54	108.037	724.14
117.4982	725.2	158.663	725.14175.4356		725.2199.3833	725.23200.0636		725.25
240.4556	726.41241.4389		726.44281.7278		727.91282.3598	727.93324.4932		729.82
325.104	729.84	368.711	730.36413.5901		730.81414.2438	730.82456.2384		731.28
456.7409	731.29457.6156		731.29501.0569		732.08501.4998	732.09		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1177.66348 .05117.4982 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 77.66348117.4982 350.15 376 403.42 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description: Interpolated between US and DS surveyed Xsections, points were modified based on GEC and IDOT Tins.

Station Elevation Data num= 36											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -185.75 .11 92.33 .05 134.98 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.33 134.98 96.85 104 111.58 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -189 .09 96.437 .05 189.85 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 96.437 189.85 152 143 172 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 42											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	732	-50	729.5	-20	728	0	726.23	.537122	726.17		
9.693759	725.8817.96078		725.5535.38584		726.2336.01735		726.2236.98616		726.09		
57.37652	725.1859.64951		725.0564.47989		723.44 70.3069		721.5278.64016		720.39		
85.87483	718.9390.61574		719.3790.91806		719.5795.43697		720.56105.7258		722.12		
118.2908	723.9118.9698		724.08127.3197		724.15141.7605		724.04 147.534		724.04		
148.0156	724.04 148.739		724.06 167.183		724.56186.7215		725.5193.0373		725.81		
194.0911	725.83216.7024		726.92218.2687		726.95 242.918		728.48265.4388		728.74		
269.1036	728.77 315.993		731.95316.7762		731.96 318.031		732361.4998		733.74		
361.896	733.75362.2298		733.76								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val

-75 .1359.64951 .045118.9698 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
59.64951118.9698 70 148 626 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT  
Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input  
07-2010

Station Elevation Data num= 41  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 730.2325.89646 728.3234.58134 727.6847.53335 726.7461.65466 725.98  
62.86731 725.3171.52296 724.580.80232 723.9286.33195 723.2987.81361 722.7  
91.14569 721.7892.60942 720.993.44381 720.3494.39133 719.797.08542 719.6  
102.3392 719.29113.2782 720.26114.9753 723.84 129.198 723.96172.1069 723.76  
207.7128 723.81245.1637 723.92245.9037 723.94284.2046 724.19284.8347 724.2  
325.5757 724.59326.0558 724.61344.0362 724.9365.4267 725.29366.2567 725.29  
386.9972 725.89407.8078 726.51408.2278 726.53448.8588 729450.0789 729.04  
474.1395 729.48487.6698 729.71490.6599 729.87525.8707 732.04609.3928 738.15  
609.7329 738.17

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .1186.33195 .045114.9753 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
86.33195114.9753 141 87 58 .1 .3

Ineffective Flow num= 1  
Sta L Sta R Elev Permanent  
194.84609.7329 729.85 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT  
Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 39  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-270.5 731.66 -210 729.95 -30 728.95 0 727.6915.09991 727.46  
19.13766 727.1833.21519 726.3636.79197 725.43 38.4556 725.1743.10466 723.81  
49.34686 722.2749.95718 721.8451.55831 720.2351.95881 720.260.06436 718.35  
60.64471 719.0169.96091 719.2971.04166 720.2171.78226 720.2973.38339 722.87  
75.39461 722.3111.7997 723.27120.8857 723.37125.1487 723.47139.5584 723.98  
169.439 722.97199.0895 724.12243.0502 723.99275.1607 724.28312.3935 724.69  
320.8542 724.82364.3776 725.18 422.652 726.84423.6721 726.87514.6191 731.58  
515.9192 731.63558.3625 738.18628.1378 741.89628.7879 741.9

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-270.5 .1349.34686 .04573.38339 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
49.3468673.38339 33 35 35 .1 .3

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-270.5 8.07 729.85 F  
112.73628.7879 729.85 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139242

INPUT  
Description: USF Main St Bridge, GEC Input 07-2010

Station Elevation Data num= 55  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 730.01.7500667 73020.15028 729.6221.78031 729.5644.05058 729.2  
49.99065 729.1161.35076 728.5178.32095 728.4681.67101 728.42145.5518 728.35  
160.7319 728.08163.6919 728.04 169.422 728.27 170.032 728.26182.3922 727.99  
184.5822 728.01191.5523 727.85192.0423 727.87192.3923 727.89197.0223 727.88  
198.3524 726.62204.9824 728.09206.8825 720.1207.8725 719.88213.0925 719.1  
213.4725 719.24216.7326 720.28218.4826 720.33224.4228 719.24 232.17 716.82  
234.04 716.09 239.43 717.17239.8432 728.23240.5632 728.24241.0232 728.24  
241.2132 727.66252.0134 725.8253.8335 726.88254.4235 727.21257.9736 727.35  
276.074 727.85277.2241 727.97300.2545 728.21300.6246 728.19327.9552 728.22  
343.4694 728.27362.1741 728.3394.0724 728.7 396.213 728.81433.3827 729.1  
435.5333 729.09478.0144 730.2497.8195 730.28505.0213 730.33522.5659 731.1

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val  
0 .09197.0223 .055241.0232 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
197.0223241.0232 43 43 43 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 204.98 729.85 F  
241.02522.5659 729.85 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139220

INPUT

Description: Main Street Bridge (GEC 2010)

Distance from Upstream XS = 2

Deck/Roadway Width = 40

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 7

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1.75	730.48				101.82	728.94				205.23	728.59	726.66		
240.58	728.52	726.66			301.98	728.65				502.3	729.64			
602.27	731.66													

Upstream Bridge Cross Section Data

Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.01.7500667	73020.15028				729.6221.78031	729.5644.05058	729.2	
49.99065	729.1161.35076	728.5178.32095	728.4681.67101	728.42145.5518	728.35				
160.7319	728.08163.6919	728.04 169.422	728.27 170.032	728.26182.3922	727.99				
184.5822	728.01191.5523	727.85192.0423	727.87192.3923	727.89197.0223	727.88				
198.3524	726.62204.9824	728.09206.8825	720.1207.8725	719.88213.0925	719.1				
213.4725	719.24216.7326	720.28218.4826	720.33224.4228	719.24 232.17	716.82				
234.04	716.09 239.43	717.17239.8432	728.23240.5632	728.24241.0232	728.24				
241.2132	727.66252.0134	725.8253.8335	726.88254.4235	727.21257.9736	727.35				
276.074	727.85277.2241	727.97300.2545	728.21300.6246	728.19327.9552	728.22				
343.4694	728.27362.1741	728.3394.0724	728.7 396.213	728.81433.3827	729.1				
435.5333	729.09478.0144	730.2497.8195	730.28505.0213	730.33522.5659	731.1				

Manning's n Values

num= 3

Sta n Val Sta n Val Sta n Val  
0 .09197.0223 .055241.0232 .09

Bank Sta: Left Right Coeff Contr. Expan.  
197.0223241.0232 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 204.98 729.85 F  
241.02522.5659 729.85 F

Downstream Deck/Roadway Coordinates

num= 10

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	729.84				7.62	729.64				73.25	728.94			
133.48	728.51				176.17	728.59	726.66	211.78	728.55	726.66				
273.09	728.65				374.15	729.64		400	729.9					
461	731.2													

Downstream Bridge Cross Section Data

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523.70975	728.8227.89148	728.5981.48389	728.4292.49826	728.3				
111.306	728.28 115.568	728.2138.8976	727.86139.7679	727.87151.9729	727.4				
160.1664	727.89160.8067	727.79161.2372	727.71172.2425	728.22176.3284	728.11				
176.3584	728.3176.7189	727.36 177.47	725.82177.7802	725.18 177.96	725.08				
178.92	724.37179.7504	723.97181.7406	720.15188.4514	719.69195.9922	718.08				
202.94	718.09 208.88	718.24211.1571	718.4211.5572	728.21212.6979	728.22				
215.3794	728.2218.1695	728.17223.3598	726.12226.2598	727.62227.1299	727.59				
233.6101	727.97233.9502	727.96237.7803	727.99255.4309	728.09 257.701	728.08				
258.1511	728.09259.2011	728.11260.1811	728.01270.0684	727.03277.6136	727.28				
290.1828	728.52311.0581	728.56337.4271	728.57340.2892	728.37359.5701	727.36				
362.9002	728.21402.1619	728.27461.9445	730.9470.3348	730.1471.7349	730.13				
484.1907	730.3514.9351	731.97570.0804	734.25575.2929	734.42576.8837	734.48				
635.2205	736.76 638.472	736.89639.2523	736.91						

Manning's n Values

num= 3

Sta n Val Sta n Val Sta n Val  
0 .09176.3284 .055212.6979 .09

Bank Sta: Left Right Coeff Contr. Expan.  
176.3284212.6979 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 176.33 729.85 F  
212.69639.2523 729.85 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
 Pier Station Upstream= 222.11 Downstream= 193.92  
 Upstream num= 2  
 Width Elev Width Elev  
 2 714 2 727.6  
 Downstream num= 2  
 Width Elev Width Elev  
 2 714 2 727.6

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139201

INPUT  
 Description: DSF Main St Bridge, GEC Input 07-2010  
 Station Elevation Data num= 63  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523	70975	728.8227	89148	728.5981	48389	728.4292	49826	728.3
111.306	728.28	115.568	728.2138	8976	727.86139	7679	727.87151	9729	727.4
160.1664	727.89160	8067	727.79161	2372	727.71172	2425	728.22176	3284	728.11
176.3584	728.3176	7189	727.36	177.47	725.82177	7802	725.18	177.96	725.08
178.92	724.37179	7504	723.97181	7406	720.15188	4514	719.69195	9922	718.08
202.94	718.09	208.88	718.24211	1571	718.4211	5572	728.21212	6979	728.22
215.3794	728.2218	1695	728.17223	3598	726.12226	2598	727.62227	1299	727.59
233.6101	727.97233	9502	727.96237	7803	727.99255	4309	728.09	257.701	728.08
258.1511	728.09259	2011	728.11260	1811	728.01270	0684	727.03277	6136	727.28
290.1828	728.52311	0581	728.56337	4271	728.57340	2892	728.37359	5701	727.36
362.9002	728.21402	1619	728.27461	9445	730.9470	3348	730.1471	7349	730.13
484.1907	730.3514	9351	731.97570	0804	734.25575	2929	734.42576	8837	734.48
635.2205	736.76	638.472	736.89639	2523	736.91				

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.09176	3284	.055212	6979	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 176.3284212.6979 20 21 19 .3 .5  
 Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
0	176.33	729.85	F
212.69639	2523	729.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139180

INPUT  
 Description: DS Main St Xsec, GEC 07-2010  
 Station Elevation Data num= 47  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62
88.46001	720.0689	37001	719.9394	15001	719.2196	36001	718.0598	99001	719.22
103.44	719.72	104.16	719.79104	5201	720.3108	8901	723.01109	6001	723.18
112.0626	723.73112	2529	723.91	132.651	722.85	133.01	722.87133	4516	722.87
140.9519	722.97157	3524	723.25185	4334	724.32186	8835	724.48	200.824	724.1

202.8144	724.06237.8324	725.57239.0326	725.87240.7531	725.88359.7095	726.08
361.3396	726.13412.6096	727.17414.2996	727.28415.0897	727.32417.8119	727.42
474.3699	728.87475.9402	728.96539.6592	733.47540.1493	733.45540.5194	733.44
592.1792	737.52592.9095	737.57			

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 76.65 .055112.2529 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 76.65112.2529 27 27 27 .1 .3  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 71 729 F  
 118592.9095 729 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data		num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321.94402	728.0524.42452	728.2730.15558	728.433.69627	728.64						
53.62989	728.7655.24017	728.883.58551	728.784.68569	728.6293.64731	727.75						
99.92865	727.16144.9669	725.01148.6377	724.63174.0424	724.03 182.394	723.16						
188.0251	721.86192.4358	721.41 193.546	720.6197.9669	718.93198.8469	718.6						
199.287	718.29200.1873	717.97201.1675	718.25210.6992	719.7211.3994	719.82						
211.8396	720.15215.6702	723.81217.8506	723.69228.2125	723.28234.4736	723.55						
285.1931	724.38290.2141	724.32303.1765	725.57318.4593	725.33334.4223	725.81						
346.4945	725.98360.7272	726.23378.3205	726.04387.0722	726.02388.8324	726.02						
484.5803	726.6559.9542	727.21598.6415	727.49625.3665	728.1634.1082	728.43						
636.6285	728.73653.9019	729.96									

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13174.0424 .055215.6702 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 174.0424215.6702 612 483 587 .1 .3  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 167.9 727.5 F  
 233653.9019 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data		num= 67									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423.72051	733.5850.52278	732.97103.7242	731.47105.4352	731.41						
131.3751	730.4131.8137	730.38158.5284	728.95159.2807	728.91212.4323	726.45						
213.4117	726.4214.4225	726.38237.1291	725.95238.4291	725.87270.6048	725.04						
301.9967	724.55329.4541	724.34348.9568	723.99353.0579	723.93383.6354	723.56						
393.7921	720.73395.9406	718.84397.8362	718.62412.9881	717.03413.5182	717.39						
421.4882	723.09422.3705	723.13423.6802	723.32426.9516	723.8 431.308	724.75						
431.8838	724.82433.9684	725.32438.4547	725.81444.5365	726.47451.8719	727.21						
453.17	727.34462.0598	726.78464.8397	724.87466.0078	724.88660.9682	724.72						
662.7347	724.78665.5562	725.71672.5701	726.12672.9245	726.08 678.82	725.76						
688.87	724.89 720.06	724.86779.3023	724.71779.8826	724.73 781.903	724.91						
794.0884	726.09822.4244	726.78837.3586	729.02851.4493	733.36859.5363	736.1						
859.9111	736.1870.0308	736.22874.1083	735.74999.9396	735.691018.729	735.71						
1019.092	735.731043.219	736.681043.782	736.741094.542	736.951094.985	736.99						
1156.851	738.171162.934	738.32									

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .11383.6354 .055426.9516 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 383.6354426.9516 477 490 222 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 453.171162.934 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227	70591	736.4139	66846	735.9370	28796	734.64103	4348	733.35
112.8032	732.98127	3655	732.42149	6064	731.55158	5392	731.24192	9704	729.96
193.9008	729.93228	3727	728.93238	0518	728.63274	1718	727.4274	5956	727.39
276.3068	727.33311	4224	726.11324	7386	725.78353	8317	725.07371	0858	724.94
377.2663	724.83386	0002	724.69408	0329	724.48426	6654	724.26441	0691	724.01
461.0534	723.27479	9106	722.54	480.648	722.51509	3992	722.38518	2288	722.26
538.5144	722.18541	1888	722.16554	0018	721.87561	3702	718.31562	7351	717.82
568.9442	717.09571	9603	716.6572	3747	716.53576	5869	717.44579	1799	718
581.3936	718.56584	1164	722.45585	6533	723.17590	2328	725.28606	3673	726.51
606.6901	726.5615	4731	726.14621	5073	725.58627	2417	724.05651	4352	724.38
652.6528	724683	0341	723.96685	8575	724.01686	6508	724.35688	3648	724.29
689.888	724.18	698.492	724.71727	7194	724.72	755.626	724.31757	1407	724.31
852.5659	724.38855	0814	724.56855	6722	725.07861	3923	725.08890	1413	727.49
891.4794	727.52892	5094	727.53932	6591	728.35933	8849	728.4961	7881	729.41
969.2715	729.75970	3898	729.861004	611	735.131014	855	735.35	1023.59	735.53
1072.667	732.511073	249	732.51	1110.48	734.54	1141.5	737.11169	515	739.84
1170.197	739.89								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13441	0691	.055590	2328	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	441.0691	590.2328		465	465	465		.1	.3
Ineffective Flow			num=	1					
Sta L	Sta R	Elev	Permanent						
606.411170	197	726.7	F						

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930	720		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.5924	00007	730.5935	00002	729.1985	00035	727.99119	0003	727.29
184.0007	726.59229	0009	725.69276	0009	724.09	324.001	721.79374	0013	720.69
424.0015	720.49474	0016	720.19516	0019	719.79	562.002	719.49565	0021	717.79
565.0021	716.49	569.002	714.29572	0021	713.99	573.002	714.39	574.002	715.99
576.002	717.89	583.002	720.09624	0022	721.09674	0022	719.99719	0024	720.29
764.0026	720.89806	0028	722.19834	0028	723.29874	0029	726.09934	0033	730.89
979.0035	733.59								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13474	0016	.055624	0022	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	474.0016624	0022		0	0	0		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3



Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139242	.09	.055	.09
Main Before D	139220			
Main Before D	139201	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	152	143	172
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	33	35	35
Main Before D	139242	43	43	43
Main Before D	139220			
Main Before D	139201	20	21	19
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

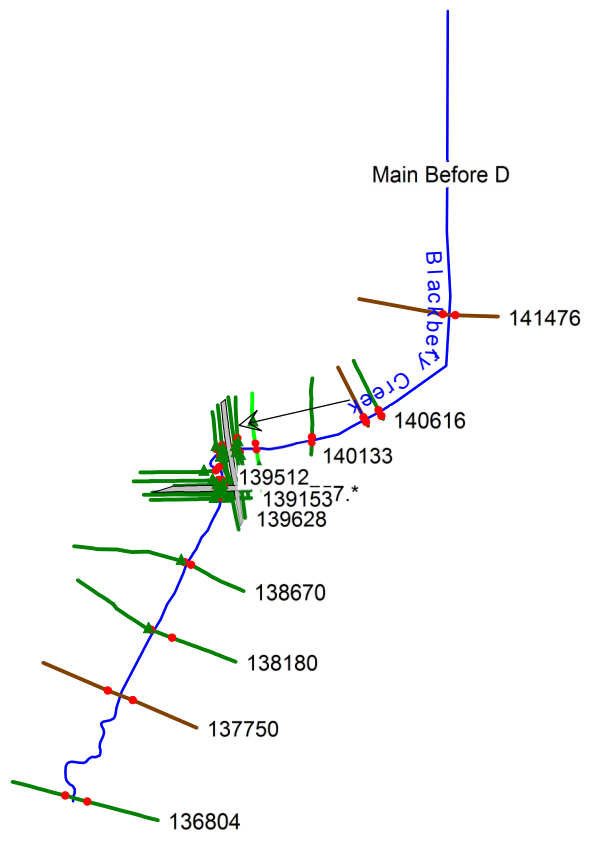
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139242	.3	.5
Main Before D	139220		
Main Before D	139201	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

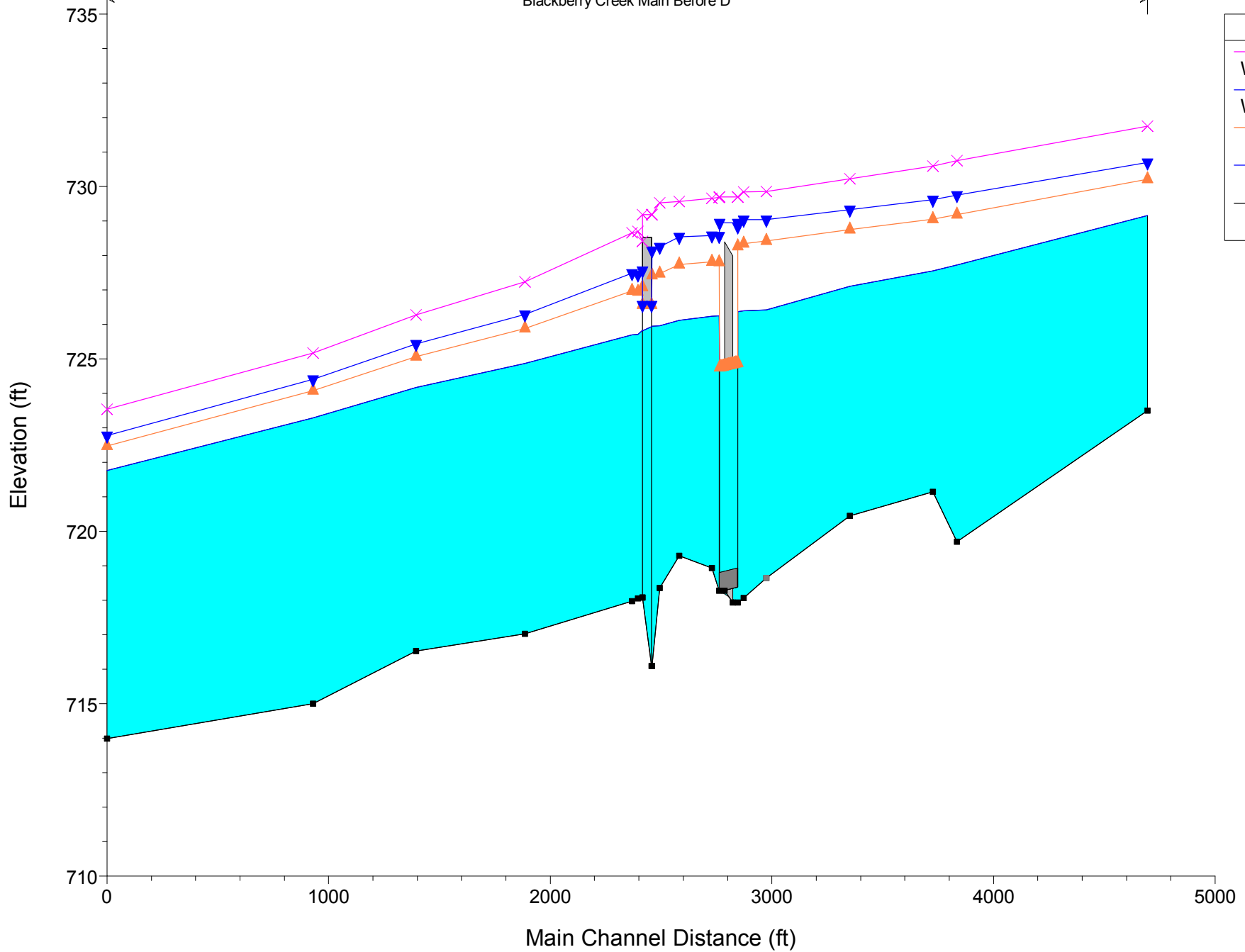
**GROUP #1 - EXISTING CONDITIONS**

**Existing Route 47 Culvert and Main St. bridge**



3 of the 19 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003314	2.68	391.73	300.75	0.31
Main Before D	141476	Q50	1128.00	723.50	730.21		730.29	0.002187	2.80	753.36	387.85	0.27
Main Before D	141476	Q100	1384.00	723.50	730.70		730.79	0.001873	2.83	957.09	438.67	0.25
Main Before D	141476	Q500	2108.00	723.50	731.75		731.84	0.001578	3.05	1474.47	549.66	0.24
Main Before D	140616	Q10	637.00	719.70	727.73		727.80	0.001001	2.46	438.45	232.02	0.20
Main Before D	140616	Q50	1126.00	719.70	729.18		729.25	0.000769	2.60	803.86	272.45	0.19
Main Before D	140616	Q100	1381.00	719.70	729.75		729.82	0.000748	2.73	964.68	293.83	0.19
Main Before D	140616	Q500	2104.00	719.70	730.75		730.85	0.000896	3.28	1279.46	341.65	0.21
Main Before D	140504	Q10	637.00	721.14	727.55		727.66	0.001666	3.02	397.28	206.39	0.26
Main Before D	140504	Q50	1126.00	721.14	729.05		729.14	0.001232	3.16	749.10	256.94	0.23
Main Before D	140504	Q100	1381.00	721.14	729.62		729.72	0.001174	3.28	900.13	270.33	0.23
Main Before D	140504	Q500	2104.00	721.14	730.60		730.72	0.001386	3.92	1175.06	293.15	0.25
Main Before D	140133	Q10	635.00	720.45	727.10		727.19	0.001163	2.66	399.60	188.22	0.22
Main Before D	140133	Q50	1122.00	720.45	728.75		728.82	0.000824	2.76	748.68	234.62	0.20
Main Before D	140133	Q100	1378.00	720.45	729.33		729.41	0.000808	2.91	890.66	249.65	0.20
Main Before D	140133	Q500	2098.00	720.45	730.22		730.35	0.001106	3.70	1127.72	296.16	0.24
Main Before D	139757.*	Q10	635.00	718.65	726.42	724.52	726.57	0.002357	3.33	293.92	192.97	0.30
Main Before D	139757.*	Q50	1122.00	718.65	728.42	725.57	728.49	0.000893	2.72	768.54	341.35	0.20
Main Before D	139757.*	Q100	1378.00	718.65	729.04	726.03	729.11	0.000754	2.67	1075.35	373.31	0.19
Main Before D	139757.*	Q500	2098.00	718.65	729.85	726.93	729.94	0.000944	3.24	1396.37	425.49	0.21
Main Before D	139653	Q10	634.00	718.06	726.40	722.10	726.45	0.000435	1.85	349.48	271.54	0.14
Main Before D	139653	Q50	1120.00	718.06	728.34	722.87	728.42	0.000464	2.34	520.82	417.22	0.15
Main Before D	139653	Q100	1376.00	718.06	729.04	723.23	729.06	0.000162	1.42	1634.30	475.25	0.09
Main Before D	139653	Q500	2097.00	718.06	729.84	724.15	729.88	0.000236	1.83	2073.83	613.75	0.11
Main Before D	139628	Q10	634.00	717.93	726.36	720.72	726.44	0.000564	2.15	294.56	83.37	0.14
Main Before D	139628	Q50	1120.00	717.93	728.26	721.74	728.40	0.000807	3.01	372.35	279.04	0.18
Main Before D	139628	Q100	1376.00	717.93	728.85	722.22	729.04	0.000989	3.47	396.43	407.37	0.20
Main Before D	139628	Q500	2097.00	717.93	729.70	723.40	729.86	0.001026	3.62	1225.38	563.49	0.20
Main Before D	139602		Culvert									
Main Before D	139545	Q10	634.00	718.27	726.25	721.62	726.34	0.000694	2.40	263.71	91.98	0.17
Main Before D	139545	Q50	1120.00	718.27	727.81	722.54	727.99	0.001067	3.43	326.18	273.28	0.21
Main Before D	139545	Q100	1376.00	718.27	728.57	722.98	728.80	0.001196	3.86	356.65	472.25	0.23
Main Before D	139545	Q500	2097.00	718.27	729.69	724.07	729.79	0.000841	2.93	1545.68	717.57	0.18
Main Before D	139512	Q10	634.00	718.93	726.23	722.64	726.31	0.000585	2.21	309.02	202.46	0.18
Main Before D	139512	Q50	1120.00	718.93	727.81	723.60	727.93	0.000670	2.87	428.90	249.97	0.20
Main Before D	139512	Q100	1376.00	718.93	728.58	724.00	728.73	0.000677	3.12	487.69	283.53	0.21
Main Before D	139512	Q500	2097.00	718.93	729.66	724.96	729.77	0.000537	3.05	1335.95	333.86	0.19
Main Before D	139364	Q10	634.00	719.29	726.12	722.82	726.16	0.000464	2.12	715.54	335.84	0.16
Main Before D	139364	Q50	1120.00	719.29	727.74	724.58	727.77	0.000324	2.09	1312.37	394.44	0.14
Main Before D	139364	Q100	1376.00	719.29	728.54	724.95	728.57	0.000273	2.06	1637.11	418.43	0.13
Main Before D	139364	Q500	2097.00	719.29	729.56	725.87	729.60	0.000350	2.52	2083.93	469.71	0.15
Main Before D	139277	Q10	634.00	718.35	725.96	722.40	726.10	0.001004	3.31	304.26	357.16	0.23
Main Before D	139277	Q50	1120.00	718.35	727.48	723.96	727.71	0.001328	4.39	435.18	421.68	0.28
Main Before D	139277	Q100	1376.00	718.35	728.25	724.42	728.51	0.001354	4.72	515.64	463.71	0.28
Main Before D	139277	Q500	2097.00	718.35	729.53	725.51	729.57	0.000372	2.71	2366.13	609.62	0.15
Main Before D	139242	Q10	634.00	716.09	725.95	720.91	726.06	0.000960	2.63	240.68	35.39	0.17
Main Before D	139242	Q50	1120.00	716.09	727.42	721.94	727.66	0.001694	3.87	289.54	57.18	0.23
Main Before D	139242	Q100	1376.00	716.09	728.15	722.44	728.45	0.002002	4.39	315.25	126.90	0.25
Main Before D	139242	Q500	2097.00	716.09	729.18	723.68	729.51	0.003104	4.93	682.08	393.81	0.30
Main Before D	139220		Bridge									
Main Before D	139201	Q10	634.00	718.08	725.83	721.19	725.96	0.001354	2.89	219.66	33.99	0.20
Main Before D	139201	Q50	1120.00	718.08	727.08	722.31	727.36	0.002489	4.27	262.55	40.83	0.27
Main Before D	139201	Q100	1376.00	718.08	727.57	722.82	727.95	0.003090	4.92	279.59	69.49	0.30
Main Before D	139201	Q500	2097.00	718.08	728.41	724.14	729.13	0.005320	6.79	308.78	272.87	0.40
Main Before D	139180	Q10	640.00	718.05	725.71	722.91	725.90	0.002539	3.60	203.17	210.70	0.29
Main Before D	139180	Q50	1132.00	718.05	726.95	724.36	727.28	0.003364	4.86	270.79	387.01	0.35
Main Before D	139180	Q100	1389.00	718.05	727.45	724.80	727.86	0.003775	5.43	298.06	409.44	0.38
Main Before D	139180	Q500	2117.00	718.05	728.70	725.82	728.77	0.000931	3.04	1611.81	467.82	0.19

HEC-RAS Plan: G#1 - Ex Cond River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139153	Q10	640.00	717.97	725.70	722.51	725.83	0.001683	2.96	268.26	200.37	0.24
Main Before D	139153	Q50	1132.00	717.97	726.97	724.03	727.17	0.002119	3.90	370.49	426.24	0.28
Main Before D	139153	Q100	1389.00	717.97	727.49	724.47	727.74	0.002333	4.33	412.23	501.65	0.30
Main Before D	139153	Q500	2117.00	717.97	728.66	725.38	728.74	0.000980	3.14	1654.82	571.52	0.20
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.96	563.78	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.32	497.09	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.50	560.59	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002980	2.89	485.19	188.16	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003086	3.43	642.38	225.03	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.44	0.00	109.95	505.35	22.70	300.75
Main Before D	141476	Q50	730.29	730.21	0.09	1.04	0.01	261.19	767.60	99.22	387.85
Main Before D	141476	Q100	730.79	730.70	0.08	0.96	0.00	338.57	891.44	153.99	438.67
Main Before D	141476	Q500	731.84	731.75	0.09	0.99	0.00	546.03	1220.45	341.51	549.66
Main Before D	140616	Q10	727.80	727.73	0.07	0.14	0.00	0.24	489.25	147.51	232.02
Main Before D	140616	Q50	729.25	729.18	0.07	0.10	0.00	2.82	684.55	438.64	272.45
Main Before D	140616	Q100	729.82	729.75	0.07	0.10	0.00	5.03	785.79	590.18	293.83
Main Before D	140616	Q500	730.85	730.75	0.10	0.12	0.00	12.33	1090.97	1000.70	341.65
Main Before D	140504	Q10	727.66	727.55	0.11	0.47	0.01	0.00	468.44	168.56	206.39
Main Before D	140504	Q50	729.14	729.05	0.10	0.32	0.01	0.51	660.74	464.75	256.94
Main Before D	140504	Q100	729.72	729.62	0.10	0.30	0.01	1.09	754.53	625.38	270.33
Main Before D	140504	Q500	730.72	730.60	0.13	0.38	0.00	3.13	1039.01	1061.86	293.15
Main Before D	140133	Q10	727.19	727.10	0.08	0.61	0.01	2.74	470.89	161.37	188.22
Main Before D	140133	Q50	728.82	728.75	0.08	0.33	0.00	11.62	669.85	440.53	234.62
Main Before D	140133	Q100	729.41	729.33	0.08	0.30	0.00	17.24	773.25	587.50	249.65
Main Before D	140133	Q500	730.35	730.22	0.12	0.39	0.01	33.84	1114.75	949.41	296.16
Main Before D	139757.*	Q10	726.57	726.42	0.15	0.09	0.03	9.15	539.45	86.39	192.97
Main Before D	139757.*	Q50	728.49	728.42	0.07	0.07	0.00	66.11	671.05	384.85	341.35
Main Before D	139757.*	Q100	729.11	729.04	0.06	0.03	0.01	101.53	731.78	544.69	373.31
Main Before D	139757.*	Q500	729.94	729.85	0.09	0.04	0.01	196.97	998.35	902.67	425.49
Main Before D	139653	Q10	726.45	726.40	0.05	0.01	0.00	2.14	631.86		271.54
Main Before D	139653	Q50	728.42	728.34	0.08	0.02	0.01	33.10	1086.90		417.22
Main Before D	139653	Q100	729.06	729.04	0.02	0.01	0.02	55.78	995.32	324.90	475.25
Main Before D	139653	Q500	729.88	729.84	0.04	0.01	0.01	124.22	1426.12	546.66	613.75
Main Before D	139628	Q10	726.44	726.36	0.07				633.99	0.01	83.37
Main Before D	139628	Q50	728.40	728.26	0.14				1119.79	0.21	279.04
Main Before D	139628	Q100	729.04	728.85	0.19				1375.65	0.35	407.37
Main Before D	139628	Q500	729.86	729.70	0.16			234.59	1577.77	284.64	563.49
Main Before D	139602		Culvert								
Main Before D	139545	Q10	726.34	726.25	0.09	0.02	0.01		634.00		91.98
Main Before D	139545	Q50	727.99	727.81	0.18	0.03	0.03		1120.00		273.28
Main Before D	139545	Q100	728.80	728.57	0.23	0.03	0.04		1376.00		472.25
Main Before D	139545	Q500	729.79	729.69	0.10	0.02	0.00	222.46	1573.22	301.32	717.57
Main Before D	139512	Q10	726.31	726.23	0.07	0.13	0.01	1.43	616.03	16.54	202.46
Main Before D	139512	Q50	727.93	727.81	0.12	0.13	0.03	7.04	1068.08	44.88	249.97
Main Before D	139512	Q100	728.73	728.58	0.14	0.12	0.03	10.88	1303.16	61.97	283.53
Main Before D	139512	Q500	729.77	729.66	0.10	0.15	0.02	162.27	1471.03	463.71	333.86
Main Before D	139364	Q10	726.16	726.12	0.04	0.05	0.01	16.82	347.66	269.52	335.84
Main Before D	139364	Q50	727.77	727.74	0.03	0.04	0.02	43.05	440.09	636.86	394.44
Main Before D	139364	Q100	728.57	728.54	0.03	0.04	0.02	62.93	479.94	833.12	418.43
Main Before D	139364	Q500	729.60	729.56	0.04	0.03	0.00	117.43	661.05	1318.53	469.71
Main Before D	139277	Q10	726.10	725.96	0.14	0.03	0.01	14.21	504.29	115.50	357.16
Main Before D	139277	Q50	727.71	727.48	0.23	0.05	0.00	36.60	828.92	254.48	421.68
Main Before D	139277	Q100	728.51	728.25	0.25	0.06	0.00	66.81	978.14	331.05	463.71
Main Before D	139277	Q500	729.57	729.53	0.04	0.03	0.03	57.87	645.40	1393.72	609.62
Main Before D	139242	Q10	726.06	725.95	0.11	0.00	0.00		634.00		35.39
Main Before D	139242	Q50	727.66	727.42	0.23				1119.98	0.02	57.18
Main Before D	139242	Q100	728.45	728.15	0.30				1375.00	1.00	126.90
Main Before D	139242	Q500	729.51	729.18	0.33			101.75	1833.19	162.05	393.81
Main Before D	139220		Bridge								
Main Before D	139201	Q10	725.96	725.83	0.13	0.04	0.02		634.00		33.99
Main Before D	139201	Q50	727.36	727.08	0.28	0.06	0.02		1120.00		40.83
Main Before D	139201	Q100	727.95	727.57	0.38	0.07	0.01		1376.00		69.49
Main Before D	139201	Q500	729.13	728.41	0.72	0.04	0.33		2097.00		272.87

HEC-RAS Plan: G#1 - Ex Cond River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139180	Q10	725.90	725.71	0.19	0.06	0.02	22.38	594.59	23.03	210.70
Main Before D	139180	Q50	727.28	726.95	0.33	0.07	0.04	58.07	1015.57	58.36	387.01
Main Before D	139180	Q100	727.86	727.45	0.41	0.08	0.05	78.28	1232.45	78.28	409.44
Main Before D	139180	Q500	728.77	728.70	0.06	0.03	0.00	264.60	825.28	1027.13	467.82
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.15	572.92	52.94	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.08	0.00	44.31	960.59	127.11	426.24
Main Before D	139153	Q100	727.74	727.49	0.25	1.20	0.00	61.92	1158.85	168.23	501.65
Main Before D	139153	Q500	728.74	728.66	0.08	0.86	0.02	179.84	993.61	943.56	571.52
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.46	1146.30	11.24	563.78
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.22	1359.77	0.01	497.09
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.49	2012.52	1.98	560.59
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.21	1.79	188.16
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.70	13.03	225.03
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09



Errors Warnings and Notes for Plan : G#1 - Ex Cond

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : G#1 - Ex Cond (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : G#1 - Ex Cond (Continued)

	surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7

Errors Warnings and Notes for Plan : G#1 - Ex Cond (Continued)

	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : G#1 - Ex Cond (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX       XX       XXXX
X   X  X        X   X      X   X      X   X      X
X   X  X        X        X   X X      X   X      X
XXXXXXXX XXXX   X          XXX XXXX   XXXXXXXX   XXXX
X   X  X        X        X   X      X   X        X
X   X  X        X   X      X   X      X   X      X
X   X  XXXXXX   XXXX       X   X      X   X      XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 10:03:21 AM

Project in English units

PLAN DATA

Plan Title: Group #1 Existing (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p06

Geometry Title: Group #1- Existing (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g15

Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Existing Main St structure (low chord at 726.56') and existing IL-47 culvert.

Plan Summary Information:

Number of:	Cross Sections =	19	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	141476	638	1128	1384	2108
Blackberry CreekMain	Before D	140616	637	1126	1381	2104
Blackberry CreekMain	Before D	140133	635	1122	1378	2098
Blackberry CreekMain	Before D	139653	634	1120	1376	2097
Blackberry CreekMain	Before D	139364	634	1120	1376	2097
Blackberry CreekMain	Before D	139180	640	1132	1389	2117
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #1- Existing (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g15

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and channel data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 31 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and channel data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and channel data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 29 rows of elevation data.

117.4982	725.2	158.663	725.14175	4356	725.2199	3833	725.23200	0.636	725.25
240.4556	726.41241	4389	726.44281	7278	727.91282	3598	727.93324	4.932	729.82
325.104	729.84	368.711	730.36413	5901	730.81414	2438	730.82456	2.384	731.28
456.7409	731.29457	6156	731.29501	0569	732.08501	4998	732.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1177	66348	.05117	4982	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

77.66348	117.4982	350.15	376	403.42	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-185.75	.11	92.33	.05	134.98	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

92.33	134.98	96.85	104	111.58	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-185.75	-17	728.94	F
276.6	467.58	728.94	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-189	.09	96.437	.05	189.85	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

96.437	189.85	42	25	47	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-189	69.5	728.94	F
159.5	458.336	728.94	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	139.31	726.24		
140.021	726.208	140.201	726.2	140.321	723.93	142.649	723.41	145.058	721.44		
146.85	720	147.509	719.58	149.301	719.02	156.113	717.93	158.35	718.33		



159.363	718.32	160.173	718.12	162.156	718.16	176.532	718.44	176.968	718.58
177.523	718.84	180.53	719.45	181.594	724.48	181.979	726.05	201.008	725.99
202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24	258.696	727.26
280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57	327.86	729.59
397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72	421.627	732.15
508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 140.201 .055 181.979 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 140.201 181.979 85 85 85 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 141.1 728.94 F  
 182.1 510.226 728.94 F

CULVERT

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT  
 Description: US IL 47 Culvert  
 Distance from Upstream XS = 24  
 Deck/Roadway Width = 36  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates  
 num= 11  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-287	729.6				-220	729				-170.67	728.66			
-17.57	728.44				74.44	727.99				148.68	728.27			
169.57	728.66				211.03	729.24				264.46	730.12			
354.3	731.73				408.76	732.81								

Upstream Bridge Cross Section Data  
 Station Elevation Data num= 59  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	139.31	726.24
140.021	726.208	140.201	726.2	140.321	723.93	142.649	723.41	145.058	721.44
146.85	720	147.509	719.58	149.301	719.02	156.113	717.93	158.35	718.33
159.363	718.32	160.173	718.12	162.156	718.16	176.532	718.44	176.968	718.58
177.523	718.84	180.53	719.45	181.594	724.48	181.979	726.05	201.008	725.99
202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24	258.696	727.26
280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57	327.86	729.59
397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72	421.627	732.15
508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 140.201 .055 181.979 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 140.201 181.979 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 141.1 728.94 F  
 182.1 510.226 728.94 F

Downstream Deck/Roadway Coordinates  
 num= 14  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-339.77	731.43				-247.66	729.97				-90.89	728.63			
-78.51	728.48				17.09	728.39				84.47	729.69			
161.61	730.24				211.4	730.68				235.29	730.94			
264.33	731.26				375.89	732.81				429.87	733.78			
443.16	734.08				465.03	734.5								

Downstream Bridge Cross Section Data  
 Station Elevation Data num= 56  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31189	1777	725.42189	4154	725.29190	0861	721.27
193.62	720.33197	8178	720.09	198.063	719.93205	5144	719.49205	9518	719.46
212.6496	719.03213	5154	718.87213	8096	718.83217	3705	718.27222	0379	719.83
222.7267	719.95231	0645	720.01232	1412	720.54	232.23	720.67	232.86	724.17
242.69	725.05	249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21
272.4837	726.22285	9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93
364.1443	727.74404	2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37
520.2271	729.91								

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val  
 -300 .13189.1777 .055255.9665 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 189.1777255.9665 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 189.7 728.94 F  
 229.7520.2271 728.94 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span  
 Culvert #2 Box 6.5 8.75  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 1 82 .013 .015 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 144.875 175.925  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 195.875 226.925

Culvert Name Shape Rise Span  
 Culvert #1 Box 6.5 10.4  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 2 82 .013 .013 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 154.95 165.85  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 205.95 216.85

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139545

INPUT  
 Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
 elevation based on IDOT/GEC tin

Station Elevation Data num= 56  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
 25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
 75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
 122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
 164.8799 727.57166.6929 727.31189.1777 725.42189.4154 725.29190.0861 721.27  
 193.62 720.33197.8178 720.09 198.063 719.93205.5144 719.49205.9518 719.46  
 212.6496 719.03213.5154 718.87213.8096 718.83217.3705 718.27222.0379 719.83  
 222.7267 719.95231.0645 720.01232.1412 720.54 232.23 720.67 232.86 724.17  
 242.69 725.05 249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21  
 272.4837 726.22285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93  
 364.1443 727.74404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37  
 520.2271 729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13189.1777 .055255.9665 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 189.1777255.9665 25 33 40 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 189.7 728.94 F  
 229.7520.2271 728.94 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139512

INPUT  
Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 42									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	732	-50	729.5	-20	728	0	726.23	.537122	726.17
9.693759	725.8817	9.6078	725.5535	3.8584	726.2336	0.1735	726.2236	9.98616	726.09
57.37652	725.1859	6.4951	725.0564	4.7989	723.44	70.3069	721.5278	6.4016	720.39
85.87483	718.9390	6.1574	719.3790	9.1806	719.5795	4.3697	720.56105	7.258	722.12
118.2908	723.9118	9.698	724.08127	3.197	724.15141	7.605	724.04	147.534	724.04
148.0156	724.04	148.739	724.06	167.183	724.56186	7.215	725.5193	0.373	725.81
194.0911	725.83216	7.024	726.92218	2.687	726.95	242.918	728.48265	4.388	728.74
269.1036	728.77	315.993	731.95316	7.762	731.96	318.031	732361	4.998	733.74
361.896	733.75362	2.298	733.76						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-75	.1359	6.4951	.045118	9.698	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	59.64951	1118.9698		70	148	626	.1		.3
Ineffective Flow num= 2									
Sta L	Sta R	Elev	Permanent						
-75	54.9	728.94	F						
130.9362	2.298	728.94	F						

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT  
Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input  
07-2010

Station Elevation Data num= 41									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.2325	8.9646	728.3234	5.8134	727.6847	5.3335	726.7461	6.5466	725.98
62.86731	725.3171	5.2296	724.580	8.0232	723.9286	3.3195	723.2987	8.1361	722.7
91.14569	721.7892	6.0942	720.993	4.4381	720.3494	3.9133	719.797	0.8542	719.6
102.3392	719.29113	2.782	720.26114	9.753	723.84	129.198	723.96172	1.1069	723.76
207.7128	723.81245	1.637	723.92245	9.037	723.94284	2.046	724.19284	8.347	724.2
325.5757	724.59326	0.558	724.61344	0.362	724.9365	4.267	725.29366	2.567	725.29
386.9972	725.89407	8.078	726.51408	2.278	726.53448	8.588	729450	0.0789	729.04
474.1395	729.48487	6.698	729.71490	6.599	729.87525	8.707	732.04609	3.928	738.15
609.7329	738.17								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1186	3.3195	.045114	9.753	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	86.33195	114.9753		141	87	58	.1		.3
Ineffective Flow num= 1									
Sta L	Sta R	Elev	Permanent						
194.84609	7.329	725.87	F						

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT  
Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 39									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-270.5	731.66	-210	729.95	-30	728.95	0	727.6915	0.9991	727.46
19.13766	727.1833	2.1519	726.3636	7.9197	725.43	38.4556	725.1743	1.0466	723.81
49.34686	722.2749	9.5718	721.8451	5.5831	720.2351	9.5881	720.260	0.6436	718.35
60.64471	719.0169	9.6091	719.2971	0.4166	720.2171	7.8226	720.2973	3.8339	722.87
75.39461	722.3111	7.997	723.27120	8.857	723.37125	1.487	723.47139	5.584	723.98
169.439	722.97199	0.895	724.12243	0.502	723.99275	1.607	724.28312	3.935	724.69
320.8542	724.82364	3.776	725.18	422.652	726.84423	6.721	726.87514	6.191	731.58
515.9192	731.63558	3.625	738.18628	1.378	741.89628	7.879	741.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-270.5	.1349	3.4686	.04573	3.8339	.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	49.34686	73.38339		33	35	35	.1		.3
Ineffective Flow num= 2									
Sta L	Sta R	Elev	Permanent						

-270.5 8.07 728.57 F  
112.73628.7879 728.57 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139242

INPUT

Description: USF Main St Bridge, GEC Input 07-2010  
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.017500667	73020.15028	729.622178031	729.564405058	729.2	49.99065	729.116135076	728.517832095	728.468167101
160.7319	728.081636919	728.04169422	728.27170032	728.261823922	727.99	184.5822	728.011915523	727.851920423	727.871923923
198.3524	726.622049824	728.092068825	720.12078725	719.882130925	719.1	213.4725	719.242167326	720.282184826	720.332244228
234.04	716.0923943	717.172398432	728.232405632	728.242410232	728.24	241.2132	727.662520134	725.82538335	726.882544235
276.074	727.852772241	727.973002545	728.213006246	728.193279552	728.22	343.4694	728.273621741	728.33940724	728.7396213
435.5333	729.094780144	730.24978195	730.285050213	730.335225659	731.1				

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .09197.0223 .055241.0232 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
197.0223241.0232 43 43 43 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 206.7 728.57 F  
243.84522.5659 728.57 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139220

INPUT

Description: Main Street Bridge (GEC 2010)  
Distance from Upstream XS = 2  
Deck/Roadway Width = 40  
Weir Coefficient = 2.6  
Upstream Deck/Roadway Coordinates

num= 7  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
1.75 730.48 101.82 728.94 205.23 728.59 726.56  
240.58 728.52 726.56 301.98 728.65 502.3 729.64  
602.27 731.66

Upstream Bridge Cross Section Data

Station Elevation Data num= 55  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 730.017500667 73020.15028 729.622178031 729.564405058 729.2  
49.99065 729.116135076 728.517832095 728.468167101 728.421455518 728.35  
160.7319 728.081636919 728.04169422 728.27170032 728.261823922 727.99  
184.5822 728.011915523 727.851920423 727.871923923 727.891970223 727.88  
198.3524 726.622049824 728.092068825 720.12078725 719.882130925 719.1  
213.4725 719.242167326 720.282184826 720.332244228 719.24 232.17 716.82  
234.04 716.0923943 717.172398432 728.232405632 728.242410232 728.24  
241.2132 727.662520134 725.82538335 726.882544235 727.212579736 727.35  
276.074 727.852772241 727.973002545 728.213006246 728.193279552 728.22  
343.4694 728.273621741 728.33940724 728.7396213 728.814333827 729.1  
435.5333 729.094780144 730.24978195 730.285050213 730.335225659 731.1

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .09197.0223 .055241.0232 .09

Bank Sta: Left Right Coeff Contr. Expan.  
197.0223241.0232 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 206.7 728.57 F  
243.84522.5659 728.57 F

Downstream Deck/Roadway Coordinates

num= 10  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
0 729.84 7.62 729.64 73.25 728.94  
133.48 728.51 176.17 728.59 726.56 211.78 728.55 726.56  
273.09 728.65 374.15 729.64 400 729.9  
461 731.2

Downstream Bridge Cross Section Data

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523	70975	728.8227	89148	728.5981	48389	728.4292	49826	728.3
111.306	728.28	115.568	728.2138	8976	727.86139	7679	727.87151	9729	727.4
160.1664	727.89160	8067	727.79161	2372	727.71172	2425	728.22176	3284	728.11
176.3584	728.3176	7189	727.36	177.47	725.82177	7802	725.18	177.96	725.08
178.92	724.37179	7504	723.97181	7406	720.15188	4514	719.69195	9922	718.08
202.94	718.09	208.88	718.24211	1571	718.4211	5572	728.21212	6979	728.22
215.3794	728.2218	1695	728.17223	3598	726.12226	2598	727.62227	1299	727.59
233.6101	727.97233	9502	727.96237	7803	727.99255	4309	728.09	257.701	728.08
258.1511	728.09259	2011	728.11260	1811	728.01270	0684	727.03277	6136	727.28
290.1828	728.52311	0581	728.56337	4271	728.57340	2892	728.37359	5701	727.36
362.9002	728.21402	1619	728.27461	9445	730.9470	3348	730.1471	7349	730.13
484.1907	730.3514	9351	731.97570	0804	734.25575	2929	734.42576	8837	734.48
635.2205	736.76	638.472	736.89639	2523	736.91				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09176	3284	.055212	6979	.09

Bank Sta: Left Right Coeff Contr. Expan.

176.3284	212.6979		.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	177.03	728.57	F
212.05639	2523	728.57	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .98  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

Pier Station	Upstream=	Downstream=
	222.11	193.92

Upstream num= 2

Width	Elev	Width	Elev
2	714	2	727.6

Downstream num= 2

Width	Elev	Width	Elev
2	714	2	727.6

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy	
Momentum	Cd = 2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow	
Submerged Inlet Cd	=
Submerged Inlet + Outlet Cd	= .8
Max Low Cord	=

Additional Bridge Parameters

- Add Friction component to Momentum
- Do not add Weight component to Momentum
- Class B flow critical depth computations use critical depth inside the bridge at the upstream end
- Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139201

INPUT

Description: DSF Main St Bridge, GEC Input 07-2010

Station	Elevation	Data	num=	63					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523	70975	728.8227	89148	728.5981	48389	728.4292	49826	728.3
111.306	728.28	115.568	728.2138	8976	727.86139	7679	727.87151	9729	727.4
160.1664	727.89160	8067	727.79161	2372	727.71172	2425	728.22176	3284	728.11
176.3584	728.3176	7189	727.36	177.47	725.82177	7802	725.18	177.96	725.08
178.92	724.37179	7504	723.97181	7406	720.15188	4514	719.69195	9922	718.08
202.94	718.09	208.88	718.24211	1571	718.4211	5572	728.21212	6979	728.22
215.3794	728.2218	1695	728.17223	3598	726.12226	2598	727.62227	1299	727.59
233.6101	727.97233	9502	727.96237	7803	727.99255	4309	728.09	257.701	728.08
258.1511	728.09259	2011	728.11260	1811	728.01270	0684	727.03277	6136	727.28
290.1828	728.52311	0581	728.56337	4271	728.57340	2892	728.37359	5701	727.36
362.9002	728.21402	1619	728.27461	9445	730.9470	3348	730.1471	7349	730.13
484.1907	730.3514	9351	731.97570	0804	734.25575	2929	734.42576	8837	734.48
635.2205	736.76	638.472	736.89639	2523	736.91				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09176.3284		.055212.6979		.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	176.3284	212.6979		20	21	19		.3	.5
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
0	177.03	728.57	F						
212.05639	2523	728.57	F						

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data	num= 47								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62
88.46001	720.0689	37001	719.9394	15001	719.2196	36001	718.0598	99001	719.22
103.44	719.72	104.16	719.79104	5201	720.3108	8901	723.01109	6001	723.18
112.0626	723.73112	2529	723.91	132.651	722.85	133.01	722.87133	4516	722.87
140.9519	722.97157	3524	723.25185	4334	724.32186	8835	724.48	200.824	724.1
202.8144	724.06237	8324	725.57239	0326	725.87240	7531	725.88359	7095	726.08
361.3396	726.13412	6096	727.17414	2996	727.28415	0897	727.32417	8119	727.42
474.3699	728.87475	9402	728.96539	6592	733.47540	1493	733.45540	5194	733.44
592.1792	737.52592	9095	737.57						

Manning's n Values	num= 3		
Sta	n Val	Sta	n Val
0	.1	76.65	.055112.2529
			.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	76.65	112.2529		27	27	27		.1	.3
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
0	67	728.57	F						
121.6592	9095	728.57	F						

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data	num= 47								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321	94402	728.0524	42452	728.2730	15558	728.433	69627	728.64
53.62989	728.7655	24017	728.883	58551	728.784	68569	728.6293	64731	727.75
99.92865	727.16144	9669	725.01148	6377	724.63174	0424	724.03	182.394	723.16
188.0251	721.86192	4358	721.41	193.546	720.6197	9669	718.93198	8469	718.6
199.287	718.29200	1873	717.97201	1675	718.25210	6992	719.7211	3994	719.82
211.8396	720.15215	6702	723.81217	8506	723.69228	2125	723.28234	4736	723.55
285.1931	724.38290	2141	724.32303	1765	725.57318	4593	725.33334	4223	725.81
346.4945	725.98360	7272	726.23378	3205	726.04387	0722	726.02388	8324	726.02
484.5803	726.6559	9542	727.21598	6415	727.49625	3665	728.1634	1082	728.43
636.6285	728.73653	9019	729.96						

Manning's n Values	num= 3		
Sta	n Val	Sta	n Val
0	.13174	0424	.055215.6702
			.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	174.0424	215.6702		612	483	587		.1	.3
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
0	158.49	728.57	F						
239.19653	9019	728.57	F						

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data	num= 67								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423	72051	733.5850	52278	732.97103	7242	731.47105	4352	731.41
131.3751	730.4131	8137	730.38158	5284	728.95159	2807	728.91212	4323	726.45
213.4117	726.4214	4225	726.38237	1291	725.95238	4291	725.87270	6048	725.04
301.9967	724.55329	4541	724.34348	9568	723.99353	0579	723.93383	6354	723.56
393.7921	720.73395	9406	718.84397	8362	718.62412	9881	717.03413	5182	717.39
421.4882	723.09422	3705	723.13423	6802	723.32426	9516	723.8	431.308	724.75

431.8838	724.82433.9684	725.32438.4547	725.81444.5365	726.47451.8719	727.21
453.17	727.34462.0598	726.78464.8397	724.87466.0078	724.88660.9682	724.72
662.7347	724.78665.5562	725.71672.5701	726.12672.9245	726.08 678.82	725.76
688.87	724.89 720.06	724.86779.3023	724.71779.8826	724.73 781.903	724.91
794.0884	726.09822.4244	726.78837.3586	729.02851.4493	733.36859.5363	736.1
859.9111	736.1870.0308	736.22874.1083	735.74999.9396	735.691018.729	735.71
1019.092	735.731043.219	736.681043.782	736.741094.542	736.951094.985	736.99
1156.851	738.171162.934	738.32			

Manning's n Values	num=	3
Sta n Val Sta n Val		
0 .11383.6354 .055426.9516 .11		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
383.6354426.9516	477 490 222	.1	.3
Ineffective Flow num=	1		
Sta L Sta R Elev Permanent			
453.171162.934 727.5	F		

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data	num=	81
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 738.2227.70591 736.4139.66846 735.9370.28796 734.64103.4348 733.35		
112.8032 732.98127.3655 732.42149.6064 731.55158.5392 731.24192.9704 729.96		
193.9008 729.93228.3727 728.93238.0518 728.63274.1718 727.4274.5956 727.39		
276.3068 727.33311.4224 726.11324.7386 725.78353.8317 725.07371.0858 724.94		
377.2663 724.83386.0002 724.69408.0329 724.48426.6654 724.26441.0691 724.01		
461.0534 723.27479.9106 722.54 480.648 722.51509.3992 722.38518.2288 722.26		
538.5144 722.18541.1888 722.16554.0018 721.87561.3702 718.31562.7351 717.82		
568.9442 717.09571.9603 716.6572.3747 716.53576.5869 717.44579.1799 718		
581.3936 718.56584.1164 722.45585.6533 723.17590.2328 725.28606.3673 726.51		
606.6901 726.5615.4731 726.14621.5073 725.58627.2417 724.05651.4352 724.38		
652.6528 724.683.0341 723.96685.8575 724.01686.6508 724.35688.3648 724.29		
689.888 724.18 698.492 724.71727.7194 724.72 755.626 724.31757.1407 724.31		
852.5659 724.38855.0814 724.56855.6722 725.07861.3923 725.08890.1413 727.49		
891.4794 727.52892.5094 727.53932.6591 728.35933.8849 728.4961.7881 729.41		
969.2715 729.75970.3898 729.861004.611 735.131014.855 735.35 1023.59 735.53		
1072.667 732.511073.249 732.51 1110.48 734.54 1141.5 737.11169.515 739.84		
1170.197 739.89		

Manning's n Values	num=	3
Sta n Val Sta n Val		
0 .13441.0691 .055590.2328 .13		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
441.0691590.2328	465 465 465	.1	.3
Ineffective Flow num=	1		
Sta L Sta R Elev Permanent			
606.411170.197 726.7	F		

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data	num=	31
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730		
271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726		
450.5 724.6 476.8 722.6 485 720 489 718 493 716		
497 715 501 716 505 718 509 720 527.1 722		
586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1		
876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9		
1083.7 739.7		

Manning's n Values	num=	3
Sta n Val Sta n Val		
0 .13 450.5 .055 624.8 .13		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
450.5 624.8	760 930 720	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

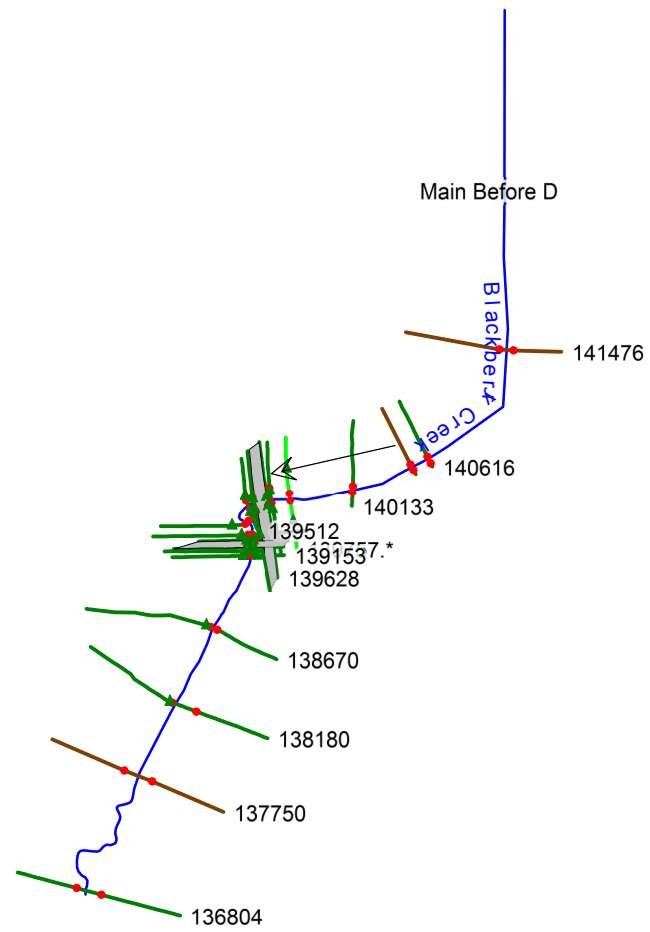
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Culvert	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139242	.3	.5
Main Before D	139220	Bridge	
Main Before D	139201	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3



HEC-RAS Model

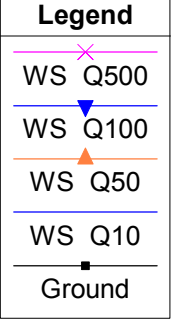
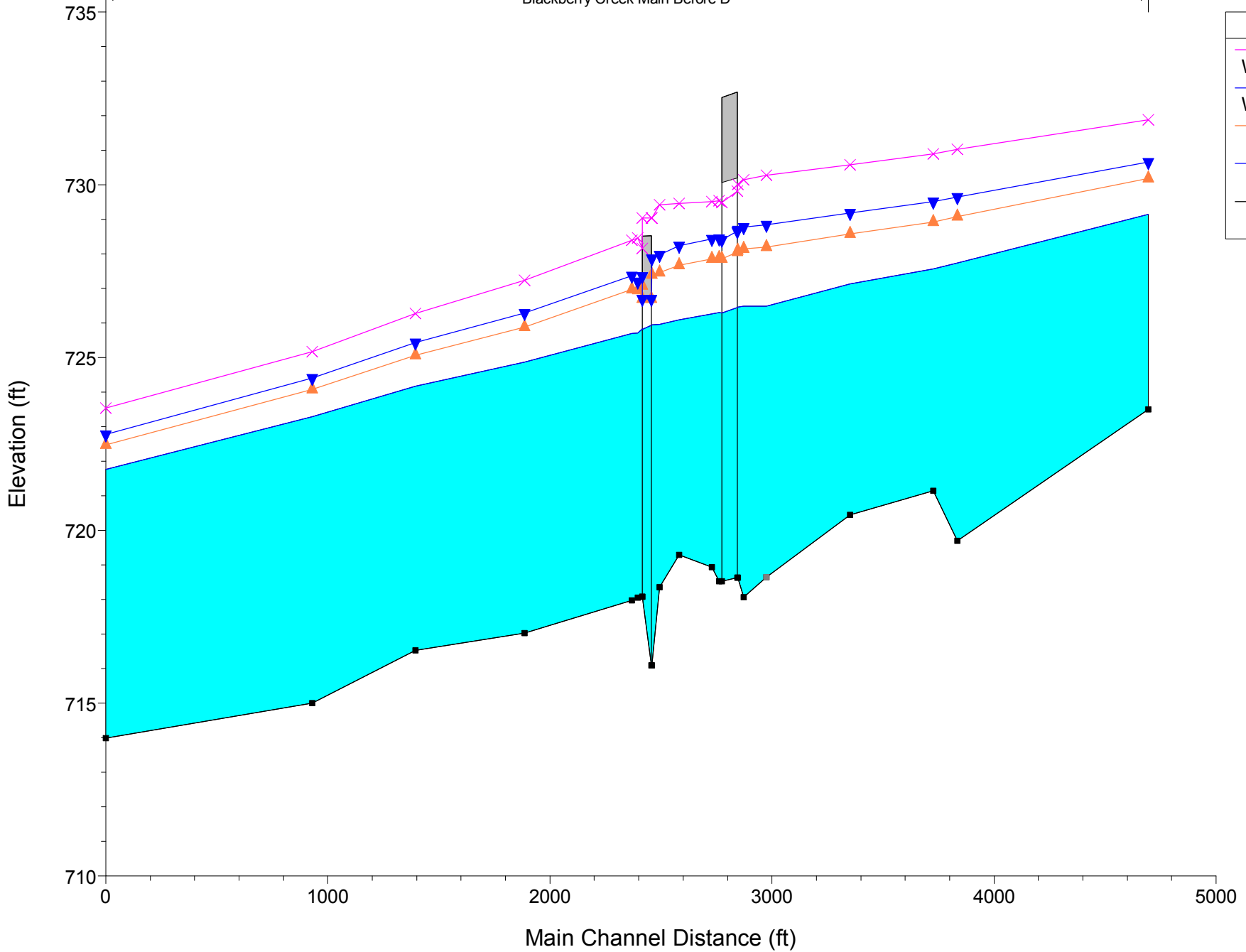
**GROUP #1 - PROPOSED CONDITIONS**

**Proposed Route 47 Arch Culvert, Existing Main  
St. bridge**



3 of the 19 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003319	2.68	391.46	300.68	0.31
Main Before D	141476	Q50	1128.00	723.50	730.18		730.27	0.002272	2.83	741.33	384.64	0.27
Main Before D	141476	Q100	1384.00	723.50	730.66		730.75	0.001951	2.87	940.61	434.78	0.26
Main Before D	141476	Q500	2108.00	723.50	731.89		731.97	0.001403	2.93	1550.84	564.52	0.23
Main Before D	140616	Q10	637.00	719.70	727.74		727.81	0.000984	2.45	441.87	232.39	0.20
Main Before D	140616	Q50	1126.00	719.70	729.07		729.15	0.000840	2.69	774.78	268.40	0.20
Main Before D	140616	Q100	1381.00	719.70	729.65		729.73	0.000806	2.80	935.54	290.07	0.19
Main Before D	140616	Q500	2104.00	719.70	731.02		731.11	0.000768	3.11	1374.25	361.20	0.20
Main Before D	140504	Q10	637.00	721.14	727.57		727.67	0.001634	2.99	400.97	207.16	0.25
Main Before D	140504	Q50	1126.00	721.14	728.92		729.03	0.001367	3.28	717.92	254.09	0.24
Main Before D	140504	Q100	1381.00	721.14	729.51		729.61	0.001278	3.39	870.28	267.74	0.24
Main Before D	140504	Q500	2104.00	721.14	730.89		731.00	0.001153	3.67	1262.82	300.33	0.23
Main Before D	140133	Q10	635.00	720.45	727.13		727.21	0.001126	2.63	405.45	189.17	0.22
Main Before D	140133	Q50	1122.00	720.45	728.58		728.67	0.000936	2.89	710.92	230.47	0.21
Main Before D	140133	Q100	1378.00	720.45	729.19		729.28	0.000893	3.02	855.71	246.03	0.21
Main Before D	140133	Q500	2098.00	720.45	730.58		730.69	0.000928	3.50	1239.35	330.75	0.22
Main Before D	139757.*	Q10	635.00	718.65	726.49	724.52	726.63	0.002165	3.23	308.02	199.58	0.29
Main Before D	139757.*	Q50	1122.00	718.65	728.20	725.58	728.28	0.001065	2.89	726.26	330.21	0.22
Main Before D	139757.*	Q100	1378.00	718.65	728.85	726.01	728.92	0.000921	2.89	911.19	363.28	0.20
Main Before D	139757.*	Q500	2098.00	718.65	730.28	726.97	730.36	0.000755	3.01	1353.27	527.32	0.19
Main Before D	139653	Q10	634.00	718.06	726.49	722.14	726.53	0.000346	1.64	393.48	276.82	0.13
Main Before D	139653	Q50	1120.00	718.06	728.14	722.88	728.21	0.000420	2.17	564.58	400.65	0.14
Main Before D	139653	Q100	1376.00	718.06	728.77	723.21	728.86	0.000464	2.41	631.98	452.96	0.15
Main Before D	139653	Q500	2097.00	718.06	730.14	724.02	730.28	0.000593	3.04	779.11	623.10	0.18
Main Before D	139628	Q10	634.00	718.63	726.46	721.70	726.52	0.000513	1.88	338.74	88.60	0.13
Main Before D	139628	Q50	1120.00	718.63	728.09	722.56	728.19	0.000736	2.62	432.65	221.72	0.16
Main Before D	139628	Q100	1376.00	718.63	728.70	722.91	728.84	0.000864	2.99	467.87	364.89	0.18
Main Before D	139628	Q500	2097.00	718.63	730.01	723.80	730.25	0.001236	3.93	543.54	601.74	0.22
Main Before D	139602		Bridge									
Main Before D	139545	Q10	634.00	718.52	726.30	721.59	726.35	0.000522	1.83	347.03	98.29	0.14
Main Before D	139545	Q50	1120.00	718.52	727.88	722.46	727.98	0.000722	2.50	448.04	303.06	0.17
Main Before D	139545	Q100	1376.00	718.52	728.45	722.81	728.58	0.000837	2.84	484.79	446.23	0.18
Main Before D	139545	Q500	2097.00	718.52	729.54	723.70	729.76	0.001244	3.78	554.33	697.72	0.23
Main Before D	139512	Q10	634.00	718.93	726.26	722.65	726.33	0.000534	2.12	349.91	203.41	0.17
Main Before D	139512	Q50	1120.00	718.93	727.85	723.60	727.95	0.000583	2.69	510.32	251.08	0.19
Main Before D	139512	Q100	1376.00	718.93	728.43	724.02	728.55	0.000642	2.99	568.68	270.64	0.20
Main Before D	139512	Q500	2097.00	718.93	729.51	725.02	729.72	0.000882	3.86	678.22	330.18	0.24
Main Before D	139364	Q10	634.00	719.29	726.09	722.82	726.18	0.000846	2.85	383.98	333.93	0.21
Main Before D	139364	Q50	1120.00	719.29	727.67	724.58	727.78	0.000840	3.35	618.88	392.20	0.22
Main Before D	139364	Q100	1376.00	719.29	728.24	724.96	728.37	0.000895	3.63	711.91	409.24	0.23
Main Before D	139364	Q500	2097.00	719.29	729.46	725.78	729.49	0.000369	2.57	2035.44	462.28	0.15
Main Before D	139277	Q10	634.00	718.35	725.96	722.40	726.10	0.001004	3.31	304.26	357.16	0.23
Main Before D	139277	Q50	1120.00	718.35	727.46	723.96	727.69	0.001343	4.40	432.85	419.85	0.28
Main Before D	139277	Q100	1376.00	718.35	727.97	724.42	728.26	0.001557	4.95	486.48	451.70	0.30
Main Before D	139277	Q500	2097.00	718.35	729.42	725.51	729.47	0.000395	2.77	2302.51	588.45	0.16
Main Before D	139242	Q10	634.00	716.09	725.95	720.91	726.06	0.000960	2.63	240.68	35.39	0.17
Main Before D	139242	Q50	1120.00	716.09	727.40	721.94	727.64	0.001708	3.88	288.72	56.04	0.23
Main Before D	139242	Q100	1376.00	716.09	727.87	722.44	728.20	0.002192	4.52	305.42	78.38	0.26
Main Before D	139242	Q500	2097.00	716.09	729.03	723.68	729.40	0.003467	5.15	624.86	373.37	0.32
Main Before D	139220		Bridge									
Main Before D	139201	Q10	634.00	718.08	725.83	721.19	725.96	0.001354	2.89	219.66	33.99	0.20
Main Before D	139201	Q50	1120.00	718.08	727.08	722.31	727.36	0.002489	4.27	262.55	40.83	0.27
Main Before D	139201	Q100	1376.00	718.08	727.35	722.82	727.75	0.003366	5.06	272.00	51.80	0.32
Main Before D	139201	Q500	2097.00	718.08	728.16	724.14	728.92	0.005781	6.99	299.81	175.92	0.42
Main Before D	139180	Q10	640.00	718.05	725.71	722.91	725.90	0.002539	3.60	203.17	210.70	0.29
Main Before D	139180	Q50	1132.00	718.05	726.95	724.36	727.28	0.003364	4.86	270.79	387.01	0.35
Main Before D	139180	Q100	1389.00	718.05	727.19	724.80	727.65	0.004374	5.69	284.10	400.78	0.41
Main Before D	139180	Q500	2117.00	718.05	728.45	725.81	728.53	0.001126	3.27	1497.02	458.15	0.21

HEC-RAS Plan: G#1 - Proposed River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139153	Q10	640.00	717.97	725.70	722.52	725.83	0.001683	2.96	268.26	200.37	0.24
Main Before D	139153	Q50	1132.00	717.97	726.97	724.03	727.17	0.002119	3.90	370.49	426.24	0.28
Main Before D	139153	Q100	1389.00	717.97	727.37	724.47	727.48	0.001416	3.33	969.46	484.83	0.23
Main Before D	139153	Q500	2117.00	717.97	728.40	725.39	728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.96	563.78	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.35	497.10	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.54	560.60	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002978	2.89	485.30	188.18	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003085	3.43	642.42	225.04	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#1 - Proposed River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.42	0.01	109.90	505.43	22.67	300.68
Main Before D	141476	Q50	730.27	730.18	0.09	1.11	0.00	260.02	770.35	97.63	384.64
Main Before D	141476	Q100	730.75	730.66	0.09	1.02	0.00	337.45	895.09	151.46	434.78
Main Before D	141476	Q500	731.97	731.89	0.08	0.86	0.00	548.17	1204.52	355.31	564.52
Main Before D	140616	Q10	727.81	727.74	0.07	0.14	0.00	0.25	487.84	148.91	232.39
Main Before D	140616	Q50	729.15	729.07	0.07	0.11	0.00	2.59	693.71	429.70	268.40
Main Before D	140616	Q100	729.73	729.65	0.08	0.11	0.00	4.74	794.62	581.64	290.07
Main Before D	140616	Q500	731.11	731.02	0.08	0.10	0.00	13.69	1071.04	1019.27	361.20
Main Before D	140504	Q10	727.67	727.57	0.10	0.45	0.01	0.00	467.06	169.94	207.16
Main Before D	140504	Q50	729.03	728.92	0.10	0.36	0.01	0.44	671.85	453.72	254.09
Main Before D	140504	Q100	729.61	729.51	0.10	0.33	0.01	1.00	764.42	615.58	267.74
Main Before D	140504	Q500	731.00	730.89	0.11	0.31	0.00	3.51	1011.67	1088.82	300.33
Main Before D	140133	Q10	727.21	727.13	0.08	0.58	0.01	2.81	468.65	163.54	189.17
Main Before D	140133	Q50	728.67	728.58	0.08	0.38	0.00	10.95	682.39	428.67	230.47
Main Before D	140133	Q100	729.28	729.19	0.09	0.35	0.00	16.53	784.35	577.12	246.03
Main Before D	140133	Q500	730.69	730.58	0.11	0.32	0.01	37.21	1102.92	957.87	330.75
Main Before D	139757.*	Q10	726.63	726.49	0.14	0.07	0.03	10.06	533.40	91.54	199.58
Main Before D	139757.*	Q50	728.28	728.20	0.08	0.07	0.00	58.94	687.67	375.39	330.21
Main Before D	139757.*	Q100	728.92	728.85	0.08	0.07	0.00	96.48	768.09	513.43	363.28
Main Before D	139757.*	Q500	730.36	730.28	0.08	0.07	0.01	245.56	982.04	870.40	527.32
Main Before D	139653	Q10	726.53	726.49	0.04	0.01	0.00	2.04	631.96		276.82
Main Before D	139653	Q50	728.21	728.14	0.07	0.01	0.00	29.99	1090.01		400.65
Main Before D	139653	Q100	728.86	728.77	0.09	0.02	0.01	52.83	1323.17		452.96
Main Before D	139653	Q500	730.28	730.14	0.14	0.02	0.01	128.07	1968.93		623.10
Main Before D	139628	Q10	726.52	726.46	0.05			0.14	633.80	0.06	88.60
Main Before D	139628	Q50	728.19	728.09	0.11			3.44	1115.45	1.11	221.72
Main Before D	139628	Q100	728.84	728.70	0.14			5.87	1368.25	1.87	364.89
Main Before D	139628	Q500	730.25	730.01	0.24	0.00	0.04	14.00	2078.60	4.40	601.74
Main Before D	139602		Bridge								
Main Before D	139545	Q10	726.35	726.30	0.05	0.02	0.00		634.00		98.29
Main Before D	139545	Q50	727.98	727.88	0.10	0.02	0.00		1120.00		303.06
Main Before D	139545	Q100	728.58	728.45	0.13	0.02	0.00		1376.00		446.23
Main Before D	139545	Q500	729.76	729.54	0.22	0.03	0.01		2097.00		697.72
Main Before D	139512	Q10	726.33	726.26	0.07	0.14	0.00	3.07	595.02	35.91	203.41
Main Before D	139512	Q50	727.95	727.85	0.10	0.17	0.00	18.98	1007.24	93.79	251.08
Main Before D	139512	Q100	728.55	728.43	0.13	0.19	0.00	28.44	1222.66	124.90	270.64
Main Before D	139512	Q500	729.72	729.51	0.21	0.17	0.05	55.77	1828.73	212.50	330.18
Main Before D	139364	Q10	726.18	726.09	0.10	0.08	0.00	22.20	464.32	147.47	333.93
Main Before D	139364	Q50	727.78	727.67	0.12	0.09	0.01	66.09	696.45	357.46	392.20
Main Before D	139364	Q100	728.37	728.24	0.13	0.09	0.02	96.17	815.08	464.75	409.24
Main Before D	139364	Q500	729.49	729.46	0.04	0.03	0.00	115.03	666.06	1315.91	462.28
Main Before D	139277	Q10	726.10	725.96	0.14	0.03	0.01	14.21	504.29	115.50	357.16
Main Before D	139277	Q50	727.69	727.46	0.23	0.05	0.00	36.92	829.33	253.74	419.85
Main Before D	139277	Q100	728.26	727.97	0.28	0.06	0.00	57.52	993.12	325.37	451.70
Main Before D	139277	Q500	729.47	729.42	0.04	0.03	0.03	55.71	653.34	1387.95	588.45
Main Before D	139242	Q10	726.06	725.95	0.11	0.00	0.00		634.00		35.39
Main Before D	139242	Q50	727.64	727.40	0.23				1119.99	0.02	56.04
Main Before D	139242	Q100	728.20	727.87	0.32				1375.51	0.49	78.38
Main Before D	139242	Q500	729.40	729.03	0.37			80.22	1880.89	135.89	373.37
Main Before D	139220		Bridge								
Main Before D	139201	Q10	725.96	725.83	0.13	0.04	0.02		634.00		33.99
Main Before D	139201	Q50	727.36	727.08	0.28	0.06	0.02		1120.00		40.83
Main Before D	139201	Q100	727.75	727.35	0.40	0.08	0.02		1376.00		51.80
Main Before D	139201	Q500	728.92	728.16	0.76	0.04	0.34		2097.00		175.92

HEC-RAS Plan: G#1 - Proposed River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139180	Q10	725.90	725.71	0.19	0.06	0.02	22.38	594.59	23.03	210.70
Main Before D	139180	Q50	727.28	726.95	0.33	0.07	0.04	58.07	1015.57	58.36	387.01
Main Before D	139180	Q100	727.65	727.19	0.46	0.06	0.10	74.81	1239.21	74.99	400.78
Main Before D	139180	Q500	728.53	728.45	0.08	0.03	0.00	257.03	859.24	1000.72	458.15
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.15	572.92	52.94	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.08	0.00	44.31	960.59	127.11	426.24
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.48	876.71	416.81	484.83
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.46	1146.30	11.24	563.78
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.10
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.50	2012.51	1.99	560.60
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.18
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.70	13.03	225.04
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#1 - Proposed

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.



Errors Warnings and Notes for Plan : G#1 - Proposed (Continued)

	surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Errors Warnings and Notes for Plan : G#1 - Proposed (Continued)

	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : G#1 - Proposed (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy

Errors Warnings and Notes for Plan : G#1 - Proposed (Continued)

	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X        X   X       X  X   X  X   X
X   X  X        X   X       X  X   X  X   X
XXXXXXXX XXXX   X          XXX XXXX  XXXXXX  XXXX
X   X  X        X          X  X   X   X     X
X   X  X        X   X       X  X   X   X     X
X   X  XXXXXX   XXXX       X   X   X   X  XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 9/2/2014 1:54:48 PM

Project in English units

PLAN DATA

Plan Title: Group#2 - Pr NoMNST (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p17  
 Geometry Title: Group #2 - Prop No Struct (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g08  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Proposed 3-sided Arch geometry under IL 47 and no Main St bridge.

Plan Summary Information:

Number of:	Cross Sections =	17	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	141476	638	1128	1384	2108
Blackberry CreekMain	Before D	140616	637	1126	1381	2104
Blackberry CreekMain	Before D	140133	635	1122	1378	2098
Blackberry CreekMain	Before D	139653	634	1120	1376	2097
Blackberry CreekMain	Before D	139364	634	1120	1376	2097
Blackberry CreekMain	Before D	139180	640	1132	1389	2117
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #2 - Prop No Struct (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g08

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and channel data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 31 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and channel data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and channel data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 29 rows of elevation data.

117.4982	725.2	158.663	725.14175	4356	725.2199	3833	725.23200	0.636	725.25
240.4556	726.41241	4389	726.44281	7278	727.91282	3598	727.93324	4.932	729.82
325.104	729.84	368.711	730.36413	5901	730.81414	2438	730.82456	2.384	731.28
456.7409	731.29457	6156	731.29501	0569	732.08501	4998	732.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1177	66348	.05117	4982	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

77.66348	117.4982	350.15	376	403.42	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-185.75	.11	92.33	.05	134.98	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

92.33	134.98	96.85	104	111.58	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-185.75	-23.4	733.85	F
287.6	467.58	733.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-189	.09	96.437	.05	189.85	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

96.437	189.85	42	25	47	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-189	61	733.85	F
168.11	458.336	733.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	134.49	726.18		
134.61	722	145.21	721.2	152.9	718.63	169.9	718.63	177.58	721.2		
188.19	722	188.33	726.07	201.008	725.99	202.062	726.22	225.184	726.93		

226.063	726.98	257.989	727.24	258.696	727.26	280.162	727.94	288.516	728.21
298.002	728.54	327.195	729.57	327.86	729.59	397.969	731.25	405.368	731.26
406.608	731.27	415.055	731.72	421.627	732.15	508.169	734.32	508.734	734.43
509.762	734.62	510.226	734.63						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 134.49 .055 188.33 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 134.49 188.33 85 85 85 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 131.4 733.85 F  
 189.1 510.226 733.85 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT

Description: US IL 47 Culvert  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 70  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates num= 22  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-283	732.85				-231	732.69				-87.24	732.95			
-37	733.01				63	733.8				113	734.04			
134.11	734.02	717.2	134.12	734.01	720.78	134.93	734.005	723.48						
137.191	734	725.68	138.871	734	726.5	140.63	734	727.14						
144.91	734	728.6	150.76	734	729.43	161.1	733.99	730.2						
171.44	733.99	729.43	176.93	733.99	728.53	181.57	733.99	727.14						
183.52	733.99	725.68	185.2	733.99	723.47	187.46	733.99	720.78						
509.93	735.61													

Upstream Bridge Cross Section Data

Station Elevation Data num= 47  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	134.49	726.18
134.61	722	145.21	721.2	152.9	718.63	169.9	718.63	177.58	721.2
188.19	722	188.33	726.07	201.008	725.99	202.062	726.22	225.184	726.93
226.063	726.98	257.989	727.24	258.696	727.26	280.162	727.94	288.516	728.21
298.002	728.54	327.195	729.57	327.86	729.59	397.969	731.25	405.368	731.26
406.608	731.27	415.055	731.72	421.627	732.15	508.169	734.32	508.734	734.43
509.762	734.62	510.226	734.63						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 134.49 .055 188.33 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 134.49 188.33 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 131.4 733.85 F  
 189.1 510.226 733.85 F

Downstream Deck/Roadway Coordinates

num= 23  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-300	733.38				-236.72	732.86				-136.72	732.53			
-36.72	732.8				63.28	733.57				163.28	734.68			
184.65	734.87	717.07	184.66	734.87	720.65	185.47	734.88	723.35						
187.731	734.9	725.55	189.411	734.92	726.37	191.17	734.94	727.01						
194.59	734.98	728.47	201.3	735.05	729.3	211.64	735.15	730.07						
221.98	735.29	729.3	227.89	735.35	728.4	232.11	735.4	727.01						
234.06	735.43	725.55	235.74	735.45	723.34	238	735.47	720.65						
270	735.81		520.23	737.01										

Downstream Bridge Cross Section Data

Station Elevation Data num= 45  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31	185.04	726.07	185.16	721.89	195.76	721.09
203.45	718.52	220.45	718.52	228.13	721.09	238.74	721.89	242.69	725.05
249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21272	4837	726.22
285.9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93364	1443	727.74
404.2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37520	2271	729.91

Manning's n Values num= 3



Sta n Val Sta n Val Sta n Val  
-300 .13166.6929 .055 249.6 .1

Bank Sta: Left Right Coeff Contr. Expan.  
166.6929 249.6 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-300 179.7 733.4 F  
243.7520.2271 733.4 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .98  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
Momentum Cd = 1

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139545

INPUT

Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 45  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
164.8799 727.57166.6929 727.31 185.04 726.07 185.16 721.89 195.76 721.09  
203.45 718.52 220.45 718.52 228.13 721.09 238.74 721.89 242.69 725.05  
249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21272.4837 726.22  
285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93364.1443 727.74  
404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37520.2271 729.91

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-300 .13166.6929 .055 249.6 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
166.6929 249.6 25 33 40 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-300 179.7 733.4 F  
243.7520.2271 733.4 F

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 42  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-75 732 -50 729.5 -20 728 0 726.23 .537122 726.17  
9.693759 725.8817.96078 725.5535.38584 726.2336.01735 726.2236.98616 726.09  
57.37652 725.1859.64951 725.0564.47989 723.44 70.3069 721.5278.64016 720.39  
85.87483 718.9390.61574 719.3790.91806 719.5795.43697 720.56105.7258 722.12  
118.2908 723.9118.9698 724.08127.3197 724.15141.7605 724.04 147.534 724.04  
148.0156 724.04 148.739 724.06 167.183 724.56186.7215 725.5193.0373 725.81  
194.0911 725.83216.7024 726.92218.2687 726.95 242.918 728.48265.4388 728.74  
269.1036 728.77 315.993 731.95316.7762 731.96 318.031 732361.4998 733.74  
361.896 733.75362.2298 733.76

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val

-75 .1359.64951 .045118.9698 .09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
59.64951	118.9698	70	148	626	.1	.3	
Ineffective Flow		num=	2				
Sta L	Sta R	Elev	Permanent				
-75	43.9	733.4	F				
144.9362	.2298	733.4	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT  
Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input  
07-2010

Station Elevation Data	num=	41							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 730.2325.89646	728.3234.58134	727.6847.53335	726.7461.65466	725.98					
62.86731 725.3171.52296	724.580.80232	723.9286.33195	723.2987.81361	722.7					
91.14569 721.7892.60942	720.993.44381	720.3494.39133	719.797.08542	719.6					
102.3392 719.29113.2782	720.26114.9753	723.84 129.198	723.96172.1069	723.76					
207.7128 723.81245.1637	723.92245.9037	723.94284.2046	724.19284.8347	724.2					
325.5757 724.59326.0558	724.61344.0362	724.9365.4267	725.29366.2567	725.29					
386.9972 725.89407.8078	726.51408.2278	726.53448.8588	729450.0789	729.04					
474.1395 729.48487.6698	729.71490.6599	729.87525.8707	732.04609.3928	738.15					
609.7329 738.17									

Manning's n Values	num=	3			
Sta n Val Sta n Val Sta n Val					
0 .1186.33195	.045114.9753	.09			

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
86.33195	114.9753	141	87	58	.1	.3	

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT  
Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data	num=	39							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
-270.5 731.66 -210	729.95 -30	728.95 0	727.6915.09991	727.46					
19.13766 727.1833.21519	726.3636.79197	725.43 38.4556	725.1743.10466	723.81					
49.34686 722.2749.95718	721.8451.55831	720.2351.95881	720.260.06436	718.35					
60.64471 719.0169.96091	719.2971.04166	720.2171.78226	720.2973.38339	722.87					
75.39461 722.3111.7997	723.27120.8857	723.37125.1487	723.47139.5584	723.98					
169.439 722.97199.0895	724.12243.0502	723.99275.1607	724.28312.3935	724.69					
320.8542 724.82364.3776	725.18 422.652	726.84423.6721	726.87514.6191	731.58					
515.9192 731.63558.3625	738.18628.1378	741.89628.7879	741.9						

Manning's n Values	num=	3			
Sta n Val Sta n Val Sta n Val					
-270.5 .1349.34686	.04573.38339	.11			

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
49.34686	73.38339	96	97	95	.1	.3	

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139180

INPUT  
Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data	num=	47							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 728.36 37.86	724.74 38.57	724.7 39.19	724.64 59.94	723.95					
63.84 723.94 76.25	723.63 76.65	723.61 84.91	722.68 87.7	720.62					
88.46001 720.0689.37001	719.9394.15001	719.2196.36001	718.0598.99001	719.22					
103.44 719.72 104.16	719.79104.5201	720.3108.8901	723.01109.6001	723.18					
112.0626 723.73112.2529	723.91 132.651	722.85 133.01	722.87133.4516	722.87					
140.9519 722.97157.3524	723.25185.4334	724.32186.8835	724.48 200.824	724.1					
202.8144 724.06237.8324	725.57239.0326	725.87240.7531	725.88359.7095	726.08					
361.3396 726.13412.6096	727.17414.2996	727.28415.0897	727.32417.8119	727.42					
474.3699 728.87475.9402	728.96539.6592	733.47540.1493	733.45540.5194	733.44					
592.1792 737.52592.9095	737.57								

Manning's n Values	num=	3			
Sta n Val Sta n Val Sta n Val					
0 .1 76.65	.055112.2529	.1			

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
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76.65112.2529 27 27 27 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321.94402	728.0524.42452	728.2730.15558	728.433.69627	728.64				
53.62989	728.7655.24017	728.883.58551	728.784.68569	728.6293.64731	727.75				
99.92865	727.16144.9669	725.01148.6377	724.63174.0424	724.03 182.394	723.16				
188.0251	721.86192.4358	721.41 193.546	720.6197.9669	718.93198.8469	718.6				
199.287	718.29200.1873	717.97201.1675	718.25210.6992	719.7211.3994	719.82				
211.8396	720.15215.6702	723.81217.8506	723.69228.2125	723.28234.4736	723.55				
285.1931	724.38290.2141	724.32303.1765	725.57318.4593	725.33334.4223	725.81				
346.4945	725.98360.7272	726.23378.3205	726.04387.0722	726.02388.8324	726.02				
484.5803	726.6559.9542	727.21598.6415	727.49625.3665	728.1634.1082	728.43				
636.6285	728.73653.9019	729.96							

Manning's n Values num= 3			
Sta	n Val	Sta	n Val
0	.13174.0424	.055215.6702	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	174.0424	215.6702		612	483	587		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data num= 67									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.64223.72051	733.5850.52278	732.97103.7242	731.47105.4352	731.41				
131.3751	730.4131.8137	730.38158.5284	728.95159.2807	728.91212.4323	726.45				
213.4117	726.4214.4225	726.38237.1291	725.95238.4291	725.87270.6048	725.04				
301.9967	724.55329.4541	724.34348.9568	723.99353.0579	723.93383.6354	723.56				
393.7921	720.73395.9406	718.84397.8362	718.62412.9881	717.03413.5182	717.39				
421.4882	723.09422.3705	723.13423.6802	723.32426.9516	723.8 431.308	724.75				
431.8838	724.82433.9684	725.32438.4547	725.81444.5365	726.47451.8719	727.21				
453.17	727.34462.0598	726.78464.8397	724.87466.0078	724.88660.9682	724.72				
662.7347	724.78665.5562	725.71672.5701	726.12672.9245	726.08 678.82	725.76				
688.87	724.89 720.06	724.86779.3023	724.71779.8826	724.73 781.903	724.91				
794.0884	726.09822.4244	726.78837.3586	729.02851.4493	733.36859.5363	736.1				
859.9111	736.1870.0308	736.22874.1083	735.74999.9396	735.691018.729	735.71				
1019.092	735.731043.219	736.681043.782	736.741094.542	736.951094.985	736.99				
1156.851	738.171162.934	738.32							

Manning's n Values num= 3			
Sta	n Val	Sta	n Val
0	.11383.6354	.055426.9516	.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	383.6354	426.9516		477	490	222		.1	.3

Ineffective Flow num= 1			
Sta L	Sta R	Elev	Permanent
453.171162.934	727.5		F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data num= 81									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227.70591	736.4139.66846	735.9370.28796	734.64103.4348	733.35				
112.8032	732.98127.3655	732.42149.6064	731.55158.5392	731.24192.9704	729.96				
193.9008	729.93228.3727	728.93238.0518	728.63274.1718	727.4274.5956	727.39				
276.3068	727.33311.4224	726.11324.7386	725.78353.8317	725.07371.0858	724.94				
377.2663	724.83386.0002	724.69408.0329	724.48426.6654	724.26441.0691	724.01				
461.0534	723.27479.9106	722.54 480.648	722.51509.3992	722.38518.2288	722.26				
538.5144	722.18541.1888	722.16554.0018	721.87561.3702	718.31562.7351	717.82				
568.9442	717.09571.9603	716.6572.3747	716.53576.5869	717.44579.1799	718				
581.3936	718.56584.1164	722.45585.6533	723.17590.2328	725.28606.3673	726.51				
606.6901	726.5615.4731	726.14621.5073	725.58627.2417	724.05651.4352	724.38				
652.6528	724683.0341	723.96685.8575	724.01686.6508	724.35688.3648	724.29				
689.888	724.18 698.492	724.71727.7194	724.72 755.626	724.31757.1407	724.31				
852.5659	724.38855.0814	724.56855.6722	725.07861.3923	725.08890.1413	727.49				
891.4794	727.52892.5094	727.53932.6591	728.35933.8849	728.4961.7881	729.41				
969.2715	729.75970.3898	729.861004.611	735.131014.855	735.35 1023.59	735.53				

1072.667 732.511073.249 732.51 1110.48 734.54 1141.5 737.11169.515 739.84  
 1170.197 739.89

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13441.0691 .055590.2328 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 441.0691590.2328 465 465 465 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and  
 the channel data was interpolated based on the surrounding xs by  
 BW 2-18-05

Station Elevation Data num= 31  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730  
 271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726  
 450.5 724.6 476.8 722.6 485 720 489 718 493 716  
 497 715 501 716 505 718 509 720 527.1 722  
 586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1  
 876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9  
 1083.7 739.7

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data num= 31  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 730.5924.00007 730.5935.00002 729.1985.00035 727.99119.0003 727.29  
 184.0007 726.59229.0009 725.69276.0009 724.09 324.001 721.79374.0013 720.69  
 424.0015 720.49474.0016 720.19516.0019 719.79 562.002 719.49565.0021 717.79  
 565.0021 716.49 569.002 714.29572.0021 713.99 573.002 714.39 574.002 715.99  
 576.002 717.89 583.002 720.09624.0022 721.09674.0022 719.99719.0024 720.29  
 764.0026 720.89806.0028 722.19834.0028 723.29874.0029 726.09934.0033 730.89  
 979.0035 733.59

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13474.0016 .055624.0022 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 474.0016624.0022 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139602			
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13

Main Before D	136804	.13	.055	.13
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SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139602	Bridge		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	96	97	95
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

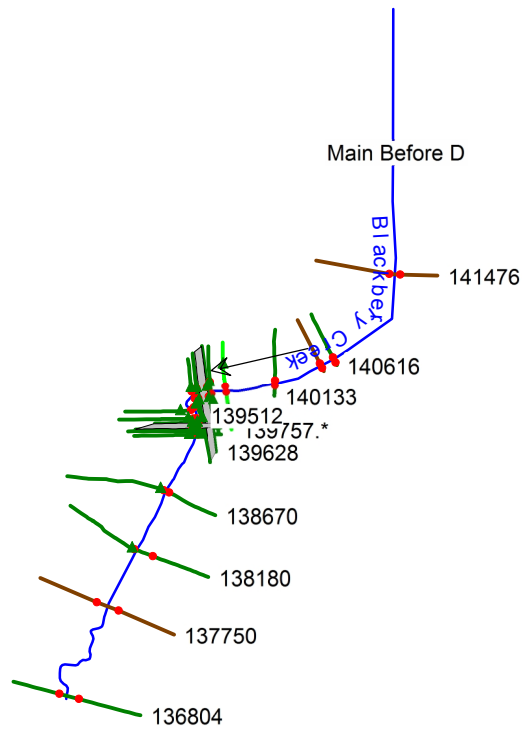
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Bridge	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

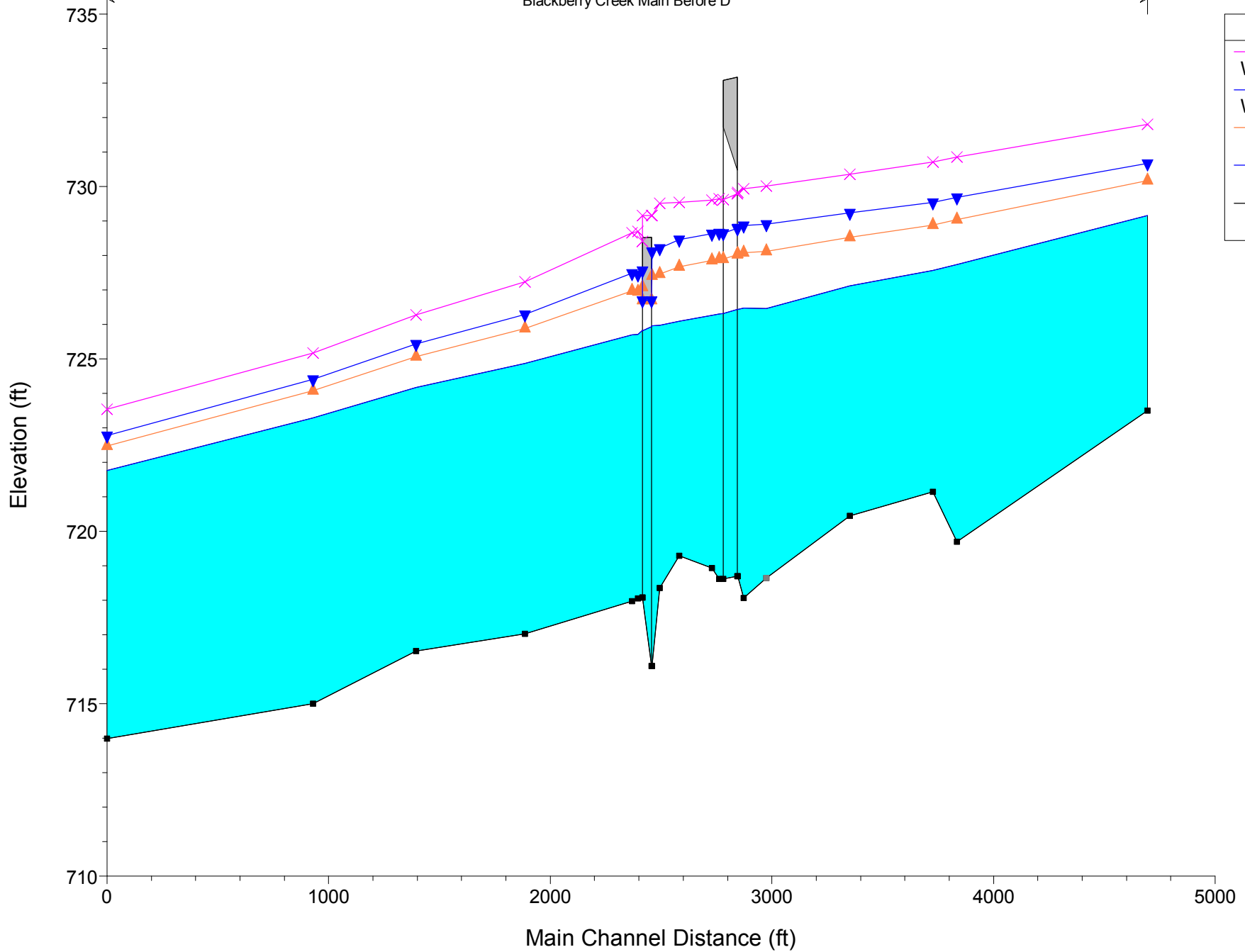
**GROUP #1 - PROPOSED CONDITIONS**

**Proposed Route 47 bridge, Existing Main St. bridge**



3 of the 19 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D





Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003316	2.68	391.59	300.71	0.31
Main Before D	141476	Q50	1128.00	723.50	730.17		730.26	0.002298	2.84	737.70	383.67	0.27
Main Before D	141476	Q100	1384.00	723.50	730.67		730.76	0.001929	2.86	945.13	435.85	0.26
Main Before D	141476	Q500	2108.00	723.50	731.80		731.89	0.001512	3.01	1502.02	555.06	0.24
Main Before D	140616	Q10	637.00	719.70	727.73		727.81	0.000993	2.46	440.07	232.19	0.20
Main Before D	140616	Q50	1126.00	719.70	729.04		729.11	0.000865	2.72	765.02	267.02	0.20
Main Before D	140616	Q100	1381.00	719.70	729.68		729.75	0.000789	2.78	943.83	291.15	0.19
Main Before D	140616	Q500	2104.00	719.70	730.85		730.94	0.000845	3.22	1314.58	349.02	0.21
Main Before D	140504	Q10	637.00	721.14	727.56		727.67	0.001651	3.01	399.02	206.76	0.25
Main Before D	140504	Q50	1126.00	721.14	728.88		728.99	0.001417	3.33	707.32	253.11	0.25
Main Before D	140504	Q100	1381.00	721.14	729.54		729.64	0.001247	3.36	878.82	268.48	0.24
Main Before D	140504	Q500	2104.00	721.14	730.71		730.83	0.001291	3.83	1208.15	295.78	0.25
Main Before D	140133	Q10	635.00	720.45	727.12		727.20	0.001145	2.65	402.35	188.66	0.22
Main Before D	140133	Q50	1122.00	720.45	728.53		728.61	0.000980	2.94	697.71	228.99	0.21
Main Before D	140133	Q100	1378.00	720.45	729.23		729.32	0.000867	2.98	865.81	247.08	0.21
Main Before D	140133	Q500	2098.00	720.45	730.36		730.48	0.001032	3.62	1169.35	308.17	0.23
Main Before D	139757.*	Q10	635.00	718.65	726.45	724.52	726.60	0.002264	3.28	300.58	196.12	0.30
Main Before D	139757.*	Q50	1122.00	718.65	728.12	725.58	728.21	0.001129	2.95	724.64	326.18	0.22
Main Before D	139757.*	Q100	1378.00	718.65	728.91	726.01	728.98	0.000849	2.80	962.58	366.55	0.20
Main Before D	139757.*	Q500	2098.00	718.65	730.02	727.02	730.10	0.000862	3.14	1329.52	471.60	0.20
Main Before D	139653	Q10	634.00	718.06	726.47	722.14	726.50	0.000282	1.44	448.71	275.76	0.11
Main Before D	139653	Q50	1120.00	718.06	728.08	722.96	728.14	0.000334	1.88	652.66	396.28	0.13
Main Before D	139653	Q100	1376.00	718.06	728.86	723.23	728.93	0.000337	2.04	759.02	460.73	0.13
Main Before D	139653	Q500	2097.00	718.06	729.93	723.95	730.04	0.000480	2.65	904.99	616.50	0.16
Main Before D	139628	Q10	634.00	718.70	726.44	721.75	726.49	0.000592	1.82	350.41	87.28	0.15
Main Before D	139628	Q50	1120.00	718.70	728.04	722.61	728.12	0.000692	2.38	487.69	218.04	0.17
Main Before D	139628	Q100	1376.00	718.70	728.81	723.00	728.91	0.000707	2.60	553.88	395.30	0.17
Main Before D	139628	Q500	2097.00	718.70	729.83	723.96	730.01	0.001036	3.44	641.97	579.52	0.21
Main Before D	139602		Bridge									
Main Before D	139545	Q10	634.00	718.62	726.31	721.68	726.36	0.000602	1.80	353.37	103.64	0.15
Main Before D	139545	Q50	1120.00	718.62	727.89	722.53	727.97	0.000694	2.35	494.81	306.02	0.17
Main Before D	139545	Q100	1376.00	718.62	728.66	722.91	728.76	0.000702	2.55	567.39	495.73	0.17
Main Before D	139545	Q500	2097.00	718.62	729.64	723.88	729.81	0.001035	3.38	660.51	711.17	0.21
Main Before D	139512	Q10	634.00	718.93	726.27	722.65	726.33	0.000531	2.12	362.03	203.60	0.17
Main Before D	139512	Q50	1120.00	718.93	727.86	723.60	727.95	0.000556	2.62	573.04	251.23	0.18
Main Before D	139512	Q100	1376.00	718.93	728.63	724.02	728.73	0.000543	2.80	675.61	288.22	0.19
Main Before D	139512	Q500	2097.00	718.93	729.61	725.01	729.78	0.000776	3.65	805.82	332.52	0.23
Main Before D	139364	Q10	634.00	719.29	726.09	722.82	726.19	0.000841	2.85	384.91	334.29	0.21
Main Before D	139364	Q50	1120.00	719.29	727.67	724.58	727.79	0.000838	3.34	619.51	392.32	0.22
Main Before D	139364	Q100	1376.00	719.29	728.45	724.96	728.57	0.000789	3.47	748.94	415.80	0.22
Main Before D	139364	Q500	2097.00	719.29	729.54	725.78	729.58	0.000352	2.53	2077.14	468.66	0.15
Main Before D	139277	Q10	634.00	718.35	725.97	722.40	726.11	0.000999	3.30	304.83	357.45	0.23
Main Before D	139277	Q50	1120.00	718.35	727.46	723.96	727.69	0.001340	4.40	433.28	420.04	0.28
Main Before D	139277	Q100	1376.00	718.35	728.22	724.42	728.48	0.001377	4.74	512.03	462.23	0.29
Main Before D	139277	Q500	2097.00	718.35	729.52	725.51	729.56	0.000375	2.72	2357.15	606.68	0.15
Main Before D	139242	Q10	634.00	716.09	725.96	720.90	726.06	0.001068	2.60	244.00	35.45	0.17
Main Before D	139242	Q50	1120.00	716.09	727.41	721.94	727.64	0.001938	3.81	293.99	56.45	0.23
Main Before D	139242	Q100	1376.00	716.09	728.12	722.44	728.42	0.002316	4.32	318.78	121.40	0.25
Main Before D	139242	Q500	2097.00	716.09	729.16	723.68	729.50	0.003154	4.97	673.91	391.64	0.30
Main Before D	139220		Bridge									
Main Before D	139201	Q10	634.00	718.08	725.83	721.19	725.96	0.001354	2.89	219.66	33.99	0.20
Main Before D	139201	Q50	1120.00	718.08	727.08	722.31	727.36	0.002489	4.27	262.55	40.83	0.27
Main Before D	139201	Q100	1376.00	718.08	727.57	722.82	727.95	0.003090	4.92	279.59	69.49	0.30
Main Before D	139201	Q500	2097.00	718.08	728.41	724.14	729.13	0.005320	6.79	308.78	272.87	0.40
Main Before D	139180	Q10	640.00	718.05	725.71	722.91	725.90	0.002539	3.60	203.17	210.70	0.29
Main Before D	139180	Q50	1132.00	718.05	726.95	724.36	727.28	0.003364	4.86	270.79	387.01	0.35
Main Before D	139180	Q100	1389.00	718.05	727.45	724.80	727.86	0.003775	5.43	298.06	409.44	0.38
Main Before D	139180	Q500	2117.00	718.05	728.70	725.82	728.77	0.000931	3.04	1611.81	467.82	0.19

HEC-RAS Plan: g1propBR River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139153	Q10	640.00	717.97	725.70	722.51	725.83	0.001683	2.96	268.26	200.37	0.24
Main Before D	139153	Q50	1132.00	717.97	726.97	724.03	727.17	0.002119	3.90	370.49	426.24	0.28
Main Before D	139153	Q100	1389.00	717.97	727.49	724.47	727.74	0.002333	4.33	412.23	501.65	0.30
Main Before D	139153	Q500	2117.00	717.97	728.66	725.38	728.74	0.000980	3.14	1654.82	571.52	0.20
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.96	563.78	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.35	497.10	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.54	560.60	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002978	2.89	485.33	188.19	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003085	3.43	642.42	225.04	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: g1propBR River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.43	0.00	109.92	505.40	22.68	300.71
Main Before D	141476	Q50	730.26	730.17	0.09	1.14	0.00	259.66	771.19	97.15	383.67
Main Before D	141476	Q100	730.76	730.67	0.09	1.00	0.00	337.76	894.09	152.15	435.85
Main Before D	141476	Q500	731.89	731.80	0.09	0.94	0.00	546.85	1214.61	346.54	555.06
Main Before D	140616	Q10	727.81	727.73	0.07	0.14	0.00	0.25	488.58	148.17	232.19
Main Before D	140616	Q50	729.11	729.04	0.08	0.12	0.00	2.51	696.89	426.60	267.02
Main Before D	140616	Q100	729.75	729.68	0.07	0.11	0.00	4.82	792.07	584.10	291.15
Main Before D	140616	Q500	730.94	730.85	0.09	0.11	0.00	12.84	1083.59	1007.57	349.02
Main Before D	140504	Q10	727.67	727.56	0.10	0.46	0.01	0.00	467.79	169.21	206.76
Main Before D	140504	Q50	728.99	728.88	0.11	0.37	0.01	0.41	675.79	449.80	253.11
Main Before D	140504	Q100	729.64	729.54	0.10	0.32	0.01	1.02	761.54	618.44	268.48
Main Before D	140504	Q500	730.83	730.71	0.12	0.35	0.00	3.31	1028.33	1072.36	295.78
Main Before D	140133	Q10	727.20	727.12	0.08	0.60	0.01	2.77	469.84	162.39	188.66
Main Before D	140133	Q50	728.61	728.53	0.09	0.40	0.00	10.71	686.99	424.30	228.99
Main Before D	140133	Q100	729.32	729.23	0.09	0.33	0.00	16.74	781.08	580.18	247.08
Main Before D	140133	Q500	730.48	730.36	0.12	0.36	0.01	35.12	1109.52	953.36	308.17
Main Before D	139757.*	Q10	726.60	726.45	0.14	0.06	0.03	9.58	536.58	88.84	196.12
Main Before D	139757.*	Q50	728.21	728.12	0.09	0.06	0.01	56.23	691.54	374.23	326.18
Main Before D	139757.*	Q100	728.98	728.91	0.07	0.05	0.00	97.36	749.83	530.82	366.55
Main Before D	139757.*	Q500	730.10	730.02	0.08	0.07	0.00	214.13	991.10	892.77	471.60
Main Before D	139653	Q10	726.50	726.47	0.03	0.01	0.00	1.80	632.20		275.76
Main Before D	139653	Q50	728.14	728.08	0.05	0.01	0.00	28.08	1091.92		396.28
Main Before D	139653	Q100	728.93	728.86	0.06	0.01	0.00	57.68	1318.32		460.73
Main Before D	139653	Q500	730.04	729.93	0.10	0.02	0.01	132.05	1964.95		616.50
Main Before D	139628	Q10	726.49	726.44	0.05			0.13	633.82	0.05	87.28
Main Before D	139628	Q50	728.12	728.04	0.09			9.35	1108.33	2.32	218.04
Main Before D	139628	Q100	728.91	728.81	0.10			17.68	1354.05	4.27	395.30
Main Before D	139628	Q500	730.01	729.83	0.18			38.29	2049.64	9.07	579.52
Main Before D	139602		Bridge								
Main Before D	139545	Q10	726.36	726.31	0.05	0.02	0.00	0.02	633.97	0.01	103.64
Main Before D	139545	Q50	727.97	727.89	0.09	0.02	0.00	5.17	1112.40	2.43	306.02
Main Before D	139545	Q100	728.76	728.66	0.10	0.02	0.00	12.88	1358.49	4.64	495.73
Main Before D	139545	Q500	729.81	729.64	0.17	0.03	0.00	32.05	2054.98	9.97	711.17
Main Before D	139512	Q10	726.33	726.27	0.07	0.14	0.00	4.56	594.36	35.09	203.60
Main Before D	139512	Q50	727.95	727.86	0.10	0.16	0.00	45.75	984.65	89.60	251.23
Main Before D	139512	Q100	728.73	728.63	0.11	0.16	0.00	75.74	1179.35	120.91	288.22
Main Before D	139512	Q500	729.78	729.61	0.18	0.16	0.04	147.12	1749.53	200.36	332.52
Main Before D	139364	Q10	726.19	726.09	0.09	0.08	0.00	22.23	463.95	147.81	334.29
Main Before D	139364	Q50	727.79	727.67	0.12	0.09	0.01	66.18	696.20	357.62	392.32
Main Before D	139364	Q100	728.57	728.45	0.12	0.08	0.01	101.99	800.98	473.03	415.80
Main Before D	139364	Q500	729.58	729.54	0.04	0.03	0.00	117.09	661.74	1318.17	468.66
Main Before D	139277	Q10	726.11	725.97	0.14	0.04	0.01	14.25	504.08	115.67	357.45
Main Before D	139277	Q50	727.69	727.46	0.23	0.06	0.00	36.96	829.19	253.86	420.04
Main Before D	139277	Q100	728.48	728.22	0.26	0.06	0.00	65.67	979.95	330.38	462.23
Main Before D	139277	Q500	729.56	729.52	0.04	0.03	0.03	57.53	646.51	1392.96	606.68
Main Before D	139242	Q10	726.06	725.96	0.10	0.00	0.00		634.00		35.45
Main Before D	139242	Q50	727.64	727.41	0.23				1120.00		56.45
Main Before D	139242	Q100	728.42	728.12	0.29				1376.00		121.40
Main Before D	139242	Q500	729.50	729.16	0.34			98.92	1840.31	157.77	391.64
Main Before D	139220		Bridge								
Main Before D	139201	Q10	725.96	725.83	0.13	0.04	0.02		634.00		33.99
Main Before D	139201	Q50	727.36	727.08	0.28	0.06	0.02		1120.00		40.83
Main Before D	139201	Q100	727.95	727.57	0.38	0.07	0.01		1376.00		69.49
Main Before D	139201	Q500	729.13	728.41	0.72	0.04	0.33		2097.00		272.87

HEC-RAS Plan: g1propBR River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139180	Q10	725.90	725.71	0.19	0.06	0.02	22.38	594.59	23.03	210.70
Main Before D	139180	Q50	727.28	726.95	0.33	0.07	0.04	58.07	1015.57	58.36	387.01
Main Before D	139180	Q100	727.86	727.45	0.41	0.08	0.05	78.28	1232.45	78.28	409.44
Main Before D	139180	Q500	728.77	728.70	0.06	0.03	0.00	264.60	825.28	1027.13	467.82
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.15	572.92	52.94	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.08	0.00	44.31	960.59	127.11	426.24
Main Before D	139153	Q100	727.74	727.49	0.25	1.20	0.00	61.92	1158.85	168.23	501.65
Main Before D	139153	Q500	728.74	728.66	0.08	0.86	0.02	179.84	993.61	943.56	571.52
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.46	1146.30	11.24	563.78
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.10
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.50	2012.51	1.99	560.60
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.19
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.70	13.03	225.04
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : g1propBR

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500

Errors Warnings and Notes for Plan : g1propBR (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Errors Warnings and Notes for Plan : g1propBR (Continued)

	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139242 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been

Errors Warnings and Notes for Plan : g1propBR (Continued)

	projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139201 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.



Errors Warnings and Notes for Plan : g1propBR (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X       X   X       X  X   X  X   X
X   X  X       X           X  X   X  X   X
XXXXXXXX XXXX   X           XXX XXXX XXXXXX XXXX
X   X  X       X           X  X   X  X       X
X   X  X       X   X       X  X   X  X   X
X   X  XXXXXX   XXXX       X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 2:40:18 PM

Project in English units

PLAN DATA

Plan Title: Group #1 - Proposed BR (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p09

Geometry Title: Group #1- Proposed BR (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g16

Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Proposed IL 47 Bridge with Existing Main Street Bridge geometry.

Plan Summary Information:

Number of:	Cross Sections =	19	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	141476	638	1128	1384	2108
Blackberry CreekMain	Before D	140616	637	1126	1381	2104
Blackberry CreekMain	Before D	140133	635	1122	1378	2098
Blackberry CreekMain	Before D	139653	634	1120	1376	2097
Blackberry CreekMain	Before D	139364	634	1120	1376	2097
Blackberry CreekMain	Before D	139180	640	1132	1389	2117
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #1- Proposed BR (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g16

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and length data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 31 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and length data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of Manning's n values.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of bank and length data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 29 rows of elevation data.

117.4982	725.2	158.663	725.14175	4356	725.2199	3833	725.23200	0.636	725.25
240.4556	726.41241	4389	726.44281	7278	727.91282	3598	727.93324	4.932	729.82
325.104	729.84	368.711	730.36413	5901	730.81414	2438	730.82456	2.384	731.28
456.7409	731.29457	6156	731.29501	0569	732.08501	4998	732.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1177	66348	.05117	4982	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

77.66348	117.4982	350.15	376	403.42	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-185.75	.11	92.33	.05	134.98	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

92.33	134.98	96.85	104	111.58	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-185.75	-38.4	734.37	F
303.6	467.58	734.37	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-189	.09	96.437	.05	189.85	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

96.437	189.85	42	25	47	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-189	46.5	734.37	F
183.1	458.336	734.37	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin, Modified channel geometry to reflect proposed abutment slope walls and natural channel elevations

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	129.13	726.08	138.89	721.16		

145.47	721.09	154.36	718.7	168.24	718.7	176.73	721.09	183.3	721.16
193.07	726.05	202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24
258.696	727.26	280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57
327.86	729.59	397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72
421.627	732.15	508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 129.13 .055 202.062 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 129.13 202.062 85 85 85 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 118.1 734.37 F  
 204.1 510.226 734.37 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT

Description: US IL 47 Proposed Bridge  
 Distance from Upstream XS = 4  
 Deck/Roadway Width = 62  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-287	733.47		-170.67	733.17		-17.57	733.72	
74.44	734.37		123.1	734.56	730.1	148.68	734.69	730.23
169.57	734.8	730.33	199.1	734.95	730.48	211.03	734.94	
264.46	734.91		354.3	735.17		408.76	735.5	
508	736.09							

Upstream Bridge Cross Section Data

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	129.13	726.08	138.89	721.16
145.47	721.09	154.36	718.7	168.24	718.7	176.73	721.09	183.3	721.16
193.07	726.05	202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24
258.696	727.26	280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57
327.86	729.59	397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72
421.627	732.15	508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 129.13 .055 202.062 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 129.13 202.062 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 118.1 734.37 F  
 204.1 510.226 734.37 F

Downstream Deck/Roadway Coordinates

num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-339.77	734.43		-247.66	733.58		-90.89	733.11	
-78.51	733.08		17.09	733.63		84.47	734.33	
161.61	735.17		173.65	735.29	731.34	211.4	735.48	731.53
249.64	735.67	731.73	264.33	735.83		375.89	736.89	
429.87	737.1		443.16	737.14		465.03	737.2	
523	737.67							

Downstream Bridge Cross Section Data

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31	179.63	726.07	189.44	721.08	196.02	721.01
204.91	718.62	218.79	718.62	227.28	721.01	233.85	721.08	242.69	725.05
249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21272	4837	726.22
285.9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93364	1443	727.74
404.2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37520	2271	729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13 179.63 .055255.9665 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 179.63255.9665 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 164 733.4 F  
 258.7520.2271 733.4 F

Upstream Embankment side slope = horiz. to 1.0 vertical  
 Downstream Embankment side slope = horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data

Upstream num= 2  
 Sta Elev Sta Elev  
 123.1 730.1 138.87 721.18  
 Downstream num= 2  
 Sta Elev Sta Elev  
 173.65 730.1 189.42 721.07

Abutment Data

Upstream num= 2  
 Sta Elev Sta Elev  
 183.3 721.16 199.1 730.1  
 Downstream num= 2  
 Sta Elev Sta Elev  
 233.85 721.04 249.64 730.1

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139545

INPUT

Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
 elevation based on IDOT/GEC tin, Modified channel geometry to  
 reflect proposed abutment slope walls and natural channel  
 elevations

Station Elevation Data num= 45  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
 25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
 75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
 122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
 164.8799 727.57166.6929 727.31 179.63 726.07 189.44 721.08 196.02 721.01  
 204.91 718.62 218.79 718.62 227.28 721.01 233.85 721.08 242.69 725.05  
 249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21272.4837 726.22  
 285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93364.1443 727.74  
 404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37520.2271 729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13 179.63 .05255.9665 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 179.63255.9665 25 33 40 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 164 733.4 F  
 258.7520.2271 733.4 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 42
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-75 732 -50 729.5 -20 728 0 726.23 .537122 726.17
9.693759 725.8817.96078 725.5535.38584 726.2336.01735 726.2236.98616 726.09
57.37652 725.1859.64951 725.0564.47989 723.44 70.3069 721.5278.64016 720.39
85.87483 718.9390.61574 719.3790.91806 719.5795.43697 720.56105.7258 722.12
118.2908 723.9118.9698 724.08127.3197 724.15141.7605 724.04 147.534 724.04
148.0156 724.04 148.739 724.06 167.183 724.56186.7215 725.5193.0373 725.81
194.0911 725.83216.7024 726.92218.2687 726.95 242.918 728.48265.4388 728.74
269.1036 728.77 315.993 731.95316.7762 731.96 318.031 732361.4998 733.74
361.896 733.75362.2298 733.76

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-75 .1359.64951 .045118.9698 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
59.64951118.9698 70 148 626 .1 .3

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
-75 11.4 733.4 F
144.3362.2298 733.4 F

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139364

INPUT

Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input 07-2010

Station Elevation Data num= 41
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 730.2325.89646 728.3234.58134 727.6847.53335 726.7461.65466 725.98
62.86731 725.3171.52296 724.580.80232 723.9286.33195 723.2987.81361 722.7
91.14569 721.7892.60942 720.993.44381 720.3494.39133 719.797.08542 719.6
102.3392 719.29113.2782 720.26114.9753 723.84 129.198 723.96172.1069 723.76
207.7128 723.81245.1637 723.92245.9037 723.94284.2046 724.19284.8347 724.2
325.5757 724.59326.0558 724.61344.0362 724.9365.4267 725.29366.2567 725.29
386.9972 725.89407.8078 726.51408.2278 726.53448.8588 729450.0789 729.04
474.1395 729.48487.6698 729.71490.6599 729.87525.8707 732.04609.3928 738.15
609.7329 738.17

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .1186.33195 .045114.9753 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
86.33195114.9753 141 87 58 .1 .3

Ineffective Flow num= 1
Sta L Sta R Elev Permanent
194.84609.7329 728.57 F

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139277

INPUT

Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 39
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-270.5 731.66 -210 729.95 -30 728.95 0 727.6915.09991 727.46
19.13766 727.1833.21519 726.3636.79197 725.43 38.4556 725.1743.10466 723.81
49.34686 722.2749.95718 721.8451.55831 720.2351.95881 720.260.06436 718.35
60.64471 719.0169.96091 719.2971.04166 720.2171.78226 720.2973.38339 722.87
75.39461 722.3111.7997 723.27120.8857 723.37125.1487 723.47139.5584 723.98
169.439 722.97199.0895 724.12243.0502 723.99275.1607 724.28312.3935 724.69
320.8542 724.82364.3776 725.18 422.652 726.84423.6721 726.87514.6191 731.58
515.9192 731.63558.3625 738.18628.1378 741.89628.7879 741.9

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-270.5 .1349.34686 .04573.38339 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
49.3468673.38339 33 35 35 .1 .3

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
-270.5 8.07 728.57 F
112.73628.7879 728.57 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139242

INPUT

Description: USF Main St Bridge, GEC Input 07-2010

Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.01.7500667		73020.15028		729.6221.78031		729.5644.05058		729.2
49.99065	729.1161.35076		728.5178.32095		728.4681.67101		728.42145.5518		728.35
160.7319	728.08163.6919		728.04 169.422		728.27 170.032		728.26182.3922		727.99
184.5822	728.01191.5523		727.85192.0423		727.87192.3923		727.89197.0223		727.88
198.3524	726.62204.9824		728.09206.8825		720.1207.8725		719.88213.0925		719.1
213.4725	719.24216.7326		720.28218.4826		720.33224.4228		719.24 232.17		716.82
234.04	716.09 239.43		717.17239.8432		728.23240.5632		728.24241.0232		728.24
241.2132	727.66252.0134		725.8253.8335		726.88254.4235		727.21257.9736		727.35
276.074	727.85277.2241		727.97300.2545		728.21300.6246		728.19327.9552		728.22
343.4694	728.27362.1741		728.3394.0724		728.7 396.213		728.81433.3827		729.1
435.5333	729.09478.0144		730.2497.8195		730.28505.0213		730.33522.5659		731.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09197.0223		.055241.0232		.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

197.0223	241.0232		43	43	43		.3	.5
----------	----------	--	----	----	----	--	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	204.98	728.57	F
241.0252	241.5659	728.57	F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139220

INPUT

Description: Main Street Bridge (GEC 2010)

Distance from Upstream XS = 2  
Deck/Roadway Width = 40  
Weir Coefficient = 2.6  
Upstream Deck/Roadway Coordinates

num= 7

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1.75	730.48				101.82	728.94			
240.58	728.52	726.7			301.98	728.65			
602.27	731.66				502.3	729.64			

Upstream Bridge Cross Section Data

Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.01.7500667		73020.15028		729.6221.78031		729.5644.05058		729.2
49.99065	729.1161.35076		728.5178.32095		728.4681.67101		728.42145.5518		728.35
160.7319	728.08163.6919		728.04 169.422		728.27 170.032		728.26182.3922		727.99
184.5822	728.01191.5523		727.85192.0423		727.87192.3923		727.89197.0223		727.88
198.3524	726.62204.9824		728.09206.8825		720.1207.8725		719.88213.0925		719.1
213.4725	719.24216.7326		720.28218.4826		720.33224.4228		719.24 232.17		716.82
234.04	716.09 239.43		717.17239.8432		728.23240.5632		728.24241.0232		728.24
241.2132	727.66252.0134		725.8253.8335		726.88254.4235		727.21257.9736		727.35
276.074	727.85277.2241		727.97300.2545		728.21300.6246		728.19327.9552		728.22
343.4694	728.27362.1741		728.3394.0724		728.7 396.213		728.81433.3827		729.1
435.5333	729.09478.0144		730.2497.8195		730.28505.0213		730.33522.5659		731.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09197.0223		.055241.0232		.09

Bank Sta: Left Right Coeff Contr. Expan.

197.0223	241.0232		.3	.5
----------	----------	--	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	204.98	728.57	F
241.0252	241.5659	728.57	F

Downstream Deck/Roadway Coordinates

num= 10

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	729.84				7.62	729.64			
133.48	728.51				176.17	728.59	726.7		
273.09	728.65				374.15	729.64			
461	731.2				400	729.9			

Downstream Bridge Cross Section Data

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523.70975		728.8227.89148		728.5981.48389		728.4292.49826		728.3
111.306	728.28 115.568		728.2138.8976		727.86139.7679		727.87151.9729		727.4
160.1664	727.89160.8067		727.79161.2372		727.71172.2425		728.22176.3284		728.11



176.3584	728.3176.7189	727.36	177.47	725.82177.7802	725.18	177.96	725.08
178.92	724.37179.7504	723.97181.7406		720.15188.4514	719.69195.9922		718.08
202.94	718.09	208.88	718.24211.1571	718.4211.5572	728.21212.6979		728.22
215.3794	728.2218.1695	728.17223.3598		726.12226.2598	727.62227.1299		727.59
233.6101	727.97233.9502	727.96237.7803		727.99255.4309	728.09	257.701	728.08
258.1511	728.09259.2011	728.11260.1811		728.01270.0684	727.03277.6136		727.28
290.1828	728.52311.0581	728.56337.4271		728.57340.2892	728.37359.5701		727.36
362.9002	728.21402.1619	728.27461.9445		730.9470.3348	730.1471.7349		730.13
484.1907	730.3514.9351	731.97570.0804		734.25575.2929	734.42576.8837		734.48
635.2205	736.76	638.472	736.89639.2523	736.91			

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .09176.3284 .055212.6979 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 176.3284212.6979 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 177.03 728.57 F  
 212.05639.2523 728.57 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
 Pier Station Upstream= 222.11 Downstream= 193.92  
 Upstream num= 2  
 Width Elev Width Elev  
 2 714 2 727.6  
 Downstream num= 2  
 Width Elev Width Elev  
 2 714 2 727.6

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139201

INPUT  
 Description: DSF Main St Bridge, GEC Input 07-2010  
 Station Elevation Data num= 63  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523.70975	728.8227.89148	728.5981.48389	728.4292.49826	728.3				
111.306	728.28	115.568	728.2138.8976	727.86139.7679	727.87151.9729		727.4		
160.1664	727.89160.8067	727.79161.2372	727.71172.2425	728.22176.3284	728.11				
176.3584	728.3176.7189	727.36	177.47	725.82177.7802	725.18	177.96	725.08		
178.92	724.37179.7504	723.97181.7406		720.15188.4514	719.69195.9922		718.08		
202.94	718.09	208.88	718.24211.1571	718.4211.5572	728.21212.6979		728.22		
215.3794	728.2218.1695	728.17223.3598		726.12226.2598	727.62227.1299		727.59		
233.6101	727.97233.9502	727.96237.7803		727.99255.4309	728.09	257.701	728.08		
258.1511	728.09259.2011	728.11260.1811		728.01270.0684	727.03277.6136		727.28		
290.1828	728.52311.0581	728.56337.4271		728.57340.2892	728.37359.5701		727.36		
362.9002	728.21402.1619	728.27461.9445		730.9470.3348	730.1471.7349		730.13		
484.1907	730.3514.9351	731.97570.0804		734.25575.2929	734.42576.8837		734.48		
635.2205	736.76	638.472	736.89639.2523	736.91					

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .09176.3284 .055212.6979 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

176.3284212.6979 20 21 19 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 177.03 728.57 F  
 212.05639.2523 728.57 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data num= 47  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 728.36 37.86 724.74 38.57 724.7 39.19 724.64 59.94 723.95  
 63.84 723.94 76.25 723.63 76.65 723.61 84.91 722.68 87.7 720.62  
 88.46001 720.0689.37001 719.9394.15001 719.2196.36001 718.0598.99001 719.22  
 103.44 719.72 104.16 719.79104.5201 720.3108.8901 723.01109.6001 723.18  
 112.0626 723.73112.2529 723.91 132.651 722.85 133.01 722.87133.4516 722.87  
 140.9519 722.97157.3524 723.25185.4334 724.32186.8835 724.48 200.824 724.1  
 202.8144 724.06237.8324 725.57239.0326 725.87240.7531 725.88359.7095 726.08  
 361.3396 726.13412.6096 727.17414.2996 727.28415.0897 727.32417.8119 727.42  
 474.3699 728.87475.9402 728.96539.6592 733.47540.1493 733.45540.5194 733.44  
 592.1792 737.52592.9095 737.57

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1 76.65 .055112.2529 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 76.65112.2529 27 27 27 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 67 728.57 F  
 121.6592.9095 728.57 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 731.321.94402 728.0524.42452 728.2730.15558 728.433.69627 728.64  
 53.62989 728.7655.24017 728.883.58551 728.784.68569 728.6293.64731 727.75  
 99.92865 727.16144.9669 725.01148.6377 724.63174.0424 724.03 182.394 723.16  
 188.0251 721.86192.4358 721.41 193.546 720.6197.9669 718.93198.8469 718.6  
 199.287 718.29200.1873 717.97201.1675 718.25210.6992 719.7211.3994 719.82  
 211.8396 720.15215.6702 723.81217.8506 723.69228.2125 723.28234.4736 723.55  
 285.1931 724.38290.2141 724.32303.1765 725.57318.4593 725.33334.4223 725.81  
 346.4945 725.98360.7272 726.23378.3205 726.04387.0722 726.02388.8324 726.02  
 484.5803 726.6559.9542 727.21598.6415 727.49625.3665 728.1634.1082 728.43  
 636.6285 728.73653.9019 729.96

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .13174.0424 .055215.6702 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 174.0424215.6702 612 483 587 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 158.49 728.57 F  
 239.19653.9019 728.57 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data num= 67  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 734.6423.72051 733.5850.52278 732.97103.7242 731.47105.4352 731.41  
 131.3751 730.4131.8137 730.38158.5284 728.95159.2807 728.91212.4323 726.45  
 213.4117 726.4214.4225 726.38237.1291 725.95238.4291 725.87270.6048 725.04  
 301.9967 724.55329.4541 724.34348.9568 723.99353.0579 723.93383.6354 723.56  
 393.7921 720.73395.9406 718.84397.8362 718.62412.9881 717.03413.5182 717.39  
 421.4882 723.09422.3705 723.13423.6802 723.32426.9516 723.8 431.308 724.75  
 431.8838 724.82433.9684 725.32438.4547 725.81444.5365 726.47451.8719 727.21  
 453.17 727.34462.0598 726.78464.8397 724.87466.0078 724.88660.9682 724.72  
 662.7347 724.78665.5562 725.71672.5701 726.12672.9245 726.08 678.82 725.76  
 688.87 724.89 720.06 724.86779.3023 724.71779.8826 724.73 781.903 724.91

794.0884	726.09822.4244	726.78837.3586	729.02851.4493	733.36859.5363	736.1
859.9111	736.1870.0308	736.22874.1083	735.74999.9396	735.691018.729	735.71
1019.092	735.731043.219	736.681043.782	736.741094.542	736.951094.985	736.99
1156.851	738.171162.934	738.32			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.11383.6354		.055426.9516		.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 383.6354426.9516 477 490 222 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 453.171162.934 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227.70591	736.4139.66846	735.9370.28796	734.64103.4348	733.35				
112.8032	732.98127.3655	732.42149.6064	731.55158.5392	731.24192.9704	729.96				
193.9008	729.93228.3727	728.93238.0518	728.63274.1718	727.4274.5956	727.39				
276.3068	727.33311.4224	726.11324.7386	725.78353.8317	725.07371.0858	724.94				
377.2663	724.83386.0002	724.69408.0329	724.48426.6654	724.26441.0691	724.01				
461.0534	723.27479.9106	722.54 480.648	722.51509.3992	722.38518.2288	722.26				
538.5144	722.18541.1888	722.16554.0018	721.87561.3702	718.31562.7351	717.82				
568.9442	717.09571.9603	716.6572.3747	716.53576.5869	717.44579.1799	718				
581.3936	718.56584.1164	722.45585.6533	723.17590.2328	725.28606.3673	726.51				
606.6901	726.5615.4731	726.14621.5073	725.58627.2417	724.05651.4352	724.38				
652.6528	724.683.0341	723.96685.8575	724.01686.6508	724.35688.3648	724.29				
689.888	724.18 698.492	724.71727.7194	724.72 755.626	724.31757.1407	724.31				
852.5659	724.38855.0814	724.56855.6722	725.07861.3923	725.08890.1413	727.49				
891.4794	727.52892.5094	727.53932.6591	728.35933.8849	728.4961.7881	729.41				
969.2715	729.75970.3898	729.861004.611	735.131014.855	735.35 1023.59	735.53				
1072.667	732.511073.249	732.51 1110.48	734.54 1141.5	737.11169.515	739.84				
1170.197	739.89								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13441.0691		.055590.2328		.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 441.0691590.2328 465 465 465 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-----	------	-----	------	-----	------	-----	------	-----	------

0	730.5924.00007	730.5935.00002	729.1985.00035	727.99119.0003	727.29
184.0007	726.59229.0009	725.69276.0009	724.09 324.001	721.79374.0013	720.69
424.0015	720.49474.0016	720.19516.0019	719.79 562.002	719.49565.0021	717.79
565.0021	716.49 569.002	714.29572.0021	713.99 573.002	714.39 574.002	715.99
576.002	717.89 583.002	720.09624.0022	721.09674.0022	719.99719.0024	720.29
764.0026	720.89806.0028	722.19834.0028	723.29874.0029	726.09934.0033	730.89
979.0035	733.59				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13474.0016		.055624.0022		.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	474.0016	624.0022		0	0	0	.1		.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139602	Bridge		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139242	.09	.055	.09
Main Before D	139220	Bridge		
Main Before D	139201	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139602	Bridge		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	33	35	35
Main Before D	139242	43	43	43
Main Before D	139220	Bridge		
Main Before D	139201	20	21	19
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3

Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Bridge	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139242	.3	.5
Main Before D	139220	Bridge	
Main Before D	139201	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

## **15.2 Group #2 Supporting Calculations (Design Models)**

15.2.A Group #2 WIT-Arch Culvert option, Backup Calculations, Waterway opening Plot, and Created Head tables

15.2.i Group #2 WIT-Bridge option, Backup Calculations, Waterway opening Plot, and Created Head Tables

15.2.1 Natural Condition HEC-RAS Model

15.2.2 Existing Condition HEC-RAS Model

15.2.3 Proposed IL47 Bridge Condition HEC-RAS Model

15.2.4 Proposed IL47 Arch Culvert Condition HEC-RAS Model

15.2.5 Natural Condition HEC-RAS Model with no Main Street structure modeled

15.2.6 Existing Condition HEC-RAS Model with no Main Street structure modeled

15.2.7 Proposed IL 47 Arch Condition HEC-RAS Model with no Main Street structure modeled

15.2.8 Proposed IL 47 Bridge Condition HEC-RAS Model with no Main Street structure modeled

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #2 WIT (Proposed Main St bridge in place, Existing Culvert and Proposed Arch under 47)

Route: IL Route 47  
 Waterway: Blackberry Creek - Main before D  
 Section: 107B-I-1  
 County: Kane

Existing S.N.: 045-2000  
 Proposed S.N.: 045-2050  
 Prepared By: SJS Date: Sep-14  
 Checked By: DH Date: Sep-14

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (ft <sup>2</sup> )		Natural H.W.E. (ft)	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	312.3	726.33	0.12	0.17	726.45	726.50
DESIGN	50	1120	1120	203.2	376.7	727.91	0.48	0.24	728.39	728.15
BASE	100	1376	1376	203.2	394.3	728.44	0.51	0.42	728.95	728.86
MAX. CALC.	500	2097	2097	516.8~	428.0	729.88	0.04	0.57	729.92	730.45

Drainage Area = 11.32 sq mi  
 Existing Overtopping Elevation = 729.53 at Sta. 501+17  
 Proposed Overtopping Elevation = 733.97 at Sta. 501+17

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 2.03 ft/s

2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

## EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

# SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+00 20' RT

FREEBOARD: 0.2 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

NOTES:

Proposed structure details are preliminary. Subject to refinement in TS&L stage.

Waterway openings are based on the natural H.W.E.

Natural HWE taken from cross-section 139757 in Group #2 Natural Conditions model.

The existing head is the difference in water surface elevations between existing and natural conditions.

The proposed head is the difference in water surface elevations between proposed and natural conditions

Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.

Due to three sided structure design, 2 feet of the vertical wall portion will be embedded to provide protection from scour.

~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

## PROPOSED STRUCTURE

3-SIDED CULVERT TYPE: Pre-Cast Concrete Arch

LENGTH OF SPAN: 54'

# CELLS: 1

TOP OF CROWN ELEVATION: 731.36

SKEW : 0 (relative to road)

FLOWLINE ELEV: 718.63 (u/s) 718.52 (d/s)

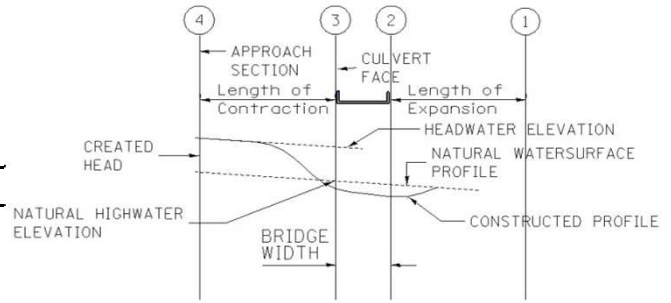
LOW EOP: 733.52 @ 501+17 60' RT

FREEBOARD: 5.41 ft

**BACKUP CALCULATIONS: Group #2 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14  
 Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.21	726.33	726.33
50-year	727.72	727.91	727.91
100-year	728.15	728.44	728.44
500-year	729.42	729.88	729.88

Section #1 : 139512<sup>+</sup>  
 Section #2 : 139545  
 Section #3 : 139653  
 Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sub>3</sub>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	726.45	726.5	0.12	0.17
50-year	727.91	728.39	728.15	0.48	0.24
100-year	728.44	728.95	728.86	0.51	0.42
500-year	729.88	729.92	730.45	0.04	0.57

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	0.12	0.17	726.45	726.50
50-year	727.91	0.48	0.24	728.39	728.15
100-year	728.44	0.51	0.42	728.95	728.86
500-year	729.88	0.04	0.57	729.92	730.45

<sup>1</sup> Natural Condition - Group #2 - Natural Conditions HEC-RAS Model.  
<sup>2</sup> Existing Condition - Group #2 - Existing Conditions HEC-RAS Model.  
<sup>3</sup> Proposed Condition - Group #2 - Proposed Condition HEC-RAS Model.  
<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.



**BACK-UP CALCULATIONS FOR WIT: Group #2 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
3.11	5.41	4.70	3.11
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
N/A	N/A	N/A	N/A

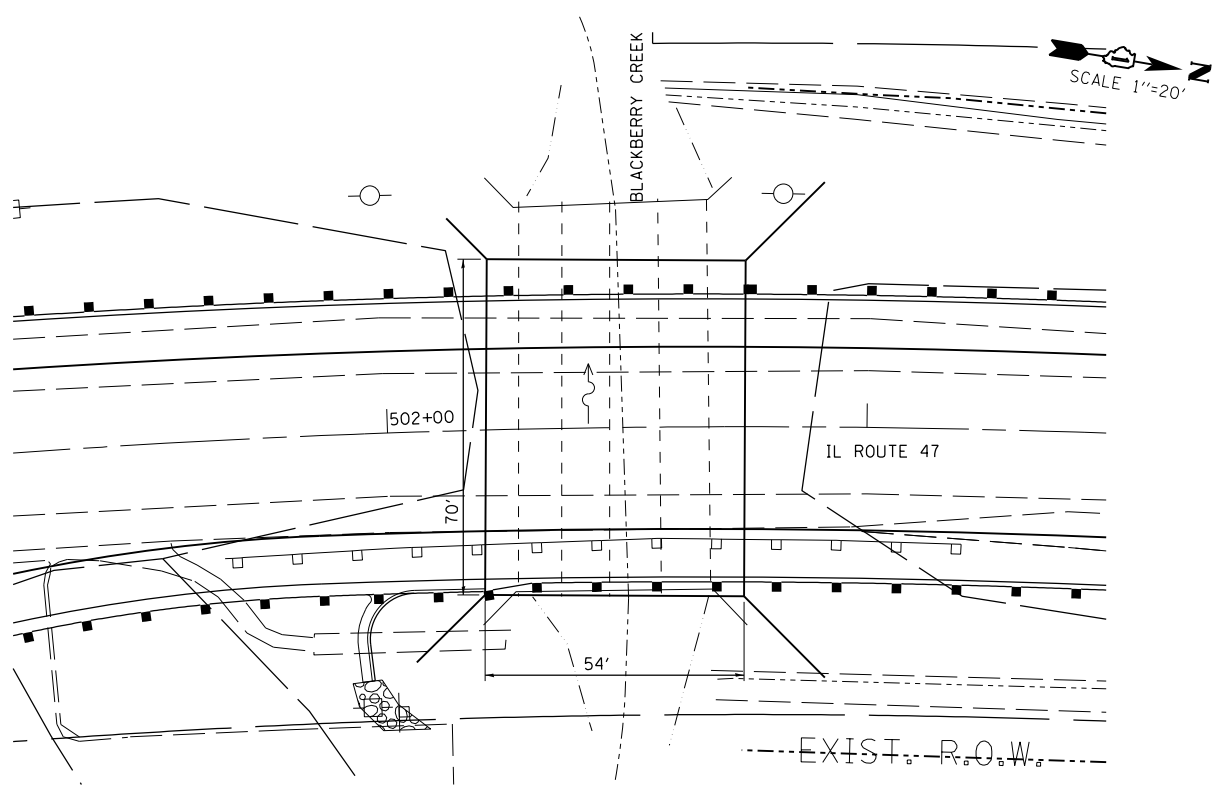
*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25	717.2	717.07
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	312.30	
50-YR	203.20	376.70	
100-YR	203.20	394.30	
500-YR	516.80	428.00	

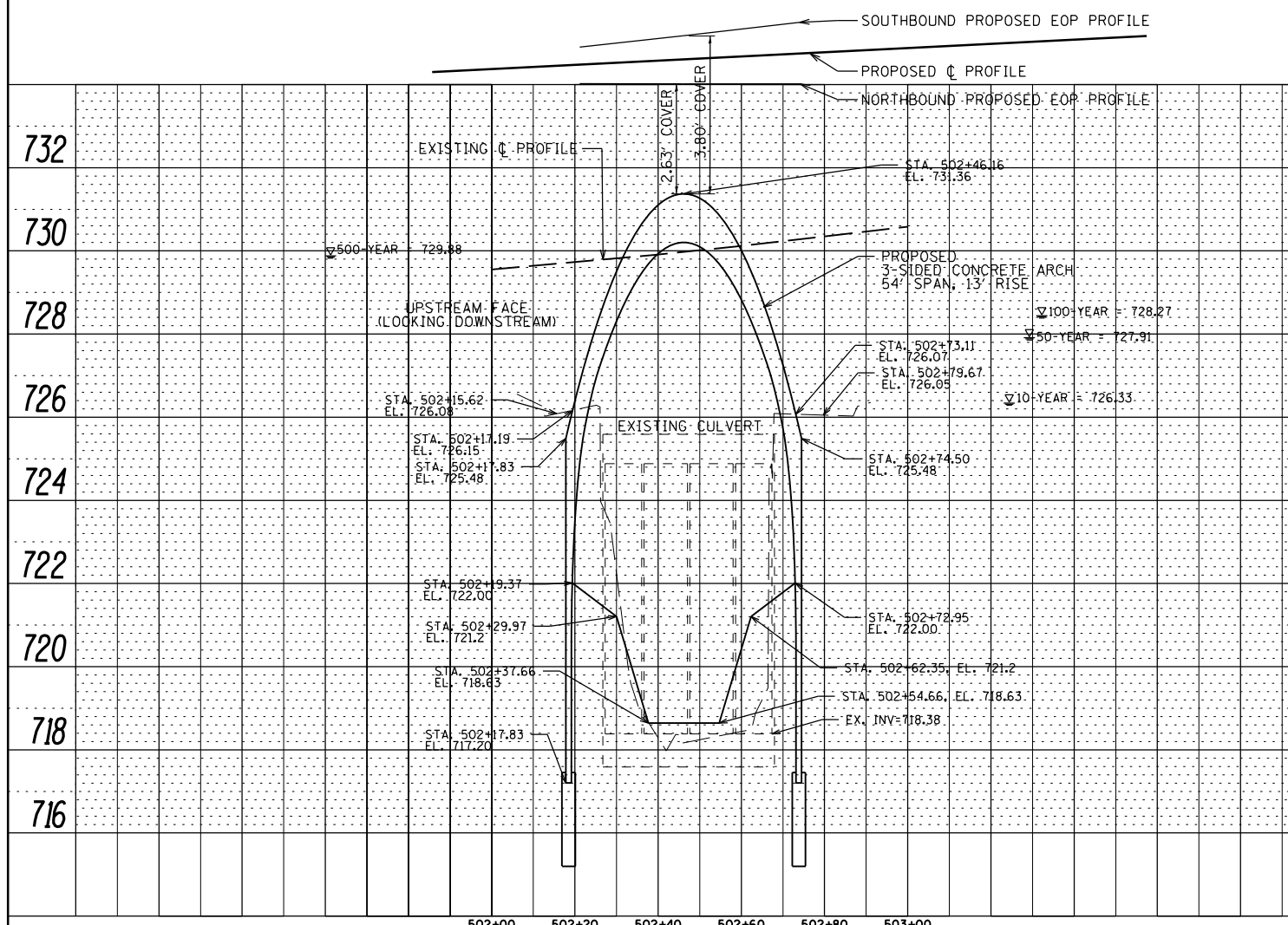
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.

PLAN	DESIGNED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	



PROFILE	DESIGNED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	B.M. NOTED	
	STRUCTURE NOTATIONS CHECKED	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\0144909-sht-drain-struct.plnprf-EX-2-CONS	DRAWN -	REVISED -	REVISED -
	PLOT SCALE = 40.0000' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF  
DEPARTMENT OF

**Created Head - G#2 - Existing/Proposed Conditions - (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.15	729.15	0.00	729.15	0.00
Main Before D	140616		727.71	727.73	0.02	727.74	0.03
Main Before D	140504		727.53	727.56	0.03	727.57	0.04
Main Before D	140133		727.06	727.12	0.06	727.14	0.08
Main Before D	139757		726.33	726.45	0.12	726.50	0.17
Main Before D	139653		726.36	726.43	0.07	726.50	0.14
Main Before D	139628						
Main Before D	141476	50-yr	730.15	730.21	0.06	730.17	0.02
Main Before D	140616		728.96	729.17	0.21	729.05	0.09
Main Before D	140504		728.79	729.03	0.24	728.90	0.11
Main Before D	140133		728.4	728.73	0.33	728.55	0.15
Main Before D	139757		727.91	728.39	0.48	728.15	0.24
Main Before D	139653		727.92	728.31	0.39	728.10	0.18
Main Before D	139628						
Main Before D	141476	100-yr	730.6	730.68	0.08	730.67	0.07
Main Before D	140616		729.45	729.7	0.25	729.66	0.21
Main Before D	140504		729.29	729.56	0.27	729.52	0.23
Main Before D	140133		728.89	729.26	0.37	729.20	0.31
Main Before D	139757		728.44	728.95	0.51	728.86	0.42
Main Before D	139653		728.44	728.94	0.50	728.79	0.35
Main Before D	139628						
Main Before D	141476	500-yr	731.76	731.77	0.01	731.95	0.19
Main Before D	140616		730.77	730.79	0.02	731.14	0.37
Main Before D	140504		730.61	730.64	0.03	731.01	0.40
Main Before D	140133		730.24	730.28	0.04	730.72	0.48
Main Before D	139757		729.88	729.92	0.04	730.45	0.57
Main Before D	139653		729.87	729.91	0.04	730.32	0.45
Main Before D	139628						

Natural condition contains Proposed Main St structure with 47 culvert removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

**Created Head - G#2 - Existing/Proposed Conditions - 10-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.15	729.15	0.00	729.15	0.00	729.15	0.00
Main Before D	140616	Q10	727.71	727.73	0.02	727.74	0.03	727.74	0.03
Main Before D	140504	Q10	727.53	727.56	0.03	727.57	0.04	727.57	0.04
Main Before D	140133	Q10	727.06	727.12	0.06	727.14	0.08	727.13	0.07
Main Before D	139757	Q10	726.33	726.45	0.12	726.50	0.17	726.46	0.13
Main Before D	139653	Q10	726.36	726.43	0.07	726.50	0.14	726.47	0.11
Main Before D	139628	Q10							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.28	726.27	-0.01	726.27	-0.01	726.27	-0.01
Main Before D	139364	Q10	726.06	726.06	0.00	726.06	0.00	726.07	0.01
Main Before D	139277	Q10	725.9	725.9	0.00	725.90	0.00	725.90	0.00
Main Before D	139264	Q10	725.94	725.94	0.00	725.94	0.00	725.95	0.01
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q10	725.79	725.79	0.00	725.79	0.00	725.79	0.00
Main Before D	139180	Q10	725.72	725.72	0.00	725.72	0.00	725.72	0.00
Main Before D	139153	Q10	725.7	725.7	0.00	725.70	0.00	725.70	0.00
Main Before D	138670	Q10	724.87	724.87	0.00	724.87	0.00	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.29	0.00	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - 50-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.15	730.21	0.06	730.17	0.02	730.16	0.01
Main Before D	140616	Q50	728.96	729.17	0.21	729.05	0.09	729.02	0.06
Main Before D	140504	Q50	728.79	729.03	0.24	728.90	0.11	728.87	0.08
Main Before D	140133	Q50	728.4	728.73	0.33	728.55	0.15	728.50	0.10
Main Before D	139757	Q50	727.91	728.39	0.48	728.15	0.24	728.08	0.17
Main Before D	139653	Q50	727.92	728.31	0.39	728.10	0.18	728.05	0.13
Main Before D	139628	Q50							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q50							
Main Before D	139512	Q50	727.83	727.78	-0.05	727.80	-0.03	727.80	-0.03
Main Before D	139364	Q50	727.55	727.54	-0.01	727.55	0.00	727.55	0.00
Main Before D	139277	Q50	727.22	727.22	0.00	727.22	0.00	727.22	0.00
Main Before D	139264	Q50	727.3	727.3	0.00	727.30	0.00	727.30	0.00
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q50	727.04	727.04	0.00	727.04	0.00	727.04	0.00
Main Before D	139180	Q50	726.96	726.96	0.00	726.96	0.00	726.96	0.00
Main Before D	139153	Q50	726.97	726.97	0.00	726.97	0.00	726.97	0.00
Main Before D	138670	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.08	0.00	724.08	0.00	724.08	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - 100-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.6	730.68	0.08	730.67	0.07	730.65	0.05
Main Before D	140616	Q100	729.45	729.7	0.25	729.66	0.21	729.60	0.15
Main Before D	140504	Q100	729.29	729.56	0.27	729.52	0.23	729.46	0.17
Main Before D	140133	Q100	728.89	729.26	0.37	729.20	0.31	729.12	0.23
Main Before D	139757	Q100	728.44	728.95	0.51	728.86	0.42	728.76	0.32
Main Before D	139653	Q100	728.44	728.94	0.50	728.79	0.35	728.71	0.27
Main Before D	139628	Q100							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q100							
Main Before D	139512	Q100	728.33	728.27	-0.06	728.45	0.12	728.45	0.12
Main Before D	139364	Q100	728	728	0.00	728.17	0.17	728.18	0.18
Main Before D	139277	Q100	727.56	727.55	-0.01	727.77	0.21	727.77	0.21
Main Before D	139264	Q100							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q100							
Main Before D	139180	Q100	727.21	727.21	0.00	727.47	0.26	727.47	0.26
Main Before D	139153	Q100	727.37	727.37	0.00	727.49	0.12	727.49	0.12
Main Before D	138670	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - 500-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.76	731.77	0.01	731.95	0.19	731.83	0.07
Main Before D	140616	Q500	730.77	730.79	0.02	731.14	0.37	730.91	0.14
Main Before D	140504	Q500	730.61	730.64	0.03	731.01	0.40	730.77	0.16
Main Before D	140133	Q500	730.24	730.28	0.04	730.72	0.48	730.44	0.20
Main Before D	139757	Q500	729.88	729.92	0.04	730.45	0.57	730.11	0.23
Main Before D	139653	Q500	729.87	729.91	0.04	730.32	0.45	730.03	0.16
Main Before D	139628	Q500							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q500							
Main Before D	139512	Q500	729.75	729.74	-0.01	729.68	-0.07	729.68	-0.07
Main Before D	139364	Q500	729.34	729.32	-0.02	729.33	-0.01	729.33	-0.01
Main Before D	139277	Q500	728.61	728.59	-0.02	728.60	-0.01	728.60	-0.01
Main Before D	139264	Q500							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q500							
Main Before D	139180	Q500	728.02	728.02	0.00	728.02	0.00	728.01	-0.01
Main Before D	139153	Q500	728.4	728.4	0.00	728.40	0.00	728.40	0.00
Main Before D	138670	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert  
 Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.68	727.69	0.01	727.70	0.02
Main Before D	140504		727.49	727.51	0.02	727.52	0.03
Main Before D	140133		726.99	727.02	0.03	727.04	0.05
Main Before D	139757		726.07	726.2	0.13	726.26	0.19
Main Before D	139653		726.13	726.18	0.05	726.26	0.13
Main Before D	139628						
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.12	728.88	0.06
Main Before D	140504		728.63	728.78	0.15	728.70	0.07
Main Before D	140133		728.15	728.37	0.22	728.26	0.11
Main Before D	139757		727.38	727.86	0.48	727.66	0.28
Main Before D	139653		727.41	727.78	0.37	727.60	0.19
Main Before D	139628						
Main Before D	141476	100-yr	730.56	730.63	0.07	730.58	0.02
Main Before D	140616		729.28	729.55	0.27	729.37	0.09
Main Before D	140504		729.09	729.39	0.30	729.20	0.11
Main Before D	140133		728.6	729.04	0.44	728.76	0.16
Main Before D	139757		727.88	728.63	0.75	728.21	0.33
Main Before D	139653		727.9	728.52	0.62	728.12	0.22
Main Before D	139628						
Main Before D	141476	500-yr	731.58	731.65	0.07	731.68	0.10
Main Before D	140616		730.35	730.53	0.18	730.59	0.24
Main Before D	140504		730.15	730.35	0.20	730.42	0.27
Main Before D	140133		729.63	729.92	0.29	730.00	0.37
Main Before D	139757		728.99	729.44	0.45	729.53	0.54
Main Before D	139653		728.98	729.43	0.45	729.37	0.39
Main Before D	139628						

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert



**Created Head - G#2 - Existing/Proposed Conditions - 10-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.16	729.15	-0.01	729.15	-0.01	729.15	-0.01
Main Before D	140616	Q10	727.68	727.69	0.01	727.7	0.02	727.69	0.01
Main Before D	140504	Q10	727.49	727.51	0.02	727.52	0.03	727.51	0.02
Main Before D	140133	Q10	726.99	727.02	0.03	727.04	0.05	727.03	0.04
Main Before D	139757	Q10	726.07	726.2	0.13	726.26	0.19	726.21	0.14
Main Before D	139653	Q10	726.13	726.18	0.05	726.26	0.13	726.24	0.11
Main Before D	139628	Q10							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.03	726.02	-0.01	726.02	-0.01	726.02	-0.01
Main Before D	139364	Q10	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	139277	Q10	725.84	725.83	-0.01	725.83	-0.01	725.83	-0.01
Main Before D	139264	Q10							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q10			0.00				
Main Before D	139180	Q10	725.74	725.74	0.00	725.74	0.00	725.74	0.00
Main Before D	139153	Q10	725.67	725.67	0.00	725.67	0.00	725.67	0.00
Main Before D	138370	Q10	724.87	724.87	0.00	724.87	0.00	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.29	0.00	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition contains No Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - 50-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.12	730.15	0.03	730.13	0.01	730.13	0.01
Main Before D	140616	Q50	728.82	728.94	0.12	728.88	0.06	728.86	0.04
Main Before D	140504	Q50	728.63	728.78	0.15	728.7	0.07	728.67	0.04
Main Before D	140133	Q50	728.15	728.37	0.22	728.26	0.11	728.22	0.07
Main Before D	139757	Q50	727.38	727.86	0.48	727.66	0.28	727.57	0.19
Main Before D	139653	Q50	727.41	727.78	0.37	727.6	0.19	727.54	0.13
Main Before D	139628	Q50							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q50							
Main Before D	139512	Q50	727.28	727.25	-0.03	727.26	-0.02	727.26	-0.02
Main Before D	139364	Q50	727.13	727.12	-0.01	727.12	-0.01	727.12	-0.01
Main Before D	139277	Q50	727.08	727.08	0.00	727.08	0.00	727.08	0.00
Main Before D	139264	Q50							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q50							
Main Before D	139180	Q50	726.98	726.98	0.00	726.98	0.00	726.98	0.00
Main Before D	139153	Q50	726.9	726.9	0.00	726.90	0.00	726.90	0.00
Main Before D	138370	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.07	-0.01	724.07	-0.01	724.07	-0.01
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition contains No Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - 100-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.56	730.63	0.07	730.58	0.02	730.57	0.01
Main Before D	140616	Q100	729.28	729.55	0.27	729.37	0.09	729.34	0.06
Main Before D	140504	Q100	729.09	729.39	0.30	729.2	0.11	729.15	0.06
Main Before D	140133	Q100	728.6	729.04	0.44	728.76	0.16	728.70	0.10
Main Before D	139757	Q100	727.88	728.63	0.75	728.21	0.33	728.10	0.22
Main Before D	139653	Q100	727.9	728.52	0.62	728.12	0.22	728.05	0.15
Main Before D	139628	Q100							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q100							
Main Before D	139512	Q100	727.75	727.71	-0.04	727.73	-0.02	727.73	-0.02
Main Before D	139364	Q100	727.6	727.59	-0.01	727.59	-0.01	727.59	-0.01
Main Before D	139277	Q100	727.55	727.54	-0.01	727.54	-0.01	727.54	-0.01
Main Before D	139264	Q100							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q100							
Main Before D	139180	Q100	727.45	727.45	0.00	727.45	0.00	727.45	0.00
Main Before D	139153	Q100	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	138670	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing IL 47 culvert  
 Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert  
 Proposed BR condition contains No Main St structure and proposed 47 - Bridge

**Created Head - G#2 - Existing/Proposed Conditions - 500-yr event (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.58	731.65	0.07	731.68	0.10	731.62	0.04
Main Before D	140616	Q500	730.35	730.53	0.18	730.59	0.24	730.46	0.11
Main Before D	140504	Q500	730.15	730.35	0.20	730.42	0.27	730.27	0.12
Main Before D	140133	Q500	729.63	729.92	0.29	730	0.37	729.81	0.18
Main Before D	139757	Q500	728.99	729.44	0.45	729.53	0.54	729.26	0.27
Main Before D	139653	Q500	728.98	729.43	0.45	729.37	0.39	729.16	0.18
Main Before D	139628	Q500							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q500							
Main Before D	139512	Q500	728.78	728.69	-0.09	728.72	-0.06	728.73	-0.05
Main Before D	139364	Q500	728.6	728.6	0.00	728.60	0.00	728.60	0.00
Main Before D	139277	Q500	728.55	728.54	-0.01	728.54	-0.01	728.54	-0.01
Main Before D	139264	Q500							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q500							
Main Before D	139180	Q500	728.45	728.45	0.00	728.45	0.00	728.45	0.00
Main Before D	139153	Q500	728.4	728.4	0.00	728.40	0.00	728.40	0.00
Main Before D	138370	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #2 WIT (Proposed Main Street Bridge Geometry in place, Proposed 47 bridge and existing Culvert Conditions)

Route:	IL Route 47	Existing S.N.:	045-2000
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050
Section:	107B-I-1	Prepared By:	SJS Date: Jul-14
County:	Kane	Checked By:	DH Date: Jul-14

Drainage Area =	11.32 sq mi	Existing Overtopping Elevation =	729.53 at Sta. 501+17								
		Proposed Overtopping Elevation =	734.50 at Sta. 501+17								
Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.		Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
	10	634	634	203.2	334.5	726.33	726.33	0.12	0.13	726.45	726.46
DESIGN	50	1120	1120	203.2	439.7	727.91	727.91	0.48	0.17	728.39	728.08
BASE	100	1376	1376	203.2	472.8	728.44	728.44	0.51	0.32	728.95	728.76
MAX. CALC.	500	2097	2097	516.8~	570.3	729.88	729.88	0.04	0.23	729.92	730.11

**Datum:** NAVD88  
**ALL - TIME H.W.E. & DATE:** 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
**10 YEAR VELOCITY THROUGH EXISTING STRUCTURE =** 3.12 ft/s  
**10 YEAR VELOCITY THROUGH PROPOSED ARCH =** 1.90 ft/s  
**Surveyed Normal Water Level:** 719.83 ft  
**2-Yr. Flow Rate =** 265 ft<sup>3</sup>/s

### EXISTING STRUCTURE

**TYPE:** RC Box Culvert  
**LENGTH/WIDTH:** (2) 6.5' x 8.75' & (2) 6.5' x 10.42'  
**# SPANS/CELLS:** 4  
**SKEW:** 0 (relative to road)  
**LOW EOP:** 728.59 @ 501+17 20' RT  
**FREEBOARD:** 0.11 ft  
**CULVERT INV.** 718.38 (U/S) 718.25 (D/S)

**NOTES:** Proposed structure details are preliminary. Subject to refinement in TS&L stage.  
 Waterway openings are based on the natural H.W.E.  
 Natural HWE taken from cross-section 139653 in Group #2 Natural Conditions model.  
 The existing head is the difference in water surface elevations between existing and natural conditions.  
 The proposed head is the difference in water surface elevations between proposed and natural conditions  
 The freeboard is calculated from the edge of the shoulder at 501+17  
 Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.  
 ~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

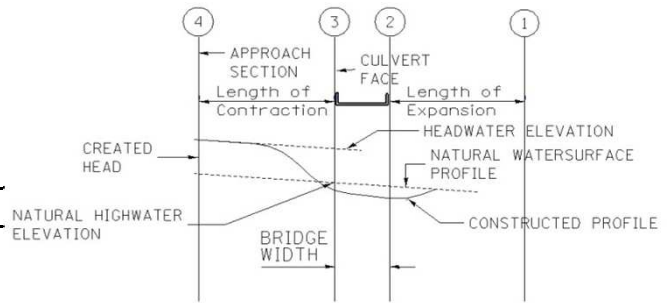
### PROPOSED STRUCTURE

**TYPE:** Open abutment with steel superstructure  
**LENGTH OF SPAN:** 76 ft  
**# SPANS:** 1  
**LOW CHORD:** 730.10  
**SKEW:** 0 (relative to road)  
**CLEARANCE:** 2.19 ft  
**BRIDGE FLOW LINE:** 718.7 (U/S) 718.62 (D/S)  
**LOW EOP:** 734.1 @ 501+17 22' RT  
**FREEBOARD:** 6.05 ft

**BACKUP CALCULATIONS: Group #2 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14  
 Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.21	726.33	726.33
50-year	727.72	727.91	727.91
100-year	728.15	728.44	728.44
500-year	729.42	729.88	729.88

Section #1 : 139512<sup>+</sup>  
 Section #2 : 139545  
 Section #3 : 139653  
 Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sub>3</sub>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	726.45	726.46	0.12	0.13
50-year	727.91	728.39	728.08	0.48	0.17
100-year	728.44	728.95	728.76	0.51	0.32
500-year	729.88	729.92	730.11	0.04	0.23

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	0.12	0.13	726.45	726.46
50-year	727.91	0.48	0.17	728.39	728.08
100-year	728.44	0.51	0.32	728.95	728.76
500-year	729.88	0.04	0.23	729.92	730.11

<sup>1</sup> Natural Condition - Group #2 - Natural Conditions HEC-RAS Model.  
<sup>2</sup> Existing Condition - Group #2 - Existing Conditions HEC-RAS Model.  
<sup>3</sup> Proposed Condition - Group #2 - Proposed Condition HEC-RAS Model.  
<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.

**BACK-UP CALCULATIONS FOR WIT: Group #2 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+17	734.13	501+17
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
7.67	6.05	5.37	4.02
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
3.77	2.19	1.66	0.22

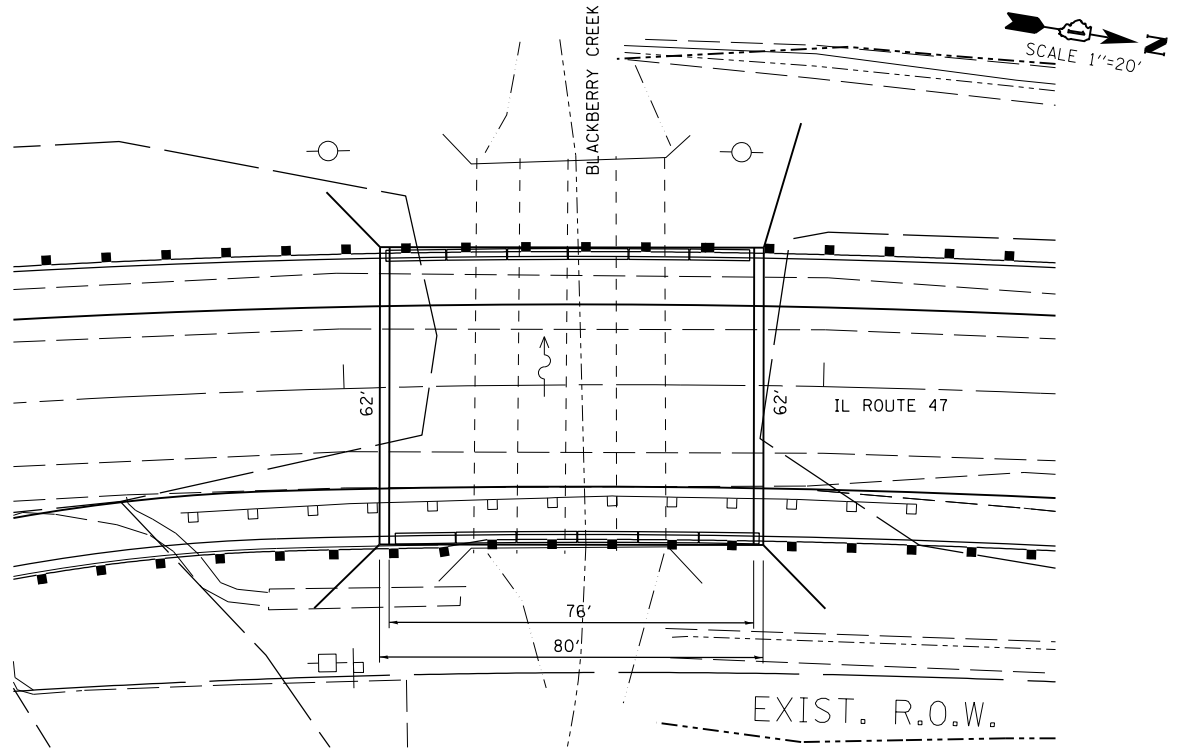
*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25		
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	334.50	
50-YR	203.20	439.70	
100-YR	203.20	472.80	
500-YR	516.80	570.30	

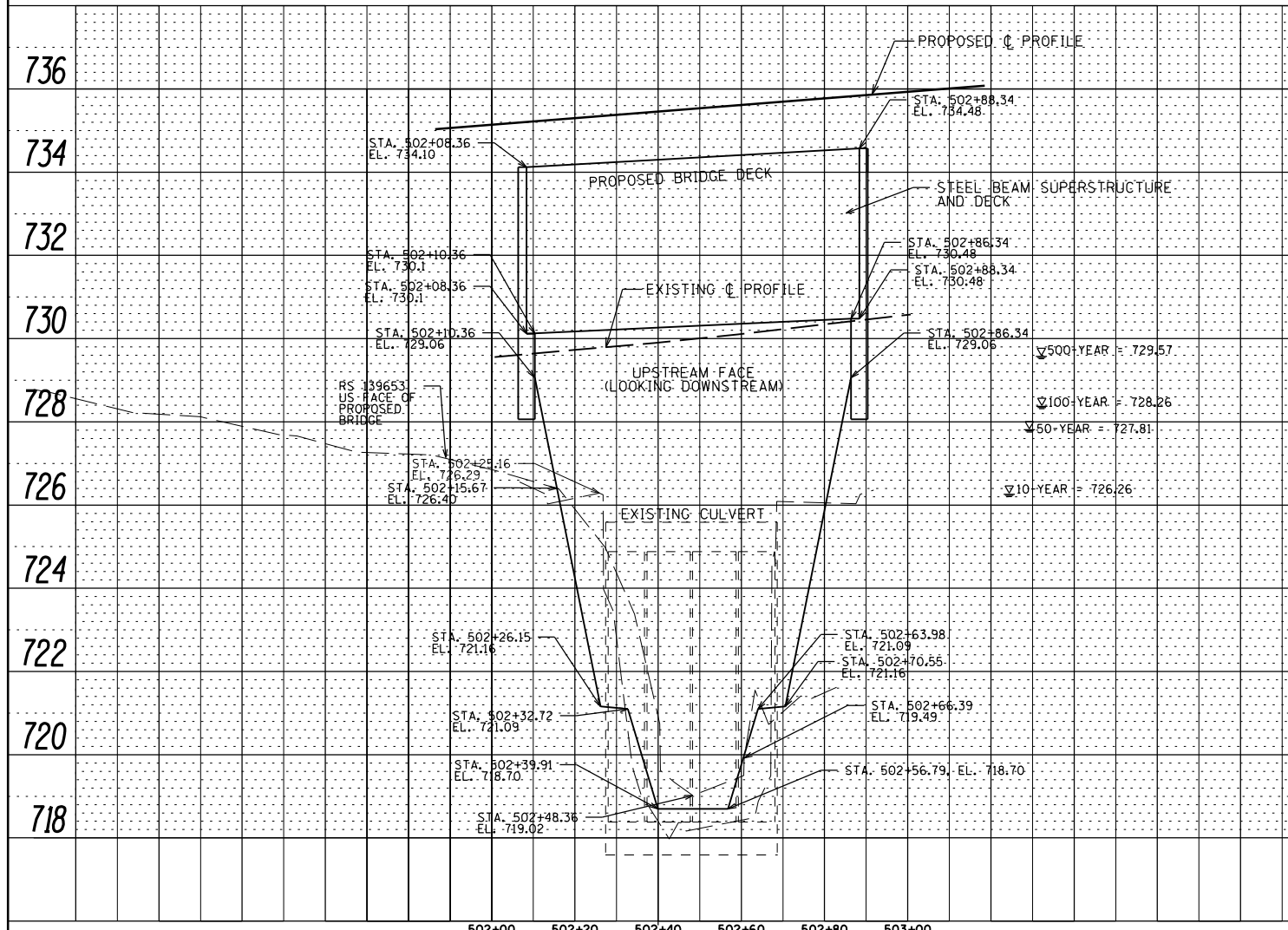
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

500-YR proposed Waterway Opening is contained within the proposed bridge no overtopping of pavement is expected.

PLAN	CHECKED	DATE
NO.	BY	
	ALIGNED	
	RT. OF WAY	
	CHECKED	
	CADD FILE	
	NAME	



PROFILE	CHECKED	DATE
NO.	BY	
	GRADES	
	CHECKED	
	B.M. NOTED	
	STRUCTURE	
	NOTATIONS	
	CHK'D	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDshets\DI44909-sht-drain-struct-plnprf-bridge.dgn		DRAWN -	REVISED -
		CHECKED -	REVISED -
		DATE -	REVISED -

STATE OF  
DEPARTMENT OF



**Created Head - G#2 - Existing/Proposed Conditions - (both structures removed in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: July-14  
 Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.68	727.69	0.01	727.69	0.01
Main Before D	140504		727.49	727.51	0.02	727.51	0.02
Main Before D	140133		726.99	727.02	0.03	727.02	0.03
Main Before D	139757		726.07	726.2	0.13	726.21	0.14
Main Before D	139653		726.13	726.18	0.05	726.23	0.10
Main Before D	139628						
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.12	728.85	0.03
Main Before D	140504		728.63	728.78	0.15	728.67	0.04
Main Before D	140133		728.15	728.37	0.22	728.21	0.06
Main Before D	139757		727.38	727.86	0.48	727.56	0.18
Main Before D	139653		727.41	727.78	0.37	727.52	0.11
Main Before D	139628						
Main Before D	141476	100-yr	730.56	730.63	0.07	730.57	0.01
Main Before D	140616		729.28	729.55	0.27	729.33	0.05
Main Before D	140504		729.09	729.39	0.30	729.14	0.05
Main Before D	140133		728.6	729.04	0.44	728.69	0.09
Main Before D	139757		727.88	728.63	0.75	728.09	0.21
Main Before D	139653		727.9	728.52	0.62	728.03	0.13
Main Before D	139628						
Main Before D	141476	500-yr	731.58	731.65	0.07	731.62	0.04
Main Before D	140616		730.35	730.53	0.18	730.46	0.11
Main Before D	140504		730.15	730.35	0.20	730.26	0.11
Main Before D	140133		729.63	729.92	0.29	729.80	0.17
Main Before D	139757		728.99	729.44	0.45	729.25	0.26
Main Before D	139653		728.98	729.43	0.45	729.15	0.17
Main Before D	139628						

Natural condition is with both structures removed  
 Existing Conditions is with no Main Street Structure and existing 47 culvert  
 Proposed is with no Main Street Structure and Proposed 47 bridge

**Created Head - G#2 - Existing/Proposed Conditions - (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: July-14  
 Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.15	729.15	0.00	729.15	0.00
Main Before D	140616	Q10	727.7	727.73	0.03	727.74	0.04
Main Before D	140504	Q10	727.52	727.56	0.04	727.57	0.05
Main Before D	140133	Q10	727.04	727.12	0.08	727.13	0.09
Main Before D	139757	Q10	726.26	726.45	0.19	726.46	0.20
Main Before D	139653	Q10	726.3	726.43	0.13	726.47	0.17
Main Before D	139628	Q10					
Main Before D	141476	Q50	730.14	730.22	0.08	730.16	0.02
Main Before D	140616	Q50	728.93	729.2	0.27	729.02	0.09
Main Before D	140504	Q50	728.75	729.07	0.32	728.87	0.12
Main Before D	140133	Q50	728.34	728.78	0.44	728.50	0.16
Main Before D	139757	Q50	727.81	728.46	0.65	728.08	0.27
Main Before D	139653	Q50	727.81	728.38	0.57	728.05	0.24
Main Before D	139628	Q50					
Main Before D	141476	Q100	730.58	730.75	0.17	730.65	0.07
Main Before D	140616	Q100	729.39	729.86	0.47	729.60	0.21
Main Before D	140504	Q100	729.21	729.75	0.54	729.46	0.25
Main Before D	140133	Q100	728.79	729.49	0.70	729.12	0.33
Main Before D	139757	Q100	728.26	729.22	0.96	728.76	0.50
Main Before D	139653	Q100	728.27	729.12	0.85	728.71	0.44
Main Before D	139628	Q100					
Main Before D	141476	Q500	731.68	731.77	0.09	731.83	0.15
Main Before D	140616	Q500	730.6	730.8	0.20	730.91	0.31
Main Before D	140504	Q500	730.43	730.65	0.22	730.77	0.34
Main Before D	140133	Q500	730.01	730.29	0.28	730.44	0.43
Main Before D	139757	Q500	729.57	729.94	0.37	730.11	0.54
Main Before D	139653	Q500	729.56	729.93	0.37	730.03	0.47
Main Before D	139628	Q500					

Natural condition contains Proposed Main St structure with 47 bridge removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and propose 47 bridge

**INEFFECTIVE FLOW CONVEYANCE AREA OFFSETS FOR EXISTING STRUCTURES**

**IL-47 ( Ex 2-6.5' x 8.75' & 2-6.5'x10.42' RC Box Culvert )**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139757	109.6	167	127	276.6	-17.4	728.94	728.94
	139653	117.5	42	48	159.5	69.5	728.94	728.94
	139628	161.1	21	20	182.1	141.1	728.94	728.94
139602								
ER 2:1	139545	211.7	18	22	229.7	189.7	728.94	728.94
	139512	85.9	45	31	130.9	54.9	728.94	728.94

**Main St (Ex 2-18' span - 40' wide concrete closed abutment bridge with pier)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139364	102.34	92.5		194.84		728.57	
	139277	60.64	52.09	52.57	112.73	8.07	728.57	
	139242	234.04	9.8	27.34	243.84	206.7	728.57	
139220								
ER 2:1	139201	202.95	9.1	25.92	212.05	177.03	728.57	
	139180	96.36	25.24	29.36	121.6	67	728.57	
	139153	200.19	39	41.7	239.19	158.49	727.5	

**INEFFECTIVE FLOW CONVEYANCE AREA OFFSETS FOR PROPOSED STRUCTURES**

**IL-47 ( Proposed 54' span 3-sided arch culvert)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139757	109.6	178	133	287.6	-23.4	733.85	733.85
	139653	117.5	50.6	56.5	168.1	61.0	733.85	733.85
	139628	161.1	28	29.7	189.1	131.4	733.85	733.85
139602								
ER 2:1	139545	211.7	32	32	243.7	179.7	733.85	733.85
	139512	85.9	59	42	144.9	43.9	733.40	733.4

**IL-47 ( Proposed 76' span bridge)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139757	109.6	194	148	303.6	-38.4	734.37	734.37
	139653	117.5	65.6	71	183.1	46.5	734.37	734.37
	139628	161.1	43	43	204.1	118.1	734.37	734.37
139602								
ER 2:1	139545	211.7	47	47.7	258.7	164.0	733.40	733.40
	139512	85.9	58.4	74.5	144.3	11.4	733.40	733.40

**Main St (Proposed 44' span reinforced concrete bridge)**

	RS	CL STA	<u>IFF Area Offsets</u>		<u>IFF Stations Hec-Ras</u>		<u>Elevations</u>	
			RT	LT	RT	LT	Group #1	Group #2
CR 1:1	139364	102.34	62.78		165.12		733.1	733.1
	139277	60.64	29.9	43.7	90.54	16.94	733.1	733.1
	139264	6	16.66	30	22.66	-24	733.1	733.1
139220								
ER 2:1	139189	2	19.5	26.5	21.5	-24.5	730.9	730.9
	139180	96.36	28.8	29.2	125.16	67.16	730.9	730.9
	139153	200.19	39	41.5	239.19	158.69	727.5	727.5



E T S

139628

139653

139757

139512

139545

ALTERNATE BRIDGE  
STRUCTURE  
ARCH CULVERT  
STRUCTURE

EXPANSION ZONE 2:1

CONTRACTION ZONE 1:1

BLACKBERRY  
CREEK

BLACKBERRY C

00+011

INV 716.86 (W)  
INV 718.68 (E)

CONTRACTION ZONE 1:1

39242

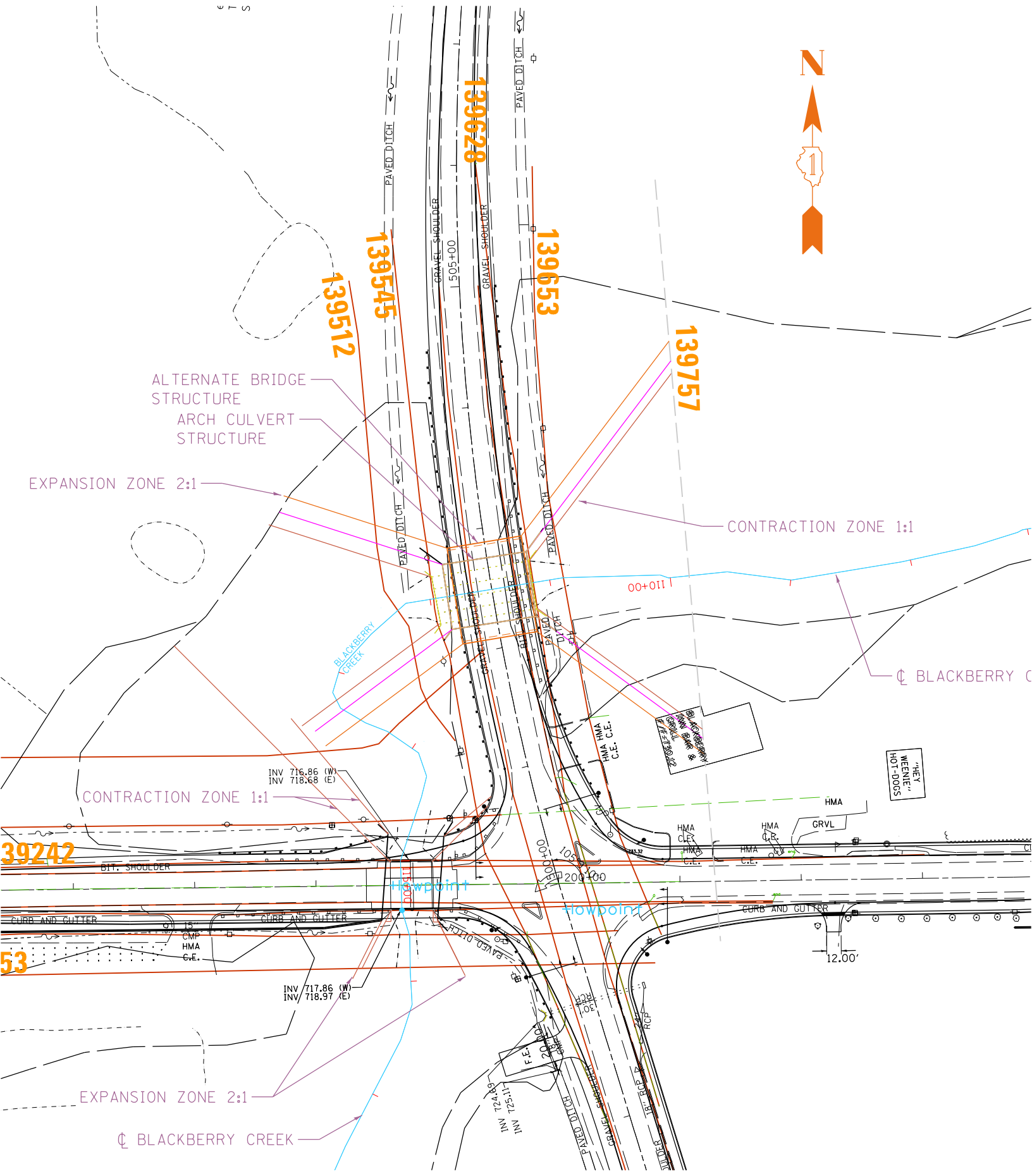
"HEY  
WEENIE"  
HOT-DOGS

53

INV 717.86 (W)  
INV 718.97 (E)

EXPANSION ZONE 2:1

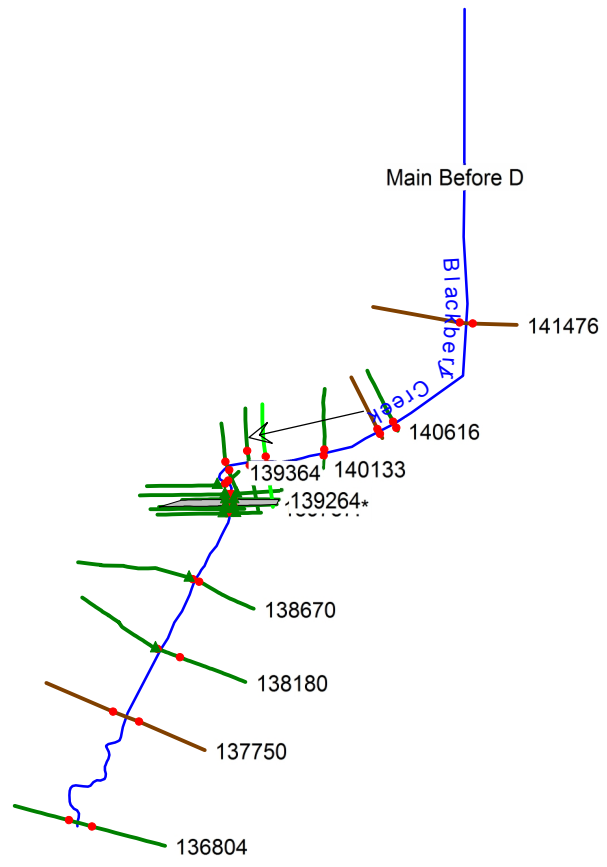
BLACKBERRY CREEK



HEC-RAS Model

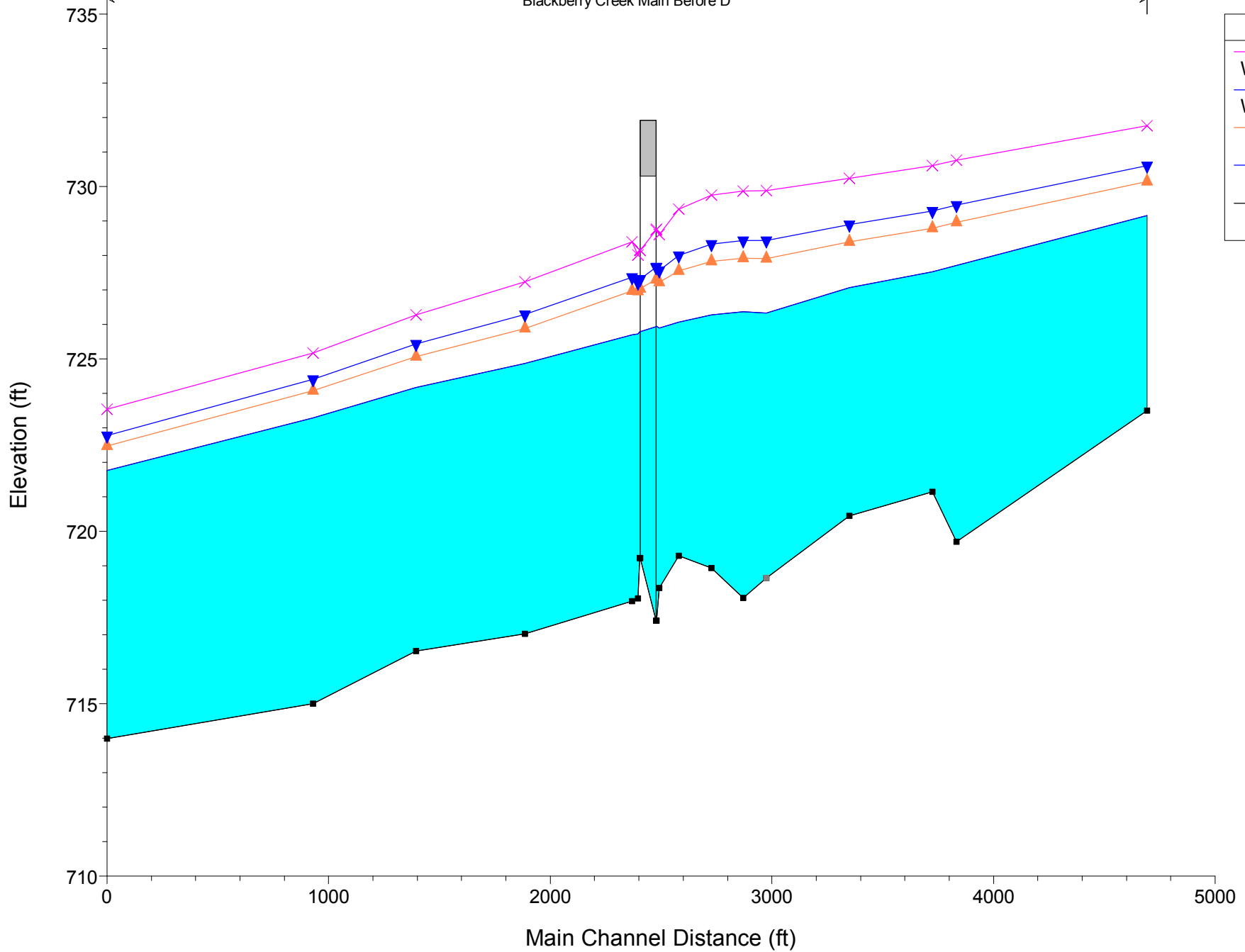
**GROUP #2 - NATURAL CONDITIONS**

**No Rte 47 Culvert, Proposed Main St. bridge**



3 of the 17 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D





HEC-RAS Plan: G#2-Natural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003307	2.68	392.05	300.83	0.31
Main Before D	141476	Q50	1128.00	723.50	730.15		730.24	0.002351	2.87	730.65	381.76	0.28
Main Before D	141476	Q100	1384.00	723.50	730.60		730.69	0.002092	2.94	913.12	428.21	0.27
Main Before D	141476	Q500	2108.00	723.50	731.76		731.85	0.001569	3.05	1478.26	550.41	0.24
Main Before D	140616	Q10	637.00	719.70	727.71		727.78	0.001020	2.48	434.45	231.57	0.21
Main Before D	140616	Q50	1126.00	719.70	728.96		729.04	0.000922	2.78	744.68	264.14	0.20
Main Before D	140616	Q100	1381.00	719.70	729.45		729.54	0.000933	2.96	879.81	282.75	0.21
Main Before D	140616	Q500	2104.00	719.70	730.77		730.86	0.000889	3.28	1284.37	342.69	0.21
Main Before D	140504	Q10	637.00	721.14	727.53		727.64	0.001706	3.04	392.93	205.48	0.26
Main Before D	140504	Q50	1126.00	721.14	728.79		728.91	0.001532	3.42	684.90	251.03	0.26
Main Before D	140504	Q100	1381.00	721.14	729.29		729.41	0.001519	3.61	811.79	262.58	0.26
Main Before D	140504	Q500	2104.00	721.14	730.61		730.74	0.001373	3.91	1179.72	293.52	0.25
Main Before D	140133	Q10	635.00	720.45	727.06		727.15	0.001211	2.70	392.54	187.06	0.23
Main Before D	140133	Q50	1122.00	720.45	728.40		728.49	0.001086	3.05	669.00	225.76	0.22
Main Before D	140133	Q100	1378.00	720.45	728.89		729.00	0.001109	3.26	784.06	238.46	0.23
Main Before D	140133	Q500	2098.00	720.45	730.24		730.36	0.001095	3.69	1133.52	297.87	0.24
Main Before D	139757.*	Q10	635.00	718.65	726.33		726.49	0.002637	3.46	276.23	184.34	0.32
Main Before D	139757.*	Q50	1122.00	718.65	727.91		728.02	0.001403	3.20	686.46	314.92	0.25
Main Before D	139757.*	Q100	1378.00	718.65	728.44		728.54	0.001274	3.25	859.18	342.47	0.24
Main Before D	139757.*	Q500	2098.00	718.65	729.88		729.96	0.000927	3.22	1407.23	432.52	0.21
Main Before D	139653	Q10	634.00	718.06	726.36		726.39	0.000238	1.28	648.26	270.22	0.10
Main Before D	139653	Q50	1120.00	718.06	727.92		727.95	0.000223	1.50	1154.33	385.72	0.10
Main Before D	139653	Q100	1376.00	718.06	728.44		728.47	0.000237	1.62	1363.97	425.33	0.11
Main Before D	139653	Q500	2097.00	718.06	729.87		729.91	0.000233	1.82	2089.46	614.54	0.11
Main Before D	139512	Q10	634.00	718.93	726.28		726.34	0.000475	2.01	444.13	204.01	0.16
Main Before D	139512	Q50	1120.00	718.93	727.83		727.90	0.000454	2.37	797.17	250.46	0.17
Main Before D	139512	Q100	1376.00	718.93	728.33		728.42	0.000493	2.60	928.01	267.25	0.18
Main Before D	139512	Q500	2097.00	718.93	729.75		729.85	0.000511	3.00	1365.45	336.04	0.18
Main Before D	139364	Q10	634.00	719.29	726.06	722.82	726.19	0.001043	3.16	312.68	332.63	0.23
Main Before D	139364	Q50	1120.00	719.29	727.55	724.47	727.72	0.001174	3.91	487.50	388.54	0.26
Main Before D	139364	Q100	1376.00	719.29	728.00	724.96	728.22	0.001350	4.37	547.37	402.20	0.28
Main Before D	139364	Q500	2097.00	719.29	729.34	725.92	729.62	0.001531	5.19	739.78	454.25	0.31
Main Before D	139277	Q10	634.00	718.35	725.90	722.40	726.09	0.001264	3.69	234.82	354.61	0.26
Main Before D	139277	Q50	1120.00	718.35	727.22	723.83	727.58	0.001940	5.19	316.55	411.89	0.33
Main Before D	139277	Q100	1376.00	718.35	727.56	724.35	728.04	0.002467	6.02	341.42	428.44	0.38
Main Before D	139277	Q500	2097.00	718.35	728.61	725.62	729.38	0.003496	7.79	418.67	479.15	0.46
Main Before D	139264	Q10	634.00	717.41	725.94	721.19	726.05	0.001060	2.58	245.85	43.68	0.19
Main Before D	139264	Q50	1120.00	717.41	727.30	722.36	727.51	0.001776	3.66	306.57	55.36	0.25
Main Before D	139264	Q100	1376.00	717.41	727.67	722.93	727.95	0.002307	4.26	324.27	70.07	0.29
Main Before D	139264	Q500	2097.00	717.41	728.77	724.26	729.25	0.003329	5.57	382.19	338.98	0.35
Main Before D	139220		Bridge									
Main Before D	139189	Q10	634.00	719.22	725.79	722.38	725.93	0.001818	3.02	209.97	44.92	0.25
Main Before D	139189	Q50	1120.00	719.22	727.04	723.49	727.32	0.002733	4.19	267.38	48.71	0.31
Main Before D	139189	Q100	1376.00	719.22	727.31	723.99	727.69	0.003594	4.92	279.91	59.74	0.35
Main Before D	139189	Q500	2097.00	719.22	728.15	725.15	728.83	0.005584	6.57	319.21	177.74	0.44
Main Before D	139180	Q10	640.00	718.05	725.72	722.90	725.90	0.002444	3.54	211.68	210.78	0.29
Main Before D	139180	Q50	1132.00	718.05	726.96	724.38	727.28	0.003192	4.74	283.98	387.85	0.34
Main Before D	139180	Q100	1389.00	718.05	727.21	724.79	727.64	0.004128	5.54	298.52	401.31	0.39
Main Before D	139180	Q500	2117.00	718.05	728.02	725.78	728.75	0.006143	7.33	345.02	437.47	0.49
Main Before D	139153	Q10	640.00	717.97	725.70	722.52	725.83	0.001683	2.96	268.00	200.37	0.24
Main Before D	139153	Q50	1132.00	717.97	726.97	724.03	727.17	0.002121	3.90	369.99	426.27	0.28
Main Before D	139153	Q100	1389.00	717.97	727.37	724.47	727.48	0.001416	3.33	969.43	484.82	0.23
Main Before D	139153	Q500	2117.00	717.97	728.40	725.38	728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.97	563.79	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.69	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22

HEC-RAS Plan: G#2-Natural River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.37	497.10	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.57	560.61	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002976	2.89	485.40	188.20	0.30
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003084	3.43	642.52	225.06	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	721.00	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#2-Natural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.46	0.00	110.01	505.26	22.73	300.83
Main Before D	141476	Q50	730.24	730.15	0.09	1.20	0.00	258.95	772.84	96.22	381.76
Main Before D	141476	Q100	730.69	730.60	0.09	1.15	0.00	335.46	901.34	147.20	428.21
Main Before D	141476	Q500	731.85	731.76	0.09	0.99	0.00	546.15	1219.64	342.21	550.41
Main Before D	140616	Q10	727.78	727.71	0.08	0.14	0.00	0.23	490.91	145.85	231.57
Main Before D	140616	Q50	729.04	728.96	0.08	0.13	0.00	2.35	703.68	419.96	264.14
Main Before D	140616	Q100	729.54	729.45	0.09	0.13	0.00	4.20	812.56	564.24	282.75
Main Before D	140616	Q500	730.86	730.77	0.09	0.12	0.00	12.40	1089.94	1001.66	342.69
Main Before D	140504	Q10	727.64	727.53	0.11	0.48	0.01	0.00	470.07	166.93	205.48
Main Before D	140504	Q50	728.91	728.79	0.12	0.41	0.01	0.36	684.39	441.24	251.03
Main Before D	140504	Q100	729.41	729.29	0.12	0.41	0.01	0.81	785.34	594.85	262.58
Main Before D	140504	Q500	730.74	730.61	0.13	0.37	0.00	3.15	1037.48	1063.37	293.52
Main Before D	140133	Q10	727.15	727.06	0.09	0.66	0.01	2.65	473.64	158.71	187.06
Main Before D	140133	Q50	728.49	728.40	0.10	0.47	0.00	10.18	697.43	414.39	225.76
Main Before D	140133	Q100	729.00	728.89	0.10	0.46	0.00	15.03	809.21	553.76	238.46
Main Before D	140133	Q500	730.36	730.24	0.12	0.39	0.01	34.03	1114.08	949.89	297.87
Main Before D	139757.*	Q10	726.49	726.33	0.16	0.06	0.04	8.01	547.26	79.73	184.34
Main Before D	139757.*	Q50	728.02	727.91	0.11	0.05	0.02	51.08	722.98	347.93	314.92
Main Before D	139757.*	Q100	728.54	728.44	0.10	0.05	0.02	80.53	806.63	490.84	342.47
Main Before D	139757.*	Q500	729.96	729.88	0.09	0.04	0.01	198.28	995.21	904.51	432.52
Main Before D	139653	Q10	726.39	726.36	0.02	0.05	0.00	1.50	580.37	52.13	270.22
Main Before D	139653	Q50	727.95	727.92	0.03	0.05	0.00	18.30	894.34	207.36	385.72
Main Before D	139653	Q100	728.47	728.44	0.03	0.05	0.00	36.43	1048.98	290.59	425.33
Main Before D	139653	Q500	729.91	729.87	0.04	0.05	0.01	126.84	1422.19	547.97	614.54
Main Before D	139512	Q10	726.34	726.28	0.06	0.14	0.01	4.65	564.92	64.43	204.01
Main Before D	139512	Q50	727.90	727.83	0.07	0.16	0.01	48.39	883.99	187.62	250.46
Main Before D	139512	Q100	728.42	728.33	0.08	0.19	0.01	72.99	1047.61	255.41	267.25
Main Before D	139512	Q500	729.85	729.75	0.10	0.21	0.02	165.88	1461.05	470.06	336.04
Main Before D	139364	Q10	726.19	726.06	0.13	0.10	0.01	24.29	511.80	97.91	332.63
Main Before D	139364	Q50	727.72	727.55	0.18	0.13	0.02	72.25	800.73	247.02	388.54
Main Before D	139364	Q100	728.22	728.00	0.21	0.15	0.03	102.96	951.28	321.76	402.20
Main Before D	139364	Q500	729.62	729.34	0.28	0.19	0.05	221.92	1327.53	547.55	454.25
Main Before D	139277	Q10	726.09	725.90	0.19	0.02	0.03	15.18	556.08	62.74	354.61
Main Before D	139277	Q50	727.58	727.22	0.36	0.02	0.05	37.98	947.40	134.62	411.89
Main Before D	139277	Q100	728.04	727.56	0.48	0.03	0.06	56.54	1149.00	170.46	428.44
Main Before D	139277	Q500	729.38	728.61	0.77	0.04	0.09	136.95	1682.08	277.98	479.15
Main Before D	139264	Q10	726.05	725.94	0.10	0.00	0.00		634.00		43.68
Main Before D	139264	Q50	727.51	727.30	0.21	0.00	0.00		1119.87	0.13	55.36
Main Before D	139264	Q100	727.95	727.67	0.28	0.00	0.00		1375.43	0.57	70.07
Main Before D	139264	Q500	729.25	728.77	0.48	0.01	0.01	0.80	2090.88	5.32	338.98
Main Before D	139220		Bridge								
Main Before D	139189	Q10	725.93	725.79	0.14	0.02	0.01		634.00		44.92
Main Before D	139189	Q50	727.32	727.04	0.27	0.03	0.01		1120.00		48.71
Main Before D	139189	Q100	727.69	727.31	0.38	0.03	0.02		1376.00		59.74
Main Before D	139189	Q500	728.83	728.15	0.67	0.05	0.02		2097.00		177.74
Main Before D	139180	Q10	725.90	725.72	0.18	0.05	0.02	21.74	584.53	33.73	210.78
Main Before D	139180	Q50	727.28	726.96	0.31	0.07	0.03	56.09	993.13	82.79	387.85
Main Before D	139180	Q100	727.64	727.21	0.43	0.06	0.09	72.26	1210.70	106.04	401.31
Main Before D	139180	Q500	728.75	728.02	0.74	0.06	0.19	124.57	1812.19	180.25	437.47
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.01	573.04	52.95	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.08	0.00	43.82	961.01	127.17	426.27
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.48	876.72	416.80	484.82
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64

HEC-RAS Plan: G#2-Natural River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.47	1146.30	11.24	563.79
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.77	1560.92	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.10
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.51	2012.51	1.99	560.61
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.20
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.69	13.04	225.06
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09



Errors Warnings and Notes for Plan : G#2-Natural (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Errors Warnings and Notes for Plan : G#2-Natural (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Errors Warnings and Notes for Plan : G#2-Natural (Continued)

	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.



HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X       X   X       X   X   X   X   X
X   X  X       X       X   X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX XXXXXXX XXXX
X   X  X       X       X   X   X   X       X
X   X  X       X   X       X   X   X   X   X
X   X  XXXXXX   XXXX       X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 10:15:57 AM

Project in English units

PLAN DATA

Plan Title: Group #2 - Natural (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p11  
 Geometry Title: Group #2 - Natural (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g17  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Group #2 - Natural Conditions, Proposed Main Street Bridge, no Existing Route  
 47 Culvert

Plan Summary Information:  
 Number of: Cross Sections = 17 Multiple Openings = 0  
 Culverts = 0 Inline Structures = 0  
 Bridges = 1 Lateral Structures = 0

Computational Information  
 Water surface calculation tolerance = 0.01  
 Critical depth calculation tolerance = 0.01  
 Maximum number of iterations = 20  
 Maximum difference tolerance = 0.3  
 Flow tolerance factor = 0.001

Computation Options  
 Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Average Conveyance  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry	CreekMain Before D	141476	638	1128	1384	2108
Blackberry	CreekMain Before D	140616	637	1126	1381	2104
Blackberry	CreekMain Before D	140133	635	1122	1378	2098
Blackberry	CreekMain Before D	139653	634	1120	1376	2097
Blackberry	CreekMain Before D	139364	634	1120	1376	2097
Blackberry	CreekMain Before D	139180	640	1132	1389	2117
Blackberry	CreekMain Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry	CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry	CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry	CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry	CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #2 - Natural (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g17

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 141476

INPUT  
 Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	736	34.7	734	94.3	732	129.3	730	157	728
277.6	727.9	319.7	727.1	325.5	725.7	330.8	723.6	337	723.5
340.2	726.9	358.9	728	425.8	728.9	495.6	730	598.3	731.2
671	732	763.7	732.8	825.4	734	914.1	736		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	277.6	.055	358.9	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	277.6	358.9		1062	860	750	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140616

INPUT  
 Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73418.14586	727.6120.01093	726.7831.69828	724.6539.43155	723.05				
43.50174	721.4650.21955	719.7 54.4631	721.24 59.8615	722.8364.14489	726.39				
80.94425	727.3290.14719	726.78103.0566	725.91145.4814	725.66150.6872	725.65				
155.3922	725.67156.8725	725.7157.8967	725.74198.5372	726.77200.2545	726.8				
236.8923	727.16238.7617	727.24276.4147	728.89277.0364	728.92330.2935	730.45				
330.6023	730.46384.2168	731.23 390.704	731.32 398.281	731.35424.3695	731.43				
424.8041	731.44								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.1120.01093		.0564.14489		.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	20.0109364.14489			111	109	107	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT  
 Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75	-162.13	730.81	-158.42	727.39	-145.96	724.25
-145.33	722.69	-139.49	721.34	-134.16	721.17	-128.02	721.14	-124.82	722.54
-122.47	725.97	-97.85	725.68	-60.35	725.83	0	725.95	19.51	726.88
80.96	728.34	138.26	730.91	192.26	731.35	242.79	732.36		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05	-122.47	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	-158.42	-122.47		412	374	230	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140133

INPUT  
 Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data num= 29									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	746.59	.661211	746.4412.27355	744.8346.09943	734.775.93997	725.73			

77.66348	724.88	89.8	721.5	94.87	720.45105.2784	721.54	108.037	724.14
117.4982	725.2	158.663	725.14175.4356		725.2199.3833	725.23200.0636		725.25
240.4556	726.41241.4389		726.44281.7278		727.91282.3598	727.93324.4932		729.82
325.104	729.84	368.711	730.36413.5901		730.81414.2438	730.82456.2384		731.28
456.7409	731.29457.6156		731.29501.0569		732.08501.4998	732.09		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1177.66348 .05117.4982 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 77.66348117.4982 350.15 376 403.42 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45
467.58	732.81								

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -185.75 .11 92.33 .05 134.98 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.33 134.98 96.85 104 111.58 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -189 .09 96.437 .05 189.85 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 96.437 189.85 152 143 172 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 42									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	732	-50	729.5	-20	728	0	726.23	.537122	726.17
9.693759	725.8817.96078		725.5535.38584		726.2336.01735		726.2236.98616		726.09
57.37652	725.1859.64951		725.0564.47989		723.44 70.3069		721.5278.64016		720.39
85.87483	718.9390.61574		719.3790.91806		719.5795.43697		720.56105.7258		722.12
118.2908	723.9118.9698		724.08127.3197		724.15141.7605		724.04 147.534		724.04
148.0156	724.04 148.739		724.06 167.183		724.56186.7215		725.5193.0373		725.81
194.0911	725.83216.7024		726.92218.2687		726.95 242.918		728.48265.4388		728.74
269.1036	728.77 315.993		731.95316.7762		731.96 318.031		732361.4998		733.74
361.896	733.75362.2298		733.76						

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -75 .1359.64951 .045118.9698 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 59.64951118.9698 70 148 626 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139364

INPUT  
 Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input  
 07-2010

Station Elevation Data		num= 41									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.2325	89646	728.3234	58134	727.6847	53335	726.7461	65466	725.98		
62.86731	725.3171	52296	724.5808	80232	723.9286	33195	723.2987	81361	722.7		
91.14569	721.7892	60942	720.993	44381	720.3494	39133	719.797	08542	719.6		
102.3392	719.2911	32782	720.2611	49753	723.84	129.198	723.9617	21069	723.76		
207.7128	723.8124	51637	723.9224	59037	723.9428	42046	724.1928	48347	724.2		
325.5757	724.5932	60558	724.6134	40362	724.9365	4267	725.2936	62567	725.29		
386.9972	725.8940	78078	726.5140	82278	726.5344	8588	729450	0789	729.04		
474.1395	729.4848	76698	729.7149	06599	729.8752	58707	732.0460	93928	738.15		
609.7329	738.17										

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1186	33195	.0451	114.9753	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 86.33195114.9753 141 87 58 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 165.12609.7329 733.1 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139277

INPUT  
 Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS,  
 elevation based on IDOT/GEC tin

Station Elevation Data		num= 39									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-270.5	731.66	-210	729.95	-30	728.95	0	727.6915	09991	727.46		
19.13766	727.1833	21519	726.3636	79197	725.43	38.4556	725.1743	10466	723.81		
49.34686	722.2749	95718	721.8451	55831	720.2351	95881	720.260	06436	718.35		
60.64471	719.0169	96091	719.2971	04166	720.2171	78226	720.2973	38339	722.87		
75.39461	722.3111	7997	723.2712	08857	723.3712	51487	723.4713	95584	723.98		
169.439	722.9719	90895	724.1224	30502	723.9927	51607	724.2831	23935	724.69		
320.8542	724.8236	43776	725.18	422.652	726.8442	36721	726.8751	46191	731.58		
515.9192	731.6355	83625	738.1862	81378	741.8962	87879	741.9				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-270.5	.1349	34686	.0457	338339	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 49.3468673.38339 12 13 13 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -270.5 16.94 733.1 F  
 90.54628.7879 733.1 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139264

INPUT  
 Description: USF Main St Bridge, GEC Input 07-2010, relocated to proposed  
 bridge face

Station Elevation Data		num= 54									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56		
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42		
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26		
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89		
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62		
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2		
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66		
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85		
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27		
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09		
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val

Sta	n Val	Sta	n Val	Sta	n Val
-309	.09	-22.98	.055	25	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
-22.98	25	75	75	75	.3	.5	
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
-309	-24	733.1	F				
30	303.57	733.1	F				

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139220

INPUT

Description: Main Street Bridge (GEC 2010)

Distance from Upstream XS = 2

Deck/Roadway Width = 72

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	13													
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-503	740.08				-372	736.33				-272	734.18			
-172	732.74				-72	732.02				-22	731.92	730.3		
0	731.94	730.2			22	731.99	730.11			69	732.18			
169	732.64				269	733.65				369	735.38			
419	736.52													

Upstream Bridge Cross Section Data

Station Elevation Data	num=	54													
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56						
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42						
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26						
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89						
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62						
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2						
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66						
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85						
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27						
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09						
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1								

Manning's n Values

num=	3													
Sta	n Val	Sta	n Val	Sta	n Val									
-309	.09	-22.98	.055	25	.09									

Bank Sta: Left	Right	Coeff	Contr.	Expan.
-22.98	25	.3	.5	

Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
-309	-24	733.1	F				
30	303.57	733.1	F				

Downstream Deck/Roadway Coordinates

num=	13													
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-503	740.08				-372	736.33				-272	734.18			
-172	732.74				-72	732.02				-22	731.92	730.3		
0	731.94	730.2			22	731.99	730.11			69	732.18			
169	732.64				269	733.65				369	735.38			
419	736.52													

Downstream Bridge Cross Section Data

Station Elevation Data	num=	60													
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-296	732.05	-194	729.15	-170.29	728.82	-166.11	728.59	-112.52	728.42						
-101.5	728.3	-82.69	728.28	-78.43	728.2	-55.1	727.86	-54.23	727.87						
-42.03	727.4	-33.83	727.89	-33.19	727.79	-32.76	727.71	-28	728.22						
-24.86	728.11	-24.7	728.3	-22.47	722.84	-20.37	720.66	-5.85	719.7						
0	719.22	7.28	719.91	9.3	722	12.22	722.71	19.67	724.72						
21.56	726	22.5	728.22	25.38	728.2	28.17	728.17	31.36	726.12						
32.26	727.62	33.13	727.59	39.61	727.97	39.95	727.96	43.78	727.99						
61.43	728.09	63.7	728.08	64.15	728.09	65.2	728.11	66.18	728.01						
76.07	727.03	83.61	727.28	96.18	728.52	117.06	728.56	143.43	728.57						
146.29	728.37	165.57	727.36	168.9	728.21	208.16	728.27	267.94	730.9						
276.33	730.1	277.73	730.13	290.19	730.3	320.94	731.97	376.08	734.25						
381.29	734.42	382.88	734.48	441.22	736.76	444.47	736.89	445.25	736.91						

Manning's n Values

num=	3													
Sta	n Val	Sta	n Val	Sta	n Val									
-296	.09	-24.86	.055	22.5	.09									

Bank Sta: Left	Right	Coeff	Contr.	Expan.
-24.86	22.5	.3	.5	

Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
-296	-24.5	730.1	F				

26.5 445.25 730.1 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 2
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139189

INPUT

Description: DSF Main St Bridge, GEC Input 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains elevation data for 60 stations.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains Manning's n values for 3 stations.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left Channel, Right, Coeff Contr., Expan. Contains bank station data.

Table with 4 columns: Ineffective Flow, Sta L, Sta R, Elev, Permanent. Contains ineffective flow data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains elevation data for 47 stations.

Table with 6 columns: Manning's n, Sta, n Val, Sta, n Val, Sta, n Val. Contains Manning's n values for 3 stations.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left Channel, Right, Coeff Contr., Expan. Contains bank station data.

76.65112.2529		27	27	27	.1	.3
Ineffective Flow	num=	2				
Sta L	Sta R	Elev	Permanent			
0	67.16	730.1	F			
125.16592.9095	730.1	F				

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data	num=	47							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321.94402	728.0524.42452	728.2730.15558	728.433.69627	728.64				
53.62989	728.7655.24017	728.883.58551	728.784.68569	728.6293.64731	727.75				
99.92865	727.16144.9669	725.01148.6377	724.63174.0424	724.03 182.394	723.16				
188.0251	721.86192.4358	721.41 193.546	720.6197.9669	718.93198.8469	718.6				
199.287	718.29200.1873	717.97201.1675	718.25210.6992	719.7211.3994	719.82				
211.8396	720.15215.6702	723.81217.8506	723.69228.2125	723.28234.4736	723.55				
285.1931	724.38290.2141	724.32303.1765	725.57318.4593	725.33334.4223	725.81				
346.4945	725.98360.7272	726.23378.3205	726.04387.0722	726.02388.8324	726.02				
484.5803	726.6559.9542	727.21598.6415	727.49625.3665	728.1634.1082	728.43				
636.6285	728.73653.9019	729.96							

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	n Val
0	.13174.0424	.055215.6702	.1	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
174.0424	215.6702	612	483	587	.1	.3

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
0	158.69	727	F
239.19653.9019	727	F	

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data	num=	67							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423.72051	733.5850.52278	732.97103.7242	731.47105.4352	731.41				
131.3751	730.4131.8137	730.38158.5284	728.95159.2807	728.91212.4323	726.45				
213.4117	726.4214.4225	726.38237.1291	725.95238.4291	725.87270.6048	725.04				
301.9967	724.55329.4541	724.34348.9568	723.99353.0579	723.93383.6354	723.56				
393.7921	720.73395.9406	718.84397.8362	718.62412.9881	717.03413.5182	717.39				
421.4882	723.09422.3705	723.13423.6802	723.32426.9516	723.8 431.308	724.75				
431.8838	724.82433.9684	725.32438.4547	725.81444.5365	726.47451.8719	727.21				
453.17	727.34462.0598	726.78464.8397	724.87466.0078	724.88660.9682	724.72				
662.7347	724.78665.5562	725.71672.5701	726.12672.9245	726.08 678.82	725.76				
688.87	724.89 720.06	724.86779.3023	724.71779.8826	724.73 781.903	724.91				
794.0884	726.09822.4244	726.78837.3586	729.02851.4493	733.36859.5363	736.1				
859.9111	736.1870.0308	736.22874.1083	735.74999.9396	735.691018.729	735.71				
1019.092	735.731043.219	736.681043.782	736.741094.542	736.951094.985	736.99				
1156.851	738.171162.934	738.32							

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	n Val
0	.11383.6354	.055426.9516	.11	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
383.6354	426.9516	477	490	222	.1	.3

Ineffective Flow	num=	1	
Sta L	Sta R	Elev	Permanent
453.171162.934	727.5	F	

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data	num=	81							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227.70591	736.4139.66846	735.9370.28796	734.64103.4348	733.35				
112.8032	732.98127.3655	732.42149.6064	731.55158.5392	731.24192.9704	729.96				
193.9008	729.93228.3727	728.93238.0518	728.63274.1718	727.4274.5956	727.39				
276.3068	727.33311.4224	726.11324.7386	725.78353.8317	725.07371.0858	724.94				
377.2663	724.83386.0002	724.69408.0329	724.48426.6654	724.26441.0691	724.01				
461.0534	723.27479.9106	722.54 480.648	722.51509.3992	722.38518.2288	722.26				
538.5144	722.18541.1888	722.16554.0018	721.87561.3702	718.31562.7351	717.82				

568.9442	717.09571	9603	716.6572	3747	716.53576	5869	717.44579	1799	718
581.3936	718.56584	1164	722.45585	6533	723.17590	2328	725.28606	3673	726.51
606.6901	726.5615	4731	726.14621	5073	725.58627	2417	724.05651	4352	724.38
652.6528	724683	0341	723.96685	8575	724.01686	6508	724.35688	3648	724.29
689.888	724.18	698.492	724.71727	7194	724.72	755.626	724.31757	1407	724.31
852.5659	724.38855	0814	724.56855	6722	725.07861	3923	725.08890	1413	727.49
891.4794	727.52892	5094	727.53932	6591	728.35933	8849	728.4961	7881	729.41
969.2715	729.75970	3898	729.861004	611	735.131014	855	735.35	1023.59	735.53
1072.667	732.511073	249	732.51	1110.48	734.54	1141.5	737.11169	515	739.84
1170.197	739.89								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13441.0691 .055590.2328 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 441.0691590.2328 465 465 465 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT  
 Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730									
271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726									
450.5 724.6 476.8 722.6 485 720 489 718 493 716									
497 715 501 716 505 718 509 720 527.1 722									
586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1									
876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9									
1083.7 739.7									

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT  
 Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data num= 31									
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 730.5924.00007 730.5935.00002 729.1985.00035 727.99119.0003 727.29									
184.0007 726.59229.0009 725.69276.0009 724.09 324.001 721.79374.0013 720.69									
424.0015 720.49474.0016 720.19516.0019 719.79 562.002 719.49565.0021 717.79									
565.0021 716.49 569.002 714.29572.0021 713.99 573.002 714.39 574.002 715.99									
576.002 717.89 583.002 720.09624.0022 721.09674.0022 719.99719.0024 720.29									
764.0026 720.89806.0028 722.19834.0028 723.29874.0029 726.09934.0033 730.89									
979.0035 733.59									

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13474.0016 .055624.0022 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 474.0016624.0022 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11



Main Before D	139264	.09	.055	.09
Main Before D	139220	Bridge		
Main Before D	139189	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	152	143	172
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	12	13	13
Main Before D	139264	75	75	75
Main Before D	139220	Bridge		
Main Before D	139189	9	9	7
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

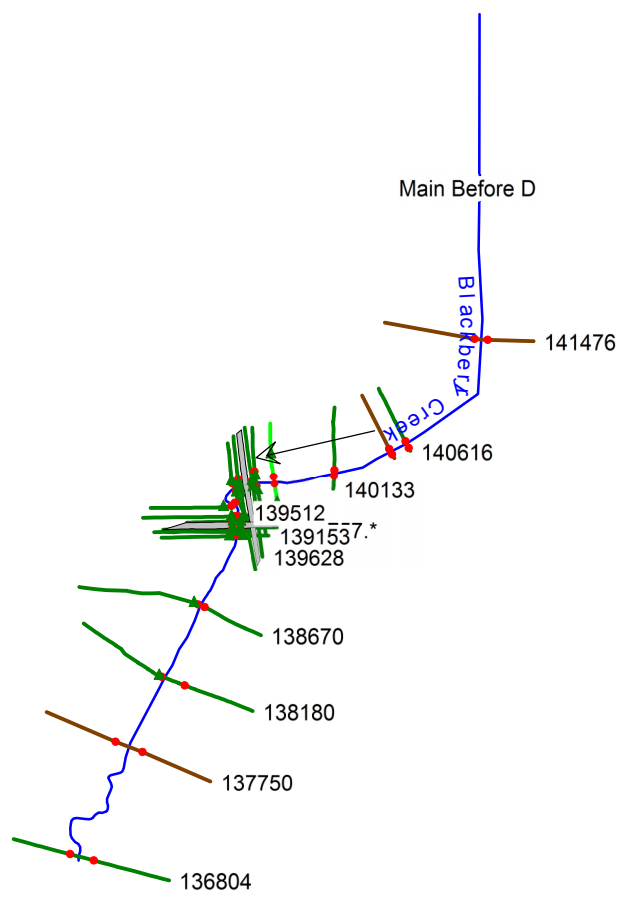
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139264	.3	.5
Main Before D	139220	Bridge	
Main Before D	139189	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

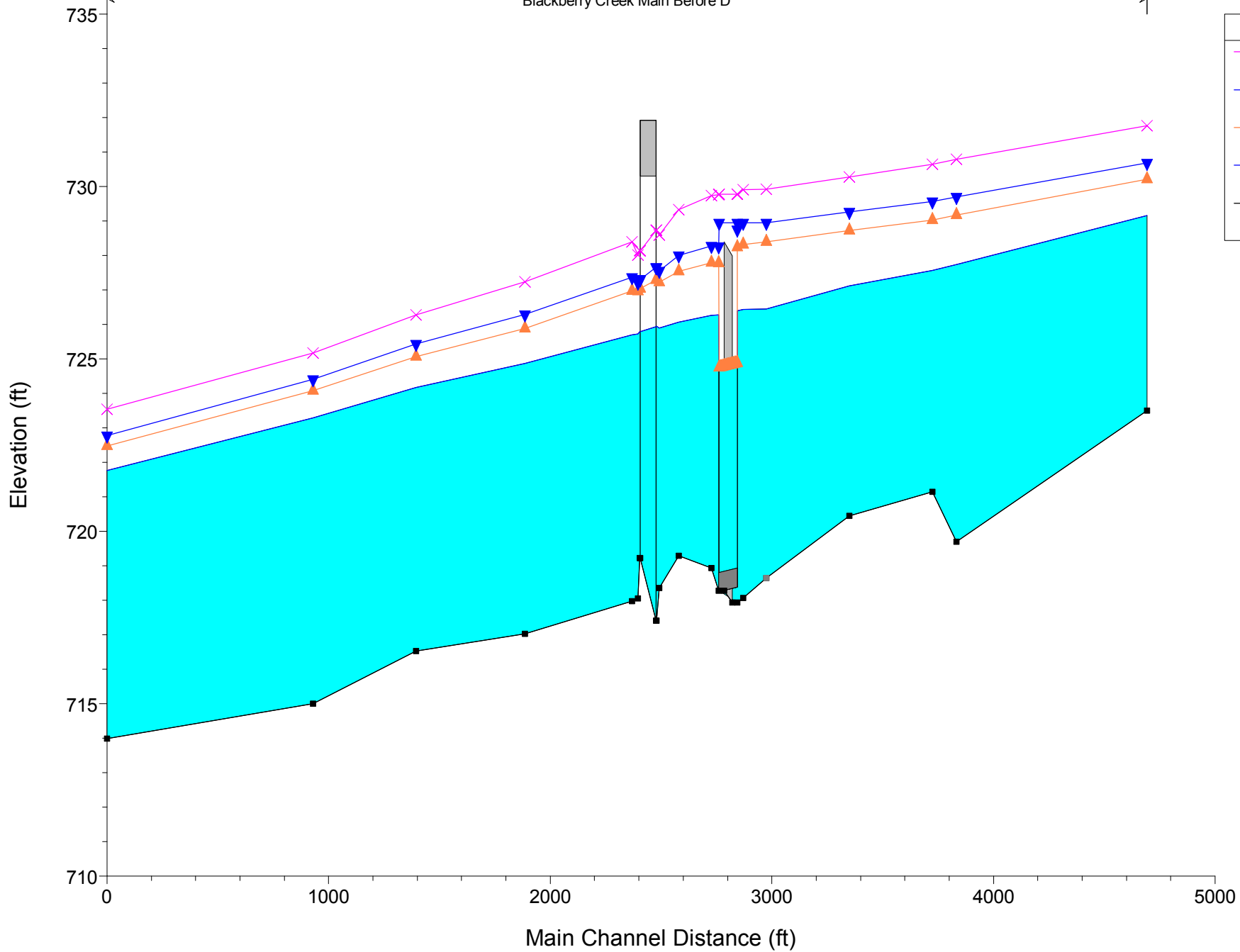
**GROUP #2 - EXISTING CONDITIONS**

**Existing Rte. 47 Culvert, Proposed Main St.  
bridge**



3 of the 19 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003316	2.68	391.61	300.72	0.31
Main Before D	141476	Q50	1128.00	723.50	730.21		730.29	0.002197	2.80	751.84	387.45	0.27
Main Before D	141476	Q100	1384.00	723.50	730.68		730.77	0.001915	2.86	948.03	436.53	0.26
Main Before D	141476	Q500	2108.00	723.50	731.77		731.86	0.001552	3.03	1485.06	551.74	0.24
Main Before D	140616	Q10	637.00	719.70	727.73		727.81	0.000993	2.46	439.98	232.19	0.20
Main Before D	140616	Q50	1126.00	719.70	729.17		729.24	0.000777	2.61	800.37	271.96	0.19
Main Before D	140616	Q100	1381.00	719.70	729.70		729.77	0.000778	2.77	948.99	291.81	0.19
Main Before D	140616	Q500	2104.00	719.70	730.79		730.88	0.000876	3.26	1293.12	344.54	0.21
Main Before D	140504	Q10	637.00	721.14	727.56		727.67	0.001652	3.01	398.94	206.74	0.25
Main Before D	140504	Q50	1126.00	721.14	729.03		729.13	0.001247	3.17	745.42	256.60	0.23
Main Before D	140504	Q100	1381.00	721.14	729.56		729.66	0.001228	3.34	884.12	268.94	0.23
Main Before D	140504	Q500	2104.00	721.14	730.64		730.77	0.001348	3.88	1188.00	294.18	0.25
Main Before D	140133	Q10	635.00	720.45	727.12		727.20	0.001146	2.65	402.24	188.65	0.22
Main Before D	140133	Q50	1122.00	720.45	728.73		728.80	0.000836	2.78	744.30	234.15	0.20
Main Before D	140133	Q100	1378.00	720.45	729.26		729.34	0.000852	2.97	872.03	247.73	0.20
Main Before D	140133	Q500	2098.00	720.45	730.28		730.40	0.001076	3.67	1143.90	300.89	0.23
Main Before D	139757.*	Q10	635.00	718.65	726.45	724.52	726.60	0.002267	3.29	300.34	196.00	0.30
Main Before D	139757.*	Q50	1122.00	718.65	728.39	725.57	728.47	0.000912	2.74	761.79	340.08	0.20
Main Before D	139757.*	Q100	1378.00	718.65	728.95	726.03	729.01	0.000817	2.75	1039.63	368.39	0.19
Main Before D	139757.*	Q500	2098.00	718.65	729.92	726.93	730.01	0.000898	3.18	1426.89	444.96	0.21
Main Before D	139653	Q10	634.00	718.06	726.43	722.10	726.48	0.000427	1.84	351.92	273.49	0.14
Main Before D	139653	Q50	1120.00	718.06	728.31	722.87	728.40	0.000470	2.35	518.56	415.12	0.15
Main Before D	139653	Q100	1376.00	718.06	728.94	723.23	728.97	0.000172	1.45	1589.08	467.27	0.09
Main Before D	139653	Q500	2097.00	718.06	729.91	724.15	729.95	0.000226	1.80	2117.17	615.95	0.11
Main Before D	139628	Q10	634.00	717.93	726.40	720.72	726.47	0.000556	2.14	295.90	85.14	0.14
Main Before D	139628	Q50	1120.00	717.93	728.24	721.74	728.38	0.000815	3.02	371.30	260.61	0.18
Main Before D	139628	Q100	1376.00	717.93	728.75	722.22	728.94	0.001024	3.51	392.35	379.21	0.20
Main Before D	139628	Q500	2097.00	717.93	729.78	723.40	729.93	0.000974	3.54	1270.06	573.21	0.19
Main Before D	139586		Culvert									
Main Before D	139545	Q10	634.00	718.27	726.28	721.62	726.37	0.000683	2.39	264.99	99.04	0.16
Main Before D	139545	Q50	1120.00	718.27	727.78	722.54	727.97	0.001078	3.44	325.19	265.20	0.21
Main Before D	139545	Q100	1376.00	718.27	728.26	722.98	728.51	0.001344	4.00	344.37	417.49	0.24
Main Before D	139545	Q500	2097.00	718.27	729.76	724.07	729.86	0.000793	2.87	1601.88	728.01	0.18
Main Before D	139512	Q10	634.00	718.93	726.27	722.64	726.34	0.000571	2.19	311.50	203.51	0.18
Main Before D	139512	Q50	1120.00	718.93	727.78	723.60	727.91	0.000679	2.88	427.01	249.29	0.20
Main Before D	139512	Q100	1376.00	718.93	728.27	724.00	728.43	0.000790	3.27	464.13	265.05	0.22
Main Before D	139512	Q500	2097.00	718.93	729.74	724.96	729.84	0.000514	3.00	1361.33	335.73	0.18
Main Before D	139364	Q10	634.00	719.29	726.06	722.82	726.19	0.001043	3.16	312.68	332.63	0.23
Main Before D	139364	Q50	1120.00	719.29	727.54	724.47	727.72	0.001176	3.92	487.14	388.45	0.26
Main Before D	139364	Q100	1376.00	719.29	728.00	724.96	728.21	0.001353	4.38	546.76	402.06	0.28
Main Before D	139364	Q500	2097.00	719.29	729.32	725.92	729.61	0.001543	5.20	737.51	453.24	0.31
Main Before D	139277	Q10	634.00	718.35	725.90	722.40	726.09	0.001264	3.69	234.82	354.61	0.26
Main Before D	139277	Q50	1120.00	718.35	727.22	723.83	727.58	0.001943	5.19	316.33	411.78	0.33
Main Before D	139277	Q100	1376.00	718.35	727.55	724.35	728.03	0.002474	6.03	341.02	427.97	0.38
Main Before D	139277	Q500	2097.00	718.35	728.59	725.62	729.37	0.003527	7.81	417.19	478.28	0.46
Main Before D	139264	Q10	634.00	717.41	725.94	721.19	726.05	0.001060	2.58	245.85	43.68	0.19
Main Before D	139264	Q50	1120.00	717.41	727.30	722.36	727.51	0.001735	3.66	305.71	55.27	0.25
Main Before D	139264	Q100	1376.00	717.41	727.66	722.93	727.94	0.002232	4.27	322.04	69.84	0.28
Main Before D	139264	Q500	2097.00	717.41	728.74	724.26	729.24	0.003245	5.64	372.33	337.96	0.35
Main Before D	139220		Bridge									
Main Before D	139189	Q10	634.00	719.22	725.79	722.38	725.93	0.001818	3.02	209.97	44.92	0.25
Main Before D	139189	Q50	1120.00	719.22	727.04	723.49	727.32	0.002661	4.19	267.02	48.65	0.31
Main Before D	139189	Q100	1376.00	719.22	727.31	723.99	727.69	0.003481	4.93	279.35	59.68	0.35
Main Before D	139189	Q500	2097.00	719.22	728.15	725.15	728.82	0.005343	6.60	317.65	176.34	0.44
Main Before D	139180	Q10	640.00	718.05	725.72	722.90	725.90	0.002444	3.54	211.68	210.78	0.29
Main Before D	139180	Q50	1132.00	718.05	726.96	724.38	727.28	0.003192	4.74	283.98	387.85	0.34
Main Before D	139180	Q100	1389.00	718.05	727.21	724.79	727.64	0.004128	5.54	298.52	401.32	0.39
Main Before D	139180	Q500	2117.00	718.05	728.02	725.78	728.75	0.006144	7.33	345.01	437.46	0.49

HEC-RAS Plan: Goup#2 - Exi River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139153	Q10	640.00	717.97	725.70	722.52	725.83	0.001683	2.96	268.00	200.37	0.24
Main Before D	139153	Q50	1132.00	717.97	726.97	724.03	727.17	0.002121	3.90	369.99	426.27	0.28
Main Before D	139153	Q100	1389.00	717.97	727.37	724.47	727.48	0.001416	3.33	969.46	484.83	0.23
Main Before D	139153	Q500	2117.00	717.97	728.40	725.38	728.50	0.001236	3.44	1506.86	556.87	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.96	563.78	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.66	627.18	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.32	497.09	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.50	560.59	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002980	2.89	485.21	188.17	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003086	3.43	642.39	225.03	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: Goup#2 - Exi River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.43	0.00	109.93	505.39	22.68	300.72
Main Before D	141476	Q50	730.29	730.21	0.09	1.05	0.01	261.04	767.94	99.02	387.45
Main Before D	141476	Q100	730.77	730.68	0.09	0.99	0.00	337.96	893.44	152.60	436.53
Main Before D	141476	Q500	731.86	731.77	0.09	0.97	0.00	546.35	1218.20	343.45	551.74
Main Before D	140616	Q10	727.81	727.73	0.07	0.14	0.00	0.25	488.62	148.14	232.19
Main Before D	140616	Q50	729.24	729.17	0.07	0.11	0.00	2.79	685.62	437.59	271.96
Main Before D	140616	Q100	729.77	729.70	0.07	0.10	0.00	4.87	790.50	585.62	291.81
Main Before D	140616	Q500	730.88	730.79	0.09	0.12	0.00	12.53	1088.10	1003.37	344.54
Main Before D	140504	Q10	727.67	727.56	0.11	0.46	0.01	0.00	467.81	169.18	206.74
Main Before D	140504	Q50	729.13	729.03	0.10	0.32	0.01	0.50	662.02	463.48	256.60
Main Before D	140504	Q100	729.66	729.56	0.10	0.32	0.01	1.04	759.77	620.19	268.94
Main Before D	140504	Q500	730.77	730.64	0.13	0.37	0.00	3.20	1034.78	1066.02	294.18
Main Before D	140133	Q10	727.20	727.12	0.08	0.60	0.01	2.77	469.88	162.36	188.65
Main Before D	140133	Q50	728.80	728.73	0.08	0.34	0.00	11.54	671.26	439.20	234.15
Main Before D	140133	Q100	729.34	729.26	0.08	0.32	0.00	16.87	779.09	582.05	247.73
Main Before D	140133	Q500	730.40	730.28	0.12	0.38	0.01	34.35	1112.83	950.82	300.89
Main Before D	139757.*	Q10	726.60	726.45	0.14	0.09	0.03	9.57	536.68	88.75	196.00
Main Before D	139757.*	Q50	728.47	728.39	0.08	0.07	0.00	65.34	673.44	383.22	340.08
Main Before D	139757.*	Q100	729.01	728.95	0.07	0.03	0.01	98.21	742.59	537.20	368.39
Main Before D	139757.*	Q500	730.01	729.92	0.08	0.04	0.01	200.61	989.70	907.69	444.96
Main Before D	139653	Q10	726.48	726.43	0.05	0.01	0.00	2.15	631.85		273.49
Main Before D	139653	Q50	728.40	728.31	0.08	0.02	0.01	32.64	1087.36		415.12
Main Before D	139653	Q100	728.97	728.94	0.02	0.01	0.02	52.45	1003.65	319.89	467.27
Main Before D	139653	Q500	729.95	729.91	0.04	0.01	0.01	131.48	1415.26	550.26	615.95
Main Before D	139628	Q10	726.47	726.40	0.07				633.99	0.01	85.14
Main Before D	139628	Q50	728.38	728.24	0.14				1119.79	0.21	260.61
Main Before D	139628	Q100	728.94	728.75	0.19				1375.67	0.33	379.21
Main Before D	139628	Q500	729.93	729.78	0.15			250.24	1556.41	290.36	573.21
Main Before D	139586		Culvert								
Main Before D	139545	Q10	726.37	726.28	0.09	0.02	0.01		634.00		99.04
Main Before D	139545	Q50	727.97	727.78	0.18	0.03	0.03		1120.00		265.20
Main Before D	139545	Q100	728.51	728.26	0.25	0.03	0.04		1376.00		417.49
Main Before D	139545	Q500	729.86	729.76	0.10	0.02	0.00	235.13	1552.64	309.23	728.01
Main Before D	139512	Q10	726.34	726.27	0.07	0.14	0.01	1.49	615.74	16.77	203.51
Main Before D	139512	Q50	727.91	727.78	0.12	0.18	0.01	6.98	1068.34	44.68	249.29
Main Before D	139512	Q100	728.43	728.27	0.16	0.21	0.01	10.03	1306.58	59.39	265.05
Main Before D	139512	Q500	729.84	729.74	0.10	0.21	0.02	165.38	1462.43	469.19	335.73
Main Before D	139364	Q10	726.19	726.06	0.13	0.10	0.01	24.29	511.80	97.91	332.63
Main Before D	139364	Q50	727.72	727.54	0.18	0.13	0.02	72.18	800.90	246.92	388.45
Main Before D	139364	Q100	728.21	728.00	0.22	0.15	0.03	102.82	951.59	321.59	402.06
Main Before D	139364	Q500	729.61	729.32	0.28	0.19	0.05	221.20	1328.73	547.07	453.24
Main Before D	139277	Q10	726.09	725.90	0.19	0.02	0.03	15.18	556.08	62.74	354.61
Main Before D	139277	Q50	727.58	727.22	0.36	0.02	0.05	37.93	947.50	134.58	411.78
Main Before D	139277	Q100	728.03	727.55	0.48	0.03	0.06	56.35	1149.26	170.39	427.97
Main Before D	139277	Q500	729.37	728.59	0.78	0.04	0.08	136.03	1683.28	277.68	478.28
Main Before D	139264	Q10	726.05	725.94	0.10	0.00	0.00		634.00		43.68
Main Before D	139264	Q50	727.51	727.30	0.21	0.00	0.00		1120.00		55.27
Main Before D	139264	Q100	727.94	727.66	0.28	0.00	0.00		1376.00		69.84
Main Before D	139264	Q500	729.24	728.74	0.49	0.01	0.00	0.75	2096.25		337.96
Main Before D	139220		Bridge								
Main Before D	139189	Q10	725.93	725.79	0.14	0.02	0.01		634.00		44.92
Main Before D	139189	Q50	727.32	727.04	0.27	0.03	0.01		1120.00		48.65
Main Before D	139189	Q100	727.69	727.31	0.38	0.03	0.01		1376.00		59.68
Main Before D	139189	Q500	728.82	728.15	0.68	0.05	0.02		2097.00		176.34

HEC-RAS Plan: Goup#2 - Exi River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139180	Q10	725.90	725.72	0.18	0.05	0.02	21.74	584.53	33.73	210.78
Main Before D	139180	Q50	727.28	726.96	0.31	0.07	0.03	56.09	993.13	82.79	387.85
Main Before D	139180	Q100	727.64	727.21	0.43	0.06	0.09	72.26	1210.70	106.04	401.32
Main Before D	139180	Q500	728.75	728.02	0.74	0.06	0.19	124.57	1812.19	180.24	437.46
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.01	573.04	52.95	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.08	0.00	43.82	961.01	127.17	426.27
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.48	876.71	416.81	484.83
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.29	889.64	556.87
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.46	1146.30	11.24	563.78
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.75	1560.94	32.31	627.18
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.22	1359.77	0.01	497.09
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.49	2012.52	1.98	560.59
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.21	1.80	188.17
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.70	13.03	225.03
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09



Errors Warnings and Notes for Plan : Goup#2 - Exi

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500

Errors Warnings and Notes for Plan : Goup#2 - Exi (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139586 Profile: Q100
Warning:	During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : Goup#2 - Exi (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10

Errors Warnings and Notes for Plan : Goup#2 - Exi (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500

Errors Warnings and Notes for Plan : Goup#2 - Exi (Continued)

Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X        X   X     X   X   X   X   X
X   X  X        X        X   X   X   X   X
XXXXXXXX XXXX   X        XXX XXXX XXXXXXX XXXX
X   X  X        X        X   X   X   X   X
X   X  X        X   X     X   X   X   X   X
X   X  XXXXXX   XXXX       X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 10:20:21 AM

Project in English units

PLAN DATA

Plan Title: Goup#2 - Existing (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p04  
  
 Geometry Title: Group #2 - Existing (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g12  
  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Group #2 -Existing IL-47 Conditions, Proposed Main Street Bridge (low chord at 729.7'), and Existing Route 47 Culvert

Plan Summary Information:

Number of:	Cross Sections =	19	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Average Conveyance  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry	CreekMain Before D	141476	638	1128	1384	2108
Blackberry	CreekMain Before D	140616	637	1126	1381	2104
Blackberry	CreekMain Before D	140133	635	1122	1378	2098
Blackberry	CreekMain Before D	139653	634	1120	1376	2097
Blackberry	CreekMain Before D	139364	634	1120	1376	2097
Blackberry	CreekMain Before D	139180	640	1132	1389	2117
Blackberry	CreekMain Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry	CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry	CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry	CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry	CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #2 - Existing (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g12

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 736 34.7 734 94.3 732 129.3 730 157 728
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2
671 732 763.7 732.8 825.4 734 914.1 736
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .13 277.6 .055 358.9 .13
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
277.6 358.9 1062 860 750 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010
Station Elevation Data num= 31
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 73418.14586 727.6120.01093 726.7831.69828 724.6539.43155 723.05
43.50174 721.4650.21955 719.7 54.4631 721.24 59.8615 722.8364.14489 726.39
80.94425 727.3290.14719 726.78103.0566 725.91145.4814 725.66150.6872 725.65
155.3922 725.67156.8725 725.7157.8967 725.74198.5372 726.77200.2545 726.8
236.8923 727.16238.7617 727.24276.4147 728.89277.0364 728.92330.2935 730.45
330.6023 730.46384.2168 731.23 390.704 731.32 398.281 731.35424.3695 731.43
424.8041 731.44
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .1120.01093 .0564.14489 .09
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
20.0109364.14489 111 109 107 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88
80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-186.58 .11 -158.42 .05 -122.47 .11
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-158.42 -122.47 412 374 230 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010
Station Elevation Data num= 29
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 746.59 .661211 746.4412.27355 744.8346.09943 734.775.93997 725.73

77.66348	724.88	89.8	721.5	94.87	720.45105.2784	721.54	108.037	724.14
117.4982	725.2	158.663	725.14175.4356		725.2199.3833	725.23200.0636		725.25
240.4556	726.41241.4389		726.44281.7278		727.91282.3598	727.93324.4932		729.82
325.104	729.84	368.711	730.36413.5901		730.81414.2438	730.82456.2384		731.28
456.7409	731.29457.6156		731.29501.0569		732.08501.4998	732.09		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1177.66348 .05117.4982 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 77.66348117.4982 350.15 376 403.42 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -185.75 .11 92.33 .05 134.98 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.33 134.98 96.85 104 111.58 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -185.75 -17.4 728.94 F  
 276.6 467.58 728.94 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -189 .09 96.437 .05 189.85 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 96.437 189.85 42 25 47 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -189 69.5 728.94 F  
 159.5 458.336 728.94 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 59											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	139.31	726.24		
140.021	726.208	140.201	726.2	140.321	723.93	142.649	723.41	145.058	721.44		





Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13189.1777 .055255.9665 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 189.1777255.9665 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 189.7 728.94 F  
 229.7520.2271 728.94 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span  
 Culvert #2 Box 6.5 8.75  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 1 82 .013 .015 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 144.875 175.925  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 195.875 226.925

Culvert Name Shape Rise Span  
 Culvert #1 Box 6.5 10.4  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 2 82 .013 .013 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 154.95 165.85  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 205.95 216.85

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139545

INPUT  
 Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
 elevation based on IDOT/GEC tin

Station Elevation Data num= 56  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
 25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
 75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
 122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
 164.8799 727.57166.6929 727.31189.1777 725.42189.4154 725.29190.0861 721.27  
 193.62 720.33197.8178 720.09 198.063 719.93205.5144 719.49205.9518 719.46  
 212.6496 719.03213.5154 718.87213.8096 718.83217.3705 718.27222.0379 719.83  
 222.7267 719.95231.0645 720.01232.1412 720.54 232.23 720.67 232.86 724.17  
 242.69 725.05 249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21  
 272.4837 726.22285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93  
 364.1443 727.74404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37  
 520.2271 729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13189.1777 .055255.9665 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 189.1777255.9665 25 33 40 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 189.7 728.94 F  
 229.7520.2271 728.94 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station	Elevation	Data	num=	42
Sta	Elev	Sta	Elev	Sta
-75	732	-50	729.5	-20
9.693759	725.8817	9.6078	725.5535	3.8584
57.37652	725.1859	6.4951	725.0564	4.7989
85.87483	718.9390	6.1574	719.3790	9.1806
118.2908	723.9118	9.698	724.0812	7.3197
148.0156	724.04	148.739	724.06	167.183
194.0911	725.8321	6.7024	726.9221	8.2687
269.1036	728.77	315.993	731.9531	6.7762
361.896	733.7536	2.2298	733.76	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
-75	.1359	6.4951	.045118
		9.698	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	59.6495	1118.9698		70	148	626		.1	.3
Ineffective Flow	num=		2						
Sta L	Sta R	Elev	Permanent						
-75	54.9	728.94	F						
130.9362	2.2298	728.94	F						

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139364

INPUT

Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input 07-2010

Station	Elevation	Data	num=	41
Sta	Elev	Sta	Elev	Sta
0	730.2325	8.9646	728.3234	5.8134
62.86731	725.3171	5.2296	724.5808	8.0232
91.14569	721.7892	6.0942	720.9933	4.4381
102.3392	719.2911	3.2782	720.2611	4.9753
207.7128	723.8124	5.1637	723.9224	5.9037
325.5757	724.5932	6.0558	724.6134	4.0362
386.9972	725.8940	7.8078	726.5140	8.2278
474.1395	729.4848	7.6698	729.7149	0.6599
609.7329	738.17		729.8752	5.8707

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.1186	8.3319	.045114
		9.753	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	86.3319	5114.9753		141	87	58		.1	.3
Ineffective Flow	num=		1						
Sta L	Sta R	Elev	Permanent						
165.1260	9.7329	733.1	F						

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139277

INPUT

Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS, elevation based on IDOT/GEC tin

Station	Elevation	Data	num=	39
Sta	Elev	Sta	Elev	Sta
-270.5	731.66	-210	729.95	-30
19.13766	727.1833	2.1519	726.3636	7.9197
49.34686	722.2749	9.5718	721.8451	5.5831
60.64471	719.0169	9.6091	719.2971	0.4166
75.39461	722.3111	7.997	723.2712	0.8857
169.439	722.9719	9.0895	724.1224	3.0502
320.8542	724.8236	4.3776	725.18	422.652
515.9192	731.6355	8.3625	738.1862	8.1378

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
-270.5	.1349	9.3468	.04573
		3.8339	.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	49.3468	673.3833		12	13	13		.1	.3
Ineffective Flow	num=		2						

Sta L	Sta R	Elev	Permanent
-270.5	16.94	733.1	F
90.54628	7879	733.1	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139264

INPUT

Description: USF Main St Bridge, GEC Input 07-2010, relocated to proposed bridge face

Station Elevation Data		num=	54							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56	
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42	
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26	
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89	
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62	
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2	
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66	
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85	
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27	
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09	
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1			

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
-309	.09	-22.98	.055	25	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	-22.98	25		75	75	75		.3	.5

Ineffective Flow		num=	2	
Sta L	Sta R	Elev	Permanent	
-309	-24	733.1	F	
22.66	303.57	733.1	F	

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139220

INPUT

Description: Main Street Bridge (GEC 2010)

Distance from Upstream XS = 2  
 Deck/Roadway Width = 72  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates		num=	13							
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	
-503	740.08				-372	736.33				
-172	732.74				-72	732.02				
0	731.94	730.2	22	731.99	730.11	69	732.18			
169	732.64				269	733.65				
419	736.52				369	735.38				

Upstream Bridge Cross Section Data		num=	54							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56	
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42	
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26	
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89	
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62	
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2	
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66	
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85	
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27	
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09	
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1			

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
-309	.09	-22.98	.055	25	.09

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	-22.98	25		.3	.5

Ineffective Flow		num=	2	
Sta L	Sta R	Elev	Permanent	
-309	-24	733.1	F	
22.66	303.57	733.1	F	

Downstream Deck/Roadway Coordinates		num=	13							
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	
-503	740.08				-372	736.33				
-172	732.74				-72	732.02				
0	731.94	730.2	22	731.99	730.11	69	732.18			

169 732.64                    269 733.65                    369 735.38  
419 736.52

Downstream Bridge Cross Section Data

Station Elevation Data num= 60  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-296 732.05 -194 729.15 -170.29 728.82 -166.11 728.59 -112.52 728.42  
-101.5 728.3 -82.69 728.28 -78.43 728.2 -55.1 727.86 -54.23 727.87  
-42.03 727.4 -33.83 727.89 -33.19 727.79 -32.76 727.71 -28 728.22  
-24.86 728.11 -24.7 728.3 -22.47 722.84 -20.37 720.66 -5.85 719.7  
0 719.22 7.28 719.91 9.3 722 12.22 722.71 19.67 724.72  
21.56 726 22.5 728.22 25.38 728.2 28.17 728.17 31.36 726.12  
32.26 727.62 33.13 727.59 39.61 727.97 39.95 727.96 43.78 727.99  
61.43 728.09 63.7 728.08 64.15 728.09 65.2 728.11 66.18 728.01  
76.07 727.03 83.61 727.28 96.18 728.52 117.06 728.56 143.43 728.57  
146.29 728.37 165.57 727.36 168.9 728.21 208.16 728.27 267.94 730.9  
276.33 730.1 277.73 730.13 290.19 730.3 320.94 731.97 376.08 734.25  
381.29 734.42 382.88 734.48 441.22 736.76 444.47 736.89 445.25 736.91

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-296 .09 -24.86 .055 22.5 .09

Bank Sta: Left Right Coeff Contr. Expan.  
-24.86 22.5 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-296 -24.5 730.1 F  
21.5 445.25 730.1 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .98  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
Energy  
Momentum Cd = 2  
Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
Pressure and Weir flow  
Submerged Inlet Cd =  
Submerged Inlet + Outlet Cd = .8  
Max Low Cord =

Additional Bridge Parameters  
Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139189

INPUT  
Description: DSF Main St Bridge, GEC Input 07-2010  
Station Elevation Data num= 60  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-296 732.05 -194 729.15 -170.29 728.82 -166.11 728.59 -112.52 728.42  
-101.5 728.3 -82.69 728.28 -78.43 728.2 -55.1 727.86 -54.23 727.87  
-42.03 727.4 -33.83 727.89 -33.19 727.79 -32.76 727.71 -28 728.22  
-24.86 728.11 -24.7 728.3 -22.47 722.84 -20.37 720.66 -5.85 719.7  
0 719.22 7.28 719.91 9.3 722 12.22 722.71 19.67 724.72  
21.56 726 22.5 728.22 25.38 728.2 28.17 728.17 31.36 726.12  
32.26 727.62 33.13 727.59 39.61 727.97 39.95 727.96 43.78 727.99  
61.43 728.09 63.7 728.08 64.15 728.09 65.2 728.11 66.18 728.01  
76.07 727.03 83.61 727.28 96.18 728.52 117.06 728.56 143.43 728.57  
146.29 728.37 165.57 727.36 168.9 728.21 208.16 728.27 267.94 730.9  
276.33 730.1 277.73 730.13 290.19 730.3 320.94 731.97 376.08 734.25  
381.29 734.42 382.88 734.48 441.22 736.76 444.47 736.89 445.25 736.91

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-296 .09 -24.86 .055 22.5 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-24.86 22.5 9 9 7 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-296 -24.5 730.1 F

21.5 445.25 730.1 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62
88.46001	720.0689	37001	719.9394	15001	719.2196	36001	718.0598	99001	719.22
103.44	719.72	104.16	719.79104	5201	720.3108	8901	723.01109	6001	723.18
112.0626	723.73112	2529	723.91	132.651	722.85	133.01	722.87133	4516	722.87
140.9519	722.97157	3524	723.25185	4334	724.32186	8835	724.48	200.824	724.1
202.8144	724.06237	8324	725.57239	0326	725.87240	7531	725.88359	7095	726.08
361.3396	726.13412	6096	727.17414	2996	727.28415	0897	727.32417	8119	727.42
474.3699	728.87475	9402	728.96539	6592	733.47540	1493	733.45540	5194	733.44
592.1792	737.52592	9095	737.57						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	76.65	.055112	2529	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	76.65	112.2529		27	27	27		.1	.3

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	67.16	730.1	F	
125.16592	9095	730.1	F	

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321	94402	728.0524	42452	728.2730	15558	728.433	69627	728.64
53.62989	728.7655	24017	728.883	58551	728.784	68569	728.6293	64731	727.75
99.92865	727.16144	9669	725.01148	6377	724.63174	0424	724.03	182.394	723.16
188.0251	721.86192	4358	721.41	193.546	720.6197	9669	718.93198	8469	718.6
199.287	718.29200	1873	717.97201	1675	718.25210	6992	719.7211	3994	719.82
211.8396	720.15215	6702	723.81217	8506	723.69228	2125	723.28234	4736	723.55
285.1931	724.38290	2141	724.32303	1765	725.57318	4593	725.33334	4223	725.81
346.4945	725.98360	7272	726.23378	3205	726.04387	0722	726.02388	8324	726.02
484.5803	726.6559	9542	727.21598	6415	727.49625	3665	728.1634	1082	728.43
636.6285	728.73653	9019	729.96						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13174	0424	.055215	6702	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	174.0424	215.6702		612	483	587		.1	.3

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
0	158.69	727	F	
239.19653	9019	727	F	

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data num= 67									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423	72051	733.5850	52278	732.97103	7242	731.47105	4352	731.41
131.3751	730.4131	8137	730.38158	5284	728.95159	2807	728.91212	4323	726.45
213.4117	726.4214	4225	726.38237	1291	725.95238	4291	725.87270	6048	725.04
301.9967	724.55329	4541	724.34348	9568	723.99353	0579	723.93383	6354	723.56
393.7921	720.73395	9406	718.84397	8362	718.62412	9881	717.03413	5182	717.39
421.4882	723.09422	3705	723.13423	6802	723.32426	9516	723.8	431.308	724.75
431.8838	724.82433	9684	725.32438	4547	725.81444	5365	726.47451	8719	727.21
453.17	727.34462	0598	726.78464	8397	724.87466	0078	724.88660	9682	724.72
662.7347	724.78665	5562	725.71672	5701	726.12672	9245	726.08	678.82	725.76
688.87	724.89	720.06	724.86779	3023	724.71779	8826	724.73	781.903	724.91
794.0884	726.09822	4244	726.78837	3586	729.02851	4493	733.36859	5363	736.1
859.9111	736.1870	0308	736.22874	1083	735.74999	9396	735.691018	729	735.71
1019.092	735.731043	219	736.681043	782	736.741094	542	736.951094	985	736.99
1156.851	738.171162	934	738.32						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .11383.6354 .055426.9516 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 383.6354426.9516 477 490 222 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 453.171162.934 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010  
 Station Elevation Data num= 81  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227	70591	736.4139	66846	735.9370	28796	734.64103	4348	733.35
112.8032	732.98127	3655	732.42149	6064	731.55158	5392	731.24192	9704	729.96
193.9008	729.93228	3727	728.93238	0518	728.63274	1718	727.4274	5956	727.39
276.3068	727.33311	4224	726.11324	7386	725.78353	8317	725.07371	0858	724.94
377.2663	724.83386	0002	724.69408	0329	724.48426	6654	724.26441	0691	724.01
461.0534	723.27479	9106	722.54	480.648	722.51509	3992	722.38518	2288	722.26
538.5144	722.18541	1888	722.16554	0018	721.87561	3702	718.31562	7351	717.82
568.9442	717.09571	9603	716.6572	3747	716.53576	5869	717.44579	1799	718
581.3936	718.56584	1164	722.45585	6533	723.17590	2328	725.28606	3673	726.51
606.6901	726.5615	4731	726.14621	5073	725.58627	2417	724.05651	4352	724.38
652.6528	724683	0341	723.96685	8575	724.01686	6508	724.35688	3648	724.29
689.888	724.18	698.492	724.71727	7194	724.72	755.626	724.31757	1407	724.31
852.5659	724.38855	0814	724.56855	6722	725.07861	3923	725.08890	1413	727.49
891.4794	727.52892	5094	727.53932	6591	728.35933	8849	728.4961	7881	729.41
969.2715	729.75970	3898	729.861004	611	735.131014	855	735.35	1023.59	735.53
1072.667	732.511073	249	732.51	1110.48	734.54	1141.5	737.11169	515	739.84
1170.197	739.89								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13441.0691 .055590.2328 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 441.0691590.2328 465 465 465 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05  
 Station Elevation Data num= 31  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985  
 Station Elevation Data num= 31  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.5924	00007	730.5935	00002	729.1985	00035	727.99119	0003	727.29
184.0007	726.59229	0009	725.69276	0009	724.09	324.001	721.79374	0013	720.69
424.0015	720.49474	0016	720.19516	0019	719.79	562.002	719.49565	0021	717.79
565.0021	716.49	569.002	714.29572	0021	713.99	573.002	714.39	574.002	715.99

576.002 717.89 583.002 720.09624.0022 721.09674.0022 719.99719.0024 720.29  
 764.0026 720.89806.0028 722.19834.0028 723.29874.0029 726.09934.0033 730.89  
 979.0035 733.59

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13474.0016 .055624.0022 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 474.0016624.0022 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139586	Culvert		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139264	.09	.055	.09
Main Before D	139220	Bridge		
Main Before D	139189	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139586	Culvert		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	12	13	13
Main Before D	139264	75	75	75
Main Before D	139220	Bridge		
Main Before D	139189	9	9	7
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139586	Culvert	
Main Before D	139545	.3	.5

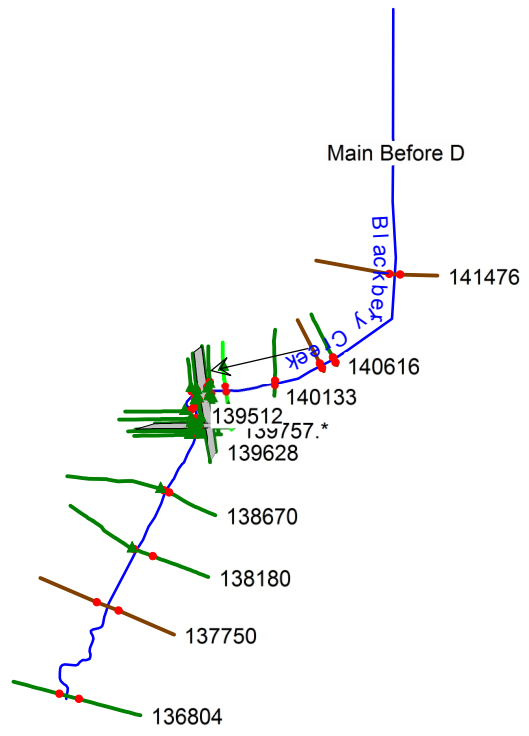


Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139264	.3	.5
Main Before D	139220	Bridge	
Main Before D	139189	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

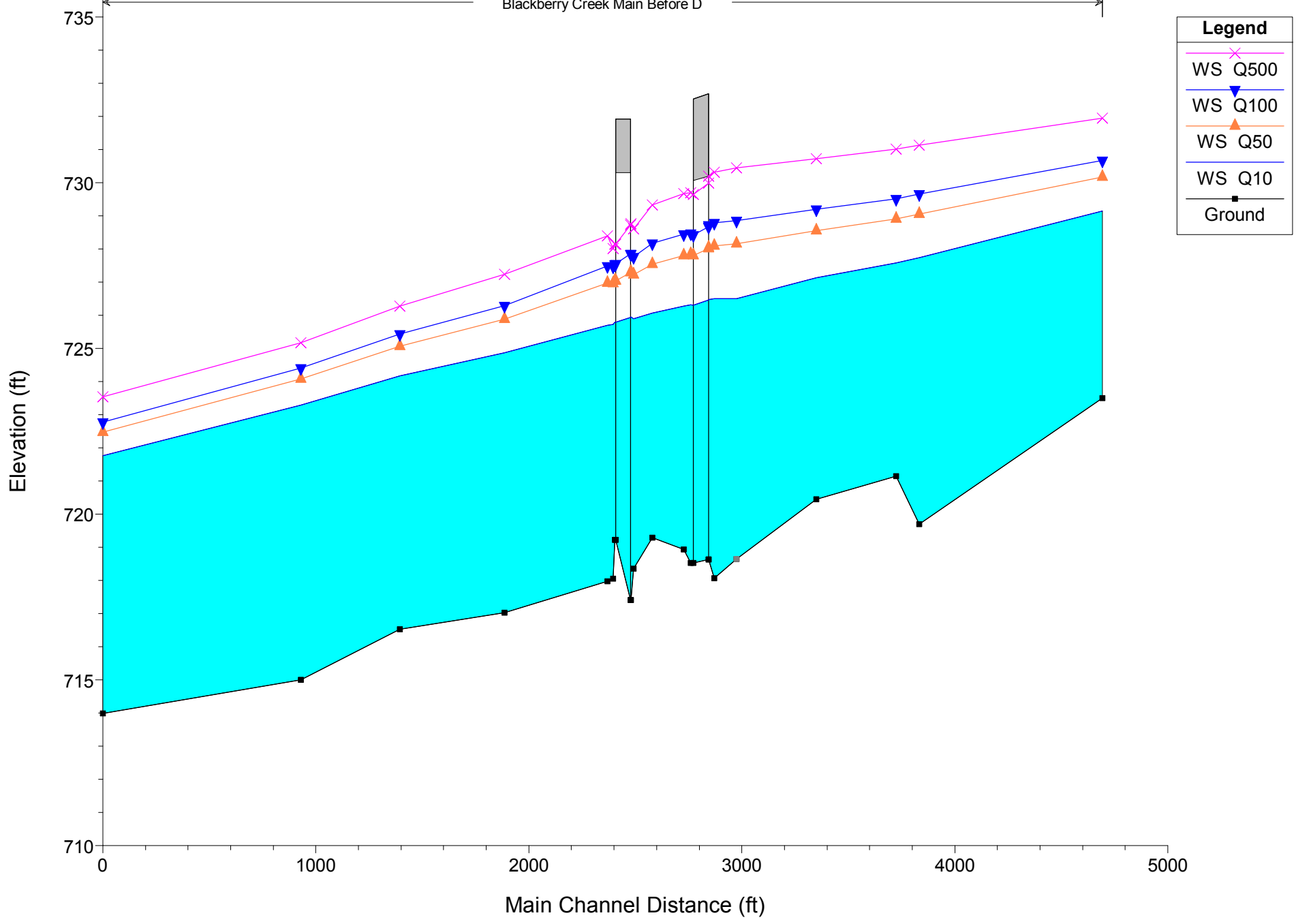
**GROUP #2 - PROPOSED CONDITIONS**

**Proposed Rte. 47 Arch, Proposed Main St.  
bridge**



3 of the 19 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



**Legend**

- WS Q500
- WS Q100
- WS Q50
- WS Q10
- Ground

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003320	2.68	391.42	300.67	0.31
Main Before D	141476	Q50	1128.00	723.50	730.17		730.26	0.002286	2.84	739.39	384.12	0.27
Main Before D	141476	Q100	1384.00	723.50	730.67		730.75	0.001944	2.87	941.94	435.09	0.26
Main Before D	141476	Q500	2108.00	723.50	731.95		732.03	0.001329	2.88	1587.03	571.42	0.22
Main Before D	140616	Q10	637.00	719.70	727.74		727.81	0.000982	2.45	442.37	232.45	0.20
Main Before D	140616	Q50	1126.00	719.70	729.05		729.13	0.000853	2.70	769.62	267.67	0.20
Main Before D	140616	Q100	1381.00	719.70	729.66		729.73	0.000801	2.80	937.97	290.39	0.19
Main Before D	140616	Q500	2104.00	719.70	731.14		731.22	0.000719	3.04	1416.62	369.61	0.19
Main Before D	140504	Q10	637.00	721.14	727.57		727.68	0.001629	2.99	401.53	207.28	0.25
Main Before D	140504	Q50	1126.00	721.14	728.90		729.01	0.001393	3.30	712.33	253.57	0.24
Main Before D	140504	Q100	1381.00	721.14	729.52		729.62	0.001269	3.38	872.79	267.96	0.24
Main Before D	140504	Q500	2104.00	721.14	731.01		731.12	0.001100	3.63	1299.60	313.73	0.23
Main Before D	140133	Q10	635.00	720.45	727.14		727.22	0.001120	2.63	406.33	189.31	0.22
Main Before D	140133	Q50	1122.00	720.45	728.55		728.64	0.000959	2.92	703.98	229.69	0.21
Main Before D	140133	Q100	1378.00	720.45	729.20		729.29	0.000885	3.01	858.69	246.34	0.21
Main Before D	140133	Q500	2098.00	720.45	730.72		730.82	0.000866	3.42	1286.65	345.18	0.21
Main Before D	139757.*	Q10	635.00	718.65	726.50	724.52	726.64	0.002140	3.22	310.04	200.51	0.29
Main Before D	139757.*	Q50	1122.00	718.65	728.15	725.58	728.24	0.001110	2.94	714.12	327.95	0.22
Main Before D	139757.*	Q100	1378.00	718.65	728.86	726.01	728.94	0.000910	2.88	915.91	364.10	0.20
Main Before D	139757.*	Q500	2098.00	718.65	730.45	726.97	730.52	0.000678	2.89	1405.50	535.34	0.18
Main Before D	139653	Q10	634.00	718.06	726.50	722.14	726.54	0.000344	1.64	394.33	277.42	0.12
Main Before D	139653	Q50	1120.00	718.06	728.10	722.88	728.17	0.000429	2.18	560.29	396.99	0.15
Main Before D	139653	Q100	1376.00	718.06	728.79	723.21	728.87	0.000461	2.41	634.56	454.31	0.15
Main Before D	139653	Q500	2097.00	718.06	730.32	724.02	730.45	0.000553	2.98	799.31	628.51	0.17
Main Before D	139628	Q10	634.00	718.63	726.47	721.70	726.52	0.000545	1.87	339.32	89.14	0.14
Main Before D	139628	Q50	1120.00	718.63	728.05	722.57	728.15	0.000772	2.60	430.19	218.69	0.17
Main Before D	139628	Q100	1376.00	718.63	728.72	722.91	728.85	0.000873	2.93	469.05	370.68	0.18
Main Before D	139628	Q500	2097.00	718.63	730.20	723.79	730.42	0.001163	3.78	554.26	624.71	0.22
Main Before D	139602		Bridge									
Main Before D	139545	Q10	634.00	718.52	726.31	721.59	726.36	0.000438	1.76	361.98	108.71	0.13
Main Before D	139545	Q50	1120.00	718.52	727.84	722.47	727.93	0.000621	2.45	459.64	288.80	0.16
Main Before D	139545	Q100	1376.00	718.52	728.48	722.83	728.59	0.000707	2.76	500.50	449.81	0.17
Main Before D	139545	Q500	2097.00	718.52	729.70	723.72	729.91	0.001012	3.64	579.08	719.83	0.21
Main Before D	139512	Q10	634.00	718.93	726.27	722.65	726.34	0.000530	2.12	350.97	203.75	0.17
Main Before D	139512	Q50	1120.00	718.93	727.80	723.60	727.91	0.000599	2.71	505.53	249.78	0.19
Main Before D	139512	Q100	1376.00	718.93	728.45	724.02	728.57	0.000636	2.98	570.44	271.27	0.20
Main Before D	139512	Q500	2097.00	718.93	729.68	725.02	729.87	0.000820	3.78	694.90	334.26	0.23
Main Before D	139364	Q10	634.00	719.29	726.06	722.82	726.19	0.001043	3.16	312.75	332.67	0.23
Main Before D	139364	Q50	1120.00	719.29	727.55	724.47	727.72	0.001175	3.91	487.29	388.49	0.26
Main Before D	139364	Q100	1376.00	719.29	728.17	724.96	728.37	0.001223	4.22	570.69	407.35	0.27
Main Before D	139364	Q500	2097.00	719.29	729.33	725.92	729.61	0.001537	5.19	738.65	453.75	0.31
Main Before D	139277	Q10	634.00	718.35	725.90	722.40	726.09	0.001263	3.68	234.86	354.64	0.26
Main Before D	139277	Q50	1120.00	718.35	727.22	723.83	727.58	0.001942	5.19	316.41	411.83	0.33
Main Before D	139277	Q100	1376.00	718.35	727.77	724.35	728.21	0.002228	5.82	356.58	442.77	0.36
Main Before D	139277	Q500	2097.00	718.35	728.60	725.62	729.37	0.003511	7.80	417.93	478.71	0.46
Main Before D	139264	Q10	634.00	717.41	725.94	721.19	726.05	0.001060	2.58	245.88	43.69	0.19
Main Before D	139264	Q50	1120.00	717.41	727.30	722.36	727.51	0.001777	3.66	306.49	55.31	0.25
Main Before D	139264	Q100	1376.00	717.41	727.86	722.93	728.13	0.002133	4.14	334.04	78.17	0.28
Main Before D	139264	Q500	2097.00	717.41	728.76	724.26	729.24	0.003342	5.57	381.69	338.62	0.35
Main Before D	139220		Bridge									
Main Before D	139189	Q10	634.00	719.22	725.79	722.38	725.93	0.001818	3.02	209.97	44.92	0.25
Main Before D	139189	Q50	1120.00	719.22	727.04	723.49	727.32	0.002661	4.19	267.02	48.65	0.31
Main Before D	139189	Q100	1376.00	719.22	727.55	723.99	727.89	0.003091	4.74	290.06	75.56	0.33
Main Before D	139189	Q500	2097.00	719.22	728.15	725.15	728.82	0.005342	6.60	317.65	176.35	0.44
Main Before D	139180	Q10	640.00	718.05	725.72	722.90	725.90	0.002444	3.54	211.68	210.78	0.29
Main Before D	139180	Q50	1132.00	718.05	726.96	724.38	727.28	0.003192	4.74	283.98	387.85	0.34
Main Before D	139180	Q100	1389.00	718.05	727.47	724.79	727.85	0.003563	5.29	313.24	410.37	0.37
Main Before D	139180	Q500	2117.00	718.05	728.02	725.78	728.75	0.006143	7.33	345.02	437.47	0.49

HEC-RAS Plan: G#2-Proposed River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139153	Q10	640.00	717.97	725.70	722.52	725.83	0.001683	2.96	268.00	200.37	0.24
Main Before D	139153	Q50	1132.00	717.97	726.97	724.03	727.17	0.002121	3.90	369.99	426.27	0.28
Main Before D	139153	Q100	1389.00	717.97	727.49	724.47	727.74	0.002335	4.33	411.63	501.69	0.30
Main Before D	139153	Q500	2117.00	717.97	728.40	725.39	728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.96	563.78	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.35	497.10	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.54	560.60	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002978	2.89	485.32	188.19	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003085	3.43	642.42	225.04	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#2-Proposed River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.42	0.01	109.89	505.44	22.66	300.67
Main Before D	141476	Q50	730.26	730.17	0.09	1.13	0.00	259.83	770.80	97.37	384.12
Main Before D	141476	Q100	730.75	730.67	0.09	1.02	0.00	337.54	894.80	151.66	435.09
Main Before D	141476	Q500	732.03	731.95	0.08	0.81	0.00	549.05	1197.24	361.70	571.42
Main Before D	140616	Q10	727.81	727.74	0.07	0.14	0.00	0.25	487.64	149.11	232.45
Main Before D	140616	Q50	729.13	729.05	0.07	0.12	0.00	2.55	695.39	428.07	267.67
Main Before D	140616	Q100	729.73	729.66	0.08	0.11	0.00	4.77	793.87	582.36	290.39
Main Before D	140616	Q500	731.22	731.14	0.08	0.09	0.00	14.27	1062.18	1027.56	369.61
Main Before D	140504	Q10	727.68	727.57	0.10	0.45	0.01	0.00	466.85	170.14	207.28
Main Before D	140504	Q50	729.01	728.90	0.11	0.36	0.01	0.42	673.91	451.66	253.57
Main Before D	140504	Q100	729.62	729.52	0.10	0.33	0.01	1.00	763.57	616.43	267.96
Main Before D	140504	Q500	731.12	731.01	0.11	0.30	0.00	3.65	1014.06	1086.29	313.73
Main Before D	140133	Q10	727.22	727.14	0.08	0.58	0.01	2.82	468.32	163.86	189.31
Main Before D	140133	Q50	728.64	728.55	0.09	0.40	0.00	10.82	684.79	426.39	229.69
Main Before D	140133	Q100	729.29	729.20	0.09	0.35	0.00	16.59	783.38	578.03	246.34
Main Before D	140133	Q500	730.82	730.72	0.10	0.29	0.01	38.48	1096.84	962.69	345.18
Main Before D	139757.*	Q10	726.64	726.50	0.14	0.07	0.03	10.19	532.55	92.26	200.51
Main Before D	139757.*	Q50	728.24	728.15	0.09	0.07	0.00	57.62	692.56	371.83	327.95
Main Before D	139757.*	Q100	728.94	728.86	0.08	0.07	0.00	97.08	766.44	514.48	364.10
Main Before D	139757.*	Q500	730.52	730.45	0.07	0.06	0.01	256.16	965.40	876.44	535.34
Main Before D	139653	Q10	726.54	726.50	0.04	0.01	0.00	2.05	631.95		277.42
Main Before D	139653	Q50	728.17	728.10	0.07	0.01	0.00	29.18	1090.82		396.99
Main Before D	139653	Q100	728.87	728.79	0.09	0.02	0.00	53.62	1322.38		454.31
Main Before D	139653	Q500	730.45	730.32	0.13	0.02	0.01	134.70	1962.31		628.51
Main Before D	139628	Q10	726.52	726.47	0.05				634.00		89.14
Main Before D	139628	Q50	728.15	728.05	0.11				1120.00		218.69
Main Before D	139628	Q100	728.85	728.72	0.13				1376.00		370.68
Main Before D	139628	Q500	730.42	730.20	0.22	0.00	0.05		2097.00		624.71
Main Before D	139602		Bridge								
Main Before D	139545	Q10	726.36	726.31	0.05	0.02	0.01		633.57	0.43	108.71
Main Before D	139545	Q50	727.93	727.84	0.09	0.02	0.00		1118.00	2.00	288.80
Main Before D	139545	Q100	728.59	728.48	0.12	0.02	0.00		1372.97	3.03	449.81
Main Before D	139545	Q500	729.91	729.70	0.21	0.03	0.00		2090.92	6.08	719.83
Main Before D	139512	Q10	726.34	726.27	0.07	0.14	0.01	3.12	594.83	36.05	203.75
Main Before D	139512	Q50	727.91	727.80	0.10	0.18	0.01	18.61	1008.31	93.08	249.78
Main Before D	139512	Q100	728.57	728.45	0.12	0.19	0.01	28.58	1222.25	125.17	271.27
Main Before D	139512	Q500	729.87	729.68	0.20	0.25	0.01	57.43	1824.19	215.38	334.26
Main Before D	139364	Q10	726.19	726.06	0.13	0.10	0.01	24.30	511.77	97.94	332.67
Main Before D	139364	Q50	727.72	727.55	0.18	0.13	0.02	72.21	800.83	246.96	388.49
Main Before D	139364	Q100	728.37	728.17	0.20	0.14	0.02	108.39	939.80	327.81	407.35
Main Before D	139364	Q500	729.61	729.33	0.28	0.19	0.05	221.56	1328.12	547.31	453.75
Main Before D	139277	Q10	726.09	725.90	0.19	0.01	0.03	15.19	556.07	62.74	354.64
Main Before D	139277	Q50	727.58	727.22	0.36	0.02	0.05	37.95	947.46	134.59	411.83
Main Before D	139277	Q100	728.21	727.77	0.44	0.03	0.05	63.39	1139.46	173.15	442.77
Main Before D	139277	Q500	729.37	728.60	0.77	0.04	0.09	136.49	1682.68	277.83	478.71
Main Before D	139264	Q10	726.05	725.94	0.10	0.00	0.00		634.00		43.69
Main Before D	139264	Q50	727.51	727.30	0.21	0.00	0.00		1119.88	0.12	55.31
Main Before D	139264	Q100	728.13	727.86	0.27	0.00	0.00		1375.04	0.96	78.17
Main Before D	139264	Q500	729.24	728.76	0.48	0.01	0.01	0.78	2090.96	5.26	338.62
Main Before D	139220		Bridge								
Main Before D	139189	Q10	725.93	725.79	0.14	0.02	0.01		634.00		44.92
Main Before D	139189	Q50	727.32	727.04	0.27	0.03	0.01		1120.00		48.65
Main Before D	139189	Q100	727.89	727.55	0.35	0.03	0.01		1376.00		75.56
Main Before D	139189	Q500	728.82	728.15	0.68	0.05	0.02		2097.00		176.35

HEC-RAS Plan: G#2-Proposed River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139180	Q10	725.90	725.72	0.18	0.05	0.02	21.74	584.53	33.73	210.78
Main Before D	139180	Q50	727.28	726.96	0.31	0.07	0.03	56.09	993.13	82.79	387.85
Main Before D	139180	Q100	727.85	727.47	0.39	0.08	0.04	75.49	1203.29	110.22	410.37
Main Before D	139180	Q500	728.75	728.02	0.74	0.06	0.19	124.57	1812.19	180.25	437.47
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.01	573.04	52.95	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.08	0.00	43.82	961.01	127.17	426.27
Main Before D	139153	Q100	727.74	727.49	0.25	1.20	0.00	61.23	1159.44	168.33	501.69
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.46	1146.30	11.24	563.78
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.10
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.50	2012.51	1.99	560.60
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.19
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.70	13.03	225.04
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09



Errors Warnings and Notes for Plan : G#2-Proposed

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : G#2-Proposed (Continued)

	surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10

Errors Warnings and Notes for Plan : G#2-Proposed (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Errors Warnings and Notes for Plan : G#2-Proposed (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Errors Warnings and Notes for Plan : G#2-Proposed (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X        X   X       X  X   X  X   X
X   X  X        X           X  X   X  X   X
XXXXXXXX XXXX   X           XXX XXXX XXXXXX XXXX
X   X  X        X           X  X   X  X   X
X   X  X        X   X       X  X   X  X   X
X   X  XXXXXX   XXXX       X   X   X   X XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 9/2/2014 10:48:49 AM

Project in English units

PLAN DATA

Plan Title: Group #2 - Proposed (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p12

Geometry Title: Group #2 - Proposed (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g18

Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Proposed 3-sided Arch geometry under IL 47 and proposed Main St bridge.

Plan Summary Information:

Number of:	Cross Sections =	19	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Average Conveyance  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	141476	638	1128	1384	2108
Blackberry CreekMain	Before D	140616	637	1126	1381	2104
Blackberry CreekMain	Before D	140133	635	1122	1378	2098
Blackberry CreekMain	Before D	139653	634	1120	1376	2097
Blackberry CreekMain	Before D	139364	634	1120	1376	2097
Blackberry CreekMain	Before D	139180	640	1132	1389	2117
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #2 - Proposed (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g18

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Val, Sta, n, Val, Sta, n, Val. Contains 3 rows of Manning's n values.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff, Contr., Expan. Contains 1 row of bank and length data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 31 rows of elevation data.

Table with 6 columns: Manning's n, Val, Sta, n, Val, Sta, n, Val. Contains 3 rows of Manning's n values.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff, Contr., Expan. Contains 1 row of bank and length data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of elevation data.

Table with 6 columns: Manning's n, Val, Sta, n, Val, Sta, n, Val. Contains 3 rows of Manning's n values.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff, Contr., Expan. Contains 1 row of bank and length data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 29 rows of elevation data.

117.4982	725.2	158.663	725.14175	4356	725.2199	3833	725.23200	0.636	725.25
240.4556	726.41241	4389	726.44281	7278	727.91282	3598	727.93324	4.932	729.82
325.104	729.84	368.711	730.36413	5901	730.81414	2438	730.82456	2.384	731.28
456.7409	731.29457	6156	731.29501	0569	732.08501	4998	732.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1177	66348	.05117	4982	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

77.66348	117.4982	350.15	376	403.42	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-185.75	.11	92.33	.05	134.98	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

92.33	134.98	96.85	104	111.58	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-185.75	-23.4	733.85	F
287.6	467.58	733.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-189	.09	96.437	.05	189.85	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

96.437	189.85	42	25	47	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-189	60.51	733.85	F
168.11	458.336	733.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	134.49	726.18		
134.61	722	145.21	721.2	152.9	718.63	169.9	718.63	177.58	721.2		
188.19	722	188.33	726.07	201.008	725.99	202.062	726.22	225.184	726.93		



226.063	726.98	257.989	727.24	258.696	727.26	280.162	727.94	288.516	728.21
298.002	728.54	327.195	729.57	327.86	729.59	397.969	731.25	405.368	731.26
406.608	731.27	415.055	731.72	421.627	732.15	508.169	734.32	508.734	734.43
509.762	734.62	510.226	734.63						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 126.881 .055 201.008 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 126.881 201.008 85 85 85 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 131.4 733.85 F  
 189.1 510.226 733.85 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT

Description: US IL 47 Culvert  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 70  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates num= 22  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-283	732.85				-231	732.69				-87.24	732.95			
-37	733.01				63	733.8				113	734.04			
134.11	734.02	717.2	134.12	734.01	720.78	134.93	734.005	723.48						
137.191	734	725.68	138.871	734	726.5	140.63	734	727.14						
144.91	734	728.6	150.76	734	729.43	161.1	733.99	730.2						
171.44	733.99	729.43	176.93	733.99	728.53	181.57	733.99	727.14						
183.52	733.99	725.68	185.2	733.99	723.47	187.46	733.99	720.78						
509.93	735.61													

Upstream Bridge Cross Section Data

Station Elevation Data num= 47  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	134.49	726.18
134.61	722	145.21	721.2	152.9	718.63	169.9	718.63	177.58	721.2
188.19	722	188.33	726.07	201.008	725.99	202.062	726.22	225.184	726.93
226.063	726.98	257.989	727.24	258.696	727.26	280.162	727.94	288.516	728.21
298.002	728.54	327.195	729.57	327.86	729.59	397.969	731.25	405.368	731.26
406.608	731.27	415.055	731.72	421.627	732.15	508.169	734.32	508.734	734.43
509.762	734.62	510.226	734.63						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 126.881 .055 201.008 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 126.881 201.008 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 131.4 733.85 F  
 189.1 510.226 733.85 F

Downstream Deck/Roadway Coordinates

num= 23  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-300	733.38				-236.72	732.86				-136.72	732.53			
-36.72	732.8				63.28	733.57				163.28	734.68			
184.65	734.87	717.07	184.66	734.87	720.65	185.47	734.88	723.35						
187.731	734.9	725.55	189.411	734.92	726.37	191.17	734.94	727.01						
194.59	734.98	728.47	201.3	735.05	729.3	211.64	735.15	730.07						
221.98	735.29	729.3	227.89	735.35	728.4	232.11	735.4	727.01						
234.06	735.43	725.55	235.74	735.45	723.34	238	735.47	720.65						
270	735.81		520.23	737.01										

Downstream Bridge Cross Section Data

Station Elevation Data num= 45  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31	180.2	725.01	185.16	721.89	195.76	721.09
203.45	718.52	220.45	718.52	228.13	721.09	238.74	721.89	242.69	725.05
249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21272	4837	726.22
285.9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93364	1443	727.74
404.2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37520	2271	729.91

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val  
-300 .13166.6929 .055 242.69 .1

Bank Sta: Left Right Coeff Contr. Expan.  
166.6929 242.69 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-300 179.7 733.85 F  
243.7520.2271 733.85 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .98  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
Momentum Cd = 2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139545

INPUT

Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 45  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
164.8799 727.57166.6929 727.31 180.2 725.01 185.16 721.89 195.76 721.09  
203.45 718.52 220.45 718.52 228.13 721.09 238.74 721.89 242.69 725.05  
249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21272.4837 726.22  
285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93364.1443 727.74  
404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37520.2271 729.91

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-300 .13166.6929 .055 242.69 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
166.6929 242.69 25 33 40 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-300 179.7 733.85 F  
243.7520.2271 733.85 F

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 42  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-75 732 -50 729.5 -20 728 0 726.23 .537122 726.17  
9.693759 725.8817.96078 725.5535.38584 726.2336.01735 726.2236.98616 726.09  
57.37652 725.1859.64951 725.0564.47989 723.44 70.3069 721.5278.64016 720.39  
85.87483 718.9390.61574 719.3790.91806 719.5795.43697 720.56105.7258 722.12  
118.2908 723.9118.9698 724.08127.3197 724.15141.7605 724.04 147.534 724.04  
148.0156 724.04 148.739 724.06 167.183 724.56186.7215 725.5193.0373 725.81  
194.0911 725.83216.7024 726.92218.2687 726.95 242.918 728.48265.4388 728.74  
269.1036 728.77 315.993 731.95316.7762 731.96 318.031 732361.4998 733.74  
361.896 733.75362.2298 733.76

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val

-75 .1359.64951 .045118.9698 .09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
59.64951118.9698		70	148	626	.1		.3
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
-75	43.9	733.4	F				
144.9362.2298		733.4	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT  
Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input  
07-2010

Station Elevation Data	num=	41							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.2325.89646	728.3234.58134	727.6847.53335	726.7461.65466	725.98				
62.86731	725.3171.52296	724.580.80232	723.9286.33195	723.2987.81361	722.7				
91.14569	721.7892.60942	720.993.44381	720.3494.39133	719.797.08542	719.6				
102.3392	719.29113.2782	720.26114.9753	723.84	129.198	723.96172.1069	723.76			
207.7128	723.81245.1637	723.92245.9037	723.94284.2046	724.19284.8347	724.2				
325.5757	724.59326.0558	724.61344.0362	724.9365.4267	725.29366.2567	725.29				
386.9972	725.89407.8078	726.51408.2278	726.53448.8588	729450.0789	729.04				
474.1395	729.48487.6698	729.71490.6599	729.87525.8707	732.04609.3928	738.15				
609.7329	738.17								

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	n Val
0	.1186.33195	.045114.9753		.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
86.33195114.9753		141	87	58	.1		.3
Ineffective Flow	num=	1					
Sta L	Sta R	Elev	Permanent				
165.12609.7329		733.1	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT  
Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data	num=	39								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-270.5	731.66	-210	729.95	-30	728.95	0	727.6915.09991	727.46		
19.13766	727.1833.21519	726.3636.79197	725.43	38.4556	725.1743.10466	723.81				
49.34686	722.2749.95718	721.8451.55831	720.2351.95881	720.260.06436	718.35					
60.64471	719.0169.96091	719.2971.04166	720.2171.78226	720.2973.38339	722.87					
75.39461	722.3111.7997	723.27120.8857	723.37125.1487	723.47139.5584	723.98					
169.439	722.97199.0895	724.12243.0502	723.99275.1607	724.28312.3935	724.69					
320.8542	724.82364.3776	725.18	422.652	726.84423.6721	726.87514.6191	731.58				
515.9192	731.63558.3625	738.18628.1378	741.89628.7879	741.9						

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	n Val
-270.5	.1349.34686	.04573.38339		.11

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
49.3468673.38339		12	13	13	.1		.3
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
-270.5	16.94	733.1	F				
90.54628.7879		733.1	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139264

INPUT  
Description: USF Main St Bridge, GEC Input 07-2010, relocated to proposed  
bridge face

Station Elevation Data	num=	54								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56	
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42	
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26	
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89	
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62	
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2	
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66	
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85	

58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -309 .09 -22.98 .055 25 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -22.98 25 75 75 75 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -309 -24 733.1 F  
 30 303.57 733.1 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139220

INPUT  
 Description: Main Street Bridge (GEC 2010)  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 70  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates

num= 13											
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-503	740.08		-372	736.33		-272	734.18				
-172	732.74		-72	732.02		-22	731.92	730.11			
0	731.94	730.2	22	731.99	730.3	69	732.18				
169	732.64		269	733.65		369	735.38				
419	736.52										

Upstream Bridge Cross Section Data

Station Elevation Data num= 54											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56		
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42		
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26		
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89		
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62		
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2		
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66		
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85		
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27		
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09		
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -309 .09 -22.98 .055 25 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 -22.98 25 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -309 -24 733.1 F  
 30 303.57 733.1 F

Downstream Deck/Roadway Coordinates

num= 13											
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-503	740.08		-372	736.33		-272	734.18				
-172	732.74		-72	732.02		-22	731.92	730.11			
0	731.94	730.2	22	731.99	730.3	69	732.18				
169	732.64		269	733.65		369	735.38				
419	736.52										

Downstream Bridge Cross Section Data

Station Elevation Data num= 60											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-296	732.05	-194	729.15	-170.29	728.82	-166.11	728.59	-112.52	728.42		
-101.5	728.3	-82.69	728.28	-78.43	728.2	-55.1	727.86	-54.23	727.87		
-42.03	727.4	-33.83	727.89	-33.19	727.79	-32.76	727.71	-28	728.22		
-24.86	728.11	-24.7	728.3	-22.47	722.84	-20.37	720.66	-5.85	719.7		
0	719.22	7.28	719.91	9.3	722	12.22	722.71	19.67	724.72		
21.56	726	22.5	728.22	25.38	728.2	28.17	728.17	31.36	726.12		
32.26	727.62	33.13	727.59	39.61	727.97	39.95	727.96	43.78	727.99		
61.43	728.09	63.7	728.08	64.15	728.09	65.2	728.11	66.18	728.01		
76.07	727.03	83.61	727.28	96.18	728.52	117.06	728.56	143.43	728.57		
146.29	728.37	165.57	727.36	168.9	728.21	208.16	728.27	267.94	730.9		
276.33	730.1	277.73	730.13	290.19	730.3	320.94	731.97	376.08	734.25		
381.29	734.42	382.88	734.48	441.22	736.76	444.47	736.89	445.25	736.91		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -296 .09 -24.86 .055 22.5 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 -24.86 22.5 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -296 -24.5 730.1 F  
 21.5 445.25 730.1 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139189

INPUT

Description: DSF Main St Bridge, GEC Input 07-2010  
 Station Elevation Data num= 60  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-296	732.05	-194	729.15	-170.29	728.82	-166.11	728.59	-112.52	728.42
-101.5	728.3	-82.69	728.28	-78.43	728.2	-55.1	727.86	-54.23	727.87
-42.03	727.4	-33.83	727.89	-33.19	727.79	-32.76	727.71	-28	728.22
-24.86	728.11	-24.7	728.3	-22.47	722.84	-20.37	720.66	-5.85	719.7
0	719.22	7.28	719.91	9.3	722	12.22	722.71	19.67	724.72
21.56	726	22.5	728.22	25.38	728.2	28.17	728.17	31.36	726.12
32.26	727.62	33.13	727.59	39.61	727.97	39.95	727.96	43.78	727.99
61.43	728.09	63.7	728.08	64.15	728.09	65.2	728.11	66.18	728.01
76.07	727.03	83.61	727.28	96.18	728.52	117.06	728.56	143.43	728.57
146.29	728.37	165.57	727.36	168.9	728.21	208.16	728.27	267.94	730.9
276.33	730.1	277.73	730.13	290.19	730.3	320.94	731.97	376.08	734.25
381.29	734.42	382.88	734.48	441.22	736.76	444.47	736.89	445.25	736.91

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-296	.09	-24.86	.055	22.5	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -24.86 22.5 9 9 7 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -296 -24.5 730.1 F  
 21.5 445.25 730.1 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010  
 Station Elevation Data num= 47  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62
88.46001	720.0689	37001	719.9394	15001	719.2196	36001	718.0598	99001	719.22
103.44	719.72	104.16	719.79104	5201	720.3108	8901	723.01109	6001	723.18
112.0626	723.73112	2529	723.91	132.651	722.85	133.01	722.87133	4516	722.87
140.9519	722.97157	3524	723.25185	4334	724.32186	8835	724.48	200.824	724.1
202.8144	724.06237	8324	725.57239	0326	725.87240	7531	725.88359	7095	726.08
361.3396	726.13412	6096	727.17414	2996	727.28415	0897	727.32417	8119	727.42
474.3699	728.87475	9402	728.96539	6592	733.47540	1493	733.45540	5194	733.44
592.1792	737.52592	9095	737.57						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 76.65 .055112.2529 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 76.65112.2529 27 27 27 .1 .3  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 67.16 730.1 F  
 125.16592.9095 730.1 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 731.321.94402 728.0524.42452 728.2730.15558 728.433.69627 728.64  
 53.62989 728.7655.24017 728.883.58551 728.784.68569 728.6293.64731 727.75  
 99.92865 727.16144.9669 725.01148.6377 724.63174.0424 724.03 182.394 723.16  
 188.0251 721.86192.4358 721.41 193.546 720.6197.9669 718.93198.8469 718.6  
 199.287 718.29200.1873 717.97201.1675 718.25210.6992 719.7211.3994 719.82  
 211.8396 720.15215.6702 723.81217.8506 723.69228.2125 723.28234.4736 723.55  
 285.1931 724.38290.2141 724.32303.1765 725.57318.4593 725.33334.4223 725.81  
 346.4945 725.98360.7272 726.23378.3205 726.04387.0722 726.02388.8324 726.02  
 484.5803 726.6559.9542 727.21598.6415 727.49625.3665 728.1634.1082 728.43  
 636.6285 728.73653.9019 729.96

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13174.0424 .055215.6702 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 174.0424215.6702 612 483 587 .1 .3  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 158.69 727.5 F  
 239.19653.9019 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data num= 67  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 734.6423.72051 733.5850.52278 732.97103.7242 731.47105.4352 731.41  
 131.3751 730.4131.8137 730.38158.5284 728.95159.2807 728.91212.4323 726.45  
 213.4117 726.4214.4225 726.38237.1291 725.95238.4291 725.87270.6048 725.04  
 301.9967 724.55329.4541 724.34348.9568 723.99353.0579 723.93383.6354 723.56  
 393.7921 720.73395.9406 718.84397.8362 718.62412.9881 717.03413.5182 717.39  
 421.4882 723.09422.3705 723.13423.6802 723.32426.9516 723.8 431.308 724.75  
 431.8838 724.82433.9684 725.32438.4547 725.81444.5365 726.47451.8719 727.21  
 453.17 727.34462.0598 726.78464.8397 724.87466.0078 724.88660.9682 724.72  
 662.7347 724.78665.5562 725.71672.5701 726.12672.9245 726.08 678.82 725.76  
 688.87 724.89 720.06 724.86779.3023 724.71779.8826 724.73 781.903 724.91  
 794.0884 726.09822.4244 726.78837.3586 729.02851.4493 733.36859.5363 736.1  
 859.9111 736.1870.0308 736.22874.1083 735.74999.9396 735.691018.729 735.71  
 1019.092 735.731043.219 736.681043.782 736.741094.542 736.951094.985 736.99  
 1156.851 738.171162.934 738.32

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .11383.6354 .055426.9516 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 383.6354426.9516 477 490 222 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 453.171162.934 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data num= 81  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 738.2227.70591 736.4139.66846 735.9370.28796 734.64103.4348 733.35  
 112.8032 732.98127.3655 732.42149.6064 731.55158.5392 731.24192.9704 729.96

193.9008	729.93228.3727	728.93238.0518	728.63274.1718	727.4274.5956	727.39
276.3068	727.33311.4224	726.11324.7386	725.78353.8317	725.07371.0858	724.94
377.2663	724.83386.0002	724.69408.0329	724.48426.6654	724.26441.0691	724.01
461.0534	723.27479.9106	722.54 480.648	722.51509.3992	722.38518.2288	722.26
538.5144	722.18541.1888	722.16554.0018	721.87561.3702	718.31562.7351	717.82
568.9442	717.09571.9603	716.6572.3747	716.53576.5869	717.44579.1799	718
581.3936	718.56584.1164	722.45585.6533	723.17590.2328	725.28606.3673	726.51
606.6901	726.5615.4731	726.14621.5073	725.58627.2417	724.05651.4352	724.38
652.6528	724683.0341	723.96685.8575	724.01686.6508	724.35688.3648	724.29
689.888	724.18 698.492	724.71727.7194	724.72 755.626	724.31757.1407	724.31
852.5659	724.38855.0814	724.56855.6722	725.07861.3923	725.08890.1413	727.49
891.4794	727.52892.5094	727.53932.6591	728.35933.8849	728.4961.7881	729.41
969.2715	729.75970.3898	729.861004.611	735.131014.855	735.35 1023.59	735.53
1072.667	732.511073.249	732.51 1110.48	734.54 1141.5	737.11169.515	739.84
1170.197	739.89				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13441.0691 .055590.2328 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 441.0691590.2328 465 465 465 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data	num=	31								
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev										
0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730										
271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726										
450.5 724.6 476.8 722.6 485 720 489 718 493 716										
497 715 501 716 505 718 509 720 527.1 722										
586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1										
876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9										
1083.7 739.7										

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data	num=	31								
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev										
0 730.5924.00007 730.5935.00002 729.1985.00035 727.99119.0003 727.29										
184.0007 726.59229.0009 725.69276.0009 724.09 324.001 721.79374.0013 720.69										
424.0015 720.49474.0016 720.19516.0019 719.79 562.002 719.49565.0021 717.79										
565.0021 716.49 569.002 714.29572.0021 713.99 573.002 714.39 574.002 715.99										
576.002 717.89 583.002 720.09624.0022 721.09674.0022 719.99719.0024 720.29										
764.0026 720.89806.0028 722.19834.0028 723.29874.0029 726.09934.0033 730.89										
979.0035 733.59										

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13474.0016 .055624.0022 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 474.0016624.0022 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09

Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139602	Bridge		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139264	.09	.055	.09
Main Before D	139220	Bridge		
Main Before D	139189	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139602	Bridge		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	12	13	13
Main Before D	139264	75	75	75
Main Before D	139220	Bridge		
Main Before D	139189	9	9	7
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

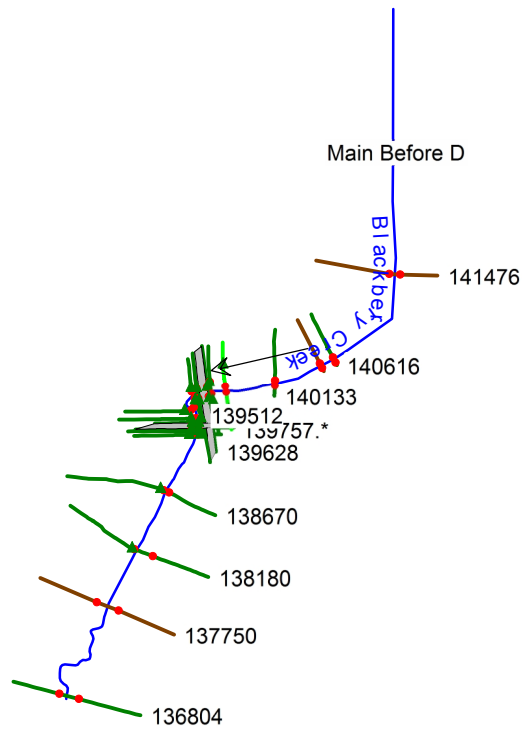
Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Bridge	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139264	.3	.5
Main Before D	139220	Bridge	
Main Before D	139189	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3



HEC-RAS Model

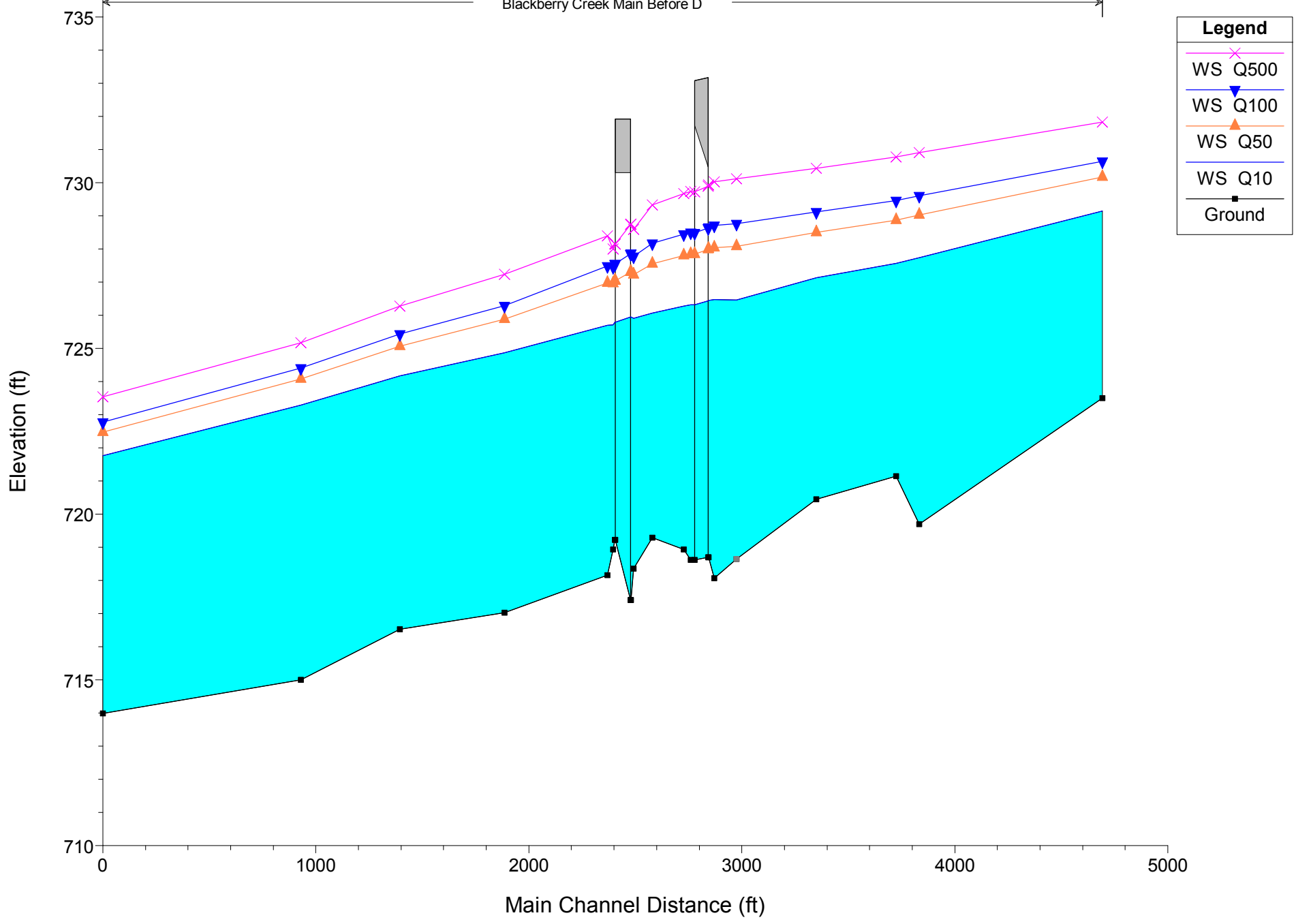
**GROUP #2 - PROPOSED CONDITIONS**

**Proposed Rte. 47 Bridge, Proposed Main St.  
bridge**



3 of the 19 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003318	2.68	391.50	300.69	0.31
Main Before D	141476	Q50	1128.00	723.50	730.16		730.25	0.002309	2.85	736.30	383.29	0.27
Main Before D	141476	Q100	1384.00	723.50	730.65		730.74	0.001987	2.89	933.38	433.06	0.26
Main Before D	141476	Q500	2108.00	723.50	731.83		731.91	0.001474	2.98	1518.26	558.23	0.24
Main Before D	140616	Q10	637.00	719.70	727.74		727.81	0.000988	2.45	441.05	232.30	0.20
Main Before D	140616	Q50	1126.00	719.70	729.02		729.10	0.000876	2.73	761.15	266.48	0.20
Main Before D	140616	Q100	1381.00	719.70	729.60		729.68	0.000834	2.84	921.92	288.30	0.20
Main Before D	140616	Q500	2104.00	719.70	730.91		731.00	0.000818	3.18	1334.79	353.19	0.20
Main Before D	140504	Q10	637.00	721.14	727.57		727.67	0.001642	3.00	400.10	206.98	0.25
Main Before D	140504	Q50	1126.00	721.14	728.87		728.98	0.001438	3.34	703.09	252.72	0.25
Main Before D	140504	Q100	1381.00	721.14	729.46		729.56	0.001331	3.44	856.17	266.50	0.24
Main Before D	140504	Q500	2104.00	721.14	730.77		730.89	0.001241	3.77	1226.86	297.25	0.24
Main Before D	140133	Q10	635.00	720.45	727.13		727.21	0.001134	2.64	404.10	188.95	0.22
Main Before D	140133	Q50	1122.00	720.45	728.50		728.59	0.000999	2.96	692.39	228.40	0.22
Main Before D	140133	Q100	1378.00	720.45	729.12		729.21	0.000938	3.07	838.86	244.27	0.21
Main Before D	140133	Q500	2098.00	720.45	730.44		730.55	0.000995	3.58	1192.96	315.97	0.23
Main Before D	139757.*	Q10	635.00	718.65	726.46	724.57	726.60	0.002305	3.31	299.75	196.63	0.30
Main Before D	139757.*	Q50	1122.00	718.65	728.08	725.62	728.17	0.001185	3.01	711.35	324.04	0.23
Main Before D	139757.*	Q100	1378.00	718.65	728.76	726.06	728.84	0.000968	2.94	914.23	358.93	0.21
Main Before D	139757.*	Q500	2098.00	718.65	730.11	727.04	730.19	0.000812	3.08	1359.65	516.98	0.20
Main Before D	139653	Q10	634.00	718.06	726.47	722.14	726.51	0.000280	1.44	449.39	276.16	0.11
Main Before D	139653	Q50	1120.00	718.06	728.05	722.96	728.10	0.000341	1.90	647.30	393.78	0.13
Main Before D	139653	Q100	1376.00	718.06	728.71	723.23	728.78	0.000364	2.08	738.44	448.20	0.14
Main Before D	139653	Q500	2097.00	718.06	730.03	723.95	730.13	0.000461	2.62	918.02	619.48	0.16
Main Before D	139628	Q10	634.00	718.70	726.44	721.75	726.49	0.000589	1.81	350.97	87.65	0.15
Main Before D	139628	Q50	1120.00	718.70	728.00	722.61	728.08	0.000707	2.40	484.26	215.20	0.17
Main Before D	139628	Q100	1376.00	718.70	728.65	723.00	728.76	0.000761	2.66	540.68	335.26	0.18
Main Before D	139628	Q500	2097.00	718.70	729.93	723.96	730.10	0.000995	3.39	650.40	591.64	0.21
Main Before D	139602		Bridge									
Main Before D	139545	Q10	634.00	718.62	726.31	721.68	726.36	0.000599	1.79	353.95	104.39	0.15
Main Before D	139545	Q50	1120.00	718.62	727.85	722.53	727.93	0.000710	2.36	490.93	294.73	0.17
Main Before D	139545	Q100	1376.00	718.62	728.50	722.91	728.60	0.000760	2.61	552.36	453.11	0.18
Main Before D	139545	Q500	2097.00	718.62	729.74	723.88	729.91	0.000991	3.34	670.22	724.93	0.21
Main Before D	139512	Q10	634.00	718.93	726.27	722.65	726.34	0.000530	2.12	349.82	203.81	0.17
Main Before D	139512	Q50	1120.00	718.93	727.80	723.60	727.91	0.000601	2.72	503.30	249.78	0.19
Main Before D	139512	Q100	1376.00	718.93	728.45	724.02	728.57	0.000638	2.99	568.07	271.37	0.20
Main Before D	139512	Q500	2097.00	718.93	729.68	725.01	729.87	0.000825	3.79	691.29	334.21	0.23
Main Before D	139364	Q10	634.00	719.29	726.07	722.82	726.19	0.001041	3.16	313.02	332.80	0.23
Main Before D	139364	Q50	1120.00	719.29	727.55	724.47	727.72	0.001175	3.91	487.42	388.52	0.26
Main Before D	139364	Q100	1376.00	719.29	728.18	724.96	728.37	0.001220	4.22	571.25	407.47	0.27
Main Before D	139364	Q500	2097.00	719.29	729.33	725.92	729.61	0.001538	5.20	738.50	453.68	0.31
Main Before D	139277	Q10	634.00	718.35	725.90	722.40	726.09	0.001261	3.68	235.02	354.75	0.26
Main Before D	139277	Q50	1120.00	718.35	727.22	723.83	727.58	0.001941	5.19	316.50	411.87	0.33
Main Before D	139277	Q100	1376.00	718.35	727.77	724.35	728.21	0.002223	5.82	356.93	442.97	0.36
Main Before D	139277	Q500	2097.00	718.35	728.60	725.62	729.37	0.003513	7.80	417.84	478.66	0.46
Main Before D	139264	Q10	634.00	717.41	725.95	721.19	726.05	0.001058	2.58	245.99	43.70	0.19
Main Before D	139264	Q50	1120.00	717.41	727.30	722.36	727.51	0.001733	3.66	305.82	55.34	0.25
Main Before D	139264	Q100	1376.00	717.41	727.86	722.93	728.13	0.002045	4.15	331.36	78.45	0.27
Main Before D	139264	Q500	2097.00	717.41	728.75	724.26	729.24	0.003234	5.64	372.70	338.27	0.35
Main Before D	139220		Bridge									
Main Before D	139189	Q10	634.00	719.22	725.79	722.38	725.93	0.001813	3.02	210.14	44.92	0.25
Main Before D	139189	Q50	1120.00	719.22	727.04	723.49	727.32	0.002657	4.19	267.14	48.77	0.31
Main Before D	139189	Q100	1376.00	719.22	727.55	723.99	727.90	0.003079	4.74	290.42	76.25	0.33
Main Before D	139189	Q500	2097.00	719.22	728.16	725.15	728.83	0.005315	6.59	318.14	177.85	0.44
Main Before D	139180	Q10	640.00	718.93	725.72	723.04	725.90	0.002506	3.58	209.43	210.75	0.29
Main Before D	139180	Q50	1132.00	718.93	726.96	724.43	727.28	0.003248	4.79	281.57	387.56	0.35
Main Before D	139180	Q100	1389.00	718.93	727.47	724.84	727.86	0.003610	5.33	310.98	410.26	0.37
Main Before D	139180	Q500	2117.00	718.93	728.01	725.84	728.76	0.006236	7.40	342.30	436.97	0.50

HEC-RAS Plan: G#2-PropBR River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139153	Q10	640.00	718.16	725.70	722.54	725.83	0.001684	2.96	267.83	200.37	0.24
Main Before D	139153	Q50	1132.00	718.16	726.97	724.03	727.17	0.002123	3.91	369.67	426.02	0.28
Main Before D	139153	Q100	1389.00	718.16	727.49	724.47	727.74	0.002332	4.33	411.57	501.91	0.30
Main Before D	139153	Q500	2117.00	718.16	728.40	725.39	728.50	0.001236	3.44	1506.38	556.83	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.09	521.57	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.96	563.78	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001557	2.31	527.84	468.43	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.35	497.10	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.56	560.60	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002886	2.67	425.79	176.24	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002977	2.89	485.36	188.20	0.31
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003085	3.43	642.45	225.04	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#2-PropBR River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.43	0.01	109.91	505.42	22.67	300.69
Main Before D	141476	Q50	730.25	730.16	0.09	1.15	0.00	259.52	771.52	96.97	383.29
Main Before D	141476	Q100	730.74	730.65	0.09	1.05	0.00	336.94	896.72	150.34	433.06
Main Before D	141476	Q500	731.91	731.83	0.08	0.92	0.00	547.31	1211.22	349.47	558.23
Main Before D	140616	Q10	727.81	727.74	0.07	0.14	0.00	0.25	488.18	148.57	232.30
Main Before D	140616	Q50	729.10	729.02	0.08	0.12	0.00	2.48	698.17	425.35	266.48
Main Before D	140616	Q100	729.68	729.60	0.08	0.11	0.00	4.61	798.87	577.52	288.30
Main Before D	140616	Q500	731.00	730.91	0.09	0.11	0.00	13.13	1079.33	1011.54	353.19
Main Before D	140504	Q10	727.67	727.57	0.10	0.46	0.01	0.00	467.38	169.62	206.98
Main Before D	140504	Q50	728.98	728.87	0.11	0.38	0.01	0.40	677.38	448.22	252.72
Main Before D	140504	Q100	729.56	729.46	0.11	0.35	0.01	0.95	769.27	610.78	266.50
Main Before D	140504	Q500	730.89	730.77	0.12	0.34	0.00	3.41	1022.48	1078.11	297.25
Main Before D	140133	Q10	727.21	727.13	0.08	0.60	0.01	2.79	469.17	163.04	188.95
Main Before D	140133	Q50	728.59	728.50	0.09	0.42	0.00	10.61	688.88	422.51	228.40
Main Before D	140133	Q100	729.21	729.12	0.09	0.37	0.00	16.19	789.92	571.89	244.27
Main Before D	140133	Q500	730.55	730.44	0.11	0.35	0.01	35.86	1107.68	954.46	315.97
Main Before D	139757.*	Q10	726.60	726.46	0.14	0.06	0.03	9.77	534.87	90.35	196.63
Main Before D	139757.*	Q50	728.17	728.08	0.09	0.06	0.01	55.46	694.00	372.54	324.04
Main Before D	139757.*	Q100	728.84	728.76	0.08	0.06	0.00	92.35	763.74	521.91	358.93
Main Before D	139757.*	Q500	730.19	730.11	0.08	0.06	0.00	221.84	977.33	898.84	516.98
Main Before D	139653	Q10	726.51	726.47	0.03	0.01	0.00	1.81	632.19		276.16
Main Before D	139653	Q50	728.10	728.05	0.05	0.01	0.00	27.12	1092.88		393.78
Main Before D	139653	Q100	728.78	728.71	0.07	0.01	0.00	53.29	1322.71		448.20
Main Before D	139653	Q500	730.13	730.03	0.10	0.02	0.01	135.68	1961.32		619.48
Main Before D	139628	Q10	726.49	726.44	0.05			0.14	633.81	0.05	87.65
Main Before D	139628	Q50	728.08	728.00	0.09			9.08	1108.66	2.26	215.20
Main Before D	139628	Q100	728.76	728.65	0.11			16.48	1355.52	4.00	335.26
Main Before D	139628	Q500	730.10	729.93	0.18			39.29	2048.41	9.29	591.64
Main Before D	139602		Bridge								
Main Before D	139545	Q10	726.36	726.31	0.05	0.02	0.00	0.02	633.97	0.01	104.39
Main Before D	139545	Q50	727.93	727.85	0.09	0.02	0.01	4.90	1112.75	2.35	294.73
Main Before D	139545	Q100	728.60	728.50	0.11	0.02	0.01	11.52	1360.18	4.30	453.11
Main Before D	139545	Q500	729.91	729.74	0.17	0.03	0.01	33.28	2053.47	10.25	724.93
Main Before D	139512	Q10	726.34	726.27	0.07	0.14	0.01	3.14	595.61	35.25	203.81
Main Before D	139512	Q50	727.91	727.80	0.10	0.18	0.01	18.65	1010.29	91.06	249.78
Main Before D	139512	Q100	728.57	728.45	0.13	0.19	0.01	28.67	1224.82	122.52	271.37
Main Before D	139512	Q500	729.87	729.68	0.20	0.25	0.01	57.55	1828.67	210.78	334.21
Main Before D	139364	Q10	726.19	726.07	0.13	0.10	0.01	24.31	511.66	98.04	332.80
Main Before D	139364	Q50	727.72	727.55	0.18	0.13	0.02	72.24	800.77	247.00	388.52
Main Before D	139364	Q100	728.37	728.18	0.20	0.14	0.02	108.52	939.53	327.95	407.47
Main Before D	139364	Q500	729.61	729.33	0.28	0.19	0.05	221.51	1328.21	547.28	453.68
Main Before D	139277	Q10	726.09	725.90	0.19	0.01	0.03	15.21	556.01	62.78	354.75
Main Before D	139277	Q50	727.58	727.22	0.36	0.02	0.05	37.97	947.42	134.61	411.87
Main Before D	139277	Q100	728.21	727.77	0.44	0.03	0.05	63.54	1139.25	173.21	442.97
Main Before D	139277	Q500	729.37	728.60	0.77	0.04	0.08	136.43	1682.76	277.81	478.66
Main Before D	139264	Q10	726.05	725.95	0.10	0.00	0.00		634.00		43.70
Main Before D	139264	Q50	727.51	727.30	0.21	0.00	0.00		1120.00		55.34
Main Before D	139264	Q100	728.13	727.86	0.27	0.00	0.00		1376.00		78.45
Main Before D	139264	Q500	729.24	728.75	0.49	0.01	0.00	0.76	2096.24		338.27
Main Before D	139220		Bridge								
Main Before D	139189	Q10	725.93	725.79	0.14	0.02	0.01		634.00		44.92
Main Before D	139189	Q50	727.32	727.04	0.27	0.03	0.01		1120.00		48.77
Main Before D	139189	Q100	727.90	727.55	0.35	0.03	0.01		1376.00		76.25
Main Before D	139189	Q500	728.83	728.16	0.67	0.05	0.02		2097.00		177.85

HEC-RAS Plan: G#2-PropBR River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139180	Q10	725.90	725.72	0.18	0.05	0.02	21.98	583.92	34.10	210.75
Main Before D	139180	Q50	727.28	726.96	0.32	0.07	0.03	56.44	992.25	83.32	387.56
Main Before D	139180	Q100	727.86	727.47	0.39	0.08	0.04	75.92	1202.24	110.85	410.26
Main Before D	139180	Q500	728.76	728.01	0.75	0.06	0.20	125.01	1811.08	180.91	436.97
Main Before D	139153	Q10	725.83	725.70	0.12	0.82	0.00	14.01	573.02	52.97	200.37
Main Before D	139153	Q50	727.17	726.97	0.21	1.09	0.00	43.80	961.07	127.13	426.02
Main Before D	139153	Q100	727.74	727.49	0.25	1.20	0.00	61.24	1159.41	168.34	501.91
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.04	1052.54	889.42	556.83
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.08	975.65	6.27	521.57
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.46	1146.30	11.24	563.78
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.73	1120.27		468.43
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.10
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.51	2012.51	1.99	560.60
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.66	0.02		1131.67	0.33	176.24
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.20
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.70	13.03	225.04
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#2-PropBR

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500



Errors Warnings and Notes for Plan : G#2-PropBR (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139364 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Errors Warnings and Notes for Plan : G#2-PropBR (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139264 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : G#2-PropBR (Continued)

	surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139220 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139189 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500

Errors Warnings and Notes for Plan : G#2-PropBR (Continued)

Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X       X   X       X  X   X  X   X
X   X  X       X       X   X  X  X  X  X
XXXXXXXX XXXX   X       XXX XXXX  XXXXXX  XXXX
X   X  X       X       X  X   X   X   X
X   X  X       X   X       X  X   X  X   X
X   X  XXXXXX   XXXX       X   X   X   X  XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 3:44:15 PM

Project in English units

PLAN DATA

Plan Title: Group #2 - Proposed BR (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p13  
 Geometry Title: Group #2 - Proposed BR (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g19  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Group #2 -Proposed Conditions, Proposed Main Street Bridge, Proposed Route 47  
 76' Single Span Bridge  
 Model used in the exp Main St Hydraulic Report for the  
 proposed conditions analysis.

Plan Summary Information:  
 Number of: Cross Sections = 19 Multiple Openings = 0  
 Culverts = 0 Inline Structures = 0  
 Bridges = 2 Lateral Structures = 0

Computational Information  
 Water surface calculation tolerance = 0.01  
 Critical depth calculation tolerance = 0.01  
 Maximum number of iterations = 20  
 Maximum difference tolerance = 0.3  
 Flow tolerance factor = 0.001

Computation Options  
 Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Average Conveyance  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	141476	638	1128	1384	2108
Blackberry Creek	Main Before D	140616	637	1126	1381	2104
Blackberry Creek	Main Before D	140133	635	1122	1378	2098
Blackberry Creek	Main Before D	139653	634	1120	1376	2097
Blackberry Creek	Main Before D	139364	634	1120	1376	2097
Blackberry Creek	Main Before D	139180	640	1132	1389	2117
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry Creek	Main Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry Creek	Main Before D	Q50	Known WS = 730.33	Known WS = 722.47

Blackberry CreekMain Before D Q100 Known WS = 730.77 Known WS = 722.78  
 Blackberry CreekMain Before D Q500 Known WS = 731.92 Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #2 - Proposed BR (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g19

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 141476

INPUT

Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Station Elevation Data		num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	736	34.7	734	94.3	732	129.3	730	157	728		
277.6	727.9	319.7	727.1	325.5	725.7	330.8	723.6	337	723.5		
340.2	726.9	358.9	728	425.8	728.9	495.6	730	598.3	731.2		
671	732	763.7	732.8	825.4	734	914.1	736				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	277.6	.055	358.9	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	277.6	358.9		1062	860	750	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140616

INPUT

Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data		num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73418.14586	727.6120.01093	726.7831.69828	724.6539.43155	723.05						
43.50174	721.4650.21955	719.7 54.4631	721.24 59.8615	722.8364.14489	726.39						
80.94425	727.3290.14719	726.78103.0566	725.91145.4814	725.66150.6872	725.65						
155.3922	725.67156.8725	725.7157.8967	725.74198.5372	726.77200.2545	726.8						
236.8923	727.16238.7617	727.24276.4147	728.89277.0364	728.92330.2935	730.45						
330.6023	730.46384.2168	731.23 390.704	731.32 398.281	731.35424.3695	731.43						
424.8041	731.44										

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1120.01093		.0564.14489		.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	20.0109364.14489			111	109	107	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data		num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75	-162.13	730.81	-158.42	727.39	-145.96	724.25		
-145.33	722.69	-139.49	721.34	-134.16	721.17	-128.02	721.14	-124.82	722.54		
-122.47	725.97	-97.85	725.68	-60.35	725.83	0	725.95	19.51	726.88		
80.96	728.34	138.26	730.91	192.26	731.35	242.79	732.36				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05	-122.47	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	-158.42	-122.47		412	374	230	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140133

INPUT

Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data		num= 29								
------------------------	--	---------	--	--	--	--	--	--	--	--

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	746.59	.661211	746.4412	.27355	744.8346	.09943	734.775	.93997	725.73
77.66348	724.88	89.8	721.5	94.87	720.45105	.2784	721.54	108.037	724.14
117.4982	725.2	158.663	725.14175	.4356	725.2199	.3833	725.23200	.0636	725.25
240.4556	726.41241	.4389	726.44281	.7278	727.91282	.3598	727.93324	.4932	729.82
325.104	729.84	368.711	730.36413	.5901	730.81414	.2438	730.82456	.2384	731.28
456.7409	731.29457	.6156	731.29501	.0569	732.08501	.4998	732.09		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1177.66348 .05117.4982 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 77.66348 117.4982 350.15 376 403.42 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02
105.75	720.89	105.94	720	108.17	718.65	112.41	719.94	113.8	720.84
114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88	134.98	724.08
139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36	275.32	726.65
322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45	467.58	732.81

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -185.75 .11 92.33 .05 134.98 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.33 134.98 96.85 104 111.58 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -185.75 -38.4 734.37 F  
 303.6 467.58 734.37 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -189 .09 96.437 .05 189.85 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 96.437 189.85 42 25 47 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -189 46.5 734.37 F  
 183.1 458.336 734.37 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin, Modified channel geometry to reflect proposed abutment slope walls and natural channel elevations

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14

41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	129.13	726.08	138.89	721.16
145.47	721.09	154.36	718.7	168.24	718.7	176.73	721.09	183.3	721.16
193.07	726.05	202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24
258.696	727.26	280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57
327.86	729.59	397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72
421.627	732.15	508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 129.13 .055 202.062 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 129.13 202.062 85 85 85 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 118.1 734.37 F  
 204.1 510.226 734.37 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT

Description: US IL 47 Proposed Bridge

Distance from Upstream XS = 4  
 Deck/Roadway Width = 62  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 13

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-287	733.47		-170.67	733.17		-17.57	733.72							
74.44	734.37		123.1	734.56	730.1	148.68	734.69	730.23						
169.57	734.8	730.33	199.1	734.95	730.48	211.03	734.94							
264.46	734.91		354.3	735.17		408.76	735.5							
508	736.09													

Upstream Bridge Cross Section Data

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	129.13	726.08	138.89	721.16
145.47	721.09	154.36	718.7	168.24	718.7	176.73	721.09	183.3	721.16
193.07	726.05	202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24
258.696	727.26	280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57
327.86	729.59	397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72
421.627	732.15	508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 129.13 .055 202.062 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 129.13 202.062 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 118.1 734.37 F  
 204.1 510.226 734.37 F

Downstream Deck/Roadway Coordinates

num= 16

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-339.77	734.43		-247.66	733.58		-90.89	733.11							
-78.51	733.08		17.09	733.63		84.47	734.33							
161.61	735.17		173.65	735.29	731.34	211.4	735.48	731.53						
249.64	735.67	731.73	264.33	735.83		375.89	736.89							
429.87	737.1		443.16	737.14		465.03	737.2							
523	737.67													

Downstream Bridge Cross Section Data

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31	179.63	726.07	189.44	721.08	196.02	721.01
204.91	718.62	218.79	718.62	227.28	721.01	233.85	721.08	242.69	725.05
249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21272	4837	726.22
285.9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93364	1443	727.74
404.2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37520	2271	729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13 179.63 .055255.9665 .1



Bank Sta: Left Right Coeff Contr. Expan.  
 179.63255.9665 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 164 733.4 F  
 258.7520.2271 733.4 F

Upstream Embankment side slope = horiz. to 1.0 vertical  
 Downstream Embankment side slope = horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data  
 Upstream num= 2  
 Sta Elev Sta Elev  
 123.1 730.1 138.87 721.18  
 Downstream num= 2  
 Sta Elev Sta Elev  
 173.65 730.1 189.42 721.07

Abutment Data  
 Upstream num= 2  
 Sta Elev Sta Elev  
 183.3 721.16 199.1 730.1  
 Downstream num= 2  
 Sta Elev Sta Elev  
 233.85 721.04 249.64 730.1

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139545

INPUT  
 Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
 elevation based on IDOT/GEC tin, Modified channel geometry to  
 reflect proposed abutment slope walls and natural channel  
 elevations

Station Elevation Data num= 45									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31	179.63	726.07	189.44	721.08	196.02	721.01
204.91	718.62	218.79	718.62	227.28	721.01	233.85	721.08	242.69	725.05
249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21272	4837	726.22
285.9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93364	1443	727.74
404.2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37520	2271	729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13 179.63 .055255.9665 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 179.63255.9665 25 33 40 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 164 733.4 F  
 258.7520.2271 733.4 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station	Elevation	Data	num=	42					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	732	-50	729.5	-20	728	0	726.23	.537122	726.17
9.693759	725.8817	9.96078	725.5535	3.38584	726.2336	0.01735	726.2236	.98616	726.09
57.37652	725.1859	6.64951	725.0564	4.47989	723.44	70.3069	721.5278	.64016	720.39
85.87483	718.9390	6.1574	719.3790	9.91806	719.5795	4.3697	720.56105	.7258	722.12
118.2908	723.9118	9.9698	724.08127	3.3197	724.15141	7.605	724.04	147.534	724.04
148.0156	724.04	148.739	724.06	167.183	724.56186	7.215	725.5193	.0373	725.81
194.0911	725.83216	7.024	726.92218	2.2687	726.95	242.918	728.48265	.4388	728.74
269.1036	728.77	315.993	731.95316	7.762	731.96	318.031	732361	.4998	733.74
361.896	733.75362	2.298	733.76						

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
-75	.1359	6.4951	.045118	9.9698	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	59.64951	118.9698		70	148	626		.1	.3
Ineffective Flow	num=	2							
Sta L	Sta R	Elev	Permanent						
-75	43.9	733.4	F						
144.3362	2.298	733.4	F						

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT

Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input 07-2010

Station	Elevation	Data	num=	41					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.2325	8.9646	728.3234	5.8134	727.6847	5.3335	726.7461	6.5466	725.98
62.86731	725.3171	5.2296	724.580	8.0232	723.9286	3.3195	723.2987	8.1361	722.7
91.14569	721.7892	6.0942	720.993	4.4381	720.3494	3.9133	719.797	0.8542	719.6
102.3392	719.29113	2.782	720.26114	9.753	723.84	129.198	723.96172	1.069	723.76
207.7128	723.81245	1.637	723.92245	9.037	723.94284	2.046	724.19284	8.347	724.2
325.5757	724.59326	0.558	724.61344	0.362	724.9365	4.267	725.29366	2.567	725.29
386.9972	725.89407	8.078	726.51408	2.278	726.53448	8.588	729450	0.0789	729.04
474.1395	729.48487	6.698	729.71490	6.599	729.87525	8.707	732.04609	3.928	738.15
609.7329	738.17								

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.1186	8.33195	.045114	9.753	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	86.33195	114.9753		141	87	58		.1	.3
Ineffective Flow	num=	1							
Sta L	Sta R	Elev	Permanent						
165.12609	7.329	733.1	F						

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT

Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS, elevation based on IDOT/GEC tin

Station	Elevation	Data	num=	39					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-270.5	731.66	-210	729.95	-30	728.95	0	727.6915	0.9991	727.46
19.13766	727.1833	2.1519	726.3636	7.9197	725.43	38.4556	725.1743	1.0466	723.81
49.34686	722.2749	9.95718	721.8451	5.5831	720.2351	9.5881	720.260	0.6436	718.35
60.64471	719.0169	9.96091	719.2971	0.4166	720.2171	7.8226	720.2973	3.8339	722.87
75.39461	722.3111	7.997	723.2120	8.857	723.37125	1.487	723.47139	5.584	723.98
169.439	722.97199	0.895	724.12243	0.502	723.99275	1.607	724.28312	3.935	724.69
320.8542	724.82364	3.776	725.18	422.652	726.84423	6.721	726.87514	6.191	731.58
515.9192	731.63558	3.625	738.18628	1.378	741.89628	7.879	741.9		

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
-270.5	.1349	3.4686	.04573	3.8339	.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	49.34686	73.38339		12	13	13		.1	.3
Ineffective Flow	num=	2							
Sta L	Sta R	Elev	Permanent						
-270.5	16.94	733.1	F						
90.54628	7.879	733.1	F						

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139264

INPUT  
 Description: USF Main St Bridge, GEC Input 07-2010, relocated to proposed  
 bridge face

Station Elevation Data num= 54									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-309	.09	-22.98	.055	25	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	-22.98	25		75	75	75		.3	.5
Ineffective Flow num= 2									
Sta L	Sta R	Elev	Permanent						
-309	-24	733.1	F						
22.66	303.57	733.1	F						

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139220

INPUT  
 Description: Main Street Bridge (GEC 2010)  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 72  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates

num= 13									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-503	740.08				-372	736.33			
-172	732.74				-72	732.02			
0	731.94	730.2			22	731.99	730.3		
169	732.64				269	733.65			
419	736.52				369	735.38			

Upstream Bridge Cross Section Data

Station Elevation Data num= 54									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-309	732.43	-219	730.01	-218.25	730	-198.85	729.62	-197.22	729.56
-174.95	729.2	-169.01	729.11	-157.65	728.51	-140.68	728.46	-137.33	728.42
-73.45	728.35	-58.27	728.08	-55.31	728.04	-49.58	728.27	-48.97	728.26
-36.61	727.99	-34.42	728.01	-27.45	727.85	-26.96	727.87	-26.61	727.89
-22.98	727.88	-21.65	726.62	-21.1	724	-16.2	722.71	-15.36	721.62
-13.85	720.03	-7.52	719.26	0	717.41	5.87	718.18	13.36	719.2
14.91	721.65	25	728.23	26.56	728.24	27.02	728.24	27.21	727.66
33.01	725.8	34.83	726.88	35.42	727.21	38.97	727.35	57.07	727.85
58.22	727.97	81.25	728.21	81.62	728.19	108.96	728.22	124.47	728.27
143.17	728.3	175.07	728.7	177.21	728.81	214.38	729.1	216.53	729.09
259.01	730.2	278.82	730.28	286.02	730.33	303.57	731.1		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-309	.09	-22.98	.055	25	.09

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	-22.98	25		.3	.5

Ineffective Flow num= 2					
Sta L	Sta R	Elev	Permanent		
-309	-24	733.1	F		
22.66	303.57	733.1	F		

Downstream Deck/Roadway Coordinates

num= 13									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-503	740.08				-372	736.33			
-172	732.74				-72	732.02			
0	731.94	730.2			22	731.99	730.3		
169	732.64				269	733.65			
419	736.52				369	735.38			

Downstream Bridge Cross Section Data

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-296	732.05	-194	729.15	-170.29	728.82	-166.11	728.59	-112.52	728.42
-101.5	728.3	-82.69	728.28	-78.43	728.2	-55.1	727.86	-54.23	727.87
-42.03	727.4	-33.83	727.89	-33.19	727.79	-32.76	727.71	-28	728.22
-24.86	728.11	-24.7	728.3	-22.47	722.84	-20.37	720.66	-5.85	719.7
0	719.22	7.28	719.91	9.3	722	12.22	722.71	19.67	724.72
21.56	726	22.5	728.22	25.38	728.2	28.17	728.17	31.36	726.12
32.26	727.62	33.13	727.59	39.61	727.97	39.95	727.96	43.78	727.99
61.43	728.09	63.7	728.08	64.15	728.09	65.2	728.11	66.18	728.01
76.07	727.03	83.61	727.28	96.18	728.52	117.06	728.56	143.43	728.57
146.29	728.37	165.57	727.36	168.9	728.21	208.16	728.27	267.94	730.9
276.33	730.1	277.73	730.13	290.19	730.3	320.94	731.97	376.08	734.25
381.29	734.42	382.88	734.48	441.22	736.76	444.47	736.89	445.25	736.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-296	.09	-24.86	.055	22.5	.09

Bank Sta: Left Right Coeff Contr. Expan.

-24.86	22.5	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-296	-24.5	730.1	F
21.5	445.25	730.1	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139189

INPUT

Description: DSF Main St Bridge, GEC Input 07-2010

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-296	732.05	-194	729.15	-170.29	728.82	-166.11	728.59	-112.52	728.42
-101.5	728.3	-82.69	728.28	-78.43	728.2	-55.1	727.86	-54.23	727.87
-42.03	727.4	-33.83	727.89	-33.19	727.79	-32.76	727.71	-28	728.22
-24.86	728.11	-24.7	728.3	-22.47	722.84	-20.37	720.66	-5.85	719.7
0	719.22	7.28	719.91	9.3	722	12.22	722.71	19.67	724.72
21.56	726	22.5	728.22	25.38	728.2	28.17	728.17	31.36	726.12
32.26	727.62	33.13	727.59	39.61	727.97	39.95	727.96	43.78	727.99
61.43	728.09	63.7	728.08	64.15	728.09	65.2	728.11	66.18	728.01
76.07	727.03	83.61	727.28	96.18	728.52	117.06	728.56	143.43	728.57
146.29	728.37	165.57	727.36	168.9	728.21	208.16	728.27	267.94	730.9
276.33	730.1	277.73	730.13	290.19	730.3	320.94	731.97	376.08	734.25
381.29	734.42	382.88	734.48	441.22	736.76	444.47	736.89	445.25	736.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-296	.09	-24.86	.055	22.5	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

-24.86	22.5	9	9	7	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-296	-24.5	730.1	F
21.5	445.25	730.1	F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62
88.46001	720.0689.37001		719.9394.15001		719.2196.36001		718.9398.99001		719.22
103.44	719.72	104.16	719.79104.5201		720.3108.8901		723.01109.6001		723.18
112.0626	723.73112.2529		723.91	132.651	722.85	133.01	722.87133.4516		722.87
140.9519	722.97157.3524		723.25185.4334		724.32186.8835		724.48	200.824	724.1
202.8144	724.06237.8324		725.57239.0326		725.87240.7531		725.88359.7095		726.08
361.3396	726.13412.6096		727.17414.2996		727.28415.0897		727.32417.8119		727.42
474.3699	728.87475.9402		728.96539.6592		733.47540.1493		733.45540.5194		733.44
592.1792	737.52592.9095		737.57						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	76.65	.055112.2529		.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

76.65	112.2529	27	27	27	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	67.16	730.1	F
125.16592.9095	730.1		F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321.94402		728.0524.42452		728.2730.15558		728.433.69627		728.64
53.62989	728.7655.24017		728.883.58551		728.784.68569		728.6293.64731		727.75
99.92865	727.16144.9669		725.01148.6377		724.63174.0424		724.03	182.394	723.16
188.0251	721.86192.4358		721.41	193.546	720.6197.9669		718.93198.8469		718.6
199.287	718.29200.1873		718.16201.1675		718.25210.6992		719.7211.3994		719.82
211.8396	720.15215.6702		723.81217.8506		723.69228.2125		723.28234.4736		723.55
285.1931	724.38290.2141		724.32303.1765		725.57318.4593		725.33334.4223		725.81
346.4945	725.98360.7272		726.23378.3205		726.04387.0722		726.02388.8324		726.02
484.5803	726.6559.9542		727.21598.6415		727.49625.3665		728.1634.1082		728.43
636.6285	728.73653.9019		729.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13174.0424		.055215.6702		.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

174.0424	215.6702	612	483	587	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	158.69	727.5	F
239.19653.9019	727.5		F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423.72051		733.5850.52278		732.97103.7242		731.47105.4352		731.41
131.3751	730.4131.8137		730.38158.5284		728.95159.2807		728.91212.4323		726.45
213.4117	726.4214.4225		726.38237.1291		725.95238.4291		725.87270.6048		725.04
301.9967	724.55329.4541		724.34348.9568		723.99353.0579		723.93383.6354		723.56
393.7921	720.73395.9406		718.84397.8362		718.62412.9881		717.03413.5182		717.39
421.4882	723.09422.3705		723.13423.6802		723.32426.9516		723.8	431.308	724.75
431.8838	724.82433.9684		725.32438.4547		725.81444.5365		726.47451.8719		727.21
453.17	727.34462.0598		726.78464.8397		724.87466.0078		724.88660.9682		724.72
662.7347	724.78665.5562		725.71672.5701		726.12672.9245		726.08	678.82	725.76
688.87	724.89	720.06	724.86779.3023		724.71779.8826		724.73	781.903	724.91
794.0884	726.09822.4244		726.78837.3586		729.02851.4493		733.36859.5363		736.1
859.9111	736.1870.0308		736.22874.1083		735.74999.9396		735.691018.729		735.71
1019.092	735.731043.219		736.681043.782		736.741094.542		736.951094.985		736.99
1156.851	738.171162.934		738.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0 .11383.6354 .055426.9516 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
383.6354426.9516 477 490 222 .1 .3  
Ineffective Flow num= 1  
Sta L Sta R Elev Permanent  
453.171162.934 727.5 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data num= 81  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 738.2227.70591 736.4139.66846 735.9370.28796 734.64103.4348 733.35  
112.8032 732.98127.3655 732.42149.6064 731.55158.5392 731.24192.9704 729.96  
193.9008 729.93228.3727 728.93238.0518 728.63274.1718 727.4274.5956 727.39  
276.3068 727.33311.4224 726.11324.7386 725.78353.8317 725.07371.0858 724.94  
377.2663 724.83386.0002 724.69408.0329 724.48426.6654 724.26441.0691 724.01  
461.0534 723.27479.9106 722.54 480.648 722.51509.3992 722.38518.2288 722.26  
538.5144 722.18541.1888 722.16554.0018 721.87561.3702 718.31562.7351 717.82  
568.9442 717.09571.9603 716.6572.3747 716.53576.5869 717.44579.1799 718  
581.3936 718.56584.1164 722.45585.6533 723.17590.2328 725.28606.3673 726.51  
606.6901 726.5615.4731 726.14621.5073 725.58627.2417 724.05651.4352 724.38  
652.6528 724.683.0341 723.96685.8575 724.01686.6508 724.35688.3648 724.29  
689.888 724.18 698.492 724.71727.7194 724.72 755.626 724.31757.1407 724.31  
852.5659 724.38855.0814 724.56855.6722 725.07861.3923 725.08890.1413 727.49  
891.4794 727.52892.5094 727.53932.6591 728.35933.8849 728.4961.7881 729.41  
969.2715 729.75970.3898 729.861004.611 735.131014.855 735.35 1023.59 735.53  
1072.667 732.511073.249 732.51 1110.48 734.54 1141.5 737.11169.515 739.84  
1170.197 739.89

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13441.0691 .055590.2328 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
441.0691590.2328 465 465 465 .1 .3  
Ineffective Flow num= 1  
Sta L Sta R Elev Permanent  
606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and  
the channel data was interpolated based on the surrounding xs by  
BW 2-18-05

Station Elevation Data num= 31  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730  
271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726  
450.5 724.6 476.8 722.6 485 720 489 718 493 716  
497 715 501 716 505 718 509 720 527.1 722  
586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1  
876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9  
1083.7 739.7

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data num= 31  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 730.5924.00007 730.5935.00002 729.1985.00035 727.99119.0003 727.29  
184.0007 726.59229.0009 725.69276.0009 724.09 324.001 721.79374.0013 720.69  
424.0015 720.49474.0016 720.19516.0019 719.79 562.002 719.49565.0021 717.79  
565.0021 716.49 569.002 714.29572.0021 713.99 573.002 714.39 574.002 715.99  
576.002 717.89 583.002 720.09624.0022 721.09674.0022 719.99719.0024 720.29  
764.0026 720.89806.0028 722.19834.0028 723.29874.0029 726.09934.0033 730.89  
979.0035 733.59

Manning's n Values            num=            3  
 Sta    n Val        Sta    n Val        Sta    n Val  
 0       .13474.0016     .055624.0022     .13

Bank Sta: Left    Right        Lengths: Left Channel    Right        Coeff Contr.    Expan.  
 474.0016624.0022                            0        0        0                    .1        .3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139602	Bridge		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139264	.09	.055	.09
Main Before D	139220	Bridge		
Main Before D	139189	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139602	Bridge		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	12	13	13
Main Before D	139264	75	75	75
Main Before D	139220	Bridge		
Main Before D	139189	9	9	7
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Bridge	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3

Main Before D	139264	.3	.5
Main Before D	139220	Bridge	
Main Before D	139189	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

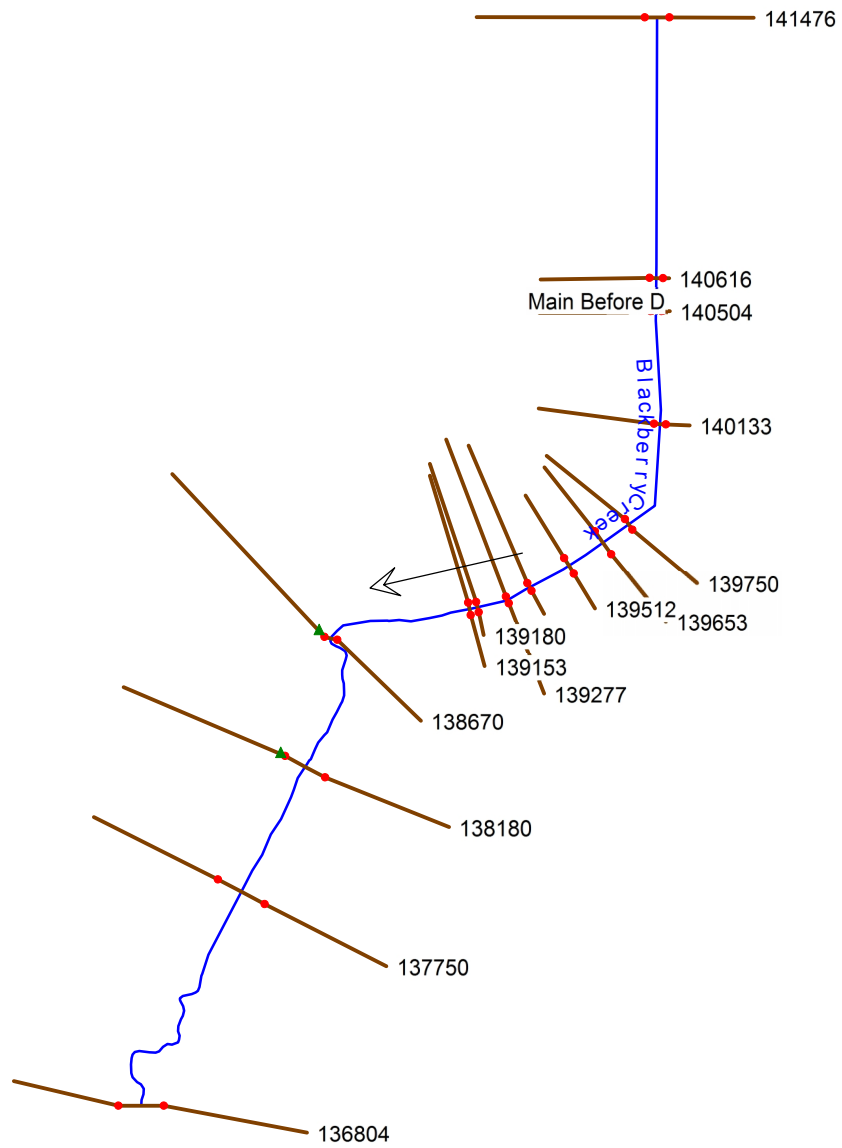


HEC-RAS Model

**GROUP #2 - NATURAL CONDITIONS**

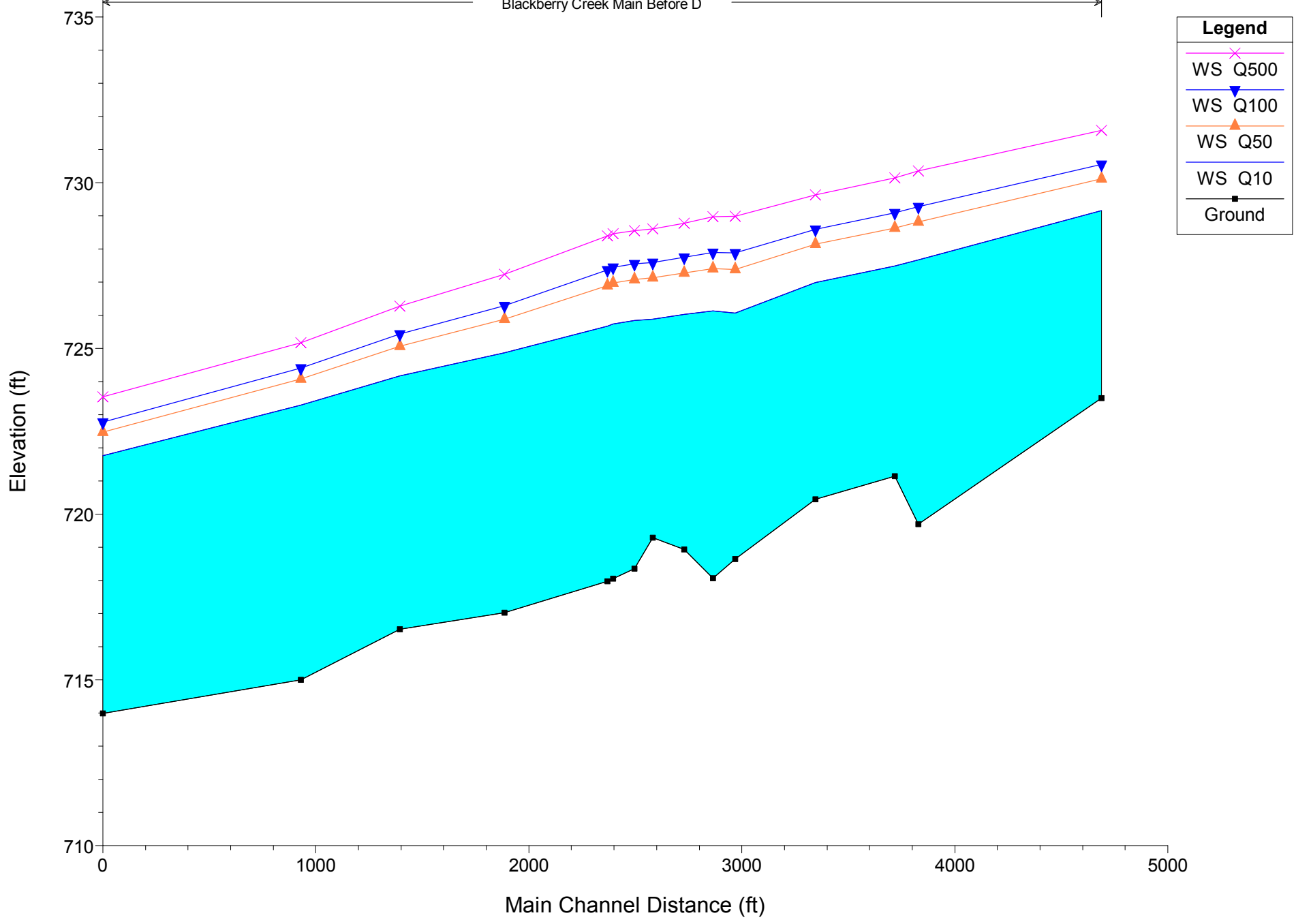
**No Rte 47 Culvert, No Main St. bridge**

15.2.5



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)  
 None of the XS's are Geo-Referenced (• Geo-Ref user entered XS • Geo-Ref interpolated XS • Non Geo-Ref user entered XS • Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



**Legend**

- WS Q500
- WS Q100
- WS Q50
- WS Q10
- Ground

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.16		729.24	0.003293	2.67	392.78	301.02	0.31
Main Before D	141476	Q50	1128.00	723.50	730.12		730.22	0.002428	2.90	720.82	379.10	0.28
Main Before D	141476	Q100	1384.00	723.50	730.56		730.65	0.002200	2.99	893.78	423.53	0.27
Main Before D	141476	Q500	2108.00	723.50	731.58		731.68	0.001831	3.21	1383.84	531.49	0.26
Main Before D	140616	Q10	637.00	719.70	727.68		727.75	0.001059	2.52	427.02	230.75	0.21
Main Before D	140616	Q50	1126.00	719.70	728.82		728.91	0.001040	2.90	708.43	260.17	0.22
Main Before D	140616	Q100	1381.00	719.70	729.28		729.38	0.001068	3.10	831.59	276.25	0.22
Main Before D	140616	Q500	2104.00	719.70	730.35		730.47	0.001137	3.57	1149.56	316.63	0.24
Main Before D	140504	Q10	637.00	721.14	727.49		727.60	0.001783	3.09	384.80	203.76	0.26
Main Before D	140504	Q50	1126.00	721.14	728.63		728.76	0.001777	3.61	643.97	247.19	0.27
Main Before D	140504	Q100	1381.00	721.14	729.09		729.23	0.001792	3.83	759.26	257.86	0.28
Main Before D	140504	Q500	2104.00	721.14	730.15		730.31	0.001868	4.37	1045.49	282.63	0.29
Main Before D	140133	Q10	635.00	720.45	726.99		727.08	0.001311	2.78	378.74	184.78	0.24
Main Before D	140133	Q50	1122.00	720.45	728.15		728.26	0.001343	3.29	612.93	219.30	0.25
Main Before D	140133	Q100	1378.00	720.45	728.60		728.72	0.001396	3.54	714.20	230.83	0.26
Main Before D	140133	Q500	2098.00	720.45	729.63		729.79	0.001525	4.12	967.01	257.36	0.27
Main Before D	139750	Q10	635.00	718.65	726.07		726.28	0.003713	3.91	230.17	160.40	0.37
Main Before D	139750	Q50	1122.00	718.65	727.38		727.56	0.002522	4.00	524.80	286.26	0.32
Main Before D	139750	Q100	1378.00	718.65	727.88		728.05	0.002204	4.00	675.66	313.39	0.31
Main Before D	139750	Q500	2098.00	718.65	728.99		729.14	0.001842	4.16	1053.03	370.51	0.29
Main Before D	139653	Q10	634.00	718.06	726.13		726.15	0.000282	1.35	588.67	229.25	0.11
Main Before D	139653	Q50	1120.00	718.06	727.41		727.45	0.000325	1.71	965.64	350.88	0.12
Main Before D	139653	Q100	1376.00	718.06	727.90		727.94	0.000345	1.85	1145.19	384.20	0.13
Main Before D	139653	Q500	2097.00	718.06	728.98		729.03	0.000395	2.20	1605.54	470.19	0.14
Main Before D	139512	Q10	634.00	718.93	726.03		726.10	0.000590	2.16	394.93	185.18	0.18
Main Before D	139512	Q50	1120.00	718.93	727.28		727.38	0.000670	2.71	664.31	235.47	0.20
Main Before D	139512	Q100	1376.00	718.93	727.75		727.86	0.000721	2.96	778.76	248.44	0.21
Main Before D	139512	Q500	2097.00	718.93	728.78		728.94	0.000904	3.67	1053.85	304.84	0.24
Main Before D	139364	Q10	634.00	719.29	725.88		725.93	0.000605	2.35	636.12	324.92	0.18
Main Before D	139364	Q50	1120.00	719.29	727.13		727.18	0.000541	2.55	1075.98	375.90	0.17
Main Before D	139364	Q100	1376.00	719.29	727.60		727.65	0.000550	2.69	1254.60	390.00	0.18
Main Before D	139364	Q500	2097.00	719.29	728.60		728.67	0.000608	3.09	1663.30	420.30	0.19
Main Before D	139277	Q10	634.00	718.35	725.84		725.89	0.000560	2.44	730.56	352.21	0.17
Main Before D	139277	Q50	1120.00	718.35	727.08		727.14	0.000556	2.74	1203.12	407.01	0.18
Main Before D	139277	Q100	1376.00	718.35	727.55		727.61	0.000580	2.92	1396.30	427.49	0.18
Main Before D	139277	Q500	2097.00	718.35	728.55		728.62	0.000664	3.38	1852.30	476.66	0.20
Main Before D	139180	Q10	640.00	718.05	725.74		725.81	0.001237	2.53	462.19	211.10	0.21
Main Before D	139180	Q50	1132.00	718.05	726.98		727.05	0.001201	2.91	872.46	388.76	0.21
Main Before D	139180	Q100	1389.00	718.05	727.45		727.52	0.001134	2.98	1061.04	409.48	0.21
Main Before D	139180	Q500	2117.00	718.05	728.45		728.53	0.001126	3.27	1497.02	458.15	0.21
Main Before D	139153	Q10	640.00	717.97	725.67		725.77	0.001427	2.71	383.53	198.85	0.22
Main Before D	139153	Q50	1132.00	717.97	726.90		727.01	0.001487	3.24	755.91	416.11	0.24
Main Before D	139153	Q100	1389.00	717.97	727.37		727.48	0.001416	3.33	969.43	484.82	0.23
Main Before D	139153	Q500	2117.00	717.97	728.40		728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.12	521.58	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.97	563.79	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.69	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001556	2.31	527.94	468.69	0.22
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.39	497.11	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001758	3.02	850.61	560.62	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.08		724.19	0.002881	2.67	426.06	176.29	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002975	2.89	485.48	188.22	0.30
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003083	3.43	642.59	225.08	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.95	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#2 Nat both rem River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.16	0.09	1.49	0.00	110.15	505.04	22.81	301.02
Main Before D	141476	Q50	730.22	730.12	0.09	1.31	0.00	257.93	775.15	94.92	379.10
Main Before D	141476	Q100	730.65	730.56	0.09	1.27	0.00	333.98	905.85	144.17	423.53
Main Before D	141476	Q500	731.68	731.58	0.10	1.21	0.00	542.95	1240.46	324.59	531.49
Main Before D	140616	Q10	727.75	727.68	0.08	0.15	0.00	0.22	494.05	142.74	230.75
Main Before D	140616	Q50	728.91	728.82	0.09	0.14	0.00	2.08	717.46	406.46	260.17
Main Before D	140616	Q100	729.38	729.28	0.10	0.15	0.00	3.72	829.34	547.94	276.25
Main Before D	140616	Q500	730.47	730.35	0.12	0.16	0.00	10.38	1122.81	970.81	316.63
Main Before D	140504	Q10	727.60	727.49	0.11	0.51	0.01	0.00	473.18	163.82	203.76
Main Before D	140504	Q50	728.76	728.63	0.13	0.49	0.01	0.28	701.19	424.53	247.19
Main Before D	140504	Q100	729.23	729.09	0.14	0.50	0.00	0.65	806.12	574.23	257.86
Main Before D	140504	Q500	730.31	730.15	0.17	0.52	0.00	2.43	1085.64	1015.94	282.63
Main Before D	140133	Q10	727.08	726.99	0.09	0.79	0.01	2.49	479.18	153.33	184.78
Main Before D	140133	Q50	728.26	728.15	0.11	0.69	0.01	9.13	719.71	393.16	219.30
Main Before D	140133	Q100	728.72	728.60	0.13	0.67	0.00	13.52	836.70	527.78	230.83
Main Before D	140133	Q500	729.79	729.63	0.16	0.65	0.00	28.54	1143.41	926.05	257.36
Main Before D	139750	Q10	726.28	726.07	0.21	0.07	0.06	5.32	566.68	63.00	160.40
Main Before D	139750	Q50	727.56	727.38	0.18	0.07	0.04	38.45	803.81	279.75	286.26
Main Before D	139750	Q100	728.05	727.88	0.17	0.07	0.04	62.22	889.89	425.89	313.39
Main Before D	139750	Q500	729.14	728.99	0.16	0.08	0.03	152.25	1119.91	825.84	370.51
Main Before D	139653	Q10	726.15	726.13	0.03	0.05	0.00	0.81	581.40	51.79	229.25
Main Before D	139653	Q50	727.45	727.41	0.04	0.06	0.01	7.24	938.71	174.06	350.88
Main Before D	139653	Q100	727.94	727.90	0.04	0.07	0.01	17.94	1104.36	253.71	384.20
Main Before D	139653	Q500	729.03	728.98	0.06	0.08	0.01	67.39	1535.78	493.83	470.19
Main Before D	139512	Q10	726.10	726.03	0.07	0.16	0.00	2.34	575.07	56.58	185.18
Main Before D	139512	Q50	727.38	727.28	0.09	0.18	0.01	34.37	922.49	163.14	235.47
Main Before D	139512	Q100	727.86	727.75	0.11	0.20	0.02	57.20	1092.13	226.67	248.44
Main Before D	139512	Q500	728.94	728.78	0.16	0.24	0.03	130.25	1576.58	390.17	304.84
Main Before D	139364	Q10	725.93	725.88	0.05	0.04	0.00	15.99	369.47	248.54	324.92
Main Before D	139364	Q50	727.18	727.13	0.05	0.04	0.00	36.83	491.68	591.50	375.90
Main Before D	139364	Q100	727.65	727.60	0.05	0.04	0.00	51.05	554.29	770.66	390.00
Main Before D	139364	Q500	728.67	728.60	0.06	0.04	0.00	97.09	725.35	1274.56	420.30
Main Before D	139277	Q10	725.89	725.84	0.05	0.08	0.00	9.65	364.13	260.22	352.21
Main Before D	139277	Q50	727.14	727.08	0.05	0.08	0.00	18.70	492.03	609.27	407.01
Main Before D	139277	Q100	727.61	727.55	0.06	0.08	0.00	23.95	555.74	796.30	427.49
Main Before D	139277	Q500	728.62	728.55	0.07	0.09	0.00	51.71	725.20	1320.09	476.66
Main Before D	139180	Q10	725.81	725.74	0.07	0.04	0.00	44.78	419.28	175.94	211.10
Main Before D	139180	Q50	727.05	726.98	0.08	0.04	0.00	120.35	611.73	399.92	388.76
Main Before D	139180	Q100	727.52	727.45	0.07	0.03	0.00	155.05	675.59	558.36	409.48
Main Before D	139180	Q500	728.53	728.45	0.08	0.03	0.00	257.03	859.24	1000.72	458.15
Main Before D	139153	Q10	725.77	725.67	0.09	0.76	0.00	17.77	522.23	100.00	198.85
Main Before D	139153	Q50	727.01	726.90	0.12	0.91	0.01	66.61	788.80	276.60	416.11
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.48	876.72	416.80	484.82
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.10	975.62	6.27	521.58
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.47	1146.30	11.24	563.79
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.77	1560.92	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.74	1120.26		468.69
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.11
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.52	2012.50	1.99	560.62
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.19	724.08	0.11	1.65	0.02		1131.66	0.34	176.29
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.22

HEC-RAS Plan: G#2 Nat both rem River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.28	2102.68	13.04	225.08
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#2 Nat both rem

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy

Errors Warnings and Notes for Plan : G#2 Nat both rem (Continued)

	was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.



HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X       X   X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX XXXXXXX XXXX
X   X   X       X       X   X   X   X   X
X   X   X       X   X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 3/26/2014 3:26:22 PM

Project in English units

PLAN DATA

Plan Title: Group#2 Nat NoMnSt  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p21

Geometry Title: Natural Condition both  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g21

Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Main St bridge removed and IL47 culvert removed.

Plan Summary Information:

Number of:	Cross Sections =	15	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance = 0.01  
 Critical depth calculation tolerance = 0.01  
 Maximum number of iterations = 20  
 Maximum difference tolerance = 0.3  
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Average Conveyance  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	141476	638	1128	1384	2108
Blackberry CreekMain	Before D	140616	637	1126	1381	2104
Blackberry CreekMain	Before D	140133	635	1122	1378	2098
Blackberry CreekMain	Before D	139653	634	1120	1376	2097
Blackberry CreekMain	Before D	139364	634	1120	1376	2097
Blackberry CreekMain	Before D	139180	640	1132	1389	2117
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Natural Condition both  
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g21

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 141476

INPUT  
Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	736	34.7	734	94.3	732	129.3	730	157	728		
277.6	727.9	319.7	727.1	325.5	725.7	330.8	723.6	337	723.5		
340.2	726.9	358.9	728	425.8	728.9	495.6	730	598.3	731.2		
671	732	763.7	732.8	825.4	734	914.1	736				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	277.6	.055	358.9	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	277.6	358.9		1062	860	750	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 140616

INPUT  
Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data num= 31											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73418.14586	727.6120.01093	726.7831.69828	724.6539.43155	723.05						
43.50174	721.4650.21955	719.7 54.4631	721.24 59.8615	722.8364.14489	726.39						
80.94425	727.3290.14719	726.78103.0566	725.91145.4814	725.66150.6872	725.65						
155.3922	725.67156.8725	725.7157.8967	725.74198.5372	726.77200.2545	726.8						
236.8923	727.16238.7617	727.24276.4147	728.89277.0364	728.92330.2935	730.45						
330.6023	730.46384.2168	731.23 390.704	731.32 398.281	731.35424.3695	731.43						
424.8041	731.44										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.1120.01093		.0564.14489		.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	20.0109364.14489			111	109	107	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 140504

INPUT  
Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data num= 19											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75	-162.13	730.81	-158.42	727.39	-145.96	724.25		
-145.33	722.69	-139.49	721.34	-134.16	721.17	-128.02	721.14	-124.82	722.54		
-122.47	725.97	-97.85	725.68	-60.35	725.83	0	725.95	19.51	726.88		
80.96	728.34	138.26	730.91	192.26	731.35	242.79	732.36				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05	-122.47	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	-158.42	-122.47		412	374	230	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 140133

INPUT  
Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data num= 29											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	746.59	.661211	746.4412.27355	744.8346.09943	734.775.93997	725.73					
77.66348	724.88	89.8	721.5	94.87	720.45105.2784	721.54	108.037	724.14			

117.4982	725.2	158.663	725.14175	4356	725.2199	3833	725.23200	0636	725.25
240.4556	726.41241	4389	726.44281	7278	727.91282	3598	727.93324	4932	729.82
325.104	729.84	368.711	730.36413	5901	730.81414	2438	730.82456	2384	731.28
456.7409	731.29457	6156	731.29501	0569	732.08501	4998	732.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1177	66348	.05117	4982	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

77.66348	117.4982	350.15	376	403.42	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139750

INPUT  
 Description: USGS IL 2001. Approach Rt47-8  
 Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02
105.75	720.89	105.94	720	108.17	718.65	112.41	719.94	113.8	720.84
114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88	134.98	724.08
139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36	275.32	726.65
322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45	467.58	732.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-185.75	.11	92.33	.05	134.98	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

92.33	134.98	96.85	104	111.58	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT  
 Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-189	.11	96.437	.05	189.85	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

96.437	189.85	331	136	146	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139512

INPUT  
 Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	732	-50	729.5	-20	728	0	726.23	.537122	726.17
9.693759	725.8817	96078	725.5535	38584	726.2336	01735	726.2236	98616	726.09
57.37652	725.1859	64951	725.0564	47989	723.44	70.3069	721.5278	64016	720.39
85.87483	718.9390	61574	719.3790	91806	719.5795	43697	720.56105	7258	722.12
118.2908	723.9118	9698	724.08127	3197	724.15141	7605	724.04	147.534	724.04
148.0156	724.04	148.739	724.06	167.183	724.56186	7215	725.5193	0373	725.81
194.0911	725.83216	7024	726.92218	2687	726.95	242.918	728.48265	4388	728.74
269.1036	728.77	315.993	731.95316	7762	731.96	318.031	732361	4998	733.74
361.896	733.75362	2298	733.76						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-75	.1359	64951	.045118	9698	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

59.64951118.9698 70 148 626 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT  
Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input  
07-2010

Station Elevation Data		num= 41									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.2325	89646	728.3234	58134	727.6847	53335	726.7461	65466	725.98		
62.86731	725.3171	52296	724.580	80232	723.9286	33195	723.2987	81361	722.7		
91.14569	721.7892	60942	720.993	44381	720.3494	39133	719.797	08542	719.6		
102.3392	719.29113	2782	720.26114	9753	723.84	129.198	723.96172	1069	723.76		
207.7128	723.81245	1637	723.92245	9037	723.94284	2046	724.19284	8347	724.2		
325.5757	724.59326	0558	724.61344	0362	724.9365	4267	725.29366	2567	725.29		
386.9972	725.89407	8078	726.51408	2278	726.53448	8588	729450	0789	729.04		
474.1395	729.48487	6698	729.71490	6599	729.87525	8707	732.04609	3928	738.15		
609.7329	738.17										

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1186	33195	.045114	9753	.09

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	86.33195	114.9753		138	85	56		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT  
Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data		num= 39									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-270.5	731.66	-210	729.95	-30	728.95	0	727.6915	09991	727.46		
19.13766	727.1833	21519	726.3636	79197	725.43	38.4556	725.1743	10466	723.81		
49.34686	722.2749	95718	721.8451	55831	720.2351	95881	720.260	06436	718.35		
60.64471	719.0169	96091	719.2971	04166	720.2171	78226	720.2973	38339	722.87		
75.39461	722.3111	7997	723.27120	8857	723.37125	1487	723.47139	5584	723.98		
169.439	722.97199	0895	724.12243	0502	723.99275	1607	724.28312	3935	724.69		
320.8542	724.82364	3776	725.18	422.652	726.84423	6721	726.87514	6191	731.58		
515.9192	731.63558	3625	738.18628	1378	741.89628	7879	741.9				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-270.5	.1349	34686	.04573	38339	.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	49.34686	73.38339		103	101	106		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139180

INPUT  
Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data		num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95		
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62		
88.46001	720.0689	37001	719.9394	15001	719.2196	36001	718.0598	99001	719.22		
103.44	719.72	104.16	719.79104	5201	720.3108	8901	723.01109	6001	723.18		
112.0626	723.73112	2529	723.91	132.651	722.85	133.01	722.87133	4516	722.87		
140.9519	722.97157	3524	723.25185	4334	724.32186	8835	724.48	200.824	724.1		
202.8144	724.06237	8324	725.57239	0326	725.87240	7531	725.88359	7095	726.08		
361.3396	726.13412	6096	727.17414	2996	727.28415	0897	727.32417	8119	727.42		
474.3699	728.87475	9402	728.96539	6592	733.47540	1493	733.45540	5194	733.44		
592.1792	737.52592	9095	737.57								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	76.65	.055112	2529	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	76.65112	2529		27	27	27		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321.94402	728.0524.42452	728.2730.15558	728.433.69627	728.64				
53.62989	728.7655.24017	728.883.58551	728.784.68569	728.6293.64731	727.75				
99.92865	727.16144.9669	725.01148.6377	724.63174.0424	724.03.182.394	723.16				
188.0251	721.86192.4358	721.41.193.546	720.6197.9669	718.93198.8469	718.6				
199.287	718.29200.1873	717.97201.1675	718.25210.6992	719.7211.3994	719.82				
211.8396	720.15215.6702	723.81217.8506	723.69228.2125	723.28234.4736	723.55				
285.1931	724.38290.2141	724.32303.1765	725.57318.4593	725.33334.4223	725.81				
346.4945	725.98360.7272	726.23378.3205	726.04387.0722	726.02388.8324	726.02				
484.5803	726.6559.9542	727.21598.6415	727.49625.3665	728.1634.1082	728.43				
636.6285	728.73653.9019	729.96							

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13174.0424		.055215.6702		.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	174.0424	215.6702		612	483	587		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423.72051	733.5850.52278	732.97103.7242	731.47105.4352	731.41				
131.3751	730.4131.8137	730.38158.5284	728.95159.2807	728.91212.4323	726.45				
213.4117	726.4214.4225	726.38237.1291	725.95238.4291	725.87270.6048	725.04				
301.9967	724.55329.4541	724.34348.9568	723.99353.0579	723.93383.6354	723.56				
393.7921	720.73395.9406	718.84397.8362	718.62412.9881	717.03413.5182	717.39				
421.4882	723.09422.3705	723.13423.6802	723.32426.9516	723.8.431.308	724.75				
431.8838	724.82433.9684	725.32438.4547	725.81444.5365	726.47451.8719	727.21				
453.17	727.34462.0598	726.78464.8397	724.87466.0078	724.88660.9682	724.72				
662.7347	724.78665.5562	725.71672.5701	726.12672.9245	726.08.678.82	725.76				
688.87	724.89.720.06	724.86779.3023	724.71779.8826	724.73.781.903	724.91				
794.0884	726.09822.4244	726.78837.3586	729.02851.4493	733.36859.5363	736.1				
859.9111	736.1870.0308	736.22874.1083	735.74999.9396	735.691018.729	735.71				
1019.092	735.731043.219	736.681043.782	736.741094.542	736.951094.985	736.99				
1156.851	738.171162.934	738.32							

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.11383.6354		.055426.9516		.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	383.6354	426.9516		477	490	222		.1	.3

Ineffective Flow			
Sta L	Sta R	Elev	Permanent
453.17	171162.934	727.5	F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227.70591	736.4139.66846	735.9370.28796	734.64103.4348	733.35				
112.8032	732.98127.3655	732.42149.6064	731.55158.5392	731.24192.9704	729.96				
193.9008	729.93228.3727	728.93238.0518	728.63274.1718	727.4274.5956	727.39				
276.3068	727.33311.4224	726.11324.7386	725.78353.8317	725.07371.0858	724.94				
377.2663	724.83386.0002	724.69408.0329	724.48426.6654	724.26441.0691	724.01				
461.0534	723.27479.9106	722.54.480.648	722.51509.3992	722.38518.2288	722.26				
538.5144	722.18541.1888	722.16554.0018	721.87561.3702	718.31562.7351	717.82				
568.9442	717.09571.9603	716.6572.3747	716.53576.5869	717.44579.1799	718				
581.3936	718.56584.1164	722.45585.6533	723.17590.2328	725.28606.3673	726.51				
606.6901	726.5615.4731	726.14621.5073	725.58627.2417	724.05651.4352	724.38				
652.6528	724683.0341	723.96685.8575	724.01686.6508	724.35688.3648	724.29				
689.888	724.18.698.492	724.71727.7194	724.72.755.626	724.31757.1407	724.31				
852.5659	724.38855.0814	724.56855.6722	725.07861.3923	725.08890.1413	727.49				
891.4794	727.52892.5094	727.53932.6591	728.35933.8849	728.4961.7881	729.41				
969.2715	729.75970.3898	729.861004.611	735.131014.855	735.35.1023.59	735.53				
1072.667	732.511073.249	732.51.1110.48	734.54.1141.5	737.11169.515	739.84				
1170.197	739.89								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13441.0691		.055590.2328		.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 441.0691590.2328 465 465 465 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09
940	730.89	985	733.59						

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	480	.055	630	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 480 630 840 1040 890 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139750	.11	.05	.09
Main Before D	139653	.11	.05	.09
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
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Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139750	96.85	104	111.58
Main Before D	139653	331	136	146
Main Before D	139512	70	148	626
Main Before D	139364	138	85	56
Main Before D	139277	103	101	106
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	840	1040	890

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS  
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139750	.1	.3
Main Before D	139653	.1	.3
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

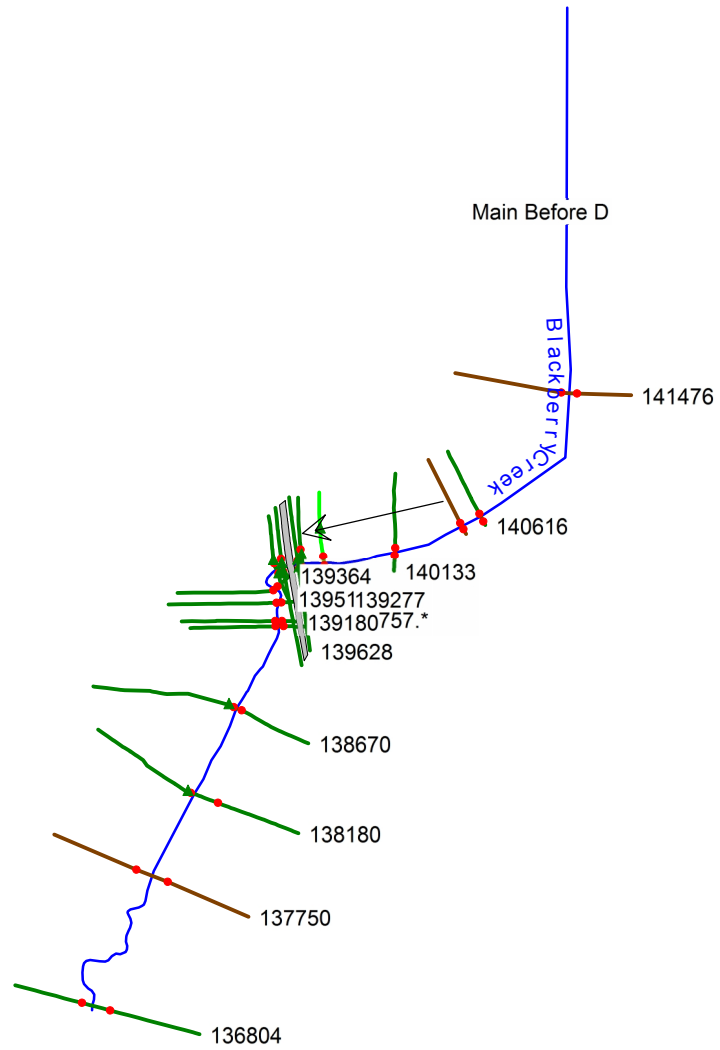
HEC-RAS Model

**GROUP #2 - EXISTING CONDITIONS**

**Existing Rte. 47 Culvert, No Main St. bridge**

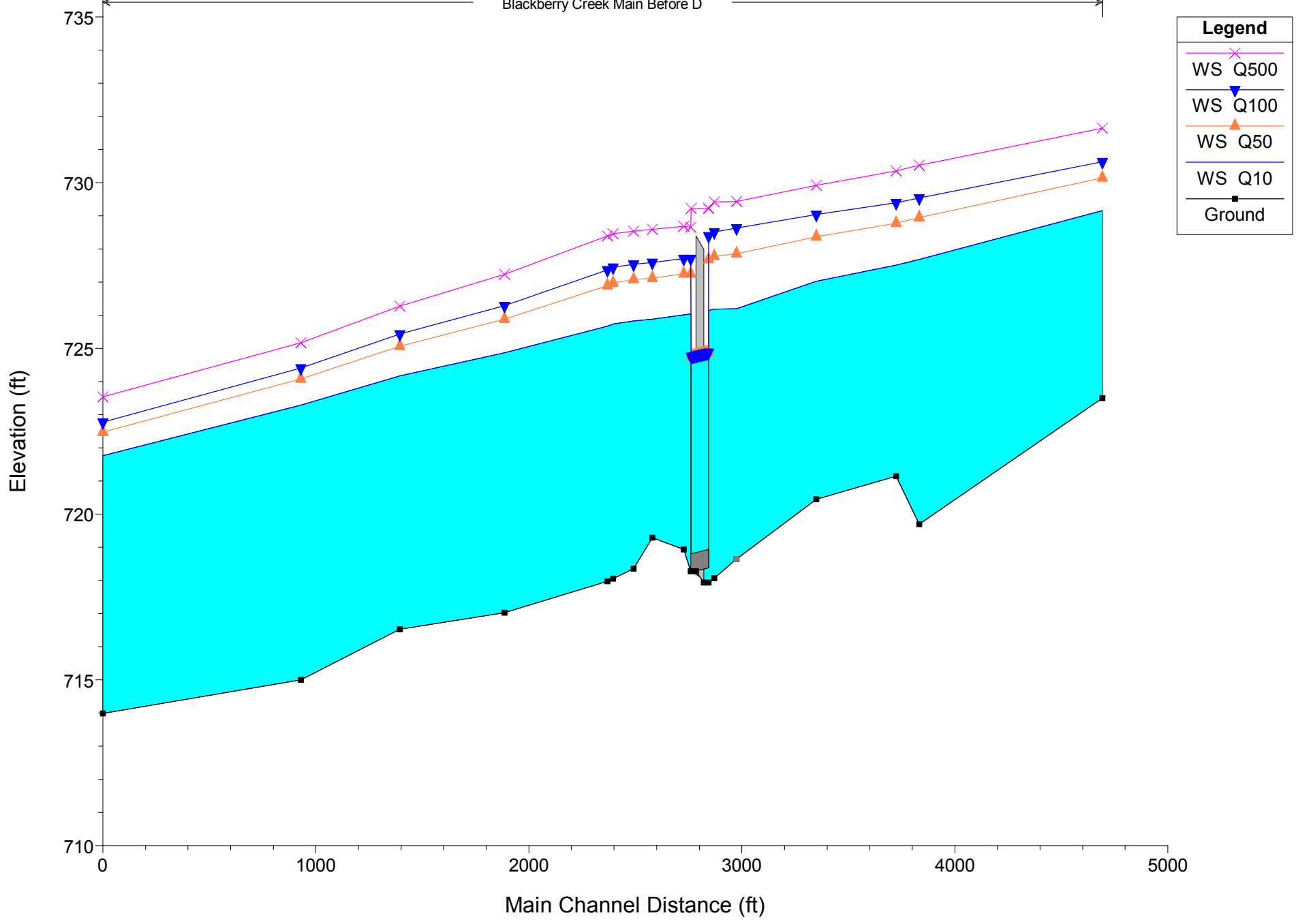
15.2.6





3 of the 17 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

IL47\_MnSt\_Design\_Model\_GEC 2013 Plan: Group#2 - Ex NoMNST (GEC) 7/22/2014  
Geom: Group #2 - Exist Cond No Struct (GEC)  
Blackberry Creek Main Before D



Legend	
WS Q500	(magenta line with 'x' marker)
WS Q100	(blue line with inverted triangle marker)
WS Q50	(orange line with triangle marker)
WS Q10	(black line with square marker)
Ground	(cyan area with black line)

HEC-RAS Plan: G#2-Ex NoMNST River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003299	2.68	392.45	300.94	0.31
Main Before D	141476	Q50	1128.00	723.50	730.15		730.24	0.002362	2.87	729.25	381.39	0.28
Main Before D	141476	Q100	1384.00	723.50	730.63		730.72	0.002028	2.91	925.26	431.12	0.26
Main Before D	141476	Q500	2108.00	723.50	731.65		731.75	0.001723	3.15	1420.22	538.86	0.25
Main Before D	140616	Q10	637.00	719.70	727.69		727.77	0.001042	2.50	430.14	231.10	0.21
Main Before D	140616	Q50	1126.00	719.70	728.94		729.02	0.000935	2.79	740.35	263.52	0.21
Main Before D	140616	Q100	1381.00	719.70	729.55		729.63	0.000871	2.88	905.75	286.18	0.20
Main Before D	140616	Q500	2104.00	719.70	730.53		730.64	0.001016	3.43	1206.56	325.82	0.22
Main Before D	140504	Q10	637.00	721.14	727.51		727.62	0.001750	3.07	388.22	204.49	0.26
Main Before D	140504	Q50	1126.00	721.14	728.78		728.89	0.001559	3.44	680.08	250.58	0.26
Main Before D	140504	Q100	1381.00	721.14	729.39		729.51	0.001399	3.50	839.26	265.02	0.25
Main Before D	140504	Q500	2104.00	721.14	730.35		730.50	0.001627	4.16	1103.77	287.41	0.27
Main Before D	140133	Q10	635.00	720.45	727.02		727.11	0.001267	2.74	384.68	185.76	0.23
Main Before D	140133	Q50	1122.00	720.45	728.37		728.47	0.001112	3.08	662.67	225.04	0.23
Main Before D	140133	Q100	1378.00	720.45	729.04		729.13	0.000998	3.14	818.34	242.11	0.22
Main Before D	140133	Q500	2098.00	720.45	729.92		730.05	0.001285	3.88	1040.91	269.39	0.25
Main Before D	139757.*	Q10	635.00	718.65	726.20	724.52	726.38	0.003067	3.65	253.93	172.76	0.34
Main Before D	139757.*	Q50	1122.00	718.65	727.86	725.57	727.98	0.001478	3.27	623.17	312.16	0.25
Main Before D	139757.*	Q100	1378.00	718.65	728.63	726.03	728.72	0.001125	3.12	826.95	352.22	0.22
Main Before D	139757.*	Q500	2098.00	718.65	729.44	726.93	729.55	0.001281	3.63	1226.50	394.41	0.24
Main Before D	139653	Q10	634.00	718.06	726.18	722.10	726.24	0.000499	1.93	333.76	240.20	0.15
Main Before D	139653	Q50	1120.00	718.06	727.78	722.87	727.88	0.000617	2.56	470.05	376.57	0.17
Main Before D	139653	Q100	1376.00	718.06	728.52	723.23	728.63	0.000643	2.80	536.67	431.85	0.18
Main Before D	139653	Q500	2097.00	718.06	729.43	724.15	729.47	0.000300	2.00	1827.83	531.78	0.13
Main Before D	139628	Q10	634.00	717.93	726.15	720.72	726.23	0.000624	2.22	285.72	70.00	0.15
Main Before D	139628	Q50	1120.00	717.93	727.69	721.74	727.85	0.001002	3.21	348.93	193.25	0.19
Main Before D	139628	Q100	1376.00	717.93	728.40	722.22	728.60	0.001160	3.64	377.96	288.22	0.21
Main Before D	139628	Q500	2097.00	717.93	729.22	723.40	729.44	0.001420	4.12	967.13	508.94	0.23
Main Before D	139586		Culvert									
Main Before D	139545	Q10	634.00	718.27	726.03	721.62	726.13	0.000774	2.48	255.27	71.94	0.17
Main Before D	139545	Q50	1120.00	718.27	727.26	722.54	727.47	0.001347	3.68	304.13	186.06	0.24
Main Before D	139545	Q100	1376.00	718.27	727.71	722.98	727.99	0.001678	4.27	322.18	247.84	0.27
Main Before D	139545	Q500	2097.00	718.27	728.65	724.07	729.18	0.002691	5.82	360.01	495.00	0.34
Main Before D	139512	Q10	634.00	718.93	726.02	722.64	726.10	0.000688	2.32	292.68	183.94	0.19
Main Before D	139512	Q50	1120.00	718.93	727.25	723.60	727.40	0.000925	3.17	386.32	234.61	0.23
Main Before D	139512	Q100	1376.00	718.93	727.71	724.00	727.90	0.001069	3.58	421.26	247.21	0.25
Main Before D	139512	Q500	2097.00	718.93	728.69	724.96	729.01	0.001493	4.67	495.78	294.88	0.31
Main Before D	139364	Q10	634.00	719.29	725.88		725.93	0.000608	2.36	634.87	324.78	0.18

HEC-RAS Plan: G#2-Ex NoMNST River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	139364	Q50	1120.00	719.29	727.12		727.17	0.000544	2.56	1074.21	375.76	0.17
Main Before D	139364	Q100	1376.00	719.29	727.59		727.64	0.000552	2.69	1252.77	389.86	0.18
Main Before D	139364	Q500	2097.00	719.29	728.60		728.66	0.000610	3.09	1661.02	420.14	0.19
Main Before D	139277	Q10	634.00	718.35	725.83		725.89	0.000563	2.44	728.69	352.00	0.17
Main Before D	139277	Q50	1120.00	718.35	727.08		727.13	0.000559	2.75	1200.67	406.79	0.18
Main Before D	139277	Q100	1376.00	718.35	727.54		727.60	0.000583	2.92	1393.69	426.97	0.18
Main Before D	139277	Q500	2097.00	718.35	728.54		728.61	0.000667	3.38	1848.99	476.36	0.20
Main Before D	139180	Q10	640.00	718.05	725.74		725.81	0.001237	2.53	462.19	211.10	0.21
Main Before D	139180	Q50	1132.00	718.05	726.98		727.05	0.001201	2.91	872.41	388.75	0.21
Main Before D	139180	Q100	1389.00	718.05	727.45		727.52	0.001134	2.98	1061.04	409.48	0.21
Main Before D	139180	Q500	2117.00	718.05	728.45		728.53	0.001126	3.27	1497.02	458.15	0.21
Main Before D	139153	Q10	640.00	717.97	725.67		725.77	0.001427	2.71	383.53	198.85	0.22
Main Before D	139153	Q50	1132.00	717.97	726.90		727.01	0.001487	3.24	755.86	416.09	0.24
Main Before D	139153	Q100	1389.00	717.97	727.37		727.48	0.001416	3.33	969.43	484.82	0.23
Main Before D	139153	Q500	2117.00	717.97	728.40		728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.04	521.55	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.97	563.79	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.68	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001558	2.31	527.67	468.15	0.23
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.39	497.11	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.56	560.60	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.07		724.18	0.002895	2.67	425.35	176.14	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002976	2.89	485.41	188.21	0.30
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003085	3.43	642.48	225.05	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#2-Ex NoMNST River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.48	0.00	110.09	505.14	22.77	300.94
Main Before D	141476	Q50	730.24	730.15	0.09	1.21	0.00	258.80	773.16	96.03	381.39
Main Before D	141476	Q100	730.72	730.63	0.09	1.09	0.00	336.36	898.56	149.08	431.12
Main Before D	141476	Q500	731.75	731.65	0.09	1.11	0.00	544.27	1232.28	331.46	538.86
Main Before D	140616	Q10	727.77	727.69	0.08	0.14	0.00	0.22	492.72	144.06	231.10
Main Before D	140616	Q50	729.02	728.94	0.08	0.13	0.00	2.32	705.16	418.52	263.52
Main Before D	140616	Q100	729.63	729.55	0.08	0.12	0.00	4.45	804.03	572.52	286.18
Main Before D	140616	Q500	730.64	730.53	0.11	0.14	0.00	11.23	1106.17	986.61	325.82
Main Before D	140504	Q10	727.62	727.51	0.11	0.50	0.01	0.00	471.86	165.14	204.49
Main Before D	140504	Q50	728.89	728.78	0.12	0.42	0.01	0.35	686.30	439.35	250.58
Main Before D	140504	Q100	729.51	729.39	0.11	0.37	0.01	0.90	775.25	604.86	265.02
Main Before D	140504	Q500	730.50	730.35	0.15	0.44	0.00	2.74	1063.64	1037.62	287.41
Main Before D	140133	Q10	727.11	727.02	0.09	0.71	0.01	2.56	476.77	155.67	185.76
Main Before D	140133	Q50	728.47	728.37	0.10	0.49	0.00	10.06	699.82	412.12	225.04
Main Before D	140133	Q100	729.13	729.04	0.10	0.41	0.00	15.76	796.94	565.31	242.11
Main Before D	140133	Q500	730.05	729.92	0.14	0.50	0.01	30.86	1121.52	945.62	269.39
Main Before D	139757.*	Q10	726.38	726.20	0.18	0.11	0.04	6.57	557.44	70.99	172.76
Main Before D	139757.*	Q50	727.98	727.86	0.11	0.10	0.00	49.78	730.16	342.06	312.16
Main Before D	139757.*	Q100	728.72	728.63	0.10	0.09	0.00	89.33	800.14	488.53	352.22
Main Before D	139757.*	Q500	729.55	729.44	0.11	0.06	0.02	175.28	1053.52	869.20	394.41
Main Before D	139653	Q10	726.24	726.18	0.06	0.01	0.00	1.50	632.50		240.20
Main Before D	139653	Q50	727.88	727.78	0.10	0.02	0.01	22.70	1097.30		376.57
Main Before D	139653	Q100	728.63	728.52	0.12	0.02	0.01	44.55	1331.45		431.85
Main Before D	139653	Q500	729.47	729.43	0.05	0.02	0.02	107.32	1473.81	515.87	531.78
Main Before D	139628	Q10	726.23	726.15	0.08				634.00	0.00	70.00
Main Before D	139628	Q50	727.85	727.69	0.16				1119.86	0.14	193.25
Main Before D	139628	Q100	728.60	728.40	0.21				1375.72	0.28	288.22
Main Before D	139628	Q500	729.44	729.22	0.22			139.93	1715.37	241.70	508.94
Main Before D	139586		Culvert								
Main Before D	139545	Q10	726.13	726.03	0.10	0.02	0.01		634.00		71.94
Main Before D	139545	Q50	727.47	727.26	0.21	0.04	0.03		1120.00		186.06
Main Before D	139545	Q100	727.99	727.71	0.28	0.04	0.05		1376.00		247.84
Main Before D	139545	Q500	729.18	728.65	0.53	0.06	0.10		2097.00		495.00
Main Before D	139512	Q10	726.10	726.02	0.08	0.16	0.01	1.06	617.94	15.00	183.94
Main Before D	139512	Q50	727.40	727.25	0.15	0.20	0.03	5.56	1074.36	40.09	234.61
Main Before D	139512	Q100	727.90	727.71	0.19	0.22	0.04	8.34	1313.52	54.15	247.21
Main Before D	139512	Q500	729.01	728.69	0.32	0.27	0.08	17.01	1984.28	95.72	294.88
Main Before D	139364	Q10	725.93	725.88	0.05	0.04	0.00	15.96	369.85	248.19	324.78

HEC-RAS Plan: G#2-Ex NoMNST River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	139364	Q50	727.17	727.12	0.05	0.04	0.00	36.78	492.13	591.09	375.76
Main Before D	139364	Q100	727.64	727.59	0.05	0.04	0.00	50.99	554.74	770.27	389.86
Main Before D	139364	Q500	728.66	728.60	0.06	0.05	0.00	96.99	725.87	1274.14	420.14
Main Before D	139277	Q10	725.89	725.83	0.05	0.08	0.00	9.63	364.62	259.74	352.00
Main Before D	139277	Q50	727.13	727.08	0.05	0.08	0.00	18.68	492.61	608.71	406.79
Main Before D	139277	Q100	727.60	727.54	0.06	0.08	0.00	24.02	556.29	795.70	426.97
Main Before D	139277	Q500	728.61	728.54	0.07	0.08	0.00	51.56	725.91	1319.53	476.36
Main Before D	139180	Q10	725.81	725.74	0.07	0.04	0.00	44.78	419.28	175.94	211.10
Main Before D	139180	Q50	727.05	726.98	0.08	0.04	0.00	120.35	611.75	399.91	388.75
Main Before D	139180	Q100	727.52	727.45	0.07	0.03	0.00	155.05	675.59	558.36	409.48
Main Before D	139180	Q500	728.53	728.45	0.08	0.03	0.00	257.03	859.24	1000.72	458.15
Main Before D	139153	Q10	725.77	725.67	0.09	0.76	0.00	17.77	522.23	100.00	198.85
Main Before D	139153	Q50	727.01	726.90	0.12	0.91	0.01	66.60	788.82	276.58	416.09
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.48	876.72	416.80	484.82
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.05	975.68	6.27	521.55
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.47	1146.30	11.24	563.79
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.76	1560.93	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.71	1120.29		468.15
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.11
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.51	2012.51	1.99	560.60
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.18	724.07	0.11	1.66	0.02		1131.67	0.33	176.14
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.21
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.27	2102.69	13.04	225.05
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#2-Ex NoMNST

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Errors Warnings and Notes for Plan : G#2-Ex NoMNST (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.



Errors Warnings and Notes for Plan : G#2-Ex NoMNST (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X       X   X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX XXXXXXX XXXX
X   X   X       X       X   X   X   X   X
X   X   X       X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/22/2014 11:43:27 AM

Project in English units

PLAN DATA

Plan Title: Group#2 - Ex NoMNST (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p16  
 Geometry Title: Group #2 - Exist Cond No Struct (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g07  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Group #2 -Existing IL-47 Conditions, Proposed Main Street Bridge (low chord at 729.7'), and Existing Route 47 Culvert

Plan Summary Information:

Number of:	Cross Sections =	17	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Average Conveyance  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry	CreekMain Before D	141476	638	1128	1384	2108
Blackberry	CreekMain Before D	140616	637	1126	1381	2104
Blackberry	CreekMain Before D	140133	635	1122	1378	2098
Blackberry	CreekMain Before D	139653	634	1120	1376	2097
Blackberry	CreekMain Before D	139364	634	1120	1376	2097
Blackberry	CreekMain Before D	139180	640	1132	1389	2117
Blackberry	CreekMain Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry	CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry	CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry	CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry	CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #2 - Exist Cond No Struct (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g07

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 736 34.7 734 94.3 732 129.3 730 157 728
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2
671 732 763.7 732.8 825.4 734 914.1 736
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .13 277.6 .055 358.9 .13
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
277.6 358.9 1062 860 750 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010
Station Elevation Data num= 31
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 73418.14586 727.6120.01093 726.7831.69828 724.6539.43155 723.05
43.50174 721.4650.21955 719.7 54.4631 721.24 59.8615 722.8364.14489 726.39
80.94425 727.3290.14719 726.78103.0566 725.91145.4814 725.66150.6872 725.65
155.3922 725.67156.8725 725.7157.8967 725.74198.5372 726.77200.2545 726.8
236.8923 727.16238.7617 727.24276.4147 728.89277.0364 728.92330.2935 730.45
330.6023 730.46384.2168 731.23 390.704 731.32 398.281 731.35424.3695 731.43
424.8041 731.44
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .1120.01093 .0564.14489 .09
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
20.0109364.14489 111 109 107 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS
Station Elevation Data num= 19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88
80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36
Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-186.58 .11 -158.42 .05 -122.47 .11
Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-158.42 -122.47 412 374 230 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010
Station Elevation Data num= 29
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 746.59 .661211 746.4412.27355 744.8346.09943 734.775.93997 725.73

77.66348	724.88	89.8	721.5	94.87	720.45105.2784	721.54	108.037	724.14
117.4982	725.2	158.663	725.14175.4356		725.2199.3833	725.23200.0636		725.25
240.4556	726.41241.4389		726.44281.7278		727.91282.3598	727.93324.4932		729.82
325.104	729.84	368.711	730.36413.5901		730.81414.2438	730.82456.2384		731.28
456.7409	731.29457.6156		731.29501.0569		732.08501.4998	732.09		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1177.66348 .05117.4982 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 77.66348117.4982 350.15 376 403.42 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -185.75 .11 92.33 .05 134.98 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.33 134.98 96.85 104 111.58 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -185.75 -17.4 728.94 F  
 276.6 467.58 728.94 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -189 .09 96.437 .05 189.85 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 96.437 189.85 42 25 47 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -189 69.5 728.94 F  
 159.5 458.336 728.94 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 59											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	139.31	726.24		
140.021	726.208	140.201	726.2	140.321	723.93	142.649	723.41	145.058	721.44		



Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13189.1777 .055255.9665 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 189.1777255.9665 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 189.7 728.94 F  
 229.7520.2271 728.94 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span  
 Culvert #2 Box 6.5 8.75  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 1 82 .013 .015 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 144.875 175.925  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 195.875 226.925

Culvert Name Shape Rise Span  
 Culvert #1 Box 6.5 10.4  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 2 82 .013 .013 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 154.95 165.85  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 205.95 216.85

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139545

INPUT  
 Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
 elevation based on IDOT/GEC tin

Station Elevation Data num= 56  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
 25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
 75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
 122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
 164.8799 727.57166.6929 727.31189.1777 725.42189.4154 725.29190.0861 721.27  
 193.62 720.33197.8178 720.09 198.063 719.93205.5144 719.49205.9518 719.46  
 212.6496 719.03213.5154 718.87213.8096 718.83217.3705 718.27222.0379 719.83  
 222.7267 719.95231.0645 720.01232.1412 720.54 232.23 720.67 232.86 724.17  
 242.69 725.05 249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21  
 272.4837 726.22285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93  
 364.1443 727.74404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37  
 520.2271 729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13189.1777 .055255.9665 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 189.1777255.9665 25 33 40 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 189.7 728.94 F  
 229.7520.2271 728.94 F

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Table with 10 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 42 data points for station elevations.

Table with 5 columns: Manning's n, Values, num, Sta, n Val, Sta, n Val. Contains Manning's n values for 3 points.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff, Contr., Expan. Contains bank station data and coefficients.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139364

INPUT

Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input 07-2010

Table with 10 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 41 data points for station elevations.

Table with 5 columns: Manning's n, Values, num, Sta, n Val, Sta, n Val. Contains Manning's n values for 3 points.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff, Contr., Expan. Contains bank station data and coefficients.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139277

INPUT

Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS, elevation based on IDOT/GEC tin

Table with 10 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 39 data points for station elevations.

Table with 5 columns: Manning's n, Values, num, Sta, n Val, Sta, n Val. Contains Manning's n values for 3 points.

Table with 6 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff, Contr., Expan. Contains bank station data and coefficients.

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data num= 47											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95		
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62		
88.46001	720.0689	37001	719.9394	15001	719.2196	36001	718.0598	99001	719.22		
103.44	719.72	104.16	719.79104	5201	720.3108	8901	723.01109	6001	723.18		
112.0626	723.73112	2529	723.91	132.651	722.85	133.01	722.87133	4516	722.87		
140.9519	722.97157	3524	723.25185	4334	724.32186	8835	724.48	200.824	724.1		
202.8144	724.06237	8324	725.57239	0326	725.87240	7531	725.88359	7095	726.08		
361.3396	726.13412	6096	727.17414	2996	727.28415	0897	727.32417	8119	727.42		
474.3699	728.87475	9402	728.96539	6592	733.47540	1493	733.45540	5194	733.44		
592.1792	737.52592	9095	737.57								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	76.65	.055112	2529	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	76.65	112.2529		27	27	27		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321	94402	728.0524	42452	728.2730	15558	728.433	69627	728.64		
53.62989	728.7655	24017	728.883	58551	728.784	68569	728.6293	64731	727.75		
99.92865	727.16144	9669	725.01148	6377	724.63174	0424	724.03	182.394	723.16		
188.0251	721.86192	4358	721.41	193.546	720.6197	9669	718.93198	8469	718.6		
199.287	718.29200	1873	717.97201	1675	718.25210	6992	719.7211	3994	719.82		
211.8396	720.15215	6702	723.81217	8506	723.69228	2125	723.28234	4736	723.55		
285.1931	724.38290	2141	724.32303	1765	725.57318	4593	725.33334	4223	725.81		
346.4945	725.98360	7272	726.23378	3205	726.04387	0722	726.02388	8324	726.02		
484.5803	726.6559	9542	727.21598	6415	727.49625	3665	728.1634	1082	728.43		
636.6285	728.73653	9019	729.96								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13174	0424	.055215	6702	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	174.0424	215.6702		612	483	587		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010

Station Elevation Data num= 67											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423	72051	733.5850	52278	732.97103	7242	731.47105	4352	731.41		
131.3751	730.4131	8137	730.38158	5284	728.95159	2807	728.91212	4323	726.45		
213.4117	726.4214	4225	726.38237	1291	725.95238	4291	725.87270	6048	725.04		
301.9967	724.55329	4541	724.34348	9568	723.99353	0579	723.93383	6354	723.56		
393.7921	720.73395	9406	718.84397	8362	718.62412	9881	717.03413	5182	717.39		
421.4882	723.09422	3705	723.13423	6802	723.32426	9516	723.8	431.308	724.75		
431.8838	724.82433	9684	725.32438	4547	725.81444	5365	726.47451	8719	727.21		
453.17	727.34462	0598	726.78464	8397	724.87466	0078	724.88660	9682	724.72		
662.7347	724.78665	5562	725.71672	5701	726.12672	9245	726.08	678.82	725.76		
688.87	724.89	720.06	724.86779	3023	724.71779	8826	724.73	781.903	724.91		
794.0884	726.09822	4244	726.78837	3586	729.02851	4493	733.36859	5363	736.1		
859.9111	736.1870	0308	736.22874	1083	735.74999	9396	735.691018	729	735.71		
1019.092	735.731043	219	736.681043	782	736.741094	542	736.951094	985	736.99		
1156.851	738.171162	934	738.32								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.11383	6354	.055426	9516	.11

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	383.6354	426.9516		477	490	222		.1	.3

Ineffective Flow num= 1					
Sta L	Sta R	Elev	Permanent		
453.17	1162.934	727.5	F		

CROSS SECTION



RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227	70591	736.4139	66846	735.9370	28796	734.64103	4348	733.35		
112.8032	732.98127	3655	732.42149	6064	731.55158	5392	731.24192	9704	729.96		
193.9008	729.93228	3727	728.93238	0518	728.63274	1718	727.4274	5956	727.39		
276.3068	727.33311	4224	726.11324	7386	725.78353	8317	725.07371	0858	724.94		
377.2663	724.83386	0002	724.69408	0329	724.48426	6654	724.26441	0691	724.01		
461.0534	723.27479	9106	722.54	480.648	722.51509	3992	722.38518	2288	722.26		
538.5144	722.18541	1888	722.16554	0018	721.87561	3702	718.31562	7351	717.82		
568.9442	717.09571	9603	716.6572	3747	716.53576	5869	717.44579	1799	718		
581.3936	718.56584	1164	722.45585	6533	723.17590	2328	725.28606	3673	726.51		
606.6901	726.5615	4731	726.14621	5073	725.58627	2417	724.05651	4352	724.38		
652.6528	724683	0341	723.96685	8575	724.01686	6508	724.35688	3648	724.29		
689.888	724.18	698.492	724.71727	7194	724.72	755.626	724.31757	1407	724.31		
852.5659	724.38855	0814	724.56855	6722	725.07861	3923	725.08890	1413	727.49		
891.4794	727.52892	5094	727.53932	6591	728.35933	8849	728.4961	7881	729.41		
969.2715	729.75970	3898	729.861004	611	735.131014	855	735.35	1023.59	735.53		
1072.667	732.511073	249	732.51	1110.48	734.54	1141.5	737.11169	515	739.84		
1170.197	739.89										

Manning's n Values						
Sta	n Val	Sta	n Val	Sta	n Val	
0	.13441	0691	.055590	2328	.13	

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	441.0691	1590.2328		465	465	465	.1		.3
Ineffective Flow	num= 1		Permanent						
Sta L	Sta R	Elev	F						
606.4111	70.197	726.7							

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730		
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726		
450.5	724.6	476.8	722.6	485	720	489	718	493	716		
497	715	501	716	505	718	509	720	527.1	722		
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1		
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9		
1083.7	739.7										

Manning's n Values						
Sta	n Val	Sta	n Val	Sta	n Val	
0	.13	450.5	.055	624.8	.13	

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930	720	.1		.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.5924	00007	730.5935	00002	729.1985	00035	727.99119	00003	727.29		
184.0007	726.59229	0009	725.69276	0009	724.09	324.001	721.79374	0013	720.69		
424.0015	720.49474	0016	720.19516	0019	719.79	562.002	719.49565	0021	717.79		
565.0021	716.49	569.002	714.29572	0021	713.99	573.002	714.39	574.002	715.99		
576.002	717.89	583.002	720.09624	0022	721.09674	0022	719.99719	0024	720.29		
764.0026	720.89806	0028	722.19834	0028	723.29874	0029	726.09934	0033	730.89		
979.0035	733.59										

Manning's n Values						
Sta	n Val	Sta	n Val	Sta	n Val	
0	.13474	0016	.055624	0022	.13	

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	474.0016	624.0022		0	0	0	.1		.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139586	Culvert		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139586	Culvert		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	96	97	95
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

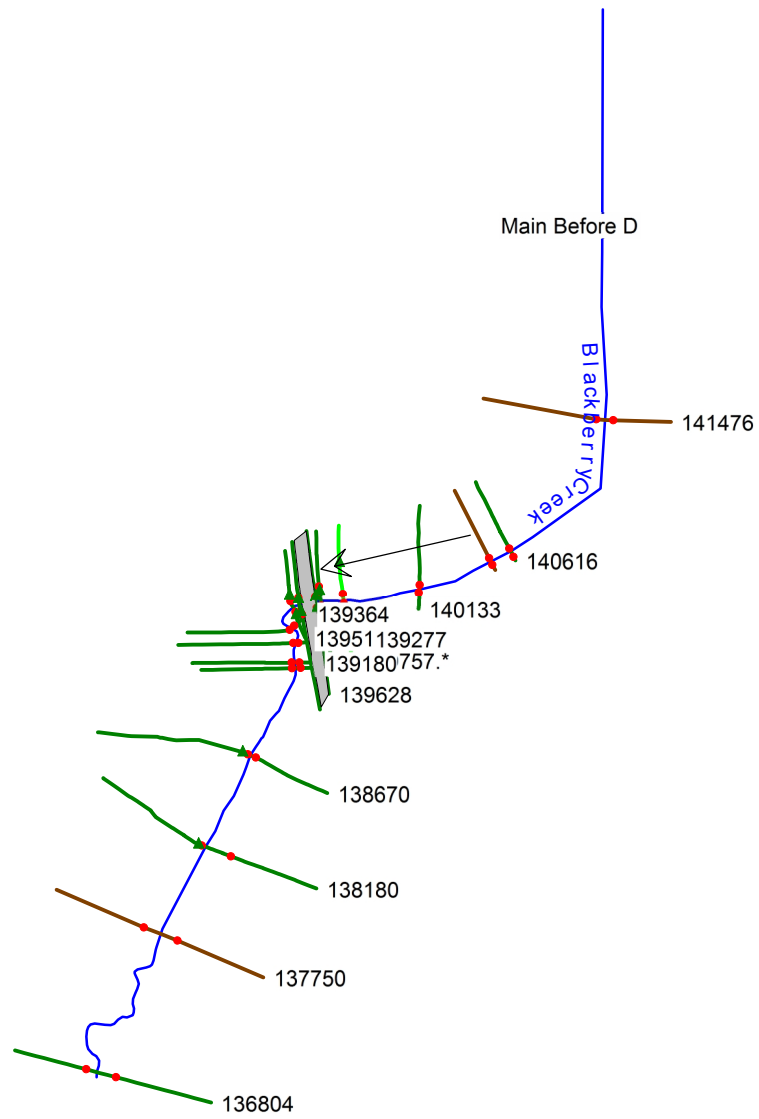
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139586	Culvert	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

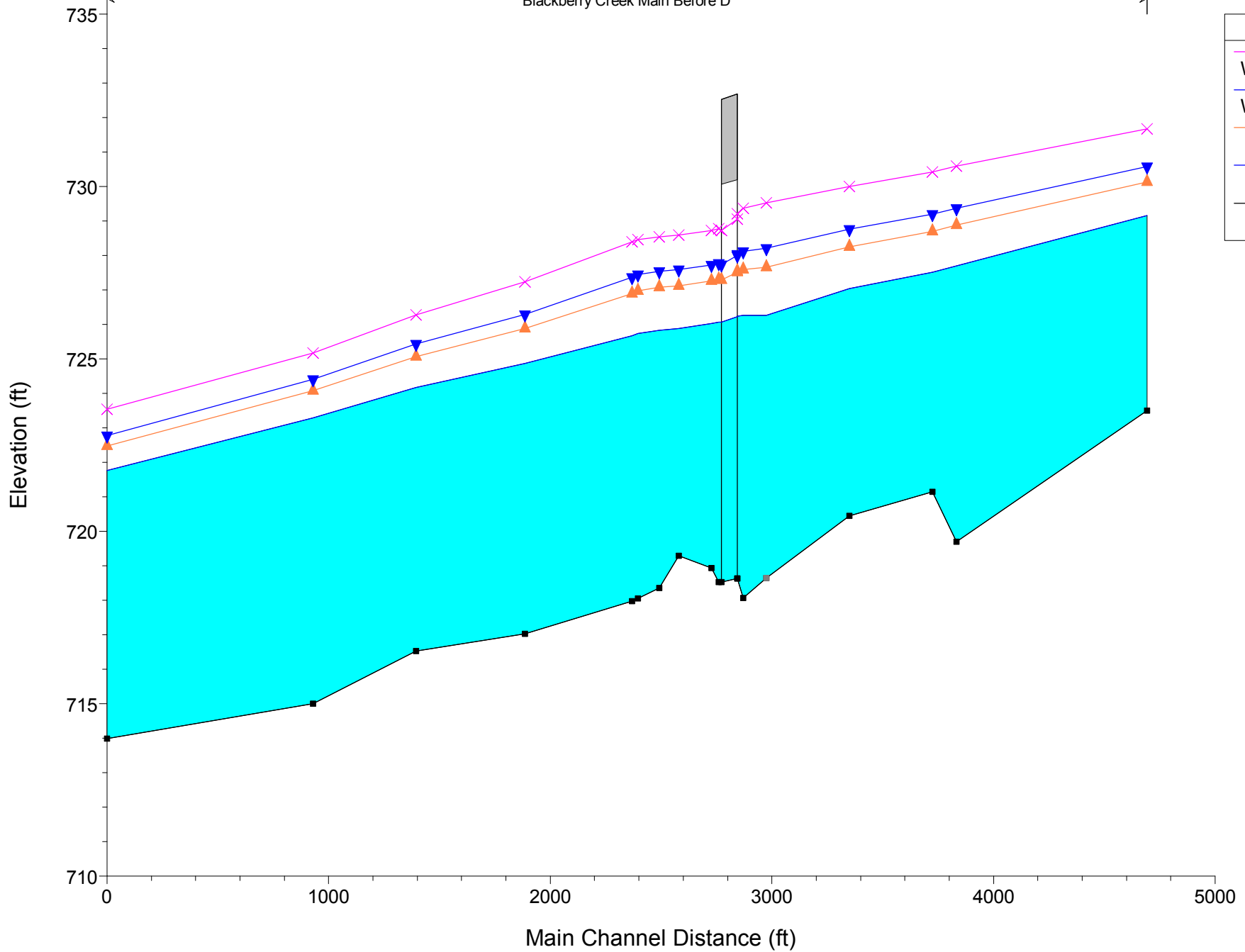
HEC-RAS Model

**GROUP #2 - PROPOSED CONDITIONS**  
**Proposed Rte. 47 Arch, No Main St. bridge**

15.2.7



3 of the 17 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003303	2.68	392.29	300.89	0.31
Main Before D	141476	Q50	1128.00	723.50	730.13		730.23	0.002399	2.88	724.46	380.09	0.28
Main Before D	141476	Q100	1384.00	723.50	730.58		730.67	0.002144	2.97	903.55	425.90	0.27
Main Before D	141476	Q500	2108.00	723.50	731.68		731.77	0.001683	3.12	1434.47	541.71	0.25
Main Before D	140616	Q10	637.00	719.70	727.70		727.77	0.001033	2.49	431.96	231.30	0.21
Main Before D	140616	Q50	1126.00	719.70	728.88		728.96	0.000989	2.85	723.33	261.63	0.21
Main Before D	140616	Q100	1381.00	719.70	729.37		729.46	0.000993	3.02	857.26	279.73	0.21
Main Before D	140616	Q500	2104.00	719.70	730.59		730.70	0.000981	3.39	1226.26	330.18	0.22
Main Before D	140504	Q10	637.00	721.14	727.52		727.63	0.001731	3.06	390.20	204.91	0.26
Main Before D	140504	Q50	1126.00	721.14	728.70		728.82	0.001670	3.53	660.96	248.79	0.27
Main Before D	140504	Q100	1381.00	721.14	729.20		729.33	0.001638	3.71	787.50	260.41	0.27
Main Before D	140504	Q500	2104.00	721.14	730.42		730.56	0.001555	4.09	1123.40	289.00	0.27
Main Before D	140133	Q10	635.00	720.45	727.04		727.13	0.001243	2.73	387.97	186.31	0.23
Main Before D	140133	Q50	1122.00	720.45	728.26		728.36	0.001224	3.19	636.88	222.08	0.24
Main Before D	140133	Q100	1378.00	720.45	728.76		728.88	0.001227	3.38	752.59	235.05	0.24
Main Before D	140133	Q500	2098.00	720.45	730.00		730.13	0.001233	3.83	1064.36	276.88	0.25
Main Before D	139757.*	Q10	635.00	718.65	726.26	724.52	726.43	0.002856	3.56	264.23	178.24	0.33
Main Before D	139757.*	Q50	1122.00	718.65	727.66	725.58	727.79	0.001795	3.51	582.74	301.10	0.28
Main Before D	139757.*	Q100	1378.00	718.65	728.21	726.01	728.34	0.001588	3.54	729.84	330.87	0.26
Main Before D	139757.*	Q500	2098.00	718.65	729.53	726.97	729.65	0.001266	3.64	1119.92	399.67	0.24
Main Before D	139653	Q10	634.00	718.06	726.26	722.14	726.31	0.000399	1.72	374.78	255.41	0.13
Main Before D	139653	Q50	1120.00	718.06	727.60	722.88	727.68	0.000561	2.37	506.13	362.38	0.16
Main Before D	139653	Q100	1376.00	718.06	728.12	723.21	728.23	0.000639	2.67	562.72	399.20	0.18
Main Before D	139653	Q500	2097.00	718.06	729.37	724.02	729.54	0.000821	3.38	695.92	522.30	0.21
Main Before D	139628	Q10	634.00	718.63	726.23	721.70	726.29	0.000580	1.95	325.66	76.33	0.14
Main Before D	139628	Q50	1120.00	718.63	727.54	722.56	727.66	0.000940	2.83	400.79	182.19	0.18
Main Before D	139628	Q100	1376.00	718.63	728.04	722.91	728.20	0.001133	3.24	429.98	218.44	0.20
Main Before D	139628	Q500	2097.00	718.63	729.21	723.80	729.50	0.001646	4.29	497.49	508.23	0.25
Main Before D	139602		Bridge									
Main Before D	139545	Q10	634.00	718.52	726.07	721.60	726.12	0.000559	1.90	333.01	69.11	0.14
Main Before D	139545	Q50	1120.00	718.52	727.31	722.45	727.42	0.000957	2.72	411.61	192.77	0.19
Main Before D	139545	Q100	1376.00	718.52	727.77	722.81	727.92	0.001145	3.12	441.38	262.92	0.21
Main Before D	139545	Q500	2097.00	718.52	728.77	723.70	729.04	0.001695	4.15	505.20	524.41	0.26
Main Before D	139512	Q10	634.00	718.93	726.02	722.65	726.10	0.000645	2.25	325.63	184.36	0.19
Main Before D	139512	Q50	1120.00	718.93	727.26	723.60	727.39	0.000831	3.01	450.82	234.93	0.22
Main Before D	139512	Q100	1376.00	718.93	727.73	724.02	727.89	0.000946	3.38	497.77	247.67	0.24
Main Before D	139512	Q500	2097.00	718.93	728.72	725.02	728.99	0.001281	4.34	598.66	298.62	0.29
Main Before D	139364	Q10	634.00	719.29	725.88		725.93	0.000608	2.36	634.87	324.78	0.18
Main Before D	139364	Q50	1120.00	719.29	727.12		727.17	0.000544	2.56	1074.19	375.76	0.17
Main Before D	139364	Q100	1376.00	719.29	727.59		727.64	0.000552	2.69	1252.77	389.86	0.18
Main Before D	139364	Q500	2097.00	719.29	728.60		728.66	0.000610	3.09	1661.02	420.14	0.19
Main Before D	139277	Q10	634.00	718.35	725.83		725.89	0.000563	2.44	728.69	352.00	0.17
Main Before D	139277	Q50	1120.00	718.35	727.08		727.13	0.000559	2.75	1200.64	406.78	0.18
Main Before D	139277	Q100	1376.00	718.35	727.54		727.60	0.000583	2.92	1393.69	426.97	0.18
Main Before D	139277	Q500	2097.00	718.35	728.54		728.61	0.000667	3.38	1848.99	476.36	0.20
Main Before D	139180	Q10	640.00	718.05	725.74		725.81	0.001237	2.53	462.19	211.10	0.21
Main Before D	139180	Q50	1132.00	718.05	726.98		727.05	0.001201	2.91	872.38	388.74	0.21
Main Before D	139180	Q100	1389.00	718.05	727.45		727.52	0.001134	2.98	1061.04	409.48	0.21
Main Before D	139180	Q500	2117.00	718.05	728.45		728.53	0.001126	3.27	1497.02	458.15	0.21
Main Before D	139153	Q10	640.00	717.97	725.67		725.77	0.001427	2.71	383.53	198.85	0.22
Main Before D	139153	Q50	1132.00	717.97	726.90		727.01	0.001487	3.24	755.84	416.08	0.24
Main Before D	139153	Q100	1389.00	717.97	727.37		727.48	0.001416	3.33	969.43	484.82	0.23
Main Before D	139153	Q500	2117.00	717.97	728.40		728.50	0.001236	3.44	1506.90	556.88	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002220	3.90	455.00	521.54	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.97	563.79	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.71	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001559	2.31	527.58	468.10	0.23

HEC-RAS Plan: G#2-PropNoMNST River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.39	497.11	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.59	560.61	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.07		724.18	0.002900	2.67	425.09	176.09	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002975	2.89	485.46	188.22	0.30
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003084	3.43	642.56	225.07	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#2-PropNoMNST River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.47	0.00	110.06	505.19	22.75	300.89
Main Before D	141476	Q50	730.23	730.13	0.09	1.26	0.00	258.31	774.29	95.40	380.09
Main Before D	141476	Q100	730.67	730.58	0.09	1.21	0.00	334.74	903.56	145.70	425.90
Main Before D	141476	Q500	731.77	731.68	0.09	1.08	0.00	544.75	1229.13	334.12	541.71
Main Before D	140616	Q10	727.77	727.70	0.08	0.14	0.00	0.23	491.96	144.82	231.30
Main Before D	140616	Q50	728.96	728.88	0.08	0.14	0.00	2.19	711.53	412.28	261.63
Main Before D	140616	Q100	729.46	729.37	0.09	0.14	0.00	3.97	820.25	556.77	279.73
Main Before D	140616	Q500	730.70	730.59	0.10	0.13	0.00	11.53	1102.09	990.38	330.18
Main Before D	140504	Q10	727.63	727.52	0.11	0.49	0.01	0.00	471.11	165.89	204.91
Main Before D	140504	Q50	728.82	728.70	0.12	0.46	0.01	0.31	694.04	431.64	248.79
Main Before D	140504	Q100	729.33	729.20	0.13	0.44	0.00	0.74	794.70	585.57	260.41
Main Before D	140504	Q500	730.56	730.42	0.14	0.42	0.00	2.85	1056.63	1044.53	289.00
Main Before D	140133	Q10	727.13	727.04	0.09	0.69	0.01	2.60	475.45	156.95	186.31
Main Before D	140133	Q50	728.36	728.26	0.11	0.56	0.00	9.58	709.87	402.55	222.08
Main Before D	140133	Q100	728.88	728.76	0.11	0.54	0.00	14.36	821.15	542.49	235.05
Main Before D	140133	Q500	730.13	730.00	0.13	0.48	0.00	31.71	1120.39	945.90	276.88
Main Before D	139757.*	Q10	726.43	726.26	0.17	0.09	0.04	7.22	552.70	75.07	178.24
Main Before D	139757.*	Q50	727.79	727.66	0.13	0.10	0.01	44.29	753.42	324.29	301.10
Main Before D	139757.*	Q100	728.34	728.21	0.13	0.10	0.01	72.86	842.83	462.31	330.87
Main Before D	139757.*	Q500	729.65	729.53	0.12	0.11	0.01	191.05	1071.01	835.94	399.67
Main Before D	139653	Q10	726.31	726.26	0.05	0.01	0.00	1.58	632.42		255.41
Main Before D	139653	Q50	727.68	727.60	0.09	0.02	0.00	18.49	1101.51		362.38
Main Before D	139653	Q100	728.23	728.12	0.11	0.02	0.01	36.40	1339.61		399.20
Main Before D	139653	Q500	729.54	729.37	0.17	0.03	0.01	102.26	1994.74		522.30
Main Before D	139628	Q10	726.29	726.23	0.06			0.02	633.96	0.02	76.33
Main Before D	139628	Q50	727.66	727.54	0.12			2.23	1117.03	0.74	182.19
Main Before D	139628	Q100	728.20	728.04	0.16			4.10	1370.57	1.33	218.44
Main Before D	139628	Q500	729.50	729.21	0.28	0.01	0.04	10.99	2082.53	3.48	508.23
Main Before D	139602		Bridge								
Main Before D	139545	Q10	726.12	726.07	0.06	0.02	0.01		634.00		69.11
Main Before D	139545	Q50	727.42	727.31	0.11	0.03	0.00		1120.00		192.77
Main Before D	139545	Q100	727.92	727.77	0.15	0.03	0.00		1376.00		262.92
Main Before D	139545	Q500	729.04	728.77	0.27	0.05	0.00		2097.00		524.41
Main Before D	139512	Q10	726.10	726.02	0.07	0.16	0.01	1.92	599.64	32.45	184.36
Main Before D	139512	Q50	727.39	727.26	0.13	0.19	0.02	14.24	1021.51	84.25	234.93
Main Before D	139512	Q100	727.89	727.73	0.16	0.21	0.03	22.13	1240.94	112.92	247.67
Main Before D	139512	Q500	728.99	728.72	0.26	0.27	0.06	47.01	1852.94	197.05	298.62
Main Before D	139364	Q10	725.93	725.88	0.05	0.04	0.00	15.96	369.85	248.19	324.78
Main Before D	139364	Q50	727.17	727.12	0.05	0.04	0.00	36.78	492.14	591.08	375.76
Main Before D	139364	Q100	727.64	727.59	0.05	0.04	0.00	50.99	554.74	770.27	389.86
Main Before D	139364	Q500	728.66	728.60	0.06	0.05	0.00	96.99	725.87	1274.14	420.14
Main Before D	139277	Q10	725.89	725.83	0.05	0.08	0.00	9.63	364.62	259.74	352.00
Main Before D	139277	Q50	727.13	727.08	0.05	0.08	0.00	18.68	492.61	608.70	406.78
Main Before D	139277	Q100	727.60	727.54	0.06	0.08	0.00	24.02	556.29	795.70	426.97
Main Before D	139277	Q500	728.61	728.54	0.07	0.08	0.00	51.56	725.91	1319.53	476.36
Main Before D	139180	Q10	725.81	725.74	0.07	0.04	0.00	44.78	419.28	175.94	211.10
Main Before D	139180	Q50	727.05	726.98	0.08	0.04	0.00	120.35	611.76	399.90	388.74
Main Before D	139180	Q100	727.52	727.45	0.07	0.03	0.00	155.05	675.59	558.36	409.48
Main Before D	139180	Q500	728.53	728.45	0.08	0.03	0.00	257.03	859.24	1000.72	458.15
Main Before D	139153	Q10	725.77	725.67	0.09	0.76	0.00	17.77	522.23	100.00	198.85
Main Before D	139153	Q50	727.01	726.90	0.12	0.91	0.01	66.60	788.83	276.57	416.08
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.48	876.72	416.80	484.82
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.07	1052.27	889.65	556.88
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64



HEC-RAS Plan: G#2-PropNoMNST River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.03	975.70	6.27	521.54
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.47	1146.30	11.24	563.79
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.78	1560.91	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.97	0.00	11.70	1120.30		468.10
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.11
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.51	2012.50	1.99	560.61
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.18	724.07	0.11	1.66	0.02		1131.67	0.33	176.09
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.22
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.28	2102.68	13.04	225.07
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#2-PropNoMNST

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7

Errors Warnings and Notes for Plan : G#2-PropNoMNST (Continued)

	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10

Errors Warnings and Notes for Plan : G#2-PropNoMNST (Continued)

Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X        X   X       X  X   X  X   X
X   X  X        X   X       X  X   X  X   X
XXXXXXXX XXXX   X          XXX XXXX XXXXXXX XXXX
X   X  X        X          X  X   X  X       X
X   X  X        X   X       X  X   X  X       X
X   X  XXXXXX   XXXX       X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 9/2/2014 11:56:36 AM

Project in English units

PLAN DATA

Plan Title: Group #1 - Proposed (GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p05

Geometry Title: Group #1- Proposed (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g14

Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Proposed 3-sided arch geometry under IL 47 and existing Main St bridge.

Plan Summary Information:

Number of:	Cross Sections =	19	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	141476	638	1128	1384	2108
Blackberry CreekMain	Before D	140616	637	1126	1381	2104
Blackberry CreekMain	Before D	140133	635	1122	1378	2098
Blackberry CreekMain	Before D	139653	634	1120	1376	2097
Blackberry CreekMain	Before D	139364	634	1120	1376	2097
Blackberry CreekMain	Before D	139180	640	1132	1389	2117
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

GEOMETRY DATA

Geometry Title: Group #1- Proposed (GEC)
Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g14

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 141476

INPUT
Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of data.

Table with 6 columns: Manning's n Values, num=, Sta, n Val, Sta, n Val. Contains 3 rows of data.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140616

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 31 rows of data.

Table with 6 columns: Manning's n Values, num=, Sta, n Val, Sta, n Val. Contains 3 rows of data.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140504

INPUT
Description: Smith Engrg 2001. MAIN-N-XS

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 19 rows of data.

Table with 6 columns: Manning's n Values, num=, Sta, n Val, Sta, n Val. Contains 3 rows of data.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left, Channel, Right, Coeff Contr., Expan. Contains 1 row of data.

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 140133

INPUT
Description: IDOT Surveyed XS, Input by GEC 07-2010

Table with 11 columns: Station, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 29 rows of data.

117.4982	725.2	158.663	725.14175	4356	725.2199	3833	725.23200	0.636	725.25
240.4556	726.41241	4389	726.44281	7278	727.91282	3598	727.93324	4.932	729.82
325.104	729.84	368.711	730.36413	5901	730.81414	2438	730.82456	2.384	731.28
456.7409	731.29457	6156	731.29501	0569	732.08501	4998	732.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1177	66348	.05117	4982	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

77.66348	117.4982	350.15	376	403.42	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82		
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24		
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02		
105.75	720.89	105.94	720	108.17	718.65	111.17	718.65	112.41	719.94		
113.8	720.84	114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88		
134.98	724.08	139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36		
275.32	726.65	322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45		
467.58	732.81										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-185.75	.11	92.33	.05	134.98	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

92.33	134.98	96.85	104	111.58	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-185.75	-23.4	733.85	F
287.6	467.58	733.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1		
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21		
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38		
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5		
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35		
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14		
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01		
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-189	.09	96.437	.05	189.85	.09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

96.437	189.85	42	25	47	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-189	61	733.85	F
168.11	458.336	733.85	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66		
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14		
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44		
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	134.49	726.18		
134.61	722	145.21	721.2	152.9	718.63	169.9	718.63	177.58	721.2		
188.19	722	188.33	726.07	201.008	725.99	202.062	726.22	225.184	726.93		

226.063	726.98	257.989	727.24	258.696	727.26	280.162	727.94	288.516	728.21
298.002	728.54	327.195	729.57	327.86	729.59	397.969	731.25	405.368	731.26
406.608	731.27	415.055	731.72	421.627	732.15	508.169	734.32	508.734	734.43
509.762	734.62	510.226	734.63						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 134.49 .055 188.33 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 134.49 188.33 85 85 85 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 131.4 733.85 F  
 189.1 510.226 733.85 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT

Description: US IL 47 Culvert  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 70  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates num= 22  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-283	732.85				-231	732.69				-87.24	732.95			
-37	733.01				63	733.8				113	734.04			
134.11	734.02	717.2	134.12	734.01	720.78	134.93	734.005	723.48						
137.191	734	725.68	138.871	734	726.5	140.63	734	727.14						
144.91	734	728.6	150.76	734	729.43	161.1	733.99	730.2						
171.44	733.99	729.43	176.93	733.99	728.53	181.57	733.99	727.14						
183.52	733.99	725.68	185.2	733.99	723.47	187.46	733.99	720.78						
509.93	735.61													

Upstream Bridge Cross Section Data

Station Elevation Data num= 47  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	126.881	725.98	134.49	726.18
134.61	722	145.21	721.2	152.9	718.63	169.9	718.63	177.58	721.2
188.19	722	188.33	726.07	201.008	725.99	202.062	726.22	225.184	726.93
226.063	726.98	257.989	727.24	258.696	727.26	280.162	727.94	288.516	728.21
298.002	728.54	327.195	729.57	327.86	729.59	397.969	731.25	405.368	731.26
406.608	731.27	415.055	731.72	421.627	732.15	508.169	734.32	508.734	734.43
509.762	734.62	510.226	734.63						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 134.49 .055 188.33 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 134.49 188.33 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 131.4 733.85 F  
 189.1 510.226 733.85 F

Downstream Deck/Roadway Coordinates

num= 23  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-300	733.38				-236.72	732.86				-136.72	732.53			
-36.72	732.8				63.28	733.57				163.28	734.68			
184.65	734.87	717.07	184.66	734.87	720.65	185.47	734.88	723.35						
187.731	734.9	725.55	189.411	734.92	726.37	191.17	734.94	727.01						
194.59	734.98	728.47	201.3	735.05	729.3	211.64	735.15	730.07						
221.98	735.29	729.3	227.89	735.35	728.4	232.11	735.4	727.01						
234.06	735.43	725.55	235.74	735.45	723.34	238	735.47	720.65						
270	735.81		520.23	737.01										

Downstream Bridge Cross Section Data

Station Elevation Data num= 45  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	5.58751	727.87
25.98772	727.7445	5.50551	727.0855	1.6744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	8.5547	728.09	99.5397	728.0599	95.563	728.05120	4.253	728.18
122.487	728.2139	0.998	727.8147	4.827	727.85161	0.936	727.65164	5.641	727.62
164.8799	727.57166	6.929	727.31	185.04	726.07	185.16	721.89	195.76	721.09
203.45	718.52	220.45	718.52	228.13	721.09	238.74	721.89	242.69	725.05
249.6	725.67254	1.034	726.06255	9.665	726.26267	8.916	726.21272	4.837	726.22
285.9674	726.36295	2.535	726.48299	3.572	726.53326	0.629	726.93364	1.443	727.74
404.2786	728.23407	4.756	728.28448	7.252	728.71483	7.318	729.37520	2.271	729.91

Manning's n Values num= 3



Sta n Val Sta n Val Sta n Val  
-300 .13166.6929 .055 249.6 .1

Bank Sta: Left Right Coeff Contr. Expan.  
166.6929 249.6 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-300 179.7 733.85 F  
243.7520.2271 733.85 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .98  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
Momentum Cd = 2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139545

INPUT

Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 45  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
164.8799 727.57166.6929 727.31 185.04 726.07 185.16 721.89 195.76 721.09  
203.45 718.52 220.45 718.52 228.13 721.09 238.74 721.89 242.69 725.05  
249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21272.4837 726.22  
285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93364.1443 727.74  
404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37520.2271 729.91

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-300 .13166.6929 .055 249.6 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
166.6929 249.6 25 33 40 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-300 179.7 733.85 F  
243.7520.2271 733.85 F

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS,  
elevation based on IDOT/GEC tin

Station Elevation Data num= 42  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-75 732 -50 729.5 -20 728 0 726.23 .537122 726.17  
9.693759 725.8817.96078 725.5535.38584 726.2336.01735 726.2236.98616 726.09  
57.37652 725.1859.64951 725.0564.47989 723.44 70.3069 721.5278.64016 720.39  
85.87483 718.9390.61574 719.3790.91806 719.5795.43697 720.56105.7258 722.12  
118.2908 723.9118.9698 724.08127.3197 724.15141.7605 724.04 147.534 724.04  
148.0156 724.04 148.739 724.06 167.183 724.56186.7215 725.5193.0373 725.81  
194.0911 725.83216.7024 726.92218.2687 726.95 242.918 728.48265.4388 728.74  
269.1036 728.77 315.993 731.95316.7762 731.96 318.031 732361.4998 733.74  
361.896 733.75362.2298 733.76

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val

-75 .1359.64951 .045118.9698 .09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
59.64951118.9698		70	148	626	.1	.3
Ineffective Flow	num=					
Sta L	Sta R	Elev	Permanent			
-75	43.9	733.4	F			
144.9362.2298	733.4	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT  
Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input 07-2010

Station Elevation Data	num=	41							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.2325.89646	728.3234.58134	727.6847.53335	726.7461.65466	725.98				
62.86731	725.3171.52296	724.580.80232	723.9286.33195	723.2987.81361	722.7				
91.14569	721.7892.60942	720.993.44381	720.3494.39133	719.797.08542	719.6				
102.3392	719.29113.2782	720.26114.9753	723.84	129.198	723.96172.1069	723.76			
207.7128	723.81245.1637	723.92245.9037	723.94284.2046	724.19284.8347	724.2				
325.5757	724.59326.0558	724.61344.0362	724.9365.4267	725.29366.2567	725.29				
386.9972	725.89407.8078	726.51408.2278	726.53448.8588	729450.0789	729.04				
474.1395	729.48487.6698	729.71490.6599	729.87525.8707	732.04609.3928	738.15				
609.7329	738.17								

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	n Val
0	.1186.33195	.045114.9753	.09	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
86.33195114.9753		141	87	58	.1	.3
Ineffective Flow	num=	1				
Sta L	Sta R	Elev	Permanent			
194.84609.7329	728.57	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT  
Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data	num=	39								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-270.5	731.66	-210	729.95	-30	728.95	0	727.6915.09991	727.46		
19.13766	727.1833.21519	726.3636.79197	725.43	38.4556	725.1743.10466	723.81				
49.34686	722.2749.95718	721.8451.55831	720.2351.95881	720.260.06436	718.35					
60.64471	719.0169.96091	719.2971.04166	720.2171.78226	720.2973.38339	722.87					
75.39461	722.3111.7997	723.27120.8857	723.37125.1487	723.47139.5584	723.98					
169.439	722.97199.0895	724.12243.0502	723.99275.1607	724.28312.3935	724.69					
320.8542	724.82364.3776	725.18	422.652	726.84423.6721	726.87514.6191	731.58				
515.9192	731.63558.3625	738.18628.1378	741.89628.7879	741.9						

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	n Val
-270.5	.1349.34686	.04573.38339	.11	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.3468673.38339		33	35	35	.1	.3
Ineffective Flow	num=	2				
Sta L	Sta R	Elev	Permanent			
-270.5	8.07	728.57	F			
112.73628.7879	728.57	F				

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139242

INPUT  
Description: USF Main St Bridge, GEC Input 07-2010

Station Elevation Data	num=	55								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	730.01.7500667	73020.15028	729.6221.78031	729.5644.05058	729.2					
49.99065	729.1161.35076	728.5178.32095	728.4681.67101	728.42145.5518	728.35					
160.7319	728.08163.6919	728.04	169.422	728.27	170.032	728.26182.3922	727.99			
184.5822	728.01191.5523	727.85192.0423	727.87192.3923	727.89197.0223	727.88					
198.3524	726.62204.9824	728.09206.8825	720.1207.8725	719.88213.0925	719.1					
213.4725	719.24216.7326	720.28218.4826	720.33224.4228	719.24	232.17	716.82				
234.04	716.09	239.43	717.17239.8432	728.23240.5632	728.24241.0232	728.24				
241.2132	727.66252.0134	725.8253.8335	726.88254.4235	727.21257.9736	727.35					
276.074	727.85277.2241	727.97300.2545	728.21300.6246	728.19327.9552	728.22					

343.4694 728.27362.1741 728.3394.0724 728.7 396.213 728.81433.3827 729.1  
435.5333 729.09478.0144 730.2497.8195 730.28505.0213 730.33522.5659 731.1

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .09197.0223 .055241.0232 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
197.0223241.0232 43 43 43 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 206.7 728.57 F  
243.84522.5659 728.57 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139220

INPUT

Description: Main Street Bridge (GEC 2010)

Distance from Upstream XS = 2

Deck/Roadway Width = 40

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 7  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
1.75 730.48 101.82 728.94 205.23 728.59 726.7  
240.58 728.52 726.7 301.98 728.65 502.3 729.64  
602.27 731.66

Upstream Bridge Cross Section Data

Station Elevation Data num= 55  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 730.01.7500667 73020.15028 729.6221.78031 729.5644.05058 729.2  
49.99065 729.1161.35076 728.5178.32095 728.4681.67101 728.42145.5518 728.35  
160.7319 728.08163.6919 728.04 169.422 728.27 170.032 728.26182.3922 727.99  
184.5822 728.01191.5523 727.85192.0423 727.87192.3923 727.89197.0223 727.88  
198.3524 726.62204.9824 728.09206.8825 720.1207.8725 719.88213.0925 719.1  
213.4725 719.24216.7326 720.28218.4826 720.33224.4228 719.24 232.17 716.82  
234.04 716.09 239.43 717.17239.8432 728.23240.5632 728.24241.0232 728.24  
241.2132 727.66252.0134 725.8253.8335 726.88254.4235 727.21257.9736 727.35  
276.074 727.85277.2241 727.97300.2545 728.21300.6246 728.19327.9552 728.22  
343.4694 728.27362.1741 728.3394.0724 728.7 396.213 728.81433.3827 729.1  
435.5333 729.09478.0144 730.2497.8195 730.28505.0213 730.33522.5659 731.1

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .09197.0223 .055241.0232 .09

Bank Sta: Left Right Coeff Contr. Expan.  
197.0223241.0232 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
0 206.7 728.57 F  
243.84522.5659 728.57 F

Downstream Deck/Roadway Coordinates

num= 10  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
0 729.84 7.62 729.64 73.25 728.94  
133.48 728.51 176.17 728.59 726.7 211.78 728.55 726.7  
273.09 728.65 374.15 729.64 400 729.9  
461 731.2

Downstream Bridge Cross Section Data

Station Elevation Data num= 63  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 729.1523.70975 728.8227.89148 728.5981.48389 728.4292.49826 728.3  
111.306 728.28 115.568 728.2138.8976 727.86139.7679 727.87151.9729 727.4  
160.1664 727.89160.8067 727.79161.2372 727.71172.2425 728.22176.3284 728.11  
176.3584 728.3176.7189 727.36 177.47 725.82177.7802 725.18 177.96 725.08  
178.92 724.37179.7504 723.97181.7406 720.15188.4514 719.69195.9922 718.08  
202.94 718.09 208.88 718.24211.1571 718.4211.5572 728.21212.6979 728.22  
215.3794 728.2218.1695 728.17223.3598 726.12226.2598 727.62227.1299 727.59  
233.6101 727.97233.9502 727.96237.7803 727.99255.4309 728.09 257.701 728.08  
258.1511 728.09259.2011 728.11260.1811 728.01270.0684 727.03277.6136 727.28  
290.1828 728.52311.0581 728.56337.4271 728.57340.2892 728.37359.5701 727.36  
362.9002 728.21402.1619 728.27461.9445 730.9470.3348 730.1471.7349 730.13  
484.1907 730.3514.9351 731.97570.0804 734.25575.2929 734.42576.8837 734.48  
635.2205 736.76 638.472 736.89639.2523 736.91

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .09176.3284 .055212.6979 .09

Bank Sta: Left Right Coeff Contr. Expan.  
176.3284212.6979 .3 .5  
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	177.03	728.57	F
212.05639.2523	728.57		F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .98  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
Pier Station Upstream= 222.11 Downstream= 193.92  
Upstream num= 2  
Width Elev Width Elev  
2 714 2 727.6  
Downstream num= 2  
Width Elev Width Elev  
2 714 2 727.6

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
Energy  
Momentum Cd = 2  
Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
Pressure and Weir flow  
Submerged Inlet Cd =  
Submerged Inlet + Outlet Cd = .8  
Max Low Cord =

Additional Bridge Parameters  
Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139201

INPUT  
Description: DSF Main St Bridge, GEC Input 07-2010  
Station Elevation Data num= 63  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	729.1523.70975	728.8227.89148	728.5981.48389	728.4292.49826	728.3				
111.306	728.28 115.568	728.2138.8976	727.86139.7679	727.87151.9729	727.4				
160.1664	727.89160.8067	727.79161.2372	727.71172.2425	728.22176.3284	728.11				
176.3584	728.3176.7189	727.36 177.47	725.82177.7802	725.18 177.96	725.08				
178.92	724.37179.7504	723.97181.7406	720.15188.4514	719.69195.9922	718.08				
202.94	718.09 208.88	718.24211.1571	718.4211.5572	728.21212.6979	728.22				
215.3794	728.2218.1695	728.17223.3598	726.12226.2598	727.62227.1299	727.59				
233.6101	727.97233.9502	727.96237.7803	727.99255.4309	728.09 257.701	728.08				
258.1511	728.09259.2011	728.11260.1811	728.01270.0684	727.03277.6136	727.28				
290.1828	728.52311.0581	728.56337.4271	728.57340.2892	728.37359.5701	727.36				
362.9002	728.21402.1619	728.27461.9445	730.9470.3348	730.1471.7349	730.13				
484.1907	730.3514.9351	731.97570.0804	734.25575.2929	734.42576.8837	734.48				
635.2205	736.76 638.472	736.89639.2523	736.91						

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.09176.3284	.055212.6979		.09	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
176.3284212.6979 20 21 19 .3 .5  
Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
0	177.03	728.57	F
212.05639.2523	728.57		F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139180

INPUT  
Description: DS Main St Xsec, GEC 07-2010  
Station Elevation Data num= 47  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36 37.86	724.74 38.57	724.7 39.19	724.64 59.94	723.95				
63.84	723.94 76.25	723.63 76.65	723.61 84.91	722.68 87.7	720.62				

88.46001	720.0689.37001	719.9394.15001	719.2196.36001	718.0598.99001	719.22
103.44	719.72 104.16	719.79104.5201	720.3108.8901	723.01109.6001	723.18
112.0626	723.73112.2529	723.91 132.651	722.85 133.01	722.87133.4516	722.87
140.9519	722.97157.3524	723.25185.4334	724.32186.8835	724.48 200.824	724.1
202.8144	724.06237.8324	725.57239.0326	725.87240.7531	725.88359.7095	726.08
361.3396	726.13412.6096	727.17414.2996	727.28415.0897	727.32417.8119	727.42
474.3699	728.87475.9402	728.96539.6592	733.47540.1493	733.45540.5194	733.44
592.1792	737.52592.9095	737.57			

Manning's n Values	num=	3
Sta n Val Sta n Val		
0 .1 76.65	.055112.2529	.1

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
76.65112.2529	27 27 27	.1	.3
Ineffective Flow	num=	2	
Sta L Sta R Elev	Permanent		
0 67 727.5	F		
121.6592.9095	727.5 F		

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139153

INPUT

Description: Main St Departure Xsec, GEC 07-2010
Station Elevation Data num= 47
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 731.321.94402 728.0524.42452 728.2730.15558 728.433.69627 728.64
53.62989 728.7655.24017 728.883.58551 728.784.68569 728.6293.64731 727.75
99.92865 727.16144.9669 725.01148.6377 724.63174.0424 724.03 182.394 723.16
188.0251 721.86192.4358 721.41 193.546 720.6197.9669 718.93198.8469 718.6
199.287 718.29200.1873 717.97201.1675 718.25210.6992 719.7211.3994 719.82
211.8396 720.15215.6702 723.81217.8506 723.69228.2125 723.28234.4736 723.55
285.1931 724.38290.2141 724.32303.1765 725.57318.4593 725.33334.4223 725.81
346.4945 725.98360.7272 726.23378.3205 726.04387.0722 726.02388.8324 726.02
484.5803 726.6559.9542 727.21598.6415 727.49625.3665 728.1634.1082 728.43
636.6285 728.73653.9019 729.96

Manning's n Values	num=	3
Sta n Val Sta n Val		
0 .13174.0424	.055215.6702	.1

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
174.0424215.6702	612 483 587	.1	.3
Ineffective Flow	num=	2	
Sta L Sta R Elev	Permanent		
0 158.49 727	F		
239.19653.9019	727 F		

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138670

INPUT

Description: GEC 07-2010
Station Elevation Data num= 67
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
0 734.6423.72051 733.5850.52278 732.97103.7242 731.47105.4352 731.41
131.3751 730.4131.8137 730.38158.5284 728.95159.2807 728.91212.4323 726.45
213.4117 726.4214.4225 726.38237.1291 725.95238.4291 725.87270.6048 725.04
301.9967 724.55329.4541 724.34348.9568 723.99353.0579 723.93383.6354 723.56
393.7921 720.73395.9406 718.84397.8362 718.62412.9881 717.03413.5182 717.39
421.4882 723.09422.3705 723.13423.6802 723.32426.9516 723.8 431.308 724.75
431.8838 724.82433.9684 725.32438.4547 725.81444.5365 726.47451.8719 727.21
453.17 727.34462.0598 726.78464.8397 724.87466.0078 724.88660.9682 724.72
662.7347 724.78665.5562 725.71672.5701 726.12672.9245 726.08 678.82 725.76
688.87 724.89 720.06 724.86779.3023 724.71779.8826 724.73 781.903 724.91
794.0884 726.09822.4244 726.78837.3586 729.02851.4493 733.36859.5363 736.1
859.9111 736.1870.0308 736.22874.1083 735.74999.9396 735.691018.729 735.71
1019.092 735.731043.219 736.681043.782 736.741094.542 736.951094.985 736.99
1156.851 738.171162.934 738.32

Manning's n Values	num=	3
Sta n Val Sta n Val		
0 .11383.6354	.055426.9516	.11

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
383.6354426.9516	477 490 222	.1	.3
Ineffective Flow	num=	1	
Sta L Sta R Elev	Permanent		
453.171162.934	727.5 F		

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138180

INPUT

Description: GEC 07-2010

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227	70591	736.4139	66846	735.9370	28796	734.64103	4348	733.35
112.8032	732.98127	3655	732.42149	6064	731.55158	5392	731.24192	9704	729.96
193.9008	729.93228	3727	728.93238	0518	728.63274	1718	727.4274	5956	727.39
276.3068	727.33311	4224	726.11324	7386	725.78353	8317	725.07371	0858	724.94
377.2663	724.83386	0002	724.69408	0329	724.48426	6654	724.26441	0691	724.01
461.0534	723.27479	9106	722.54	480.648	722.51509	3992	722.38518	2288	722.26
538.5144	722.18541	1888	722.16554	0018	721.87561	3702	718.31562	7351	717.82
568.9442	717.09571	9603	716.6572	3747	716.53576	5869	717.44579	1799	718
581.3936	718.56584	1164	722.45585	6533	723.17590	2328	725.28606	3673	726.51
606.6901	726.5615	4731	726.14621	5073	725.58627	2417	724.05651	4352	724.38
652.6528	724683	0341	723.96685	8575	724.01686	6508	724.35688	3648	724.29
689.888	724.18	698.492	724.71727	7194	724.72	755.626	724.31757	1407	724.31
852.5659	724.38855	0814	724.56855	6722	725.07861	3923	725.08890	1413	727.49
891.4794	727.52892	5094	727.53932	6591	728.35933	8849	728.4961	7881	729.41
969.2715	729.75970	3898	729.861004	611	735.131014	855	735.35	1023.59	735.53
1072.667	732.511073	249	732.51	1110.48	734.54	1141.5	737.11169	515	739.84
1170.197	739.89								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13441	0691	.055590	2328	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	441.0691	590.2328		465	465	465		.1	.3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 606.411170.197 726.7 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930	720		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.5924	00007	730.5935	00002	729.1985	00035	727.99119	00003	727.29
184.0007	726.59229	00009	725.69276	00009	724.09	324.001	721.79374	00013	720.69
424.0015	720.49474	00016	720.19516	00019	719.79	562.002	719.49565	00021	717.79
565.0021	716.49	569.002	714.29572	00021	713.99	573.002	714.39	574.002	715.99
576.002	717.89	583.002	720.09624	00022	721.09674	00022	719.99719	00024	720.29
764.0026	720.89806	00028	722.19834	00028	723.29874	00029	726.09934	00033	730.89
979.0035	733.59								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13474	00016	.055624	00022	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	474.0016	624.0022		0	0	0		.1	.3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139602	Bridge		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139242	.09	.055	.09
Main Before D	139220	Bridge		
Main Before D	139201	.09	.055	.09
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139602	Bridge		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	33	35	35
Main Before D	139242	43	43	43
Main Before D	139220	Bridge		
Main Before D	139201	20	21	19
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

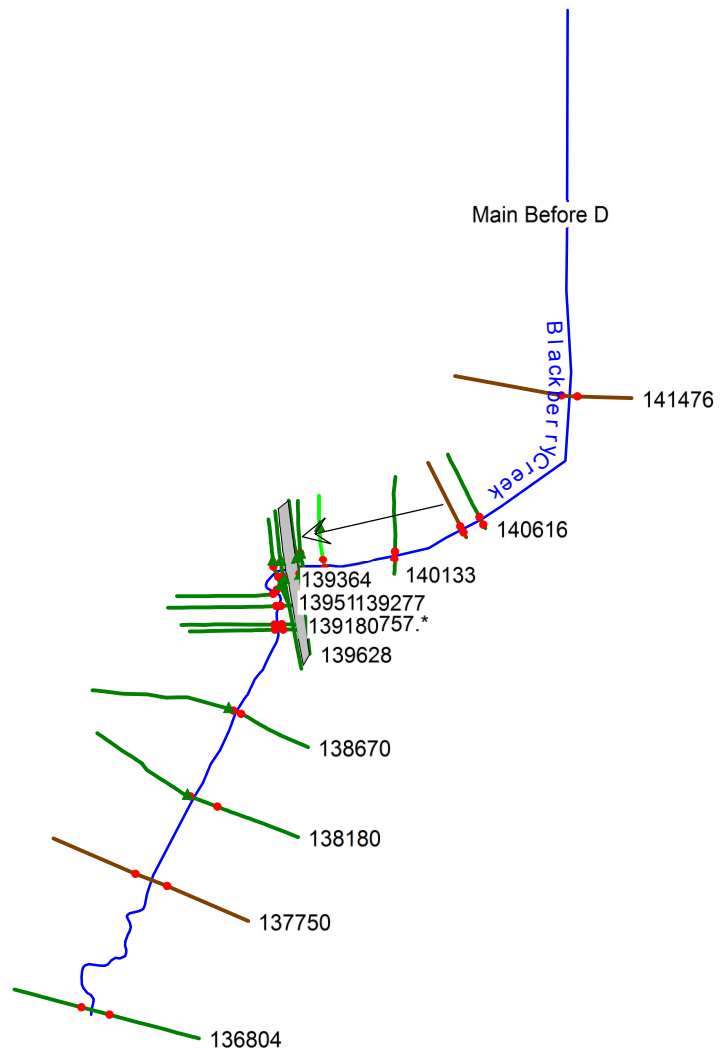
Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Bridge	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139242	.3	.5
Main Before D	139220	Bridge	
Main Before D	139201	.3	.5
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

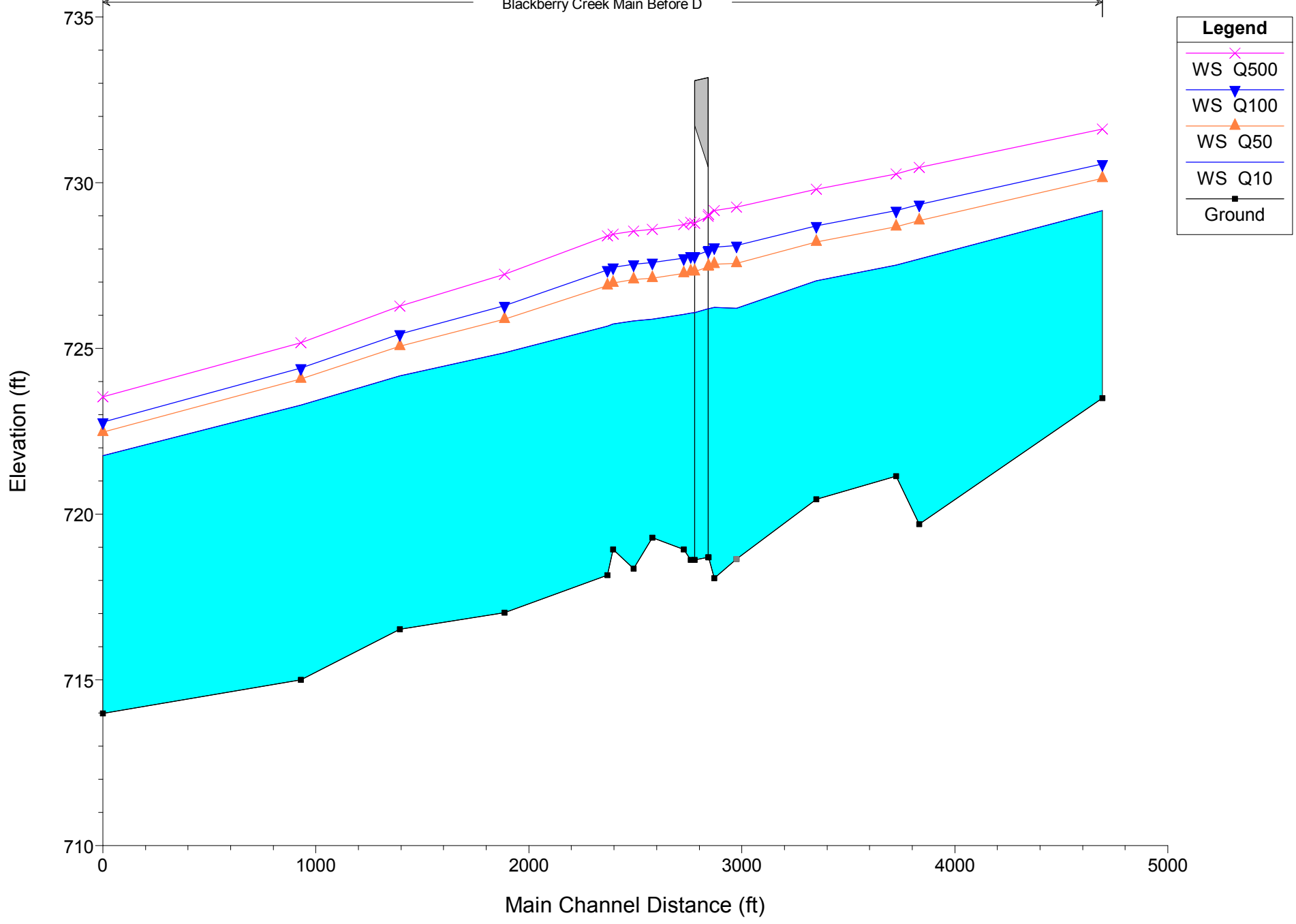
**GROUP #2 - PROPOSED CONDITIONS**

**Proposed Rte. 47 Bridge, No Main St. bridge**





3 of the 17 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	141476	Q10	638.00	723.50	729.15		729.24	0.003302	2.68	392.32	300.90	0.31
Main Before D	141476	Q50	1128.00	723.50	730.13		730.22	0.002410	2.89	723.07	379.71	0.28
Main Before D	141476	Q100	1384.00	723.50	730.57		730.66	0.002168	2.98	899.42	424.90	0.27
Main Before D	141476	Q500	2108.00	723.50	731.62		731.72	0.001770	3.18	1403.83	535.55	0.26
Main Before D	140616	Q10	637.00	719.70	727.69		727.77	0.001036	2.50	431.39	231.23	0.21
Main Before D	140616	Q50	1126.00	719.70	728.86		728.94	0.001007	2.87	717.81	261.09	0.21
Main Before D	140616	Q100	1381.00	719.70	729.34		729.43	0.001023	3.05	846.84	278.32	0.22
Main Before D	140616	Q500	2104.00	719.70	730.46		730.57	0.001059	3.48	1183.30	320.61	0.23
Main Before D	140504	Q10	637.00	721.14	727.51		727.62	0.001737	3.06	389.57	204.77	0.26
Main Before D	140504	Q50	1126.00	721.14	728.67		728.80	0.001709	3.56	654.68	248.20	0.27
Main Before D	140504	Q100	1381.00	721.14	729.15		729.29	0.001698	3.75	776.11	259.38	0.27
Main Before D	140504	Q500	2104.00	721.14	730.27		730.42	0.001719	4.24	1080.20	285.48	0.28
Main Before D	140133	Q10	635.00	720.45	727.03		727.12	0.001250	2.73	386.93	186.14	0.23
Main Before D	140133	Q50	1122.00	720.45	728.22		728.32	0.001266	3.22	628.17	221.08	0.24
Main Before D	140133	Q100	1378.00	720.45	728.70		728.81	0.001291	3.44	737.35	233.38	0.25
Main Before D	140133	Q500	2098.00	720.45	729.81		729.95	0.001359	3.95	1012.54	261.86	0.26
Main Before D	139757.*	Q10	635.00	718.65	726.21	724.57	726.40	0.003115	3.68	253.79	173.74	0.34
Main Before D	139757.*	Q50	1122.00	718.65	727.57	725.62	727.72	0.001998	3.65	569.20	296.28	0.29
Main Before D	139757.*	Q100	1378.00	718.65	728.10	726.06	728.24	0.001755	3.67	716.87	325.08	0.28
Main Before D	139757.*	Q500	2098.00	718.65	729.26	727.04	729.40	0.001498	3.86	1073.63	384.64	0.26
Main Before D	139653	Q10	634.00	718.06	726.24	722.14	726.27	0.000329	1.51	426.25	250.96	0.12
Main Before D	139653	Q50	1120.00	718.06	727.54	722.96	727.60	0.000454	2.07	578.06	359.15	0.15
Main Before D	139653	Q100	1376.00	718.06	728.05	723.23	728.13	0.000515	2.33	647.38	393.81	0.16
Main Before D	139653	Q500	2097.00	718.06	729.16	723.95	729.29	0.000679	2.96	800.00	487.06	0.19
Main Before D	139628	Q10	634.00	718.70	726.20	721.75	726.26	0.000689	1.91	331.88	74.35	0.16
Main Before D	139628	Q50	1120.00	718.70	727.48	722.61	727.58	0.000947	2.62	439.73	178.06	0.19
Main Before D	139628	Q100	1376.00	718.70	727.97	723.00	728.10	0.001083	2.96	482.01	213.33	0.21
Main Before D	139628	Q500	2097.00	718.70	729.04	723.96	729.26	0.001472	3.83	573.67	460.48	0.25
Main Before D	139602		Bridge									
Main Before D	139545	Q10	634.00	718.62	726.07	721.68	726.12	0.000695	1.89	334.98	74.55	0.16
Main Before D	139545	Q50	1120.00	718.62	727.31	722.53	727.42	0.000967	2.60	440.87	193.46	0.19
Main Before D	139545	Q100	1376.00	718.62	727.78	722.91	727.92	0.001111	2.94	484.84	265.58	0.21
Main Before D	139545	Q500	2097.00	718.62	728.80	723.88	729.02	0.001522	3.81	580.77	530.30	0.25
Main Before D	139512	Q10	634.00	718.93	726.02	722.65	726.10	0.000646	2.25	330.21	184.39	0.19
Main Before D	139512	Q50	1120.00	718.93	727.26	723.60	727.38	0.000808	2.96	493.89	234.90	0.22
Main Before D	139512	Q100	1376.00	718.93	727.73	724.02	727.88	0.000907	3.31	555.88	247.69	0.23
Main Before D	139512	Q500	2097.00	718.93	728.73	725.01	728.97	0.001193	4.19	689.63	299.47	0.28
Main Before D	139364	Q10	634.00	719.29	725.88		725.93	0.000607	2.36	635.09	324.80	0.18
Main Before D	139364	Q50	1120.00	719.29	727.12		727.17	0.000544	2.56	1073.50	375.71	0.17
Main Before D	139364	Q100	1376.00	719.29	727.59		727.64	0.000553	2.70	1252.22	389.82	0.18
Main Before D	139364	Q500	2097.00	719.29	728.60		728.66	0.000611	3.09	1660.96	420.13	0.19
Main Before D	139277	Q10	634.00	718.35	725.83		725.89	0.000563	2.44	728.91	352.02	0.17
Main Before D	139277	Q50	1120.00	718.35	727.08		727.13	0.000560	2.75	1199.90	406.72	0.18
Main Before D	139277	Q100	1376.00	718.35	727.54		727.60	0.000583	2.92	1393.07	426.85	0.18
Main Before D	139277	Q500	2097.00	718.35	728.54		728.61	0.000667	3.38	1848.90	476.35	0.20
Main Before D	139180	Q10	640.00	718.93	725.74		725.81	0.001260	2.55	459.86	211.09	0.21
Main Before D	139180	Q50	1132.00	718.93	726.98		727.05	0.001216	2.93	868.97	388.55	0.21
Main Before D	139180	Q100	1389.00	718.93	727.45		727.52	0.001144	3.00	1057.81	409.34	0.21
Main Before D	139180	Q500	2117.00	718.93	728.45		728.53	0.001132	3.29	1494.36	458.11	0.21
Main Before D	139153	Q10	640.00	718.16	725.67		725.77	0.001427	2.72	383.39	198.86	0.22
Main Before D	139153	Q50	1132.00	718.16	726.90		727.01	0.001492	3.25	754.21	415.58	0.24
Main Before D	139153	Q100	1389.00	718.16	727.37		727.48	0.001420	3.34	968.01	484.44	0.23
Main Before D	139153	Q500	2117.00	718.16	728.40		728.50	0.001236	3.44	1506.41	556.83	0.22
Main Before D	138670	Q10	640.00	717.03	724.87	721.13	725.00	0.001655	2.97	276.00	416.64	0.24
Main Before D	138670	Q50	1132.00	717.03	725.88	722.48	726.09	0.002219	3.90	455.03	521.54	0.29
Main Before D	138670	Q100	1389.00	717.03	726.30	723.03	726.53	0.002435	4.28	541.97	563.79	0.30
Main Before D	138670	Q500	2117.00	717.03	727.23	724.75	727.53	0.002819	5.06	768.71	627.19	0.33
Main Before D	138180	Q10	640.00	716.53	724.18	720.55	724.23	0.001438	1.81	354.18	200.09	0.21
Main Before D	138180	Q50	1132.00	716.53	725.07	722.71	725.15	0.001558	2.31	527.61	468.11	0.23

HEC-RAS Plan: G#2-PropBRNoMNST River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	138180	Q100	1389.00	716.53	725.44	722.96	725.53	0.001615	2.52	617.39	497.11	0.23
Main Before D	138180	Q500	2117.00	716.53	726.28	723.55	726.42	0.001759	3.02	850.59	560.61	0.25
Main Before D	137750	Q10	640.00	715.00	723.29		723.36	0.002530	2.15	297.88	147.12	0.27
Main Before D	137750	Q50	1132.00	715.00	724.07		724.18	0.002898	2.67	425.16	176.11	0.30
Main Before D	137750	Q100	1389.00	715.00	724.40		724.53	0.002975	2.89	485.48	188.22	0.30
Main Before D	137750	Q500	2117.00	715.00	725.17		725.35	0.003084	3.43	642.56	225.07	0.32
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.94	722.83	0.001294	2.05	1178.31	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.75	550.09	0.21

HEC-RAS Plan: G#2-PropBRNoMNST River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	141476	Q10	729.24	729.15	0.09	1.47	0.00	110.06	505.18	22.76	300.90
Main Before D	141476	Q50	730.22	730.13	0.09	1.28	0.00	258.16	774.62	95.22	379.71
Main Before D	141476	Q100	730.66	730.57	0.09	1.23	0.00	334.42	904.52	145.06	424.90
Main Before D	141476	Q500	731.72	731.62	0.10	1.15	0.00	543.69	1235.94	328.38	535.55
Main Before D	140616	Q10	727.77	727.69	0.08	0.14	0.00	0.23	492.20	144.58	231.23
Main Before D	140616	Q50	728.94	728.86	0.09	0.14	0.00	2.15	713.71	410.14	261.09
Main Before D	140616	Q100	729.43	729.34	0.09	0.14	0.00	3.87	823.90	553.23	278.32
Main Before D	140616	Q500	730.57	730.46	0.11	0.14	0.00	10.86	1110.94	982.20	320.61
Main Before D	140504	Q10	727.62	727.51	0.11	0.49	0.01	0.00	471.35	165.65	204.77
Main Before D	140504	Q50	728.80	728.67	0.13	0.47	0.01	0.30	696.65	429.05	248.20
Main Before D	140504	Q100	729.29	729.15	0.13	0.47	0.00	0.70	799.23	581.07	259.38
Main Before D	140504	Q500	730.42	730.27	0.15	0.47	0.00	2.61	1072.32	1029.07	285.48
Main Before D	140133	Q10	727.12	727.03	0.09	0.71	0.01	2.59	475.87	156.55	186.14
Main Before D	140133	Q50	728.32	728.22	0.11	0.60	0.00	9.42	713.39	399.20	221.08
Main Before D	140133	Q100	728.81	728.70	0.12	0.58	0.00	14.03	827.19	536.78	233.38
Main Before D	140133	Q500	729.95	729.81	0.14	0.55	0.00	29.86	1124.96	943.19	261.86
Main Before D	139757.*	Q10	726.40	726.21	0.18	0.08	0.04	6.78	555.50	72.72	173.74
Main Before D	139757.*	Q50	727.72	727.57	0.15	0.09	0.02	42.43	763.92	315.65	296.28
Main Before D	139757.*	Q100	728.24	728.10	0.14	0.09	0.02	68.76	849.49	459.75	325.08
Main Before D	139757.*	Q500	729.40	729.26	0.13	0.10	0.00	168.18	1084.70	845.12	384.64
Main Before D	139653	Q10	726.27	726.24	0.04	0.01	0.00	1.37	632.63		250.96
Main Before D	139653	Q50	727.60	727.54	0.07	0.02	0.00	14.94	1105.06		359.15
Main Before D	139653	Q100	728.13	728.05	0.08	0.02	0.01	33.33	1342.67		393.81
Main Before D	139653	Q500	729.29	729.16	0.13	0.02	0.01	100.92	1996.08		487.06
Main Before D	139628	Q10	726.26	726.20	0.06			0.01	633.99		74.35
Main Before D	139628	Q50	727.58	727.48	0.11			5.59	1112.95	1.46	178.06
Main Before D	139628	Q100	728.10	727.97	0.13			10.94	1362.33	2.73	213.33
Main Before D	139628	Q500	729.26	729.04	0.22			29.63	2060.26	7.11	460.48
Main Before D	139602		Bridge								
Main Before D	139545	Q10	726.12	726.07	0.06	0.02	0.01		634.00		74.55
Main Before D	139545	Q50	727.42	727.31	0.10	0.03	0.01	2.09	1116.52	1.39	193.46
Main Before D	139545	Q100	727.92	727.78	0.13	0.03	0.01	5.50	1367.76	2.75	265.58
Main Before D	139545	Q500	729.02	728.80	0.22	0.04	0.00	21.47	2068.03	7.51	530.30
Main Before D	139512	Q10	726.10	726.02	0.07	0.16	0.01	2.38	599.94	31.68	184.39
Main Before D	139512	Q50	727.38	727.26	0.12	0.19	0.02	31.93	1007.01	81.06	234.90
Main Before D	139512	Q100	727.88	727.73	0.15	0.21	0.03	52.66	1215.36	107.98	247.69
Main Before D	139512	Q500	728.97	728.73	0.24	0.26	0.05	119.16	1791.61	186.22	299.47
Main Before D	139364	Q10	725.93	725.88	0.05	0.04	0.00	15.97	369.78	248.25	324.80
Main Before D	139364	Q50	727.17	727.12	0.05	0.04	0.00	36.76	492.32	590.92	375.71
Main Before D	139364	Q100	727.64	727.59	0.05	0.04	0.00	50.97	554.87	770.16	389.82
Main Before D	139364	Q500	728.66	728.60	0.06	0.05	0.00	96.99	725.89	1274.13	420.13
Main Before D	139277	Q10	725.89	725.83	0.05	0.08	0.00	9.64	364.57	259.80	352.02
Main Before D	139277	Q50	727.13	727.08	0.06	0.08	0.00	18.68	492.79	608.53	406.72
Main Before D	139277	Q100	727.60	727.54	0.06	0.08	0.00	24.03	556.42	795.55	426.85
Main Before D	139277	Q500	728.61	728.54	0.07	0.08	0.00	51.56	725.92	1319.52	476.35
Main Before D	139180	Q10	725.81	725.74	0.07	0.04	0.00	45.13	417.51	177.35	211.09
Main Before D	139180	Q50	727.05	726.98	0.08	0.04	0.00	120.83	609.90	401.27	388.55
Main Before D	139180	Q100	727.52	727.45	0.07	0.03	0.00	155.54	673.54	559.92	409.34
Main Before D	139180	Q500	728.53	728.45	0.08	0.03	0.00	257.50	856.96	1002.54	458.11
Main Before D	139153	Q10	725.77	725.67	0.09	0.76	0.00	17.78	522.18	100.04	198.86
Main Before D	139153	Q50	727.01	726.90	0.12	0.92	0.01	66.52	789.39	276.09	415.58
Main Before D	139153	Q100	727.48	727.37	0.11	0.94	0.01	95.40	877.21	416.39	484.44
Main Before D	139153	Q500	728.50	728.40	0.10	0.94	0.02	175.04	1052.53	889.43	556.83
Main Before D	138670	Q10	725.00	724.87	0.13	0.75	0.02	27.90	611.17	0.93	416.64

HEC-RAS Plan: G#2-PropBRNoMNST River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	138670	Q50	726.09	725.88	0.21	0.90	0.04	150.05	975.68	6.27	521.54
Main Before D	138670	Q100	726.53	726.30	0.24	0.96	0.04	231.47	1146.30	11.24	563.79
Main Before D	138670	Q500	727.53	727.23	0.30	1.07	0.05	523.78	1560.91	32.31	627.19
Main Before D	138180	Q10	724.23	724.18	0.05	0.87	0.00	0.06	639.94		200.09
Main Before D	138180	Q50	725.15	725.07	0.08	0.96	0.00	11.70	1120.30		468.11
Main Before D	138180	Q100	725.53	725.44	0.10	1.00	0.00	29.23	1359.76	0.01	497.11
Main Before D	138180	Q500	726.42	726.28	0.13	1.06	0.00	102.51	2012.50	1.99	560.61
Main Before D	137750	Q10	723.36	723.29	0.07	1.56	0.01		640.00		147.12
Main Before D	137750	Q50	724.18	724.07	0.11	1.66	0.02		1131.67	0.33	176.11
Main Before D	137750	Q100	724.53	724.40	0.13	1.68	0.02		1387.20	1.80	188.22
Main Before D	137750	Q500	725.35	725.17	0.18	1.71	0.04	1.28	2102.68	13.04	225.07
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.63	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#2-PropBRNoMNST

Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 141476 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140133 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139757.* Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139653 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q50

Errors Warnings and Notes for Plan : G#2-PropBRNoMNST (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139628 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139602 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139545 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139512 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139277 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139180 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.



Errors Warnings and Notes for Plan : G#2-PropBRNoMNST (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139153 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138670 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138180 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX       XX       XXXX
X   X  X        X   X      X   X      X   X      X
X   X  X        X        X   X      X   X      X
XXXXXXXX XXXX   X        XXX XXXX   XXXXXXXX XXXX
X   X  X        X        X   X      X   X
X   X  X        X   X      X   X      X   X      X
X   X  XXXXXX   XXXX       X   X      X   X      XXXXX
  
```

PROJECT DATA

Project Title: IL47\_MnSt\_Design\_Model\_GEC 2013  
 Project File : IL47\_MnSt\_GEC.prj  
 Run Date and Time: 7/25/2014 9:41:12 AM

Project in English units

PLAN DATA

Plan Title: Group#2 - Pr BR NoMNST(GEC)  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.p18  
 Geometry Title: Group #2 - Prop BR NoStruct (GEC)  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g10  
 Flow Title : 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Plan Description:  
 Group #2 -Proposed Conditions, No Main Street Bridge, Proposed Route 47 76'  
 Single Span Bridge.

Plan Summary Information:

Number of: Cross Sections =	17	Multiple Openings =	0
Culverts =	0	Inline Structures =	0
Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005 Flows New RS (GEC)  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.f06

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	141476	638	1128	1384	2108
Blackberry Creek	Main Before D	140616	637	1126	1381	2104
Blackberry Creek	Main Before D	140133	635	1122	1378	2098
Blackberry Creek	Main Before D	139653	634	1120	1376	2097
Blackberry Creek	Main Before D	139364	634	1120	1376	2097
Blackberry Creek	Main Before D	139180	640	1132	1389	2117
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry Creek	Main Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry Creek	Main Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry Creek	Main Before D	Q100	Known WS = 730.77	Known WS = 722.78

GEOMETRY DATA

Geometry Title: Group #2 - Prop BR NoStruct (GEC)

Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\GEC-modified Arch Hec-Ras\IL47\_MnSt\_GEC.g10

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 141476

INPUT

Description: From FIS Model, originally interpolated cross-section for mapping purposes.

Station Elevation Data		num= 19	
Sta	Elev	Sta	Elev
0	736	34.7	734
277.6	727.9	319.7	727.1
340.2	726.9	358.9	728
671	732	763.7	732.8

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.13	277.6	.055
		358.9	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	277.6	358.9		1062	860		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140616

INPUT

Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data		num= 31	
Sta	Elev	Sta	Elev
0	73418.14586	727.6120.01093	726.7831.69828
43.50174	721.4650.21955	719.7 54.4631	721.24 59.8615
80.94425	727.3290.14719	726.78103.0566	725.91145.4814
155.3922	725.67156.8725	725.7157.8967	725.74198.5372
236.8923	727.16238.7617	727.24276.4147	728.89277.0364
330.6023	730.46384.2168	731.23 390.704	731.32 398.281
424.8041	731.44		731.35424.3695

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.1120.01093		.0564.14489
			.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	20.0109364.14489			111	109		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data		num= 19	
Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75
-145.33	722.69	-139.49	721.34
-122.47	725.97	-97.85	725.68
80.96	728.34	138.26	730.91

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05
		-122.47	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	-158.42	-122.47		412	374		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140133

INPUT

Description: IDOT Surveyed XS, Input by GEC 07-2010

Station Elevation Data		num= 29	
Sta	Elev	Sta	Elev

0	746.59	.661211	746.4412	2.27355	744.8346	0.09943	734.775	9.33997	725.73
77.66348	724.88	89.8	721.5	94.87	720.45105	2.2784	721.54	108.037	724.14
117.4982	725.2	158.663	725.14175	4.356	725.2199	3.833	725.23200	0.636	725.25
240.4556	726.41241	4.389	726.44281	7.278	727.91282	3.598	727.93324	4.932	729.82
325.104	729.84	368.711	730.36413	5.901	730.81414	2.438	730.82456	2.384	731.28
456.7409	731.29457	6.156	731.29501	0.569	732.08501	4.998	732.09		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1177.66348 .05117.4982 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 77.66348117.4982 350.15 376 403.42 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139757.\*

INPUT

Description:

Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-185.75	733.08	-153.16	730.95	-132.29	730.02	-109.38	730.06	-83.93	729.82
-48.29	730.13	14.33	728.13	38.25	727.44	59.64	726.73	69.31	726.24
77.45	725.87	84.07	725.49	92.33	724.96	99.53	723.3	105.43	721.02
105.75	720.89	105.94	720	108.17	718.65	112.41	719.94	113.8	720.84
114.3	721.6	116.86	723.35	124.22	723.74	129.87	723.88	134.98	724.08
139.89	724.24	149.7	724.64	165.91	725.2	182.06	725.36	275.32	726.65
322.52	727.19	363.41	729.26	401.16	730.75	415.87	731.45	467.58	732.81

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -185.75 .11 92.33 .05 134.98 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.33 134.98 96.85 104 111.58 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -185.75 -38.4 734.37 F  
 303.6 467.58 734.37 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139653

INPUT

Description: IL 47 US Xsec, IDOT Surveyed, Input by GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-189	731.22	-166.2	729.14	-142	729.64	-85	729.45	0	728.1
17.892	727.69	22.274	727.66	36.69	727.27	44.324	727.24	54.694	727.21
70.137	726.83	70.14	726.83	85.296	726.39	96.437	724.98	103.453	723.38
109.522	720.75	109.704	719.62	111.881	718.06	117.493	719.02	129.723	719.5
129.815	719.92	132.447	721.55	135.721	720.73	143.417	721.41	145.989	721.35
189.379	723.3	189.85	723.32	190.773	723.34	220.104	724.11	221.458	724.14
275.536	725.56	276.178	725.58	311.625	726.33	344.062	726.05	346.633	726.01
385.947	727.54	422.482	729.35	424.612	729.38	427.452	729.23	458.336	730.76

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 -189 .09 96.437 .05 189.85 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 96.437 189.85 42 25 47 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -189 46.5 734.37 F  
 183.1 458.336 734.37 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139628

INPUT

Description: USF of IL 47 Culvert, GEC 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin, Modified channel geometry to reflect proposed abutment slope walls and natural channel elevations

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44

89.756	727.44	108.388	727.06	126.274	726.23	129.13	726.08	138.89	721.16
145.47	721.09	154.36	718.7	168.24	718.7	176.73	721.09	183.3	721.16
193.07	726.05	202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24
258.696	727.26	280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57
327.86	729.59	397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72
421.627	732.15	508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 129.13 .055 202.062 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 129.13 202.062 85 85 85 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 118.1 734.37 F  
 204.1 510.226 734.37 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139602

INPUT  
 Description: US IL 47 Proposed Bridge  
 Distance from Upstream XS = 4  
 Deck/Roadway Width = 62  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates

num= 13  

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-287	733.47		-170.67	733.17		-17.57	733.72	
74.44	734.37		123.1	734.56	730.1	148.68	734.69	730.23
169.57	734.8	730.33	199.1	734.95	730.48	211.03	734.94	
264.46	734.91		354.3	735.17		408.76	735.5	
508	736.09							

Upstream Bridge Cross Section Data

Station Elevation Data num= 45  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283	730.34	-143	728.62	-90	729.2	-44	728.64	0	728.66
6.1	728.38	6.674	728.21	7.26	728.2	24.43	728.13	25.136	728.14
41.812	728.3	42.255	728.26	56.304	728.26	58.126	728.21	89.087	727.44
89.756	727.44	108.388	727.06	126.274	726.23	129.13	726.08	138.89	721.16
145.47	721.09	154.36	718.7	168.24	718.7	176.73	721.09	183.3	721.16
193.07	726.05	202.062	726.22	225.184	726.93	226.063	726.98	257.989	727.24
258.696	727.26	280.162	727.94	288.516	728.21	298.002	728.54	327.195	729.57
327.86	729.59	397.969	731.25	405.368	731.26	406.608	731.27	415.055	731.72
421.627	732.15	508.169	734.32	508.734	734.43	509.762	734.62	510.226	734.63

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -283 .11 129.13 .055 202.062 .09

Bank Sta: Left Right Coeff Contr. Expan.  
 129.13 202.062 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -283 118.1 734.37 F  
 204.1 510.226 734.37 F

Downstream Deck/Roadway Coordinates

num= 16  

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-339.77	734.43		-247.66	733.58		-90.89	733.11	
-78.51	733.08		17.09	733.63		84.47	734.33	
161.61	735.17		173.65	735.29	731.34	211.4	735.48	731.53
249.64	735.67	731.73	264.33	735.83		375.89	736.89	
429.87	737.1		443.16	737.14		465.03	737.2	
523	737.67							

Downstream Bridge Cross Section Data

Station Elevation Data num= 45  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	731	-200	729.5	-25	728.5	0	728.0715	58751	727.87
25.98772	727.7445	50551	727.0855	16744	727.33	74.0244	727.83	74.7149	727.84
75.38401	727.8391	85547	728.09	99.5397	728.0599	95563	728.05120	4253	728.18
122.487	728.2139	0998	727.8147	4827	727.85161	0936	727.65164	5641	727.62
164.8799	727.57166	6929	727.31	179.63	726.07	189.44	721.08	196.02	721.01
204.91	718.62	218.79	718.62	227.28	721.01	233.85	721.08	242.69	725.05
249.6	725.67254	1034	726.06255	9665	726.26267	8916	726.21272	4837	726.22
285.9674	726.36295	2535	726.48299	3572	726.53326	0629	726.93364	1443	727.74
404.2786	728.23407	4756	728.28448	7252	728.71483	7318	729.37520	2271	729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13 179.63 .055255.9665 .1

Bank Sta: Left Right Coeff Contr. Expan.

179.63255.9665 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 164 733.4 F  
 258.7520.2271 733.4 F

Upstream Embankment side slope = horiz. to 1.0 vertical  
 Downstream Embankment side slope = horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .98  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data  
 Upstream num= 2  
 Sta Elev Sta Elev  
 123.1 730.1 138.87 721.18  
 Downstream num= 2  
 Sta Elev Sta Elev  
 173.65 730.1 189.42 721.07

Abutment Data  
 Upstream num= 2  
 Sta Elev Sta Elev  
 183.3 721.16 199.1 730.1  
 Downstream num= 2  
 Sta Elev Sta Elev  
 233.85 721.04 249.64 730.1

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139545

INPUT  
 Description: DSF IL 47 Culvert, GEC Input 07-2010, 2 extended points LHS,  
 elevation based on IDOT/GEC tin, Modified channel geometry to  
 reflect proposed abutment slope walls and natural channel  
 elevations

Station Elevation Data num= 45  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -300 731 -200 729.5 -25 728.5 0 728.0715.58751 727.87  
 25.98772 727.7445.50551 727.0855.16744 727.33 74.0244 727.83 74.7149 727.84  
 75.38401 727.8391.85547 728.09 99.5397 728.0599.95563 728.05120.4253 728.18  
 122.487 728.2139.0998 727.8147.4827 727.85161.0936 727.65164.5641 727.62  
 164.8799 727.57166.6929 727.31 179.63 726.07 189.44 721.08 196.02 721.01  
 204.91 718.62 218.79 718.62 227.28 721.01 233.85 721.08 242.69 725.05  
 249.6 725.67254.1034 726.06255.9665 726.26267.8916 726.21272.4837 726.22  
 285.9674 726.36295.2535 726.48299.3572 726.53326.0629 726.93364.1443 727.74  
 404.2786 728.23407.4756 728.28448.7252 728.71483.7318 729.37520.2271 729.91

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -300 .13 179.63 .055255.9665 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 179.63255.9665 25 33 40 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -300 164 733.4 F  
 258.7520.2271 733.4 F

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139512

INPUT

Description: Departure IL 47 Culvert, GEC Input 07-2010, 4 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data		num= 42	
Sta	Elev	Sta	Elev
-75	732	-50	729.5
9.693759	725.8817.96078	725.5535.38584	726.2336.01735
57.37652	725.1859.64951	725.0564.47989	723.44 70.3069
85.87483	718.9390.61574	719.3790.91806	719.5795.43697
118.2908	723.9118.9698	724.08127.3197	724.15141.7605
148.0156	724.04 148.739	724.06 167.183	724.56186.7215
194.0911	725.83216.7024	726.92218.2687	726.95 242.918
269.1036	728.77 315.993	731.95316.7762	731.96 318.031
361.896	733.75362.2298	733.76	732361.4998

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
-75	.1359.64951	.045118.9698	.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
59.64951	118.9698	70	148	626	.1	.3		

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
-75	11.4	733.4	F
144.3362	2298	733.4	F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139364

INPUT

Description: Intermediate XSec between IL-47 and Main St Bridge, GEC Input 07-2010

Station Elevation Data		num= 41	
Sta	Elev	Sta	Elev
0	730.2325.89646	728.3234.58134	727.6847.53335
62.86731	725.3171.52296	724.580.80232	723.9286.33195
91.14569	721.7892.60942	720.993.44381	720.3494.39133
102.3392	719.29113.2782	720.26114.9753	723.84 129.198
207.7128	723.81245.1637	723.92245.9037	723.94284.2046
325.5757	724.59326.0558	724.61344.0362	724.9365.4267
386.9972	725.89407.8078	726.51408.2278	726.53448.8588
474.1395	729.48487.6698	729.71490.6599	729.87525.8707
609.7329	738.17		732.04609.3928

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.1186.33195	.045114.9753	.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
86.33195	114.9753	141	87	58	.1	.3		

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139277

INPUT

Description: Main St. Approach XSec, GEC 07-2010, 3 extended points LHS, elevation based on IDOT/GEC tin

Station Elevation Data		num= 39	
Sta	Elev	Sta	Elev
-270.5	731.66	-210	729.95
19.13766	727.1833.21519	726.3636.79197	725.43 38.4556
49.34686	722.2749.95718	721.8451.55831	720.2351.95881
60.64471	719.0169.96091	719.2971.04166	720.2171.78226
75.39461	722.3111.7997	723.27120.8857	723.37125.1487
169.439	722.97199.0895	724.12243.0502	723.99275.1607
320.8542	724.82364.3776	725.18 422.652	726.84423.6721
515.9192	731.63558.3625	738.18628.1378	741.89628.7879

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
-270.5	.1349.34686	.04573.38339	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
49.34686	73.38339	96	97	95	.1	.3		

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139180

INPUT

Description: DS Main St Xsec, GEC 07-2010

Station Elevation Data num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	728.36	37.86	724.74	38.57	724.7	39.19	724.64	59.94	723.95
63.84	723.94	76.25	723.63	76.65	723.61	84.91	722.68	87.7	720.62
88.46001	720.0689.37001		719.9394.15001		719.2196.36001		718.9398.99001		719.22
103.44	719.72	104.16	719.79104.5201		720.3108.8901		723.01109.6001		723.18
112.0626	723.73112.2529		723.91	132.651	722.85	133.01	722.87133.4516		722.87
140.9519	722.97157.3524		723.25185.4334		724.32186.8835		724.48	200.824	724.1
202.8144	724.06237.8324		725.57239.0326		725.87240.7531		725.88359.7095		726.08
361.3396	726.13412.6096		727.17414.2996		727.28415.0897		727.32417.8119		727.42
474.3699	728.87475.9402		728.96539.6592		733.47540.1493		733.45540.5194		733.44
592.1792	737.52592.9095		737.57						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	76.65	.055112.2529		.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	76.65	112.2529		27	27		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139153

INPUT  
Description: Main St Departure Xsec, GEC 07-2010

Station Elevation Data num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	731.321.94402		728.0524.42452		728.2730.15558		728.433.69627		728.64
53.62989	728.7655.24017		728.883.58551		728.784.68569		728.6293.64731		727.75
99.92865	727.16144.9669		725.01148.6377		724.63174.0424		724.03	182.394	723.16
188.0251	721.86192.4358		721.41	193.546	720.6197.9669		718.93198.8469		718.6
199.287	718.29200.1873		718.16201.1675		718.25210.6992		719.7211.3994		719.82
211.8396	720.15215.6702		723.81217.8506		723.69228.2125		723.28234.4736		723.55
285.1931	724.38290.2141		724.32303.1765		725.57318.4593		725.33334.4223		725.81
346.4945	725.98360.7272		726.23378.3205		726.04387.0722		726.02388.8324		726.02
484.5803	726.6559.9542		727.21598.6415		727.49625.3665		728.1634.1082		728.43
636.6285	728.73653.9019		729.96						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13174.0424		.055215.6702		.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	174.0424	215.6702		612	483		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138670

INPUT  
Description: GEC 07-2010

Station Elevation Data num= 67									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.6423.72051		733.5850.52278		732.97103.7242		731.47105.4352		731.41
131.3751	730.4131.8137		730.38158.5284		728.95159.2807		728.91212.4323		726.45
213.4117	726.4214.4225		726.38237.1291		725.95238.4291		725.87270.6048		725.04
301.9967	724.55329.4541		724.34348.9568		723.99353.0579		723.93383.6354		723.56
393.7921	720.73395.9406		718.84397.8362		718.62412.9881		717.03413.5182		717.39
421.4882	723.09422.3705		723.13423.6802		723.32426.9516		723.8	431.308	724.75
431.8838	724.82433.9684		725.32438.4547		725.81444.5365		726.47451.8719		727.21
453.17	727.34462.0598		726.78464.8397		724.87466.0078		724.88660.9682		724.72
662.7347	724.78665.5562		725.71672.5701		726.12672.9245		726.08	678.82	725.76
688.87	724.89	720.06	724.86779.3023		724.71779.8826		724.73	781.903	724.91
794.0884	726.09822.4244		726.78837.3586		729.02851.4493		733.36859.5363		736.1
859.9111	736.1870.0308		736.22874.1083		735.74999.9396		735.691018.729		735.71
1019.092	735.731043.219		736.681043.782		736.741094.542		736.951094.985		736.99
1156.851	738.171162.934		738.32						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.11383.6354		.055426.9516		.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	383.6354	426.9516		477	490		.1	.3

Ineffective Flow num= 1			
Sta L	Sta R	Elev	Permanent
453.17	1162.934	727.5	F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138180



INPUT

Description: GEC 07-2010

Station Elevation Data									
num= 81									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	738.2227	70591	736.4139	66846	735.9370	28796	734.64103	4348	733.35
112.8032	732.98127	3655	732.42149	6064	731.55158	5392	731.24192	9704	729.96
193.9008	729.93228	3727	728.93238	0518	728.63274	1718	727.4274	5956	727.39
276.3068	727.33311	4224	726.11324	7386	725.78353	8317	725.07371	0858	724.94
377.2663	724.83386	0002	724.69408	0329	724.48426	6654	724.26441	0691	724.01
461.0534	723.27479	9106	722.54	480.648	722.51509	3992	722.38518	2288	722.26
538.5144	722.18541	1888	722.16554	0018	721.87561	3702	718.31562	7351	717.82
568.9442	717.09571	9603	716.6572	3747	716.53576	5869	717.44579	1799	718
581.3936	718.56584	1164	722.45585	6533	723.17590	2328	725.28606	3673	726.51
606.6901	726.5615	4731	726.14621	5073	725.58627	2417	724.05651	4352	724.38
652.6528	724683	0341	723.96685	8575	724.01686	6508	724.35688	3648	724.29
689.888	724.18	698.492	724.71727	7194	724.72	755.626	724.31757	1407	724.31
852.5659	724.38855	0814	724.56855	6722	725.07861	3923	725.08890	1413	727.49
891.4794	727.52892	5094	727.53932	6591	728.35933	8849	728.4961	7881	729.41
969.2715	729.75970	3898	729.861004	611	735.131014	855	735.35	1023.59	735.53
1072.667	732.511073	249	732.51	1110.48	734.54	1141.5	737.11169	515	739.84
1170.197	739.89								

Manning's n Values					
num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13441	0691	.055590	2328	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	441.0691	590.2328		465	465	465		.1	.3
Ineffective Flow									
num= 1									
Sta L	Sta R	Elev	Permanent						
606.411	170.197	726.7	F						

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data									
num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values					
num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930	720		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 136804

INPUT

Description: Cross-Section Data from FIS Model, By IDNR 1985

Station Elevation Data									
num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.5924	00007	730.5935	00002	729.1985	00035	727.99119	0003	727.29
184.0007	726.59229	0009	725.69276	0009	724.09	324.001	721.79374	0013	720.69
424.0015	720.49474	0016	720.19516	0019	719.79	562.002	719.49565	0021	717.79
565.0021	716.49	569.002	714.29572	0021	713.99	573.002	714.39	574.002	715.99
576.002	717.89	583.002	720.09624	0022	721.09674	0022	719.99719	0024	720.29
764.0026	720.89806	0028	722.19834	0028	723.29874	0029	726.09934	0033	730.89
979.0035	733.59								

Manning's n Values					
num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13474	0016	.055624	0022	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	474.0016	624.0022		0	0	0		.1	.3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	141476	.13	.055	.13
Main Before D	140616	.11	.05	.09
Main Before D	140504	.11	.05	.11
Main Before D	140133	.11	.05	.09
Main Before D	139757.*	.11	.05	.09
Main Before D	139653	.09	.05	.09
Main Before D	139628	.11	.055	.09
Main Before D	139602	Bridge		
Main Before D	139545	.13	.055	.1
Main Before D	139512	.13	.045	.09
Main Before D	139364	.11	.045	.09
Main Before D	139277	.13	.045	.11
Main Before D	139180	.1	.055	.1
Main Before D	139153	.13	.055	.1
Main Before D	138670	.11	.055	.11
Main Before D	138180	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	141476	1062	860	750
Main Before D	140616	111	109	107
Main Before D	140504	412	374	230
Main Before D	140133	350.15	376	403.42
Main Before D	139757.*	96.85	104	111.58
Main Before D	139653	42	25	47
Main Before D	139628	85	85	85
Main Before D	139602	Bridge		
Main Before D	139545	25	33	40
Main Before D	139512	70	148	626
Main Before D	139364	141	87	58
Main Before D	139277	96	97	95
Main Before D	139180	27	27	27
Main Before D	139153	612	483	587
Main Before D	138670	477	490	222
Main Before D	138180	465	465	465
Main Before D	137750	760	930	720
Main Before D	136804	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	141476	.1	.3
Main Before D	140616	.1	.3
Main Before D	140504	.1	.3
Main Before D	140133	.1	.3
Main Before D	139757.*	.1	.3
Main Before D	139653	.1	.3
Main Before D	139628	.3	.5
Main Before D	139602	Bridge	
Main Before D	139545	.3	.5
Main Before D	139512	.1	.3
Main Before D	139364	.1	.3
Main Before D	139277	.1	.3
Main Before D	139180	.1	.3
Main Before D	139153	.1	.3
Main Before D	138670	.1	.3
Main Before D	138180	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

## **15.3 Group #3 Supporting Calculations (Permit Models)**

15.3.A Group #3 WIT- Arch Culvert option, Backup Calculations, Waterway opening Plot, and and Created Head Tables

15.3.i Group #3 WIT- Bridge option, Backup Calculations, Waterway opening Plot, and and Created Head Tables

15.3.AA Water Surface Elevation Comparison between FIS and Duplicate Models

15.3.1 Natural Condition HEC-RAS Model

15.3.2 Existing Condition HEC-RAS Model

15.3.3 Proposed IL47 Arch Culvert Condition HEC-RAS Model

15.3.4 Proposed IL47 Bridge Condition HEC-RAS Model

15.3.5 Duplicate Model

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #3 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Arch, Existing Main St bridge in place)

Route: IL Route 47  
 Waterway: Blackberry Creek - Main before D  
 Section: 107B-I-1  
 County: Kane

Existing S.N.: 045-2000  
 Proposed S.N.: 045-2050  
 Prepared By: SJS Date: Sep-14  
 Checked By: DH Date: Sep-14

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	325.1	726.61	0.03	0.06	726.64	726.67
DESIGN	50	1120	1120	203.2	379.8	728.00	0.44	0.18	728.44	728.18
BASE	100	1376	1376	203.2	399.8	728.62	0.40	0.24	729.02	728.86
MAX. CALC.	500	2097	2097	1053.4~	430.8	730.35	0.06	0.67	730.41	731.02

Existing Overtopping Elevation = 729.53 at Sta. 501+17  
 Proposed Overtopping Elevation = 733.97 at Sta. 501+17

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
 Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s  
 10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.95 ft/s  
 2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

## EXISTING STRUCTURE

TYPE: RC Box Culvert  
 LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'  
 # SPANS/CELLS: 4  
 SKEW: 0 (relative to road)  
 LOW EOP: 728.59 @ 501+17 20' RT  
 FREEBOARD: 0.11 ft  
 CULVERT INV. 718.38 (U/S) 718.25 (D/S)

## PROPOSED STRUCTURE

3-SIDED CULVERT TYPE: Pre-Cast Concrete Arch  
 LENGTH OF SPAN: 54 ft  
 # CELLS: 1  
 TOP OF CROWN ELEVATION: 731.36  
 SKEW: 0 (relative to road)  
 FLOWLINE ELEV: 718.63 (u/s) 718.52 (d/s)  
 LOW EOP: 733.52 @ 501+17 60' RT  
 FREEBOARD: 5.38 ft

NOTE: Proposed structure details are preliminary. Subject to refinement in TS&L stage.

Waterway openings are based on the natural H.W.E.

Natural HW E taken from cross-section 139750 in Group #3 Natural Conditions model.

The existing head is the difference in water surface elevations between existing and natural conditions.

The proposed head is the difference in water surface elevations between proposed and natural conditions

The freeboard is calculated from the edge of the proposed shoulder at 500+17

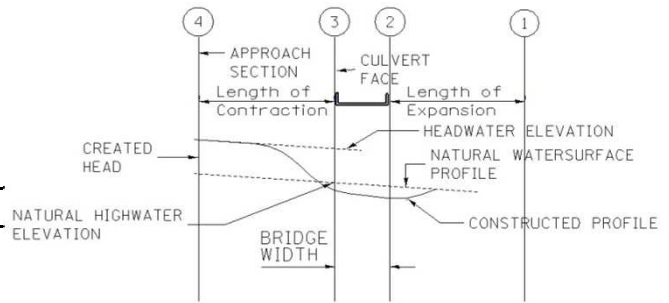
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.

~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

**BACKUP CALCULATIONS: Group #3 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14  
 Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.35	726.61	726.61
50-year	727.79	728.00	728.00
100-year	728.42	728.62	728.62
500-year	730.17	730.35	730.35

Section #1 : 139478<sup>+</sup>  
 Section #2 : 139536  
 Section #3 : 139620  
 Section #4 : 139750

\*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sub>3</sub>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	726.64	726.67	0.03	0.06
50-year	728.00	728.44	728.18	0.44	0.18
100-year	728.62	729.02	728.86	0.40	0.24
500-year	730.35	730.41	731.02	0.06	0.67

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	0.03	0.06	726.64	726.67
50-year	728.00	0.44	0.18	728.44	728.18
100-year	728.62	0.40	0.24	729.02	728.86
500-year	730.35	0.06	0.67	730.41	731.02

<sup>1</sup> Natural Condition - Group #3 - Natural Conditions HEC-RAS Model.

<sup>2</sup> Existing Condition - Group #3 - Existing Conditions HEC-RAS Model.

<sup>3</sup> Proposed Condition - Group #3 - Proposed Condition HEC-RAS Model, does not include raised IL-47 profile.

<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.

**BACK-UP CALCULATIONS FOR WIT: Group #3 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
6.89	5.38	4.70	2.54
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
N/A	N/A	N/A	N/A

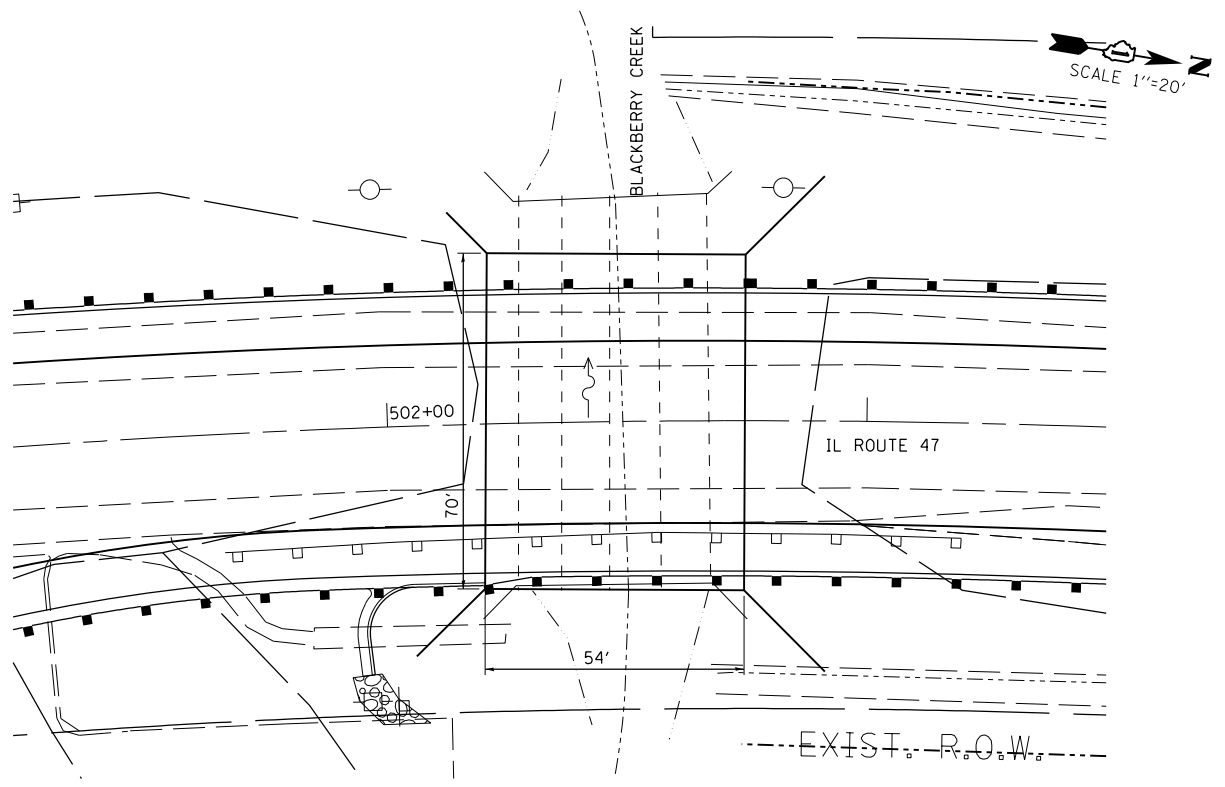
*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25	717.27	717.07
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	325.10	
50-YR	203.20	379.80	
100-YR	203.20	399.80	
500-YR	1053.40	430.80	

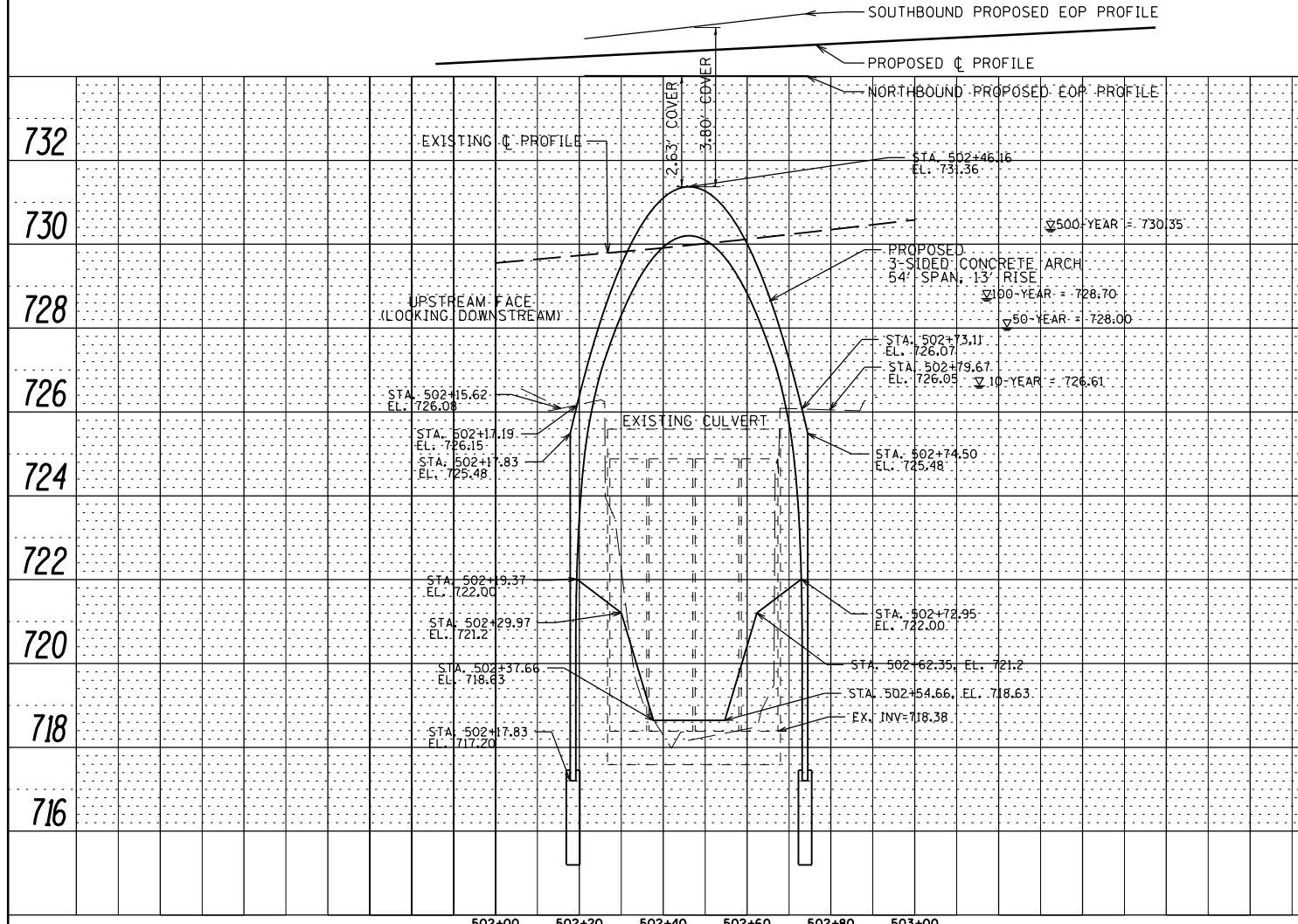
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.

PLAN	DESIGNED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	



PROFILE	DESIGNED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	B.M. NOTED	
	STRUCTURE NOTATIONS CHECKED	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\0144909-sht-drain-struct.plnprf-EX-2-CONS	DRAWN.dgn	CHECKED -	REVISED -
		DATE -	REVISED -

STATE OF  
DEPARTMENT OF

**Created Head - G#3 - Existing/Proposed Conditions - (Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.47	727.49	0.02	727.50	0.03
Main Before D	139750		726.61	726.64	0.03	726.67	0.06
Main Before D	139620						
Main Before D	140600	50-yr	730.25	730.3	0.05	730.27	0.02
Main Before D	140504		728.75	729.02	0.27	728.85	0.10
Main Before D	139750		728	728.44	0.44	728.18	0.18
Main Before D	139620						
Main Before D	140600	100-yr	730.69	730.76	0.07	730.72	0.03
Main Before D	140504		729.32	729.58	0.26	729.47	0.15
Main Before D	139750		728.62	729.02	0.40	728.86	0.24
Main Before D	139620						
Main Before D	140600	500-yr	731.89	731.92	0.03	732.22	0.33
Main Before D	140504		730.89	730.93	0.04	731.43	0.54
Main Before D	139750		730.35	730.41	0.06	731.02	0.67
Main Before D	139620						

Natural condition contains existing Main St structure with 47 culvert removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert



**Created Head - G#3 - Existing/Proposed Conditions - 10-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q10	729.32	729.32	0.00	729.32	0.00	729.32	0.00
Main Before D	140504	Q10	727.47	727.49	0.02	727.50	0.03	727.47	0.00
Main Before D	139750	Q10	726.61	726.64	0.03	726.67	0.06	726.61	0.00
Main Before D	139620	Q10							
Main Before D	139600								
Main Before D	139536	Q10							
Main Before D	139478	Q10	726.35	726.35	0.00	726.35	0.00	726.35	0.00
Main Before D	139355	Q10	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	139297	Q10	726.29	726.29	0.00	726.29	0.00	726.29	0.00
Main Before D	139256	Q10	726.22	726.22	0.00	726.22	0.00	726.22	0.00
Main Before D	139250								
Main Before D	139206	Q10	726.14	726.14	0.00	726.14	0.00	726.14	0.00
Main Before D	139158	Q10	726.1	726.1	0.00	726.10	0.00	726.10	0.00
Main Before D	138418	Q10	725.26	725.26	0.00	725.26	0.00	725.26	0.00
Main Before D	137750	Q10	723.37	723.37	0.00	723.37	0.00	723.37	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Existing Main St structure with 47 culvert removed

Existing condition contains Existing Main St structure and existing 47 culvert

Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#3 - Existing/Proposed Conditions - 50-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q50	730.25	730.3	0.05	730.27	0.02	730.26	0.01
Main Before D	140504	Q50	728.75	729.02	0.27	728.85	0.10	728.79	0.04
Main Before D	139750	Q50	728	728.44	0.44	728.18	0.18	728.08	0.08
Main Before D	139620	Q50							
Main Before D	139600								
Main Before D	139536	Q50							
Main Before D	139478	Q50	727.79	727.75	-0.04	727.75	-0.04	727.76	-0.03
Main Before D	139355	Q50	727.74	727.71	-0.03	727.71	-0.03	727.71	-0.03
Main Before D	139297	Q50	727.74	727.7	-0.04	727.70	-0.04	727.70	-0.04
Main Before D	139256	Q50	727.58	727.54	-0.04	727.54	-0.04	727.54	-0.04
Main Before D	139250								
Main Before D	139206	Q50	727.27	727.24	-0.03	727.24	-0.03	727.24	-0.03
Main Before D	139158	Q50	727.22	727.22	0.00	727.22	0.00	727.22	0.00
Main Before D	138418	Q50	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	137750	Q50	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Existing Main St structure with 47 culvert removed

Existing condition contains Existing Main St structure and existing 47 culvert

Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#3 - Existing/Proposed Conditions - 100-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q100	730.69	730.76	0.07	730.72	0.03	730.7	0.01
Main Before D	140504	Q100	729.32	729.58	0.26	729.47	0.15	729.38	0.06
Main Before D	139750	Q100	728.62	729.02	0.40	728.86	0.24	728.71	0.09
Main Before D	139620	Q100							
Main Before D	139600								
Main Before D	139536	Q100							
Main Before D	139478	Q100	728.42	728.36	-0.06	728.36	-0.06	728.36	-0.06
Main Before D	139355	Q100	728.37	728.32	-0.05	728.32	-0.05	728.32	-0.05
Main Before D	139297	Q100	728.37	728.32	-0.05	728.32	-0.05	728.32	-0.05
Main Before D	139256	Q100	728.16	728.1	-0.06	728.10	-0.06	728.10	-0.06
Main Before D	139250								
Main Before D	139206	Q100	727.67	727.62	-0.05	727.62	-0.05	727.62	-0.05
Main Before D	139158	Q100	727.61	727.61	0.00	727.61	0.00	727.61	0.00
Main Before D	138418	Q100	726.63	726.63	0.00	726.63	0.00	726.63	0.00
Main Before D	137750	Q100	724.52	724.52	0.00	724.53	0.01	724.52	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Existing Main St structure with 47 culvert removed

Existing condition contains Existing Main St structure and existing 47 culvert

Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

**Created Head - G#3 - Existing/Proposed Conditions - 500-yr event (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q500	731.89	731.92	0.03	732.22	0.33	731.97	0.08
Main Before D	140504	Q500	730.89	730.93	0.04	731.43	0.54	731.03	0.14
Main Before D	139750	Q500	730.35	730.41	0.06	731.02	0.67	730.52	0.17
Main Before D	139620	Q500							
Main Before D	139600								
Main Before D	139536	Q500							
Main Before D	139478	Q500	730.17	730.18	0.01	730.18	0.01	730.18	0.01
Main Before D	139355	Q500	730.14	730.14	0.00	730.14	0.00	730.14	0.00
Main Before D	139297	Q500	730.14	730.15	0.01	730.15	0.01	730.15	0.01
Main Before D	139256	Q500	729.78	729.78	0.00	729.78	0.00	729.78	0.00
Main Before D	139250								
Main Before D	139206	Q500	728.59	728.45	-0.14	728.45	-0.14	728.45	-0.14
Main Before D	139158	Q500	728.5	728.5	0.00	728.50	0.00	728.50	0.00
Main Before D	138418	Q500	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	137750	Q500	725.31	725.3	0.01	725.30	-0.01	725.30	-0.01
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Existing Main St structure with 47 culvert removed

Existing condition contains Existing Main St structure and existing 47 culvert

Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #3 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Bridge, with Existing Main St bridge in place)

Route: IL Route 47	Existing S.N.: 045-2000
Waterway: Blackberry Creek - Main before D	Proposed S.N.: 045-2050
Section: 107B-I-1	Prepared By: SJS Date: Jul-14
County: Kane	Checked By: DH Date: Jul-14

Drainage Area =	11.32 sq mi	Existing Overtopping Elevation =	729.53	at Sta. 501+17							
		Proposed Overtopping Elevation =	734.50	at Sta. 501+17							
Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.		Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
	10	634	634	203.2	349.9	726.61	726.61	0.03	0.00	726.64	726.61
DESIGN	50	1120	1120	203.2	452.9	728.00	728.00	0.44	0.08	728.44	728.08
BASE	100	1376	1376	203.2	498.2	728.62	728.62	0.40	0.09	729.02	728.71
MAX. CALC.	500	2097	2097	1053.4~	619.4	730.35	730.35	0.06	0.17	730.41	730.52

**Datum:** NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
 10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s  
 10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.81 ft/s  
 Surveyed Normal Water Level: 719.83 ft  
 2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

### EXISTING STRUCTURE

**TYPE:** RC Box Culvert  
**LENGTH/WIDTH:** (2) 6.5' x 8.75' & (2) 6.5'x10.42'  
**# SPANS/CELLS:** 4  
**SKEW:** 0 (relative to road)  
**LOW EOP:** 728.59 @ 501+17 20' RT  
**FREEBOARD:** 0.11 ft  
**CULVERT INV.** 718.38 (U/S) 718.25 (D/S)

**NOTE:** Proposed structure details are preliminary. Subject to refinement in TS&L stage.  
 Waterway openings are based on the natural H.W.E.  
 Natural HWE taken from cross-section 139750 in Group #3 Natural Conditions model.  
 The existing head is the difference in water surface elevations between existing and natural conditions.  
 The proposed head is the difference in water surface elevations between proposed and natural conditions  
 The freeboard is calculated from the edge of the proposed shoulder at 501+17  
 Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.  
 ~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

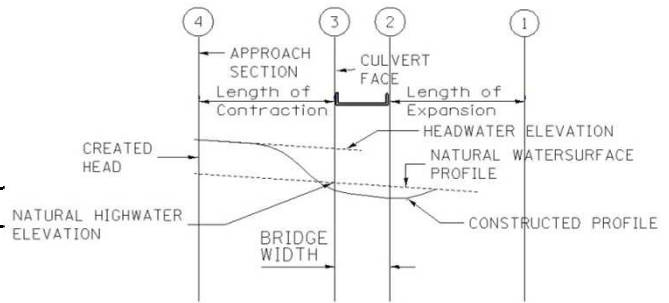
### PROPOSED STRUCTURE

**TYPE:** Open abutment with steel superstructure  
**LENGTH OF SPAN:** 76 ft  
**# SPANS:** 1  
**LOW CHORD:** 730.10  
**SKEW:** 0 (relative to road)  
**CLEARANCE:** 2.10 ft  
**BRIDGE FLOW LINE:** 718.7 (U/S) 718.62 (D/S)  
**LOW EOP:** 734.1 @ 501+17 22' RT  
**FREEBOARD:** 6.02 ft

**BACKUP CALCULATIONS: Group #3 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14  
 Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.35	726.61	726.61
50-year	727.79	728.00	728.00
100-year	728.42	728.62	728.62
500-year	730.17	730.35	730.35

Section #1 : 139478<sup>+</sup>  
 Section #2 : 139536  
 Section #3 : 139620  
 Section #4 : 139750

\*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sub>3</sub>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	726.64	726.61	0.03	0
50-year	728	728.44	728.08	0.44	0.08
100-year	728.62	729.02	728.71	0.40	0.09
500-year	730.35	730.41	730.52	0.06	0.17

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	0.03	0	726.64	726.61
50-year	728.00	0.44	0.08	728.44	728.08
100-year	728.62	0.40	0.09	729.02	728.71
500-year	730.35	0.06	0.17	730.41	730.52

<sup>1</sup> Natural Condition - Group #3 - Natural Conditions HEC-RAS Model.

<sup>2</sup> Existing Condition - Group #3 - Existing Conditions HEC-RAS Model.

<sup>3</sup> Proposed Condition - Group #3 - Proposed Condition HEC-RAS Model, with Raised 47 profile

<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.

**BACK-UP CALCULATIONS FOR WIT: Group #3 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

<b>LOW ROAD ELEVATION (ft)</b>			
Existing	Station	Proposed	Station
728.59	501+17	734.1	501+17
<b>LOW BEAM ELEVATION (ft)</b>			
Existing	Station	Proposed	Station
N/A	N/A	730.1	502+50
<b>PROPOSED FREEBOARD (ft)</b>			
10-Yr	50-Yr	100-Yr	500-Yr
7.49	6.02	5.39	3.58
<b>PROPOSED CLEARANCE (ft)</b>			
10-Yr	50-Yr	100-Yr	500-Yr
3.49	2.10	1.48	-0.25

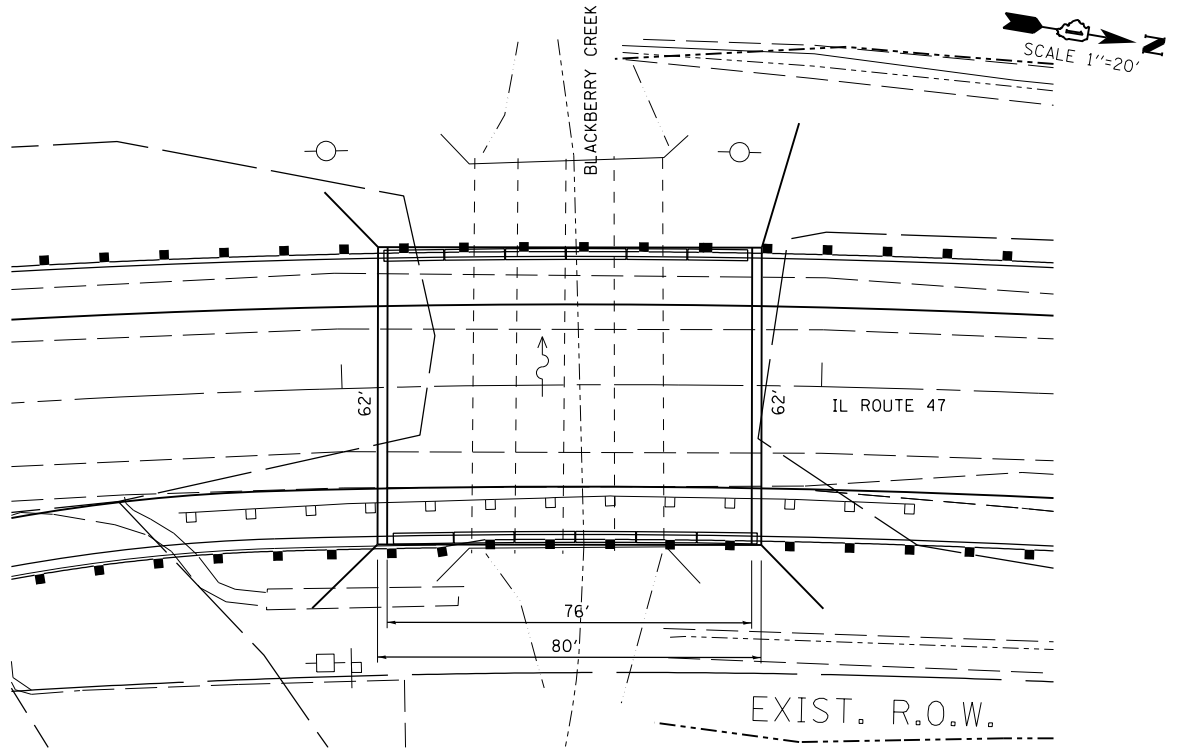
*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

<b>STRUCTURE SIZE (ft x ft)</b>			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	N/A	N/A
<b>STRUCTURE INVERT ELEVATION (ft)</b>			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25		
<b>WATERWAY OPENING AREA (ft<sup>2</sup>)</b>			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	349.90	
50-YR	203.20	452.90	
100-YR	203.20	498.20	
500-YR	1053.40	619.40	

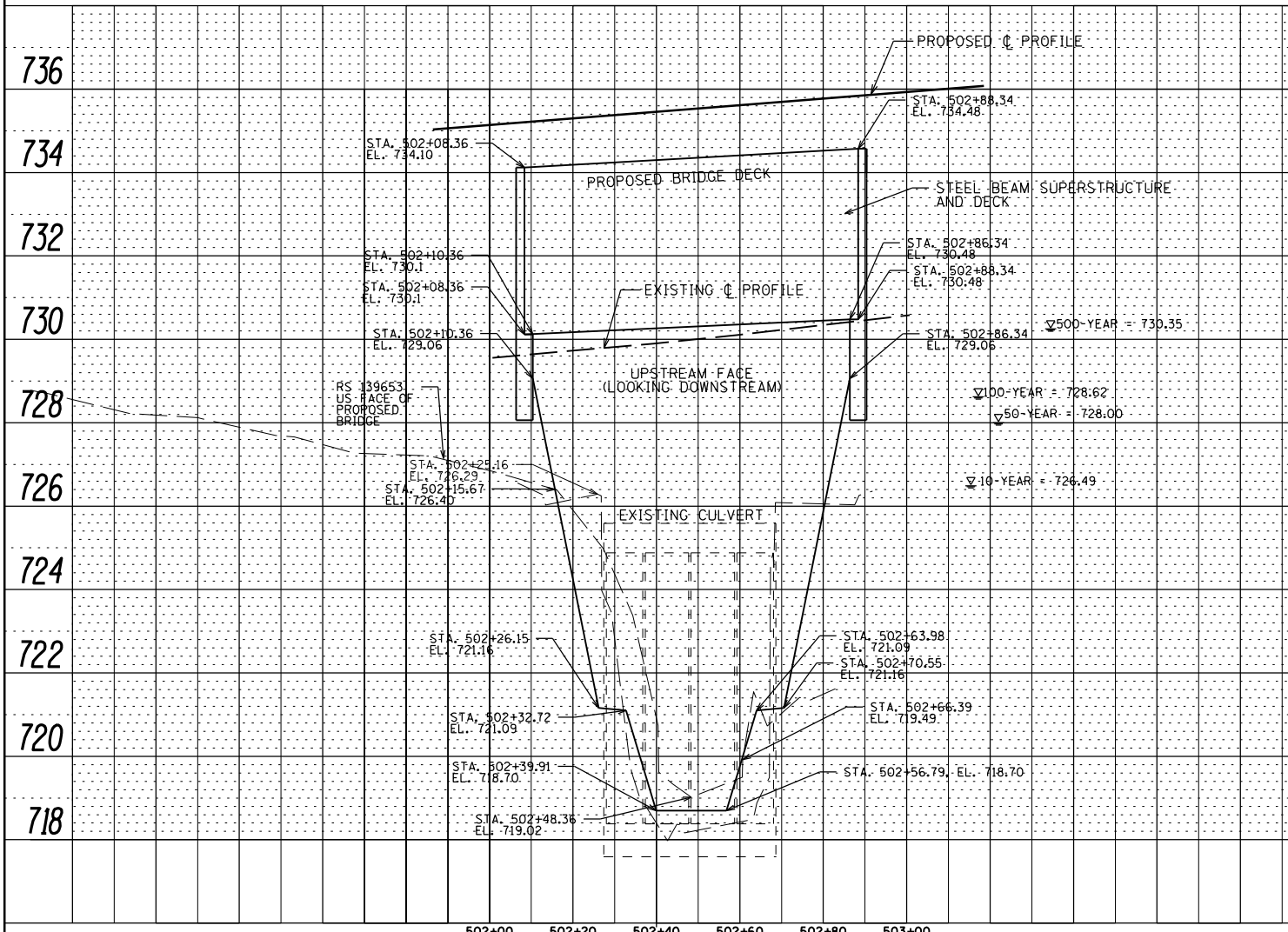
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is contained within the proposed Bridge, no overtopping of pavement is expected - area measured in Microstation

PLAN	CHECKED	DATE
NO.	BY	
	NOTED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	



PROFILE	CHECKED	DATE
NO.	BY	
	NOTED	
	GRADES CHECKED	
	B.M. NOTED	
	STRUCTURE NOTATIONS CHECKED	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\DI44909-sht-drain-struct-plnprf-bridge.dgn		DRAWN -	REVISED -
		CHECKED -	REVISED -
		DATE = 5/15/2014	REVISED -

STATE OF  
DEPARTMENT OF



**Created Head - G#3 - Existing/Proposed Conditions - (Existing Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: July-14  
 Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta		WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.47	727.49	0.02	727.47	0.00
Main Before D	139750		726.61	726.64	0.03	726.61	0.00
Main Before D	139620			726.55		726.51	
Main Before D	140600	50-yr	730.25	730.3	0.05	730.26	0.01
Main Before D	140504		728.75	729.02	0.27	728.79	0.04
Main Before D	139750		728	728.44	0.44	728.08	0.08
Main Before D	139620			728.28		727.93	
Main Before D	140600	100-yr	730.69	730.76	0.07	730.7	0.01
Main Before D	140504		729.32	729.58	0.26	729.38	0.06
Main Before D	139750		728.62	729.02	0.40	728.71	0.09
Main Before D	139620			728.90		728.54	
Main Before D	140600	500-yr	731.89	731.92	0.03	731.97	0.08
Main Before D	140504		730.89	730.93	0.04	731.03	0.14
Main Before D	139750		730.35	730.41	0.06	730.52	0.17
Main Before D	139620			730.27		730.29	

Natural condition contains Existing Main St structure with 47 bridge removed  
 Existing condition contains Existing Main St structure and existing 47 culvert  
 Proposed condition contains Existing Main St structure and propose 47 bridge

**Water Surface Elevation Comparison between Models**

Date: 2/28/2012

Reach	River Sta	Profile	W.S. Elev FIS (Entire Watershed) (1)	W.S. Elev FIS trimmed (2)	WSEL FIS to trimmed (1-2)	WSEL trimmed w/Culvert (3)	WSEL from FIS (3-1)	WSEL from USGS Report (4)	WSEL from FIS (4-1)
			(ft)	(ft)	(ft)	(ft)	(ft)		
Main Before D	140600	Q10	729.32	729.32	0.00	729.32	0.00		
Main Before D	140600	Q50	730.33	730.33	0.00	730.30	-0.03		
Main Before D	140600	Q100	730.77	730.78	-0.01	730.76	-0.01	730.74	-0.03
Main Before D	140600	Q500	731.92	731.92	0.00	731.92	0.00		
Main Before D	140504	Q10	727.51	727.51	0.00	727.49	-0.02		
Main Before D	140504	Q50	729.13	729.13	0.00	729.02	-0.11		
Main Before D	140504	Q100	729.63	729.63	0.00	729.58	-0.05	729.52	-0.11
Main Before D	140504	Q500	730.93	730.93	0.00	730.93	0.00		
Main Before D	139658	Q10	726.69	726.69	0.00	726.64	-0.05		
Main Before D	139658	Q50	728.61	728.61	0.00	728.44	-0.17		
Main Before D	139658	Q100	729.1	729.09	0.01	729.02	-0.08	729.11	0.01
Main Before D	139658	Q500	730.4	730.4	0.00	730.41	0.01		
Main Before D	139620	Q10	726.59	726.59	0.00	726.55	-0.04		
Main Before D	139620	Q50	728.46	728.46	0.00	728.28	-0.18		
Main Before D	139620	Q100	728.98	728.97	0.01	728.90	-0.08	728.99	0.01
Main Before D	139620	Q500	730.27	730.27	0.00	730.27	0.00		
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139536	Q10	726.42	726.42	0.00	726.42	0.00		
Main Before D	139536	Q50	727.85	727.85	0.00	727.81	-0.04		
Main Before D	139536	Q100	728.48	728.48	0.00	728.42	-0.06	728.52	0.04
Main Before D	139536	Q500	730.22	730.22	0.00	730.24	0.02		
Main Before D	139478	Q10	726.35	726.35	0.00	726.35	0.00		
Main Before D	139478	Q50	727.79	727.79	0.00	727.75	-0.04		
Main Before D	139478	Q100	728.42	728.42	0.00	728.36	-0.06	728.46	0.04
Main Before D	139478	Q500	730.16	730.16	0.00	730.18	0.02		

- (1) Entire Watershed Model (Hec-Ras 3.1.3), (2) Duplicate Trimmed Watershed Model (Hec-Ras 4.0)
- (3) Group #3, Existing Condition Watershed Model w/IL 47 Structure modeled as a culvert (Hec-Ras 4.0)
- (4) Results printed in USGS Report 100-yr only

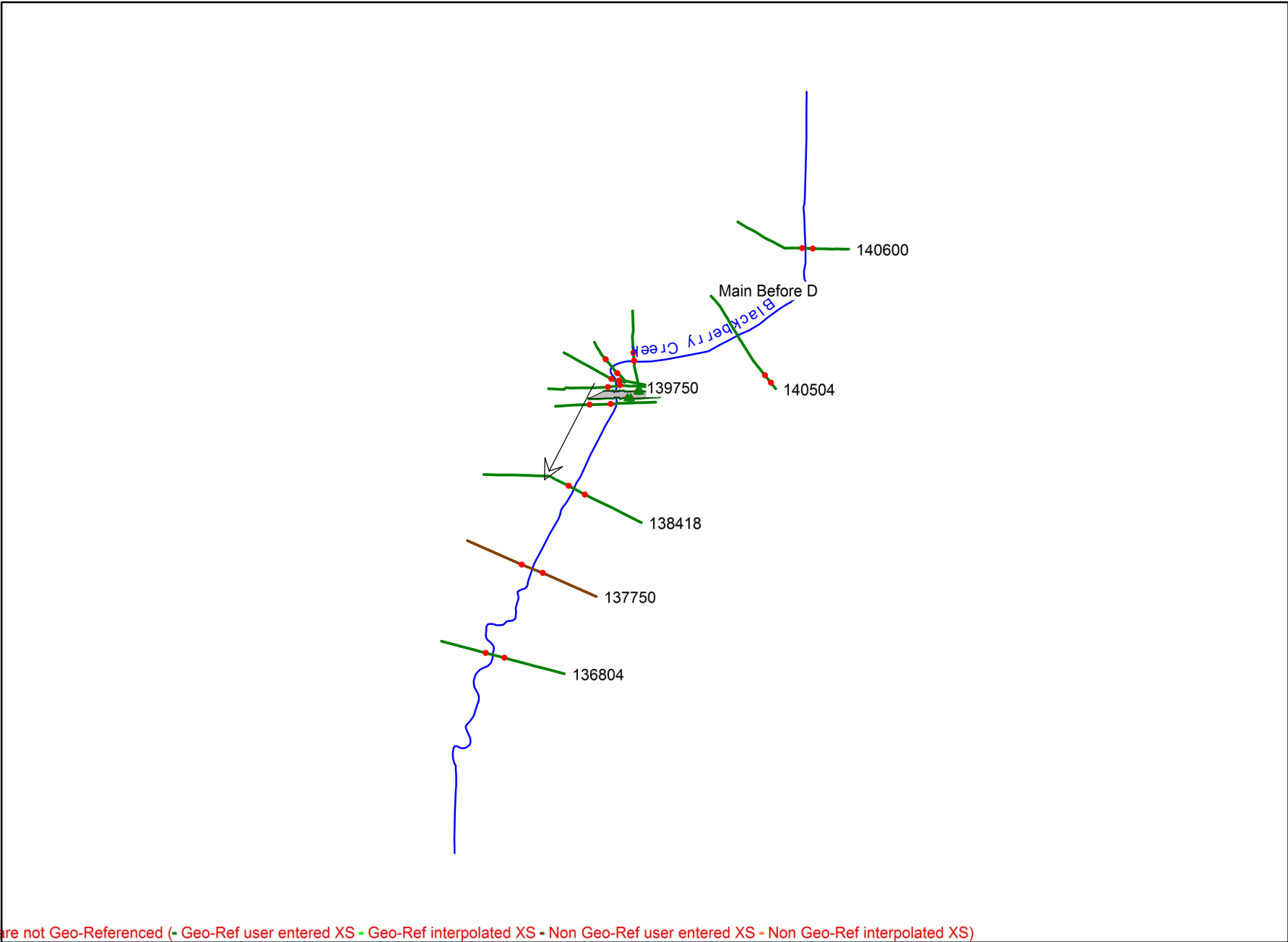
**Water Surface Elevation Comparison between Models (continued)**

Reach	River Sta	Profile	W.S. Elev FIS (Entire Watershed) (1)	W.S. Elev FIS trimmed (2)	WSEL FIS to trimmed (1-2)	WSEL trimmed w/Culvert (3)	WSEL from FIS (3-1)	WSEL from USGS Report (4)	WSEL from FIS (4-1)	
			(ft)	(ft)	(ft)	(ft)	(ft)			
Main Before D	139355	Q10	726.3	726.3	0.00	726.30	0.00			
Main Before D	139355	Q50	727.74	727.74	0.00	727.71	-0.03			
Main Before D	139355	Q100	728.38	728.37	0.01	728.32	-0.06	728.42	0.04	
Main Before D	139355	Q500	730.12	730.12	0.00	730.14	0.02			
Main Before D	139297	Q10	726.29	726.29	0.00	726.29	0.00			
Main Before D	139297	Q50	727.74	727.74	0.00	727.70	-0.04			
Main Before D	139297	Q100	728.37	728.37	0.00	728.32	-0.05	728.42	0.05	
Main Before D	139297	Q500	730.13	730.13	0.00	730.15	0.02			
Main Before D	139254	Q10	726.22	726.22	0.00	726.22	0.00			
Main Before D	139254	Q50	727.58	727.58	0.00	727.54	-0.04			
Main Before D	139254	Q100	728.16	728.16	0.00	728.10	-0.06	728.21	0.05	
Main Before D	139254	Q500	729.76	729.76	0.00	729.78	0.02			
Main Before D	139250		Main Street Bridge							
Main Before D	139208	Q10	726.13	726.14	-0.01	726.14	0.01			
Main Before D	139208	Q50	727.27	727.27	0.00	727.24	-0.03			
Main Before D	139208	Q100	727.67	727.67	0.00	727.62	-0.05	727.72	0.05	
Main Before D	139208	Q500	728.59	728.59	0.00	728.45	-0.14			
Main Before D	139158	Q10	726.1	726.1	0.00	726.10	0.00			
Main Before D	139158	Q50	727.22	727.22	0.00	727.22	0.00			
Main Before D	139158	Q100	727.62	727.61	0.01	727.61	-0.01	727.69	0.07	
Main Before D	139158	Q500	728.5	728.5	0.00	728.50	0.00			
Main Before D	138418	Q10	725.26	725.26	0.00	725.26	0.00			
Main Before D	138418	Q50	726.3	726.3	0.00	726.30	0.00			
Main Before D	138418	Q100	726.63	726.63	0.00	726.63	0.00	726.63	0.00	
Main Before D	138418	Q500	727.37	727.37	0.00	727.37	0.00			
Main Before D	137750	Q10	723.37	723.37	0.00	723.37	0.00			
Main Before D	137750	Q50	724.18	724.18	0.00	724.18	0.00			
Main Before D	137750	Q100	724.52	724.52	0.00	724.52	0.00	724.41	-0.11	
Main Before D	137750	Q500	725.3	725.3	0.00	725.30	0.00			
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00			
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00			
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.79	0.01	
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00			

HEC-RAS Model

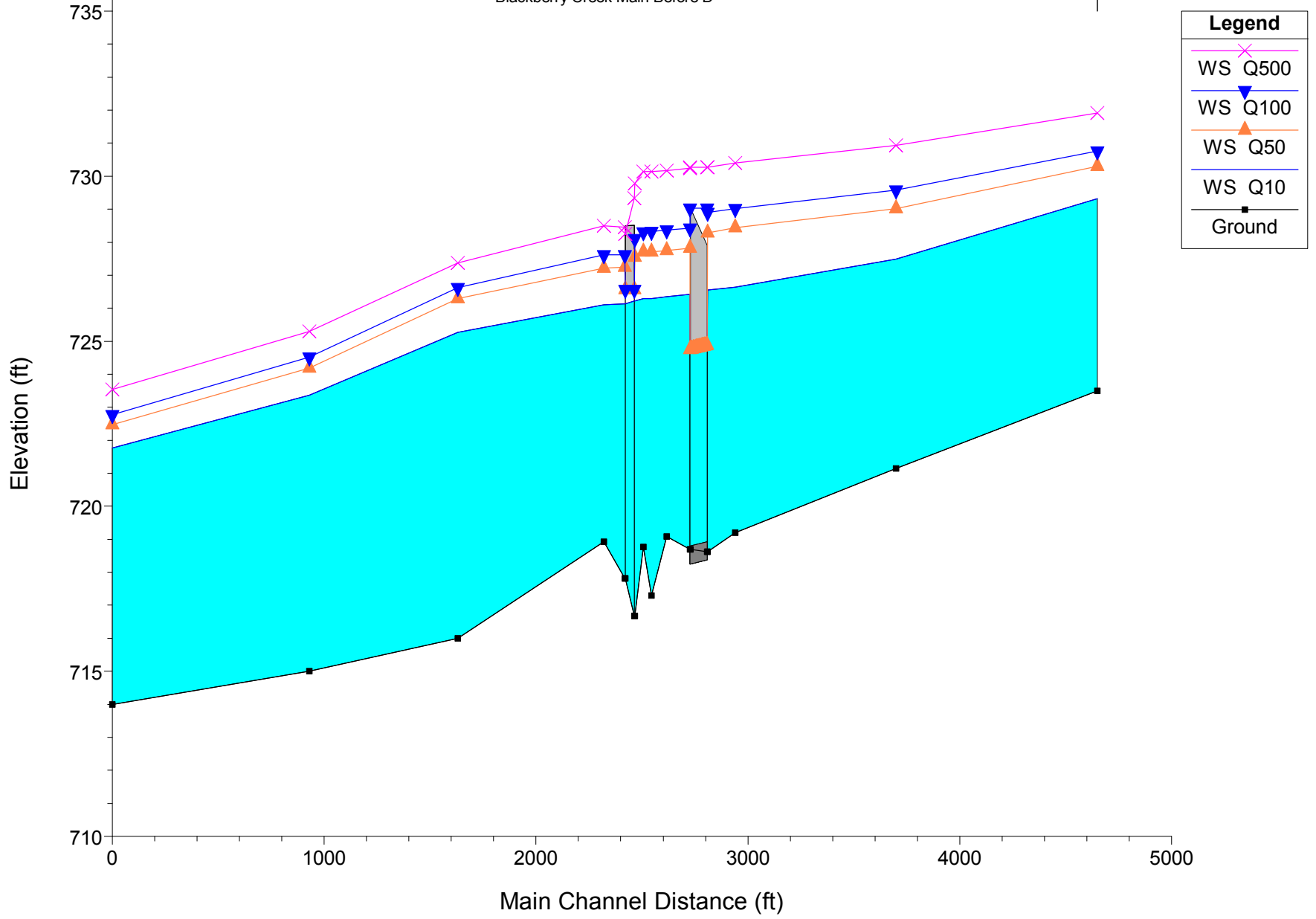
**GROUP #3 - PERMIT NATURAL CONDITIONS**

**Trimmed FIS Model - No Rte 47 Culvert**



1 of the 12 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#3-PerNatural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002041	2.20	443.27	313.72	0.25
Main Before D	140600	Q50	1128.00	723.50	730.25		730.31	0.001586	2.40	770.38	392.35	0.23
Main Before D	140600	Q100	1384.00	723.50	730.69		730.75	0.001418	2.46	951.18	437.28	0.22
Main Before D	140600	Q500	2108.00	723.50	731.89		731.95	0.000985	2.46	1554.29	565.18	0.19
Main Before D	140504	Q10	635.00	721.14	727.47		727.58	0.001815	3.11	380.39	202.83	0.27
Main Before D	140504	Q50	1123.00	721.14	728.75		728.87	0.001585	3.46	673.90	250.00	0.26
Main Before D	140504	Q100	1379.00	721.14	729.32		729.44	0.001475	3.57	820.50	263.36	0.25
Main Before D	140504	Q500	2100.00	721.14	730.89		731.00	0.001152	3.67	1261.44	300.21	0.23
Main Before D	139750	Q10	634.00	719.20	726.61		726.64	0.000588	1.74	627.22	275.03	0.15
Main Before D	139750	Q50	1120.00	719.20	728.00		728.04	0.000506	1.97	1056.19	338.16	0.15
Main Before D	139750	Q100	1376.00	719.20	728.62		728.67	0.000480	2.07	1277.61	375.27	0.15
Main Before D	139750	Q500	2097.00	719.20	730.35		730.39	0.000376	2.16	2013.66	485.79	0.14
Main Before D	139478	Q10	634.00	719.09	726.35		726.40	0.000784	1.74	366.60	152.93	0.19
Main Before D	139478	Q50	1120.00	719.09	727.79		727.85	0.000555	1.96	626.66	209.34	0.17
Main Before D	139478	Q100	1376.00	719.09	728.42		728.48	0.000507	2.06	766.36	235.68	0.17
Main Before D	139478	Q500	2097.00	719.09	730.17		730.24	0.000380	2.21	1245.06	317.96	0.15
Main Before D	139355	Q10	634.00	717.29	726.30		726.35	0.000639	2.02	541.46	228.90	0.18
Main Before D	139355	Q50	1120.00	717.29	727.74		727.81	0.000586	2.36	902.87	276.73	0.18
Main Before D	139355	Q100	1376.00	717.29	728.37		728.44	0.000569	2.50	1085.27	301.23	0.18
Main Before D	139355	Q500	2097.00	717.29	730.14		730.21	0.000471	2.70	1673.53	364.02	0.17
Main Before D	139297	Q10	634.00	718.76	726.29		726.31	0.000309	1.37	872.58	383.47	0.12
Main Before D	139297	Q50	1120.00	718.76	727.74		727.76	0.000255	1.53	1481.14	462.69	0.12
Main Before D	139297	Q100	1376.00	718.76	728.37		728.40	0.000241	1.61	1786.56	500.92	0.12
Main Before D	139297	Q500	2097.00	718.76	730.14		730.17	0.000184	1.68	2871.33	713.89	0.11
Main Before D	139254	Q10	634.00	716.67	726.22	719.60	726.28	0.000306	1.98	319.86	76.18	0.12
Main Before D	139254	Q50	1120.00	716.67	727.58	720.58	727.73	0.000588	3.03	369.71	215.24	0.17
Main Before D	139254	Q100	1376.00	716.67	728.16	721.04	728.36	0.000737	3.52	390.99	306.45	0.19
Main Before D	139254	Q500	2097.00	716.67	729.78	722.18	730.11	0.001069	4.66	450.32	512.21	0.23
Main Before D	139250		Bridge									
Main Before D	139208	Q10	634.00	717.81	726.14	721.17	726.23	0.000657	2.48	255.96	37.82	0.16
Main Before D	139208	Q50	1120.00	717.81	727.27	722.17	727.47	0.001700	3.59	400.86	230.53	0.22
Main Before D	139208	Q100	1376.00	717.81	727.67	722.63	727.91	0.002064	4.05	505.18	294.93	0.25
Main Before D	139208	Q500	2097.00	717.81	728.59	723.79	728.90	0.002680	4.94	848.61	444.41	0.29
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.56	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.76	338.47	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003381	3.16	563.92	440.38	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003099	3.51	912.38	500.17	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002628	2.80	444.46	180.07	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002699	2.82	508.40	192.62	0.29
Main Before D	137750	Q500	2150.00	715.00	725.31		725.48	0.002789	3.35	674.05	232.26	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.99	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#3-PerNatural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.78	0.01	155.55	445.59	36.86	313.72
Main Before D	140600	Q50	730.31	730.25	0.06	1.44	0.01	331.92	667.92	128.17	392.35
Main Before D	140600	Q100	730.75	730.69	0.06	1.30	0.01	421.91	771.10	190.99	437.28
Main Before D	140600	Q500	731.95	731.89	0.05	0.94	0.01	665.13	1011.08	431.80	565.18
Main Before D	140504	Q10	727.58	727.47	0.11	0.92	0.02	0.00	473.41	161.59	202.83
Main Before D	140504	Q50	728.87	728.75	0.12	0.80	0.02	0.34	686.93	435.73	250.00
Main Before D	140504	Q100	729.44	729.32	0.12	0.75	0.02	0.84	780.95	597.21	263.36
Main Before D	140504	Q500	731.00	730.89	0.11	0.59	0.02	3.50	1010.15	1086.35	300.21
Main Before D	139750	Q10	726.64	726.61	0.03	0.24	0.00	0.11	458.34	175.55	275.03
Main Before D	139750	Q50	728.04	728.00	0.04	0.19	0.00	8.69	704.14	407.16	338.16
Main Before D	139750	Q100	728.67	728.62	0.04	0.18	0.00	18.61	823.18	534.21	375.27
Main Before D	139750	Q500	730.39	730.35	0.04	0.14	0.00	81.37	1111.13	904.50	485.79
Main Before D	139478	Q10	726.40	726.35	0.05	0.05	0.00	0.10	633.75	0.14	152.93
Main Before D	139478	Q50	727.85	727.79	0.06	0.04	0.00	6.63	1104.28	9.10	209.34
Main Before D	139478	Q100	728.48	728.42	0.06	0.04	0.00	13.74	1342.63	19.63	235.68
Main Before D	139478	Q500	730.24	730.17	0.07	0.03	0.00	52.03	1973.96	71.01	317.96
Main Before D	139355	Q10	726.35	726.30	0.05	0.03	0.01		514.10	119.90	228.90
Main Before D	139355	Q50	727.81	727.74	0.06	0.03	0.01	0.96	818.45	300.60	276.73
Main Before D	139355	Q100	728.44	728.37	0.07	0.03	0.01	4.18	969.89	401.93	301.23
Main Before D	139355	Q500	730.21	730.14	0.08	0.03	0.01	29.56	1353.04	714.40	364.02
Main Before D	139297	Q10	726.31	726.29	0.02	0.02	0.00		478.94	155.06	383.47
Main Before D	139297	Q50	727.76	727.74	0.03	0.03	0.01	4.82	744.18	371.00	462.69
Main Before D	139297	Q100	728.40	728.37	0.03	0.03	0.02	14.00	876.46	485.53	500.92
Main Before D	139297	Q500	730.17	730.14	0.03	0.03	0.03	84.97	1192.86	819.17	713.89
Main Before D	139254	Q10	726.28	726.22	0.06	0.00	0.00		634.00		76.18
Main Before D	139254	Q50	727.73	727.58	0.14				1120.00		215.24
Main Before D	139254	Q100	728.36	728.16	0.19				1376.00		306.45
Main Before D	139254	Q500	730.11	729.78	0.34	0.00	0.10		2097.00		512.21
Main Before D	139250		Bridge								
Main Before D	139208	Q10	726.23	726.14	0.10	0.07	0.03		634.00		37.82
Main Before D	139208	Q50	727.47	727.27	0.19	0.12	0.07	3.03	1089.24	27.73	230.53
Main Before D	139208	Q100	727.91	727.67	0.24	0.15	0.09	15.19	1291.38	69.43	294.93
Main Before D	139208	Q500	728.90	728.59	0.32	0.19	0.11	117.09	1748.40	231.52	444.41
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.09	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.00	338.47
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.64	13.05	367.20
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.49	56.14	440.38
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.53	1856.21	242.25	500.17
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.39	0.61	180.07
Main Before D	137750	Q100	724.65	724.52	0.12	1.80	0.02		1409.38	2.62	192.62
Main Before D	137750	Q500	725.48	725.31	0.17	1.84	0.03	2.16	2132.09	15.75	232.26
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09



Errors Warnings and Notes for Plan : G#3-PerNatural

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139254 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139208 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X   XXXXXX   XXXX       XXXX       XX       XXXX
X   X   X       X   X       X   X       X   X       X
X   X   X       X       X       X   X       X   X       X
XXXXXXXX XXXX   X       XXX XXXX   XXXXXXX   XXXX
X   X   X       X       X   X       X   X       X
X   X   X       X   X       X   X       X   X       X
X   X   XXXXXX   XXXX       X   X       X   X       XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 12/12/2011 4:54:22 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#3-Permit Natural Condition  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p07

Geometry Title: Group#3-Natural Conditions

Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g07

Flow Title : 2005Flows for trimmed FIS

Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Summary Information:

Number of:	Cross Sections =	12	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	30
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	140600	638	1128	1384	2108
Blackberry CreekMain	Before D	140504	635	1123	1379	2100
Blackberry CreekMain	Before D	139750	634	1120	1376	2097
Blackberry CreekMain	Before D	139158	640	1132	1389	2117
Blackberry CreekMain	Before D	137750	651	1150	1412	2150
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

```

River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    1     1     1     1     1     1     1     1     1
River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    1     1     1     1     1     1     1     1     1
River = Blackberry Creek
Reach = ER_North          RS = 63593
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Blackberry Creek
Reach = ER_North          RS = 63593
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Blackberry Creek
Reach = ER_North          RS = 63593
Gate = Gate #3
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Chain_of_Lakes
Reach = 1                  RS = 11108.
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    2.2    1     2.2    1     2.2    1     2.2    1
River = Chain_of_Lakes
Reach = 1                  RS = 11108.
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    2.35    1     2.35    1     2.35    1     2.35    1
    
```

GEOMETRY DATA

Geometry Title: Group#3-Natural Conditions  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g07

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.  
 Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data		num= 19							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	736	34.7	734	94.3	732	129.3	730	157	728
277.6	727.9	319.7	727.1	325.5	725.7	330.8	723.6	337	723.5
340.2	726.9	358.9	728	425.8	728.9	495.6	730	598.3	731.2
671	732	763.7	732.8	825.4	734	914.1	736		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.09	277.6	.055	358.9	.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	277.6	358.9		1000	950	750	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data		num= 19							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75	-162.13	730.81	-158.42	727.39	-145.96	724.25
-145.33	722.69	-139.49	721.34	-134.16	721.17	-128.02	721.14	-124.82	722.54
-122.47	725.97	-97.85	725.68	-60.35	725.83	0	725.95	19.51	726.88
80.96	728.34	138.26	730.91	192.26	731.35	242.79	732.36		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05	-122.47	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-62	732	55	730	128	728	164.67	726.28	187.22	722.26
188.68	719.95	194.07	719.27	197.43	719.21	202.31	719.2	205.58	719.81
207.55	723.34	231.42	723.88	389	725.14	436.2	726.72	590.52	733.35

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-62	.11	164.67	.05	231.42	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 164.67 231.42 312 324 529 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data num= 17  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-306	734.1	0	730	47.71	728.07	82	726	119	724
130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39
152.54	723.2	186	724	221	726	271	728.2	302	730
341	732.2	381	734.1						

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-306	.13	82	.045	221	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 82 221 50 71 79 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend pts on LHS elevation from bb\_tinascii

Station Elevation Data num= 19  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89		

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-45	.13	0	.045	64.26	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 0 64.26 30 38 166 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data num= 30  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52

822.44 731.3 835.91 732.5 913.06 733.22 935 736.2 956 738.5

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .13 399.61 .045 492.85 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
399.61 492.85 36 43 250 .1 .3

CROSS SECTION

RIVER: Blackberry Creek
REACH: Main Before D RS: 139254

INPUT
Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in
from survey; these are road pts.
Station Elevation Data num= 32
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-390 734.9 -378 734.4 -340 732.4 -270 730.4 -212 729
-74.53 727.78 -51.77 726.46 -48.39 726 -39.87 726.18 -36.93 727.23
-36.72 718.93 -32.86 718.23 -29.51 719.03 -26.64 718.3 -21.75 717.06
-16.78 716.67 -11.45 716.8 -5.91 716.94 0 717.73 1.08 727.56
13.18 725.45 18.68 725.9 58.97 726.62 90.61 726.99 153.05 727.68
235.29 728.78 353.86 732.39 374.96 733.94 392.25 734.44 399 734.18
415.18 734.59 530.99 738.51

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-36.93 1.08 46 46 46 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
-390 -36.72 729.85 F
0 530.99 729.85 F

BRIDGE

RIVER: Blackberry Creek
REACH: Main Before D RS: 139250

INPUT
Description: Main Street (IL USGS 2001)
Distance from Upstream XS = 1
Deck/Roadway Width = 44
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 17
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
-445.77 737.76 -390.79 735.55 -378.64 735.05
-340.19 733.53 -268.95 731.37 -213.37 729.84
-212.94 729.83 -80.3 728.54 -36.93 728.56
-36.93 729.92 726.56 0 729.92 726.56 1.08 729.92 726.56
1.08 728.51 109.06 729.12 237.68 731.19
367.33 735 532.98 740.54

Upstream Bridge Cross Section Data
Station Elevation Data num= 32
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-390 734.9 -378 734.4 -340 732.4 -270 730.4 -212 729
-74.53 727.78 -51.77 726.46 -48.39 726 -39.87 726.18 -36.93 727.23
-36.72 718.93 -32.86 718.23 -29.51 719.03 -26.64 718.3 -21.75 717.06
-16.78 716.67 -11.45 716.8 -5.91 716.94 0 717.73 1.08 727.56
13.18 725.45 18.68 725.9 58.97 726.62 90.61 726.99 153.05 727.68
235.29 728.78 353.86 732.39 374.96 733.94 392.25 734.44 399 734.18
415.18 734.59 530.99 738.51

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Coeff Contr. Expan.
-36.93 1.08 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
-390 -36.72 729.85 F
0 530.99 729.85 F

Downstream Deck/Roadway Coordinates
num= 12
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
-308.86 733 -165.48 729.24 -65.04 728.54
-17.25 728.56 -17.25 729.92 726.56 0 729.92 726.56
20.99 729.92 726.56 20.99 728.5 88.9 728.78
218.32 730.49 367.76 734.45 511.92 739.44

Downstream Bridge Cross Section Data

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-17.25	.055	20.99	.13

Bank Sta: Left Right Coeff Contr. Expan.  
 -17.25 20.99 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-332.9	-15.72	726.75	F
20.53	475.96	726.75	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

Pier Station	Upstream=	Downstream=
	-17.76	2.923

Upstream num= 2

Width	Elev	Width	Elev
1.5	714	1.5	728

Downstream num= 2

Width	Elev	Width	Elev
1.5	714	1.5	728

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139208

INPUT  
 Description: USGS IL 2001. DSF Main Street.

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-17.25	.055	20.99	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -17.25 20.99 122 100 110 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-332.9	-15.72	726.75	F
20.53	475.96	726.75	F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139158

INPUT

Description: USGS IL 2001. Departure of Main Street  
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84
319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	265.13	.055	388.49	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

265.13	388.49	740	690	550	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above ms1. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01
558.72	723.73	574	722	578	720	582	718	586	716
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	487.45	.055	631.64	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

487.45	631.64	710	700	700	.1	.3
--------	--------	-----	-----	-----	----	----

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

450.5	624.8	760	930	720	.1	.3
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CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09

940 730.89 985 733.59

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 480 .055 630 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 480 630 9810 11021 10122 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139254	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139208	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	312	324	529
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	36	43	250
Main Before D	139254	46	46	46
Main Before D	139250	Bridge		
Main Before D	139208	122	100	110
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139254	.3	.5
Main Before D	139250	Bridge	
Main Before D	139208	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

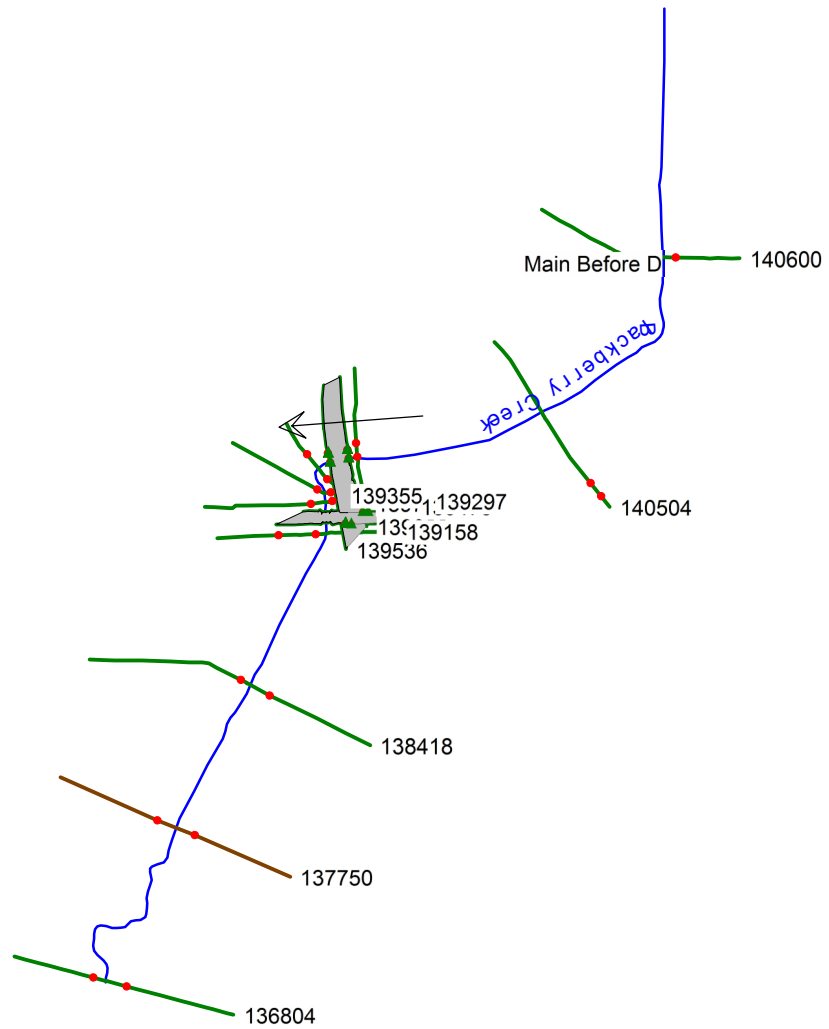


## HEC-RAS Model

### **GROUP #3 - PERMIT EXISTING CONDITIONS**

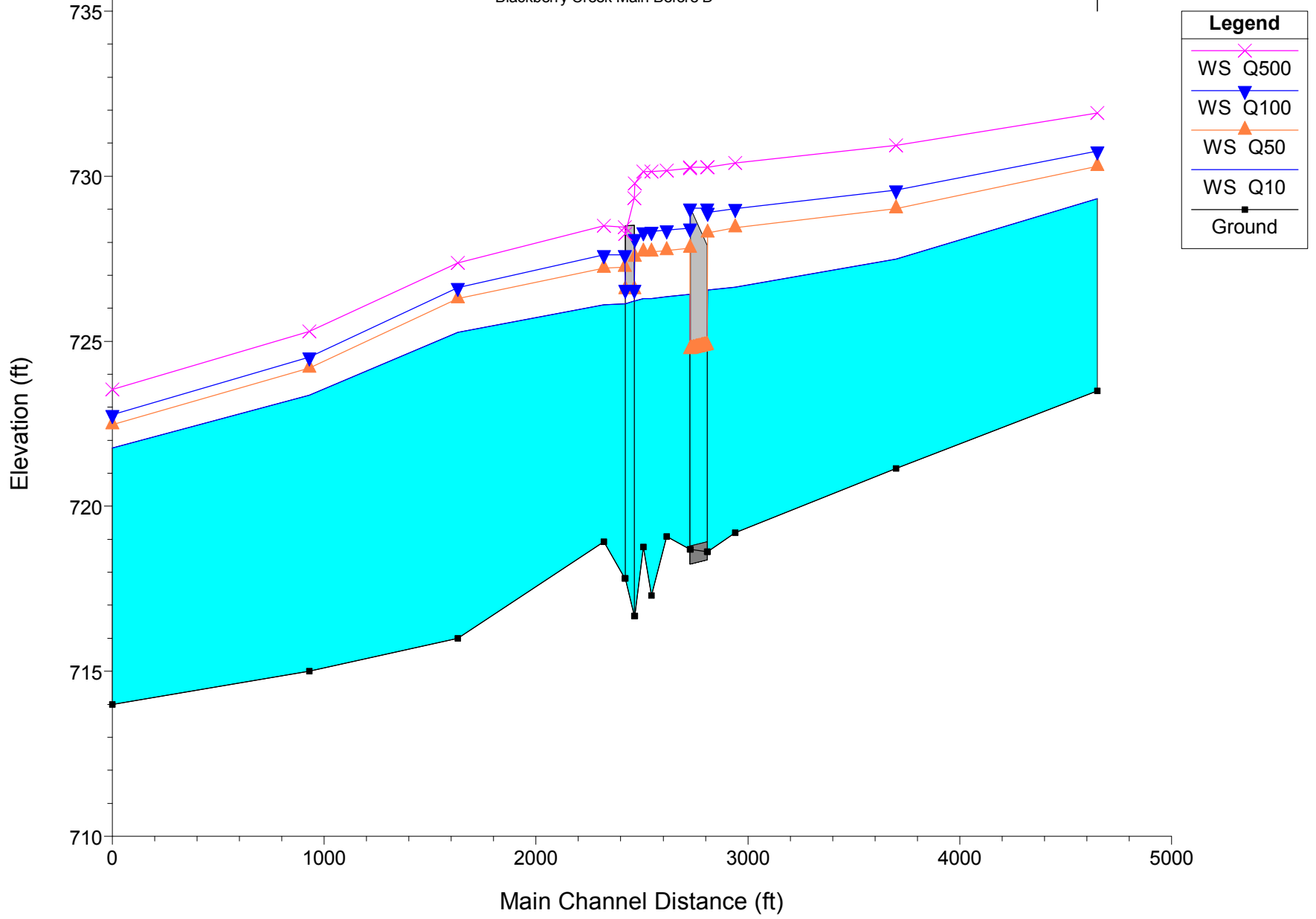
#### **Trimmed FIS Model - Revised with Rte 47 Culvert**

The modeled bridge for Route 47 was revised with the existing culvert geometry.



1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#3-PerExisting River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W. S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002043	2.20	443.13	313.69	0.25
Main Before D	140600	Q50	1128.00	723.50	730.30		730.36	0.001494	2.35	789.25	397.27	0.22
Main Before D	140600	Q100	1384.00	723.50	730.76		730.82	0.001309	2.39	982.45	444.59	0.21
Main Before D	140600	Q500	2108.00	723.50	731.92		731.97	0.000963	2.44	1568.46	567.89	0.19
Main Before D	140504	Q10	635.00	721.14	727.49		727.60	0.001780	3.08	383.93	203.58	0.26
Main Before D	140504	Q50	1123.00	721.14	729.02		729.11	0.001256	3.18	741.53	256.25	0.23
Main Before D	140504	Q100	1379.00	721.14	729.58		729.68	0.001207	3.32	889.37	269.40	0.23
Main Before D	140504	Q500	2100.00	721.14	730.93		731.04	0.001126	3.64	1275.52	303.82	0.23
Main Before D	139750	Q10	634.00	719.20	726.64		726.68	0.000564	1.71	638.15	277.06	0.15
Main Before D	139750	Q50	1120.00	719.20	728.44		728.47	0.000362	1.76	1210.68	364.45	0.13
Main Before D	139750	Q100	1376.00	719.20	729.02		729.06	0.000364	1.88	1431.92	399.09	0.13
Main Before D	139750	Q500	2097.00	719.20	730.41		730.45	0.000363	2.14	2043.65	490.81	0.14
Main Before D	139620	Q10	634.00	718.62	726.55	720.83	726.61	0.000459	1.92	330.77	143.48	0.12
Main Before D	139620	Q50	1120.00	718.62	728.28	721.71	728.40	0.000717	2.75	407.01	283.37	0.16
Main Before D	139620	Q100	1376.00	718.62	728.90	722.10	728.98	0.000591	2.61	939.48	329.95	0.15
Main Before D	139620	Q500	2097.00	718.62	730.27	723.13	730.37	0.000654	2.99	1464.20	433.50	0.16
Main Before D	139600		Culvert									
Main Before D	139536	Q10	634.00	718.69	726.42	721.32	726.48	0.000516	1.97	441.53	198.58	0.13
Main Before D	139536	Q50	1120.00	718.69	727.81	722.19	727.90	0.000680	2.56	821.55	421.06	0.16
Main Before D	139536	Q100	1376.00	718.69	728.42	722.61	728.51	0.000688	2.70	1099.51	483.72	0.16
Main Before D	139536	Q500	2097.00	718.69	730.24	723.64	730.30	0.000505	2.62	2115.48	632.46	0.14
Main Before D	139478	Q10	634.00	719.09	726.35		726.40	0.000785	1.74	366.50	152.90	0.19
Main Before D	139478	Q50	1120.00	719.09	727.75		727.81	0.000571	1.98	619.31	207.96	0.17
Main Before D	139478	Q100	1376.00	719.09	728.36		728.43	0.000528	2.09	753.71	233.41	0.17
Main Before D	139478	Q500	2097.00	719.09	730.18		730.25	0.000379	2.20	1245.79	318.18	0.15
Main Before D	139355	Q10	634.00	717.29	726.30		726.35	0.000639	2.02	541.29	228.88	0.18
Main Before D	139355	Q50	1120.00	717.29	727.71		727.77	0.000602	2.38	892.76	275.29	0.18
Main Before D	139355	Q100	1376.00	717.29	728.32		728.39	0.000591	2.54	1068.52	299.19	0.18
Main Before D	139355	Q500	2097.00	717.29	730.14		730.22	0.000470	2.70	1674.39	364.07	0.17
Main Before D	139297	Q10	634.00	718.76	726.29		726.31	0.000309	1.37	872.32	383.46	0.12
Main Before D	139297	Q50	1120.00	718.76	727.70		727.73	0.000262	1.55	1464.13	460.46	0.12
Main Before D	139297	Q100	1376.00	718.76	728.32		728.34	0.000251	1.63	1758.53	497.53	0.12
Main Before D	139297	Q500	2097.00	718.76	730.15		730.17	0.000184	1.68	2873.07	713.97	0.11
Main Before D	139256	Q10	634.00	716.67	726.22	719.60	726.28	0.000306	1.98	319.86	76.18	0.12
Main Before D	139256	Q50	1120.00	716.67	727.54	720.58	727.69	0.000596	3.04	368.34	211.13	0.17
Main Before D	139256	Q100	1376.00	716.67	728.10	721.04	728.30	0.000750	3.54	388.87	295.63	0.19
Main Before D	139256	Q500	2097.00	716.67	729.78	722.18	730.12	0.001068	4.66	450.45	512.45	0.23
Main Before D	139250		Bridge									
Main Before D	139206	Q10	634.00	717.81	726.14	721.20	726.23	0.000657	2.48	255.96	37.82	0.16
Main Before D	139206	Q50	1120.00	717.81	727.24	722.17	727.46	0.001266	3.79	295.84	225.72	0.23
Main Before D	139206	Q100	1376.00	717.81	727.62	722.62	727.92	0.001642	4.44	309.62	285.36	0.27
Main Before D	139206	Q500	2097.00	717.81	728.45	723.78	729.04	0.002791	6.17	339.97	427.59	0.35
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.95	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003485	2.99	425.99	367.16	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003380	3.16	563.98	440.39	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.47	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002625	2.60	444.59	180.10	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002702	2.82	508.17	192.58	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.47	0.002801	3.35	673.00	232.03	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.98	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#3-PerExisting River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.77	0.01	155.53	445.63	36.84	313.69
Main Before D	140600	Q50	730.36	730.30	0.06	1.24	0.00	333.54	663.34	131.11	397.27
Main Before D	140600	Q100	730.82	730.76	0.06	1.13	0.00	423.65	763.77	196.58	444.59
Main Before D	140600	Q500	731.97	731.92	0.05	0.92	0.01	665.22	1008.16	434.62	567.89
Main Before D	140504	Q10	727.60	727.49	0.11	0.90	0.02	0.00	472.04	162.96	203.58
Main Before D	140504	Q50	729.11	729.02	0.10	0.62	0.02	0.49	661.61	460.90	256.25
Main Before D	140504	Q100	729.68	729.58	0.10	0.60	0.02	1.06	756.94	621.00	269.40
Main Before D	140504	Q500	731.04	730.93	0.11	0.57	0.02	3.54	1009.18	1087.28	303.82
Main Before D	139750	Q10	726.68	726.64	0.03	0.07	0.00	0.15	456.29	177.57	277.06
Main Before D	139750	Q50	728.47	728.44	0.03	0.07	0.01	12.95	679.54	427.52	364.45
Main Before D	139750	Q100	729.06	729.02	0.03	0.07	0.01	25.50	798.79	551.71	399.09
Main Before D	139750	Q500	730.45	730.41	0.04	0.07	0.01	83.43	1106.78	906.80	490.81
Main Before D	139620	Q10	726.61	726.55	0.06				634.00		143.48
Main Before D	139620	Q50	728.40	728.28	0.12				1120.00		283.37
Main Before D	139620	Q100	728.98	728.90	0.09			122.11	1133.19	120.70	329.95
Main Before D	139620	Q500	730.37	730.27	0.10			318.41	1481.37	297.22	433.50
Main Before D	139600		Culvert								
Main Before D	139536	Q10	726.48	726.42	0.06	0.07	0.01	1.71	601.15	31.14	198.58
Main Before D	139536	Q50	727.90	727.81	0.09	0.07	0.01	19.79	939.78	160.43	421.06
Main Before D	139536	Q100	728.51	728.42	0.09	0.07	0.01	64.13	1064.68	247.19	483.72
Main Before D	139536	Q500	730.30	730.24	0.06	0.05	0.00	298.63	1243.23	555.14	632.46
Main Before D	139478	Q10	726.40	726.35	0.05	0.05	0.00	0.10	633.75	0.14	152.90
Main Before D	139478	Q50	727.81	727.75	0.06	0.04	0.00	6.38	1104.86	8.76	207.96
Main Before D	139478	Q100	728.43	728.36	0.07	0.04	0.00	13.23	1343.95	18.83	233.41
Main Before D	139478	Q500	730.25	730.18	0.07	0.03	0.00	52.05	1973.89	71.07	318.18
Main Before D	139355	Q10	726.35	726.30	0.05	0.03	0.01		514.13	119.87	228.88
Main Before D	139355	Q50	727.77	727.71	0.07	0.03	0.01	0.86	820.26	298.88	275.29
Main Before D	139355	Q100	728.39	728.32	0.07	0.03	0.01	3.83	972.85	399.31	299.19
Main Before D	139355	Q500	730.22	730.14	0.08	0.03	0.01	29.61	1352.88	714.51	364.07
Main Before D	139297	Q10	726.31	726.29	0.02	0.02	0.00		478.98	155.02	383.46
Main Before D	139297	Q50	727.73	727.70	0.03	0.03	0.01	4.51	746.14	369.35	460.46
Main Before D	139297	Q100	728.34	728.32	0.03	0.03	0.02	13.17	879.58	483.25	497.53
Main Before D	139297	Q500	730.17	730.15	0.03	0.03	0.03	85.14	1192.65	819.21	713.97
Main Before D	139256	Q10	726.28	726.22	0.06	0.00	0.00		634.00		76.18
Main Before D	139256	Q50	727.69	727.54	0.14				1120.00		211.13
Main Before D	139256	Q100	728.30	728.10	0.19				1376.00		295.63
Main Before D	139256	Q500	730.12	729.78	0.34	0.00	0.10		2097.00		512.45
Main Before D	139250		Bridge								
Main Before D	139206	Q10	726.23	726.14	0.10	0.07	0.03		634.00		37.82
Main Before D	139206	Q50	727.46	727.24	0.22	0.10	0.08		1120.00		225.72
Main Before D	139206	Q100	727.92	727.62	0.31	0.12	0.12		1376.00		285.36
Main Before D	139206	Q500	729.04	728.45	0.59	0.19	0.24		2097.00		427.59
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.08	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.65	13.04	367.16
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.38	1330.47	56.16	440.39
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.17	242.29	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.38	0.62	180.10
Main Before D	137750	Q100	724.65	724.52	0.12	1.80	0.02		1409.39	2.61	192.58
Main Before D	137750	Q500	725.47	725.30	0.17	1.84	0.03	2.13	2132.20	15.67	232.03
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75

HEC-RAS Plan: G#3-PerExisting River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#3-PerExisting

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X       X   X       X  X   X  X   X
X   X  X       X           X  X   X  X   X
XXXXXXXX XXXX   X           XXX XXXX XXXXXX XXXX
X   X  X       X           X  X   X  X       X
X   X  X       X   X       X  X   X  X   X
X   X  XXXXXX   XXXX       X   X   X   X XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPPermit.prj  
 Run Date and Time: 12/12/2011 4:48:13 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#3-Permit Existing Condition  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.p01

Geometry Title: Group #3- Permit Existing  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g05

Flow Title : 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.f03

Plan Summary Information:

Number of: Cross Sections = 14 Multiple Openings = 0  
 Culverts = 1 Inline Structures = 0  
 Bridges = 1 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01  
 Critical depth calculation tolerance = 0.01  
 Maximum number of iterations = 30  
 Maximum difference tolerance = 0.3  
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	140600	638	1128	1384	2108
Blackberry CreekMain	Before D	140504	635	1123	1379	2100
Blackberry CreekMain	Before D	139750	634	1120	1376	2097
Blackberry CreekMain	Before D	139158	640	1132	1389	2117
Blackberry CreekMain	Before D	137750	651	1150	1412	2150
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54



Inline Structure Gate Openings

```

River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    1     1     1     1     1     1     1     1     1
River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    1     1     1     1     1     1     1     1     1
River = Blackberry Creek
Reach = ER_North          RS = 63593
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Blackberry Creek
Reach = ER_North          RS = 63593
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Blackberry Creek
Reach = ER_North          RS = 63593
Gate = Gate #3
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Chain_of_Lakes
Reach = 1                  RS = 11108.
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    2.2    1     2.2    1     2.2    1     2.2    1
River = Chain_of_Lakes
Reach = 1                  RS = 11108.
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    2.35    1     2.35    1     2.35    1     2.35    1

```

GEOMETRY DATA

Geometry Title: Group #3- Permit Existing  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g05

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.  
 Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data		num= 19							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	736	34.7	734	94.3	732	129.3	730	157	728
277.6	727.9	319.7	727.1	325.5	725.7	330.8	723.6	337	723.5
340.2	726.9	358.9	728	425.8	728.9	495.6	730	598.3	731.2
671	732	763.7	732.8	825.4	734	914.1	736		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.09	277.6	.055	358.9	.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	277.6	358.9		1000	950	750	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data		num= 19							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75	-162.13	730.81	-158.42	727.39	-145.96	724.25
-145.33	722.69	-139.49	721.34	-134.16	721.17	-128.02	721.14	-124.82	722.54
-122.47	725.97	-97.85	725.68	-60.35	725.83	0	725.95	19.51	726.88
80.96	728.34	138.26	730.91	192.26	731.35	242.79	732.36		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05	-122.47	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-62	732	55	730	128	728	164.67	726.28	187.22	722.26
188.68	719.95	194.07	719.27	197.43	719.21	202.31	719.2	205.58	719.81
207.55	723.34	231.42	723.88	389	725.14	436.2	726.72	590.52	733.35

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-62	.11	164.67	.05	231.42	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 164.67 231.42 140 130 195 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139620

INPUT

Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
 bb\_Tinacii

Station Elevation Data num= 24  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-381	736.1	-342	734.4	-317	732	-67.23	726.39	-24.8	725.68
-24.12	720.07	-21.76	719.68	-19.69	719.17	-17.85	718.76	-14.09	718.63
-11.17	718.64	-6.74	718.63	-2.99	718.62	0	719.3	3.5	718.87
5.47	718.9	8.36	718.67	11.49	718.8	14.55	718.96	18.76	719.74
19.25	725.72	88.65	726.87	222.37	731.21	361.26	734.09		

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-381	.11	-24.8	.055	19.25	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -24.8 19.25 95 84 147 .3 .5

Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
-381	-24.8	728.8	F
19.25	361.26	728.8	F

CULVERT

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139600

INPUT

Description: Route 47 (IL USGS 2001)

Distance from Upstream XS = 2

Deck/Roadway Width = 80

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 7  

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-162.82	727.87		-67.02	727.98		-22.94	728.47	
17.16	728.93		75.46	729.59		225	732.24	
360.24	734.67							

Upstream Bridge Cross Section Data

Station Elevation Data num= 24  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-381	736.1	-342	734.4	-317	732	-67.23	726.39	-24.8	725.68
-24.12	720.07	-21.76	719.68	-19.69	719.17	-17.85	718.76	-14.09	718.63
-11.17	718.64	-6.74	718.63	-2.99	718.62	0	719.3	3.5	718.87
5.47	718.9	8.36	718.67	11.49	718.8	14.55	718.96	18.76	719.74
19.25	725.72	88.65	726.87	222.37	731.21	361.26	734.09		

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-381	.11	-24.8	.055	19.25	.11

Bank Sta: Left Right Coeff Contr. Expan.  
 -24.8 19.25 .3 .5

Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
-381	-24.8	728.8	F
19.25	361.26	728.8	F

Downstream Deck/Roadway Coordinates

num= 8														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-300		729			-188.23		729.21			-85.67		730.01		
-41.76		730.42			0		730.81			127.79		732.5		
302.06		735.62			350		735.92							

Downstream Bridge Cross Section Data

Station Elevation Data num= 21											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-451	732	-333	730	-197.69	727.17	-123	727.85	-71.69	727.15		
-44.48	725.27	-44.24	721.22	-39.28	720.17	-36.92	719.45	-29.35	719.41		
-22.87	718.99	-16.64	718.88	-12.29	718.69	-6.19	719.71	-1.44	719.81		
0	725.55	54.42	724.93	133.57	726.33	133.58	726.33	257.19	729.13		
319.25	731.55										

Manning's n Values

num= 3					
Sta	n	Val	Sta	n	Val
-451	.13		-44.48	.055	
				0	.13

Bank Sta: Left Right Coeff Contr. Expan.  
 -44.48 0 .3 .5

Ineffective Flow num= 2				
Sta L	Sta R	Elev	Permanent	
-451	-44.24	725.27	F	
-1.44	319.25	725.27	F	

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name	Shape	Rise	Span
Rte 47 8.75W	Box	6.5	8.75

FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
2	82	.012	.012	.55	.4	1

Number of Barrels = 2  
 Upstream Elevation = 718.38

Centerline Stations

Sta.	Sta.
-18.306	12.995

Downstream Elevation = 718.25

Centerline Stations

Sta.	Sta.
-38.505	-7.205

Culvert Name	Shape	Rise	Span
RTE 47 10.4W	Box	6.5	10.4

FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
2	82	.012	.012	.55	.4	1

Number of Barrels = 2  
 Upstream Elevation = 718.38

Centerline Stations

Sta.	Sta.
-8.417	2.83

Downstream Elevation = 718.25

Centerline Stations

Sta.	Sta.
-28.34	-17.363

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139536

INPUT

Description: USGS IL 2001. DSF of Rt47-8. 2 extend pts on LHS elevations from  
 bb\_tinascii

Station Elevation Data num= 21											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-451	732	-333	730	-197.69	727.17	-123	727.85	-71.69	727.15		
-44.48	725.27	-44.24	721.22	-39.28	720.17	-36.92	719.45	-29.35	719.41		
-22.87	718.99	-16.64	718.88	-12.29	718.69	-6.19	719.71	-1.44	719.81		
0	725.55	54.42	724.93	133.57	726.33	133.58	726.33	257.19	729.13		
319.25	731.55										

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-451	.13	-44.48	.055	0	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	-44.48	0		77	110		.3	.5
Ineffective Flow		num=		2				
Sta L	Sta R	Elev	Permanent					
-451	-44.24	725.27	F					
-1.44	319.25	725.27	F					

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). Removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data	num=	17								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-306	734.1	0	730	47.71	728.07	82	726	119	724	
130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39	
152.54	723.2	186	724	221	726	271	728.2	302	730	
341	732.2	381	734.1							

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val				
-306	.13	82	.045	221	.13				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	82	221		50	71		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend

Station Elevation Data	num=	19								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19	
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79	
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09	
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89			

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val				
-45	.13	0	.045	64.26	.13				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	64.26		30	38		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data	num=	30								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88	
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49	
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76	
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11	
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52	
822.44	731.3	835.91	732.5	913.06	733.22	935	736.2	956	738.5	

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val				
0	.13	399.61	.045	492.85	.13				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	399.61	492.85		34	41		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139256

INPUT

Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.

Station Elevation Data num= 32
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-390 734.9 -378 734.4 -340 732.4 -270 730.4 -212 729
-74.53 727.78 -51.77 726.46 -48.39 726 -39.87 726.18 -36.93 727.23
-36.72 718.93 -32.86 718.23 -29.51 719.03 -26.64 718.3 -21.75 717.06
-16.78 716.67 -11.45 716.8 -5.91 716.94 0 717.73 1.08 727.56
13.18 725.45 18.68 725.9 58.97 726.62 90.61 726.99 153.05 727.68
235.29 728.78 353.86 732.39 374.96 733.94 392.25 734.44 399 734.18
415.18 734.59 530.99 738.51

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-36.93 1.08 46 46 46 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
-390 -36.72 729.85 F
0 530.99 729.85 F

BRIDGE

RIVER: Blackberry Creek
REACH: Main Before D RS: 139250

INPUT

Description: Main Street (IL USGS 2001)

Distance from Upstream XS = 1
Deck/Roadway Width = 44
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 17
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
-445.77 737.76 -390.79 735.55 -378.64 735.05
-340.19 733.53 -268.95 731.37 -213.37 729.84
-212.94 729.83 -80.3 728.54 -36.93 728.56
-36.93 729.92 726.56 0 729.92 726.56 1.08 729.92 726.56
1.08 728.51 109.06 729.12 237.68 731.19
367.33 735 532.98 740.54

Upstream Bridge Cross Section Data
Station Elevation Data num= 32
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-390 734.9 -378 734.4 -340 732.4 -270 730.4 -212 729
-74.53 727.78 -51.77 726.46 -48.39 726 -39.87 726.18 -36.93 727.23
-36.72 718.93 -32.86 718.23 -29.51 719.03 -26.64 718.3 -21.75 717.06
-16.78 716.67 -11.45 716.8 -5.91 716.94 0 717.73 1.08 727.56
13.18 725.45 18.68 725.9 58.97 726.62 90.61 726.99 153.05 727.68
235.29 728.78 353.86 732.39 374.96 733.94 392.25 734.44 399 734.18
415.18 734.59 530.99 738.51

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Coeff Contr. Expan.
-36.93 1.08 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
-390 -36.72 729.85 F
0 530.99 729.85 F

Downstream Deck/Roadway Coordinates num= 12
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
-308.86 733 -165.48 729.24 -65.04 728.54
-17.25 728.56 -17.25 729.92 726.56 0 729.92 726.56
20.99 729.92 726.56 20.99 728.5 88.9 728.78
218.32 730.49 367.76 734.45 511.92 739.44

Downstream Bridge Cross Section Data
Station Elevation Data num= 26
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
-332.9 733.91 -278.27 733.24 -215.95 730.89 -184.04 728.19 -17.39 726.75
-17.25 727.74 -15.72 720.47 -10.58 720.32 -9.74 719.11 -8.05 719.18
-7.21 720.34 -4.54 720.06 0 719.16 6.04 717.95 10.27 717.81
17.13 718.76 20.53 719.49 20.99 727.54 23.13 726.61 70.91 726.7
142.98 726.53 163.03 727.95 203.88 728.69 219.66 728.15 228.58 727.39
475.96 735.66

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
-332.9 .13 -17.25 .055 20.99 .13

Bank Sta: Left Right Coeff Contr. Expan.

-17.25 20.99 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -15.72 728.75 F  
 20.53 475.96 728.75 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
 Pier Station Upstream= -17.8 Downstream= 3  
 Upstream num= 2  
 Width Elev Width Elev  
 1.5 714 1.5 728  
 Downstream num= 2  
 Width Elev Width Elev  
 1.5 714 1.5 728

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139206

INPUT  
 Description: USGS IL 2001. DSF Main Street.  
 Station Elevation Data num= 26  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -332.9 733.91 -278.27 733.24 -215.95 730.89 -184.04 728.19 -17.39 726.75  
 -17.25 727.74 -15.72 720.47 -10.58 720.32 -9.74 719.11 -8.05 719.18  
 -7.21 720.34 -4.54 720.06 0 719.16 6.04 717.95 10.27 717.81  
 17.13 718.76 20.53 719.49 20.99 727.54 23.13 726.61 70.91 726.7  
 142.98 726.53 163.03 727.95 203.88 728.69 219.66 728.15 228.58 727.39  
 475.96 735.66

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -332.9 .13 -17.25 .055 20.99 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -17.25 20.99 122 100 110 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -15.72 728.75 F  
 20.53 475.96 728.75 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139158

INPUT  
 Description: USGS IL 2001. Departure of Main Street  
 Station Elevation Data num= 22  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 735.77 99.86 731.62 124.22 728.63 195.07 728.14 207.18 726.09  
 213.4 723.77 225.05 725.16 265.13 724.96 283.4 723.89 297.02 721.24  
 299.85 719.15 302.84 719.02 305.57 719.24 310.13 718.93 315.62 719.84  
 319.11 723.31 331.28 723.07 388.49 723.98 418.69 726.97 468 728  
 520 730 591 732

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val  
 0 .13 265.13 .055 388.49 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 265.13 388.49 740 690 550 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01		
558.72	723.73	574	722	578	720	582	718	586	716		
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95		
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726		
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98		

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	487.45	.055	631.64	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 487.45 631.64 710 700 700 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730		
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726		
450.5	724.6	476.8	722.6	485	720	489	718	493	716		
497	715	501	716	505	718	509	720	527.1	722		
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1		
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9		
1083.7	739.7										

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99		
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79		
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49		
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39		
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99		
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09		
940	730.89	985	733.59								

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	480	.055	630	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 480 630 9810 11021 10122 .1 .3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139620	.11	.055	.11
Main Before D	139600	Culvert		
Main Before D	139536	.13	.055	.13
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139256	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139206	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	140	130	195
Main Before D	139620	95	84	147
Main Before D	139600	Culvert		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	34	41	248
Main Before D	139256	46	46	46
Main Before D	139250	Bridge		
Main Before D	139206	122	100	110
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

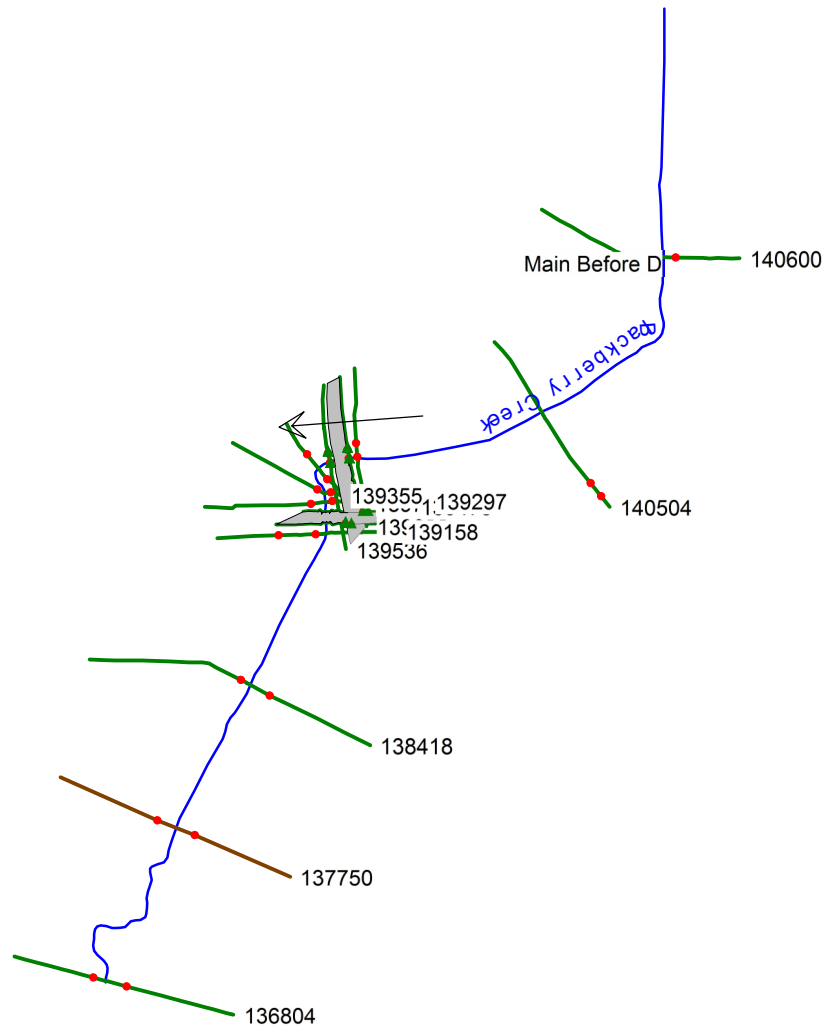
Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139620	.3	.5
Main Before D	139600	Culvert	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139256	.3	.5
Main Before D	139250	Bridge	
Main Before D	139206	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3



HEC-RAS Model

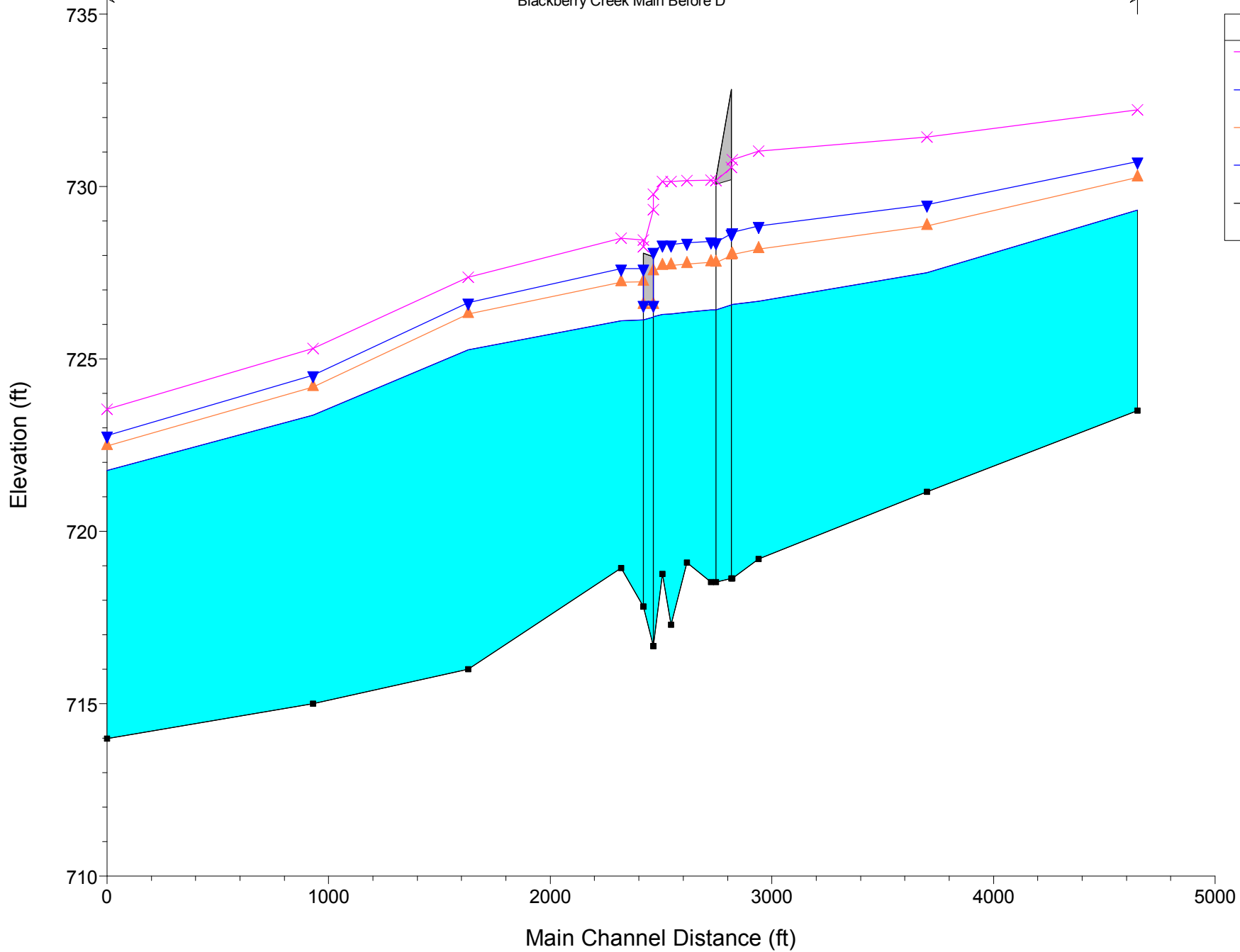
**GROUP #3-PERMIT PROPOSED CONDITIONS**

**Trimmed FIS Model - Proposed Rte 47 Arch  
Culvert**



1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002043	2.20	443.13	313.69	0.25
Main Before D	140600	Q50	1128.00	723.50	730.27		730.33	0.001554	2.38	776.81	394.03	0.23
Main Before D	140600	Q100	1384.00	723.50	730.72		730.78	0.001364	2.43	966.13	440.79	0.22
Main Before D	140600	Q500	2108.00	723.50	732.22		732.26	0.000750	2.24	1744.70	608.58	0.17
Main Before D	140504	Q10	635.00	721.14	727.50		727.61	0.001760	3.07	385.99	204.02	0.26
Main Before D	140504	Q50	1123.00	721.14	728.85		728.96	0.001445	3.35	700.05	252.44	0.25
Main Before D	140504	Q100	1379.00	721.14	729.47		729.58	0.001312	3.42	860.05	266.84	0.24
Main Before D	140504	Q500	2100.00	721.14	731.43		731.53	0.000914	3.42	1442.95	361.26	0.21
Main Before D	139750	Q10	634.00	719.20	726.67		726.70	0.000551	1.70	644.42	278.22	0.15
Main Before D	139750	Q50	1120.00	719.20	728.18		728.22	0.000440	1.88	1117.87	348.90	0.14
Main Before D	139750	Q100	1376.00	719.20	728.86		728.90	0.000407	1.95	1367.56	389.33	0.14
Main Before D	139750	Q500	2097.00	719.20	731.02		731.06	0.000260	1.90	2362.67	541.36	0.12
Main Before D	139632	Q10	634.00	718.63	726.58	721.70	726.63	0.000476	1.84	344.45	146.89	0.13
Main Before D	139632	Q50	1120.00	718.63	728.03	722.56	728.14	0.000748	2.65	423.12	264.64	0.17
Main Before D	139632	Q100	1376.00	718.63	728.67	722.90	728.81	0.000867	3.00	458.02	313.08	0.18
Main Before D	139632	Q500	2097.00	718.63	730.78	723.80	730.98	0.000959	3.67	572.15	471.48	0.20
Main Before D	139600		Bridge									
Main Before D	139536	Q10	634.00	718.52	726.42	721.59	726.47	0.000454	1.80	352.34	193.93	0.13
Main Before D	139536	Q50	1120.00	718.52	727.80	722.45	727.91	0.000716	2.59	432.92	418.14	0.17
Main Before D	139536	Q100	1376.00	718.52	728.41	722.81	728.54	0.000835	2.95	467.86	481.99	0.18
Main Before D	139536	Q500	2097.00	718.52	730.18	723.69	730.39	0.001001	3.68	570.97	627.92	0.21
Main Before D	139478	Q10	634.00	719.09	726.35		726.40	0.000785	1.74	366.50	152.90	0.19
Main Before D	139478	Q50	1120.00	719.09	727.75		727.81	0.000571	1.98	619.31	207.96	0.17
Main Before D	139478	Q100	1376.00	719.09	728.36		728.43	0.000528	2.09	753.71	233.41	0.17
Main Before D	139478	Q500	2097.00	719.09	730.18		730.25	0.000379	2.20	1245.79	318.18	0.15
Main Before D	139355	Q10	634.00	717.29	726.30		726.35	0.000639	2.02	541.29	228.88	0.18
Main Before D	139355	Q50	1120.00	717.29	727.71		727.77	0.000602	2.38	892.76	275.29	0.18
Main Before D	139355	Q100	1376.00	717.29	728.32		728.39	0.000591	2.54	1068.52	299.19	0.18
Main Before D	139355	Q500	2097.00	717.29	730.14		730.22	0.000470	2.70	1674.39	364.07	0.17
Main Before D	139297	Q10	634.00	718.76	726.29		726.31	0.000309	1.37	872.32	383.46	0.12
Main Before D	139297	Q50	1120.00	718.76	727.70		727.73	0.000262	1.55	1464.13	460.46	0.12
Main Before D	139297	Q100	1376.00	718.76	728.32		728.34	0.000251	1.63	1758.53	497.53	0.12
Main Before D	139297	Q500	2097.00	718.76	730.15		730.17	0.000184	1.68	2873.07	713.97	0.11
Main Before D	139256	Q10	634.00	716.67	726.22	719.60	726.28	0.000306	1.98	319.86	76.18	0.12
Main Before D	139256	Q50	1120.00	716.67	727.54	720.58	727.69	0.000596	3.04	368.34	211.13	0.17
Main Before D	139256	Q100	1376.00	716.67	728.10	721.04	728.30	0.000750	3.54	388.87	295.63	0.19
Main Before D	139256	Q500	2097.00	716.67	729.78	722.18	730.12	0.001068	4.66	450.45	512.45	0.23
Main Before D	139250		Bridge									
Main Before D	139206	Q10	634.00	717.81	726.14	721.20	726.23	0.000657	2.48	255.96	37.82	0.16
Main Before D	139206	Q50	1120.00	717.81	727.24	722.17	727.46	0.001266	3.79	295.84	225.72	0.23
Main Before D	139206	Q100	1376.00	717.81	727.62	722.62	727.92	0.001642	4.44	309.62	285.36	0.27
Main Before D	139206	Q500	2097.00	717.81	728.45	723.78	729.04	0.002791	6.17	339.97	427.59	0.35
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.95	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003485	2.99	425.99	367.16	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003380	3.16	563.95	440.39	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002624	2.60	444.66	180.11	0.28
Main Before D	137750	Q100	1412.00	715.00	724.53		724.65	0.002694	2.81	508.73	192.69	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.48	0.002800	3.35	673.07	232.04	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.81	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.97	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#3-PerProposed River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.76	0.01	155.53	445.63	36.84	313.69
Main Before D	140600	Q50	730.33	730.27	0.06	1.36	0.01	332.49	666.34	129.17	394.03
Main Before D	140600	Q100	730.78	730.72	0.06	1.20	0.00	422.77	767.56	193.67	440.79
Main Before D	140600	Q500	732.26	732.22	0.04	0.73	0.01	662.91	979.06	466.03	608.58
Main Before D	140504	Q10	727.61	727.50	0.11	0.88	0.02	0.00	471.24	163.76	204.02
Main Before D	140504	Q50	728.96	728.85	0.11	0.72	0.02	0.40	676.72	445.88	252.44
Main Before D	140504	Q100	729.58	729.47	0.11	0.66	0.02	0.96	766.82	611.22	266.84
Main Before D	140504	Q500	731.53	731.43	0.09	0.45	0.02	4.42	1009.56	1086.03	361.26
Main Before D	139750	Q10	726.70	726.67	0.03	0.07	0.00	0.17	455.13	178.70	278.22
Main Before D	139750	Q50	728.22	728.18	0.04	0.07	0.01	10.23	693.82	415.95	348.90
Main Before D	139750	Q100	728.90	728.86	0.04	0.07	0.01	22.53	808.57	544.89	389.33
Main Before D	139750	Q500	731.06	731.02	0.03	0.05	0.02	106.90	1063.81	926.29	541.36
Main Before D	139632	Q10	726.63	726.58	0.05				634.00		146.89
Main Before D	139632	Q50	728.14	728.03	0.11				1120.00		264.64
Main Before D	139632	Q100	728.81	728.67	0.14				1376.00		313.08
Main Before D	139632	Q500	730.98	730.78	0.21	0.01	0.05		2097.00		471.48
Main Before D	139600		Bridge								
Main Before D	139536	Q10	726.47	726.42	0.05	0.06	0.00	0.02	633.98		193.93
Main Before D	139536	Q50	727.91	727.80	0.10	0.07	0.02	0.30	1119.71		418.14
Main Before D	139536	Q100	728.54	728.41	0.13	0.08	0.03	0.53	1375.47		481.99
Main Before D	139536	Q500	730.39	730.18	0.21	0.08	0.07	1.48	2095.52		627.92
Main Before D	139478	Q10	726.40	726.35	0.05	0.05	0.00	0.10	633.75	0.14	152.90
Main Before D	139478	Q50	727.81	727.75	0.06	0.04	0.00	6.38	1104.86	8.76	207.96
Main Before D	139478	Q100	728.43	728.36	0.07	0.04	0.00	13.23	1343.95	18.83	233.41
Main Before D	139478	Q500	730.25	730.18	0.07	0.03	0.00	52.05	1973.89	71.07	318.18
Main Before D	139355	Q10	726.35	726.30	0.05	0.03	0.01		514.13	119.87	228.88
Main Before D	139355	Q50	727.77	727.71	0.07	0.03	0.01	0.86	820.26	298.88	275.29
Main Before D	139355	Q100	728.39	728.32	0.07	0.03	0.01	3.83	972.85	399.31	299.19
Main Before D	139355	Q500	730.22	730.14	0.08	0.03	0.01	29.61	1352.88	714.51	364.07
Main Before D	139297	Q10	726.31	726.29	0.02	0.02	0.00		478.98	155.02	383.46
Main Before D	139297	Q50	727.73	727.70	0.03	0.03	0.01	4.51	746.14	369.35	460.46
Main Before D	139297	Q100	728.34	728.32	0.03	0.03	0.02	13.17	879.58	483.25	497.53
Main Before D	139297	Q500	730.17	730.15	0.03	0.03	0.03	85.14	1192.65	819.21	713.97
Main Before D	139256	Q10	726.28	726.22	0.06	0.00	0.00		634.00		76.18
Main Before D	139256	Q50	727.69	727.54	0.14				1120.00		211.13
Main Before D	139256	Q100	728.30	728.10	0.19				1376.00		295.63
Main Before D	139256	Q500	730.12	729.78	0.34	0.00	0.10		2097.00		512.45
Main Before D	139250		Bridge								
Main Before D	139206	Q10	726.23	726.14	0.10	0.07	0.03		634.00		37.82
Main Before D	139206	Q50	727.46	727.24	0.22	0.10	0.08		1120.00		225.72
Main Before D	139206	Q100	727.92	727.62	0.31	0.12	0.12		1376.00		285.36
Main Before D	139206	Q500	729.04	728.45	0.59	0.19	0.24		2097.00		427.59
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.08	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.65	13.04	367.16
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.48	56.15	440.39
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.19	242.28	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.10	1.76	0.02		1149.38	0.62	180.11
Main Before D	137750	Q100	724.65	724.53	0.12	1.79	0.02		1409.37	2.63	192.69
Main Before D	137750	Q500	725.48	725.30	0.17	1.84	0.03	2.13	2132.19	15.67	232.04

HEC-RAS Plan: G#3-PerProposed River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#3-PerProposed

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139632 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139632 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139632 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139632 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q100 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500 Upstream

Errors Warnings and Notes for Plan : G#3-PerProposed (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.



Errors Warnings and Notes for Plan : G#3-PerProposed (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500
Warning:	The pressure flow/weir calculations did not converge within the given number of iterations.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Errors Warnings and Notes for Plan : G#3-PerProposed (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X       X   X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX XXXXXX XXXX
X   X   X       X       X   X   X   X   X
X   X   X       X   X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 9/2/2014 2:21:27 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#3-Permit Proposed  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p06

Geometry Title: Group #3- Permit Proposed  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g06

Flow Title : 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Description:

Permit model with Route 47 culvert replaced with 3-sided arch culvert.

Plan Summary Information:

Number of: Cross Sections =	14	Multiple Openings =	0
Culverts =	0	Inline Structures =	0
Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	30
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	140600	638	1128	1384	2108
Blackberry Creek	Main Before D	140504	635	1123	1379	2100
Blackberry Creek	Main Before D	139750	634	1120	1376	2097
Blackberry Creek	Main Before D	139158	640	1132	1389	2117
Blackberry Creek	Main Before D	137750	651	1150	1412	2150
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
-------	-------	---------	----------	------------

Blackberry CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

```

River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #1
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    1      1      1      1      1      1      1      1
River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #2
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    1      1      1      1      1      1      1      1
River = Blackberry Creek
Reach = ER_North         RS = 63593
Gate = Gate #1
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    .5      3      .5      3      .5      3      .5      3
River = Blackberry Creek
Reach = ER_North         RS = 63593
Gate = Gate #2
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    .5      3      .5      3      .5      3      .5      3
River = Blackberry Creek
Reach = ER_North         RS = 63593
Gate = Gate #3
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    .5      3      .5      3      .5      3      .5      3
River = Chain_of_Lakes
Reach = 1                 RS = 11108.
Gate = Gate #2
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    2.2      1      2.2      1      2.2      1      2.2      1
River = Chain_of_Lakes
Reach = 1                 RS = 11108.
Gate = Gate #1
  # Open Open Ht  # Open Open Ht  # Open Open Ht  # Open Open Ht
    2.35     1      2.35     1      2.35     1      2.35     1

```

GEOMETRY DATA

Geometry Title: Group #3- Permit Proposed  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g06

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.

Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 736 34.7 734 94.3 732 129.3 730 157 728		
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5		
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2		
671 732 763.7 732.8 825.4 734 914.1 736		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .09 277.6 .055 358.9 .09		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
277.6	358.9	1000	950	750	.1	.3	

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25		
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54		
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88		
80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -186.58 .11 -158.42 .05 -122.47 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -62 732 55 730 128 728 164.67 726.28 187.22 722.26  
 188.68 719.95 194.07 719.27 197.43 719.21 202.31 719.2 205.58 719.81  
 207.55 723.34 231.42 723.88 389 725.14 436.2 726.72 590.52 733.35

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -62 .11 164.67 .05 231.42 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 164.67 231.42 128 118 183 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139632

INPUT

Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
 bb\_Tinacii

Station Elevation Data num= 16  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -381 736.1 -342 734.4 -317 732 -67.23 726.39 -29.69 725.76  
 -29.49 722 -18.89 721.2 -11.2 718.63 5.8 718.63 13.48 721.2  
 24.09 722 24.23 725.8 24.59 725.81 88.65 726.87 222.37 731.21  
 361.26 734.09

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -381 .11 -29.69 .055 24.59 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -29.69 24.59 107 96 159 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -381 -29.69 733.4 F  
 24.59 361.26 733.4 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139600

INPUT

Description: Route 47 (IL USGS 2001), proposed Concrete Arch and increase in  
 road profile.

Distance from Upstream XS = 4  
 Deck/Roadway Width = 70  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 22  
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
 -447.1 732.85 -395.1 732.69 -251.34 732.95  
 -201.1 733.01 -101.1 733.8 -51.1 734.04  
 -29.69 734.02 717.2 -29.68 734.01 720.78 -28.87 734.01 723.48  
 -26.609 734 725.68 -24.929 734 726.5 -23.17 734 727.14  
 -18.89 734 728.6 -13.04 734 729.43 -3 733.99 730.2  
 7.64 733.99 729.43 13.13 733.99 728.53 17.77 733.99 727.14  
 19.72 733.99 725.68 21.4 733.99 723.47 23.66 733.99 720.78  
 346.13 735.61

Upstream Bridge Cross Section Data

Station Elevation Data num= 16  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -381 736.1 -342 734.4 -317 732 -67.23 726.39 -29.69 725.76  
 -29.49 722 -18.89 721.2 -11.2 718.63 5.8 718.63 13.48 721.2  
 24.09 722 24.23 725.8 24.59 725.81 88.65 726.87 222.37 731.21  
 361.26 734.09

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val

-381 .11 -29.69 .055 24.59 .11

Bank Sta: Left Right Coeff Contr. Expan.  
-29.69 24.59 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-381 -29.69 733.4 F  
24.59 361.26 733.4 F

Downstream Deck/Roadway Coordinates  
num= 23  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-534.52 733.38 -471.24 732.86 -371.24 732.53  
-271.24 732.8 -171.24 733.57 -71.24 734.68  
-49.87 734.87 717.07 -49.86 734.87 720.65 -49.05 734.88 723.35  
-46.789 734.9 725.55 -45.109 734.92 726.37 -43.35 734.94 727.01  
-39.93 734.98 728.47 -33.22 735.05 729.3 -22.88 735.15 730.07  
-12.54 735.29 729.3 -6.63 735.35 728.4 -2.41 735.4 727.01  
-.46 735.43 725.55 1.22 735.45 723.34 3.48 735.47 720.65  
35.48 735.81 285.71 737.01

Downstream Bridge Cross Section Data  
Station Elevation Data num= 18  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-451 732 -333 730 -197.69 727.17 -123 727.85 -71.69 727.15  
-49.48 726.07 -49.36 721.89 -38.76 721.09 -31.07 718.52 -14.07 718.52  
-6.39 721.09 4.22 721.89 8.17 725.05 54.42 724.93 133.57 726.33  
133.58 726.33 257.19 729.13 319.25 731.55

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-451 .13 -49.48 .055 8.17 .13

Bank Sta: Left Right Coeff Contr. Expan.  
-49.48 8.17 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-451 -49.87 733.4 F  
8.17 319.25 733.4 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .95  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
Energy  
Momentum Cd = 2  
Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
Energy Only

Additional Bridge Parameters  
Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139536

INPUT  
Description: USGS IL 2001. DSF of Rt47-8. 2 extend pts on LHS elevations from  
bb\_tinascii  
Station Elevation Data num= 18  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-451 732 -333 730 -197.69 727.17 -123 727.85 -71.69 727.15  
-49.48 726.07 -49.36 721.89 -38.76 721.09 -31.07 718.52 -14.07 718.52  
-6.39 721.09 4.22 721.89 8.17 725.05 54.42 724.93 133.57 726.33  
133.58 726.33 257.19 729.13 319.25 731.55

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-451 .13 -49.48 .055 8.17 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-49.48 8.17 77 110 187 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-451 -49.87 733.4 F

8.17 319.25 733.4 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data		num= 17		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-306	734.1	0	730	47.71	728.07	82	726	119	724		
130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39		
152.54	723.2	186	724	221	726	271	728.2	302	730		
341	732.2	381	734.1								

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-306	.13	82	.045	221	.13		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	82	221		50	71	79	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend

Station Elevation Data		num= 19		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19		
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79		
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09		
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89				

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-45	.13	0	.045	64.26	.13		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	64.26		30	38	166	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data		num= 30		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88		
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49		
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76		
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11		
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52		
822.44	731.3	835.91	732.5	913.06	733.22	935	736.2	956	738.5		

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.13	399.61	.045	492.85	.13		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	399.61	492.85		34	41	248	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139256

INPUT

Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.

Station Elevation Data		num= 32		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729		
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-36.93	727.23		
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06		

-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	1.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -36.93 1.08 46 46 46 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -390 -36.72 729.85 F  
 0 530.99 729.85 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139250

INPUT

Description: Main Street (IL USGS 2001)  
 Distance from Upstream XS = 1  
 Deck/Roadway Width = 44  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 18  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-449.33		737			-445.77		736.9			-390.79		734.86		
-378.64	734.37				-340.19	732.36				-268.95	730.38			
-213.37	728.99				-212.94	728.99				-80.3	727.99			
-36.93	727.98				-36.93	729.92	726.56			0	729.92	726.56		
1.08	729.92	726.56			1.08	727.96				109.06	728.53			
237.68	730.64				367.33	734.52				532.98	740.1			

Upstream Bridge Cross Section Data

Station Elevation Data num= 32  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-36.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	1.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -36.93 1.08 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -390 -36.72 729.85 F  
 0 530.99 729.85 F

Downstream Deck/Roadway Coordinates

num= 12  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-308.86	733.09				-165.48	728.87				-65.04	728.43			
-17.25	728.19				-17.25	729.92	726.56			0	729.92	726.56		
20.99	729.92	726.56			20.99	728.06				88.9	728.06			
218.32	729.36				367.76	732.93				511.92	738.03			

Downstream Bridge Cross Section Data

Station Elevation Data num= 26  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -332.9 .13 -17.25 .055 20.99 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -17.25 20.99 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -15.72 728.75 F  
 20.53 475.96 728.75 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical



Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
 Pier Station Upstream= -17.8 Downstream= 3  
 Upstream num= 2  
 Width Elev Width Elev  
 1.5 714 1.5 728  
 Downstream num= 2  
 Width Elev Width Elev  
 1.5 714 1.5 728

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139206

INPUT  
 Description: USGS IL 2001. DSF Main Street.  
 Station Elevation Data num= 26  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-17.25	.055	20.99	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -17.25 20.99 122 100 110 .3 .5  
 Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
-332.9	-15.72	728.75	F
20.53	475.96	728.75	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139158

INPUT  
 Description: USGS IL 2001. Departure of Main Street  
 Station Elevation Data num= 22  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84
319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
0	.13	265.13	.055	388.49	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 265.13 388.49 740 690 550 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01
558.72	723.73	574	722	578	720	582	718	586	716
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	487.45	.055	631.64	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	487.45	631.64		710	700	700	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930	720	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09
940	730.89	985	733.59						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	480	.055	630	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	480	630		9810	11021	10122	.1	.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139632	.11	.055	.11
Main Before D	139600	Bridge		
Main Before D	139536	.13	.055	.13

Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139256	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139206	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	128	118	183
Main Before D	139632	107	96	159
Main Before D	139600	Bridge		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	34	41	248
Main Before D	139256	46	46	46
Main Before D	139250	Bridge		
Main Before D	139206	122	100	110
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

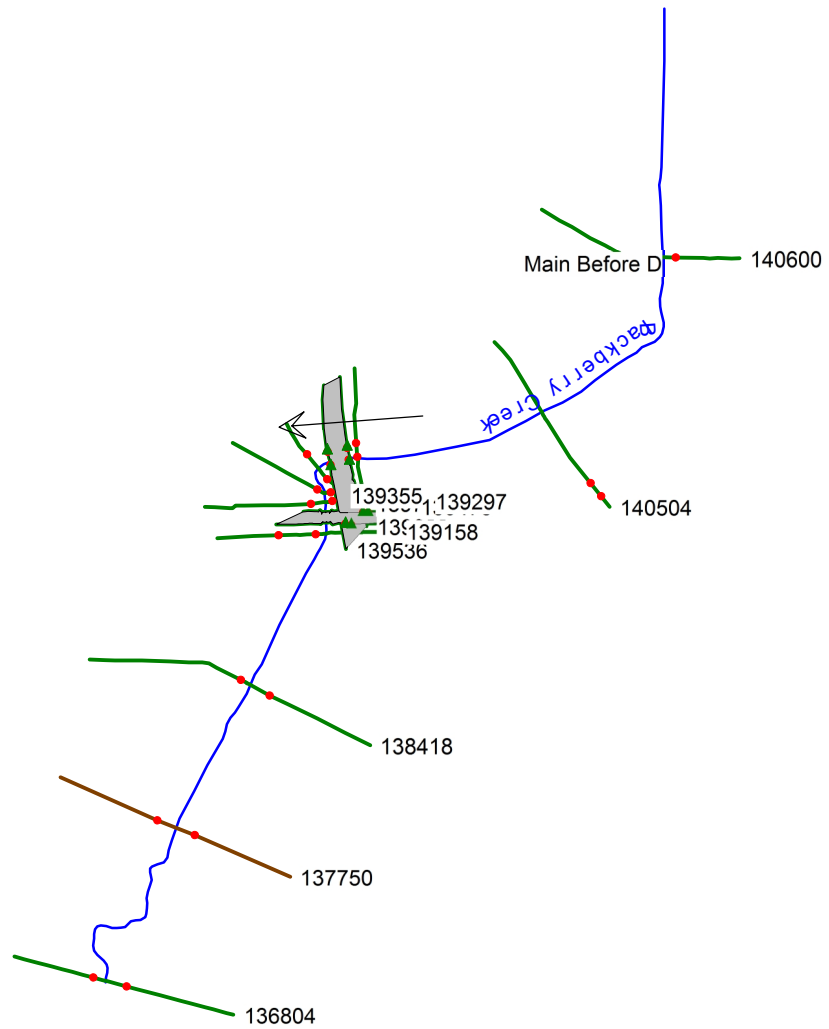
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139632	.3	.5
Main Before D	139600	Bridge	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139256	.3	.5
Main Before D	139250	Bridge	
Main Before D	139206	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

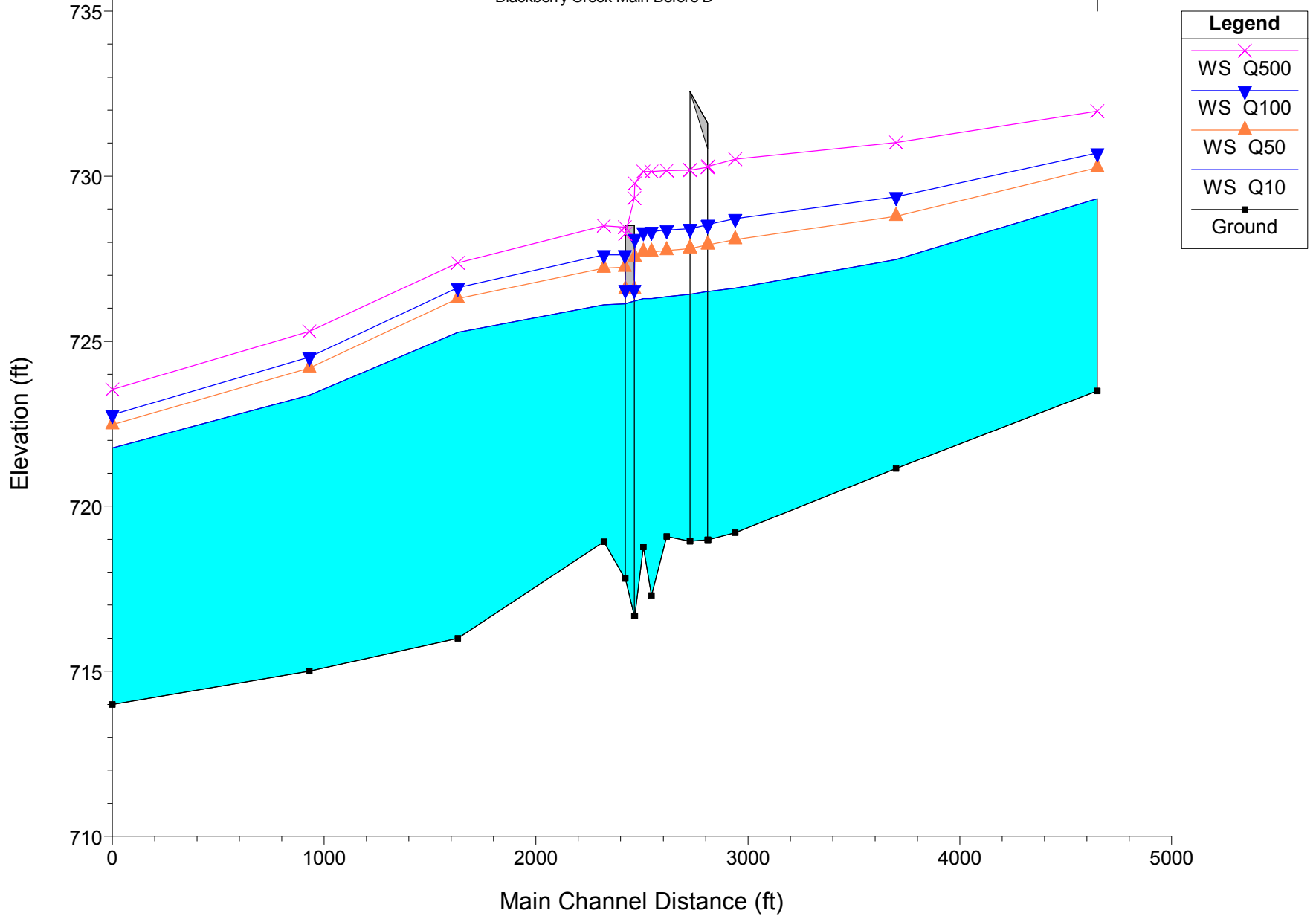
**GROUP #3-PERMIT PROPOSED CONDITIONS**

**Trimmed FIS Model - Proposed Rte 47 bridge**



1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#3-propBR River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002041	2.20	443.27	313.72	0.25
Main Before D	140600	Q50	1128.00	723.50	730.26		730.32	0.001575	2.40	772.63	392.94	0.23
Main Before D	140600	Q100	1384.00	723.50	730.70		730.76	0.001397	2.45	956.93	438.63	0.22
Main Before D	140600	Q500	2108.00	723.50	731.97		732.02	0.000917	2.40	1600.17	573.91	0.19
Main Before D	140504	Q10	635.00	721.14	727.47		727.58	0.001813	3.11	380.58	202.87	0.27
Main Before D	140504	Q50	1123.00	721.14	728.79		728.91	0.001528	3.42	684.15	250.96	0.26
Main Before D	140504	Q100	1379.00	721.14	729.38		729.49	0.001412	3.51	835.05	264.65	0.25
Main Before D	140504	Q500	2100.00	721.14	731.03		731.13	0.001089	3.61	1304.46	315.70	0.23
Main Before D	139750	Q10	634.00	719.20	726.61		726.64	0.000587	1.74	627.81	275.14	0.15
Main Before D	139750	Q50	1120.00	719.20	728.08		728.11	0.000478	1.93	1080.74	342.47	0.15
Main Before D	139750	Q100	1376.00	719.20	728.71		728.75	0.000451	2.02	1311.17	380.57	0.14
Main Before D	139750	Q500	2097.00	719.20	730.52		730.56	0.000340	2.09	2101.27	500.32	0.13
Main Before D	139620	Q10	634.00	718.98	726.51	721.85	726.57	0.000510	1.83	351.39	135.40	0.14
Main Before D	139620	Q50	1120.00	718.98	727.93	722.70	728.03	0.000721	2.54	458.87	256.91	0.17
Main Before D	139620	Q100	1376.00	718.98	728.54	723.10	728.66	0.000811	2.85	505.27	302.90	0.18
Main Before D	139620	Q500	2097.00	718.98	730.29	724.05	730.48	0.000910	3.47	638.66	435.13	0.20
Main Before D	139600		Bridge									
Main Before D	139536	Q10	634.00	718.94	726.42	721.81	726.47	0.000522	1.84	348.40	198.81	0.14
Main Before D	139536	Q50	1120.00	718.94	727.81	722.67	727.91	0.000747	2.57	453.81	419.05	0.17
Main Before D	139536	Q100	1376.00	718.94	728.41	723.03	728.54	0.000843	2.89	499.61	482.34	0.19
Main Before D	139536	Q500	2097.00	718.94	730.19	724.01	730.38	0.000935	3.51	634.93	628.58	0.20
Main Before D	139478	Q10	634.00	719.09	726.35		726.40	0.000785	1.74	366.50	152.90	0.19
Main Before D	139478	Q50	1120.00	719.09	727.76		727.81	0.000571	1.98	619.33	207.96	0.17
Main Before D	139478	Q100	1376.00	719.09	728.36		728.43	0.000528	2.09	753.68	233.41	0.17
Main Before D	139478	Q500	2097.00	719.09	730.18		730.25	0.000379	2.20	1245.79	318.18	0.15
Main Before D	139355	Q10	634.00	717.29	726.30		726.35	0.000639	2.02	541.29	228.88	0.18
Main Before D	139355	Q50	1120.00	717.29	727.71		727.77	0.000602	2.38	892.79	275.29	0.18
Main Before D	139355	Q100	1376.00	717.29	728.32		728.39	0.000591	2.54	1068.49	299.18	0.18
Main Before D	139355	Q500	2097.00	717.29	730.14		730.22	0.000470	2.70	1674.39	364.07	0.17
Main Before D	139297	Q10	634.00	718.76	726.29		726.31	0.000309	1.37	872.32	383.46	0.12
Main Before D	139297	Q50	1120.00	718.76	727.70		727.73	0.000262	1.55	1464.18	460.47	0.12
Main Before D	139297	Q100	1376.00	718.76	728.32		728.34	0.000251	1.63	1758.47	497.52	0.12
Main Before D	139297	Q500	2097.00	718.76	730.15		730.17	0.000184	1.68	2873.07	713.97	0.11
Main Before D	139256	Q10	634.00	716.67	726.22	719.60	726.28	0.000306	1.98	319.86	76.18	0.12
Main Before D	139256	Q50	1120.00	716.67	727.54	720.58	727.69	0.000596	3.04	368.35	211.14	0.17
Main Before D	139256	Q100	1376.00	716.67	728.10	721.04	728.30	0.000750	3.54	388.86	295.60	0.19
Main Before D	139256	Q500	2097.00	716.67	729.78	722.18	730.12	0.001068	4.66	450.45	512.45	0.23
Main Before D	139250		Bridge									
Main Before D	139206	Q10	634.00	717.81	726.14	721.20	726.23	0.000657	2.48	255.96	37.82	0.16
Main Before D	139206	Q50	1120.00	717.81	727.24	722.17	727.46	0.001266	3.79	295.84	225.72	0.23
Main Before D	139206	Q100	1376.00	717.81	727.62	722.62	727.92	0.001642	4.44	309.62	285.35	0.27
Main Before D	139206	Q500	2097.00	717.81	728.45	723.78	729.04	0.002791	6.17	339.97	427.59	0.35
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.56	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003381	3.16	563.92	440.38	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002627	2.60	444.47	180.07	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002697	2.82	508.51	192.64	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.48	0.002800	3.35	673.08	232.04	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.81	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.95	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.27	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#3-propBR River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.78	0.01	155.55	445.59	36.86	313.72
Main Before D	140600	Q50	730.32	730.26	0.06	1.41	0.01	332.12	667.36	128.52	392.94
Main Before D	140600	Q100	730.76	730.70	0.06	1.26	0.01	422.25	769.73	192.02	438.63
Main Before D	140600	Q500	732.02	731.97	0.05	0.88	0.01	665.38	1001.74	440.88	573.91
Main Before D	140504	Q10	727.58	727.47	0.11	0.92	0.02	0.00	473.34	161.66	202.87
Main Before D	140504	Q50	728.91	728.79	0.12	0.77	0.02	0.36	682.86	439.78	250.96
Main Before D	140504	Q100	729.49	729.38	0.11	0.72	0.02	0.88	775.64	602.48	264.65
Main Before D	140504	Q500	731.13	731.03	0.11	0.55	0.02	3.66	1012.63	1083.71	315.70
Main Before D	139750	Q10	726.64	726.61	0.03	0.08	0.00	0.11	458.23	175.66	275.14
Main Before D	139750	Q50	728.11	728.08	0.04	0.08	0.01	9.27	699.95	410.78	342.47
Main Before D	139750	Q100	728.75	728.71	0.04	0.08	0.01	20.04	817.59	538.37	380.57
Main Before D	139750	Q500	730.56	730.52	0.04	0.07	0.01	87.48	1098.57	910.96	500.32
Main Before D	139620	Q10	726.57	726.51	0.05			0.41	633.16	0.44	135.40
Main Before D	139620	Q50	728.03	727.93	0.10			5.93	1108.05	6.02	256.91
Main Before D	139620	Q100	728.66	728.54	0.12			10.18	1355.51	10.31	302.90
Main Before D	139620	Q500	730.48	730.29	0.18	0.00	0.00	26.70	2043.41	26.89	435.13
Main Before D	139600		Bridge								
Main Before D	139536	Q10	726.47	726.42	0.05	0.07	0.00	0.14	633.29	0.57	198.81
Main Before D	139536	Q50	727.91	727.81	0.10	0.07	0.02	4.29	1110.03	5.68	419.05
Main Before D	139536	Q100	728.54	728.41	0.13	0.08	0.03	7.71	1358.79	9.50	482.34
Main Before D	139536	Q500	730.38	730.19	0.19	0.07	0.06	21.64	2051.05	24.31	628.58
Main Before D	139478	Q10	726.40	726.35	0.05	0.05	0.00	0.10	633.75	0.14	152.90
Main Before D	139478	Q50	727.81	727.76	0.06	0.04	0.00	6.38	1104.86	8.76	207.96
Main Before D	139478	Q100	728.43	728.36	0.07	0.04	0.00	13.23	1343.95	18.83	233.41
Main Before D	139478	Q500	730.25	730.18	0.07	0.03	0.00	52.05	1973.89	71.07	318.18
Main Before D	139355	Q10	726.35	726.30	0.05	0.03	0.01		514.13	119.87	228.88
Main Before D	139355	Q50	727.77	727.71	0.07	0.03	0.01	0.86	820.25	298.89	275.29
Main Before D	139355	Q100	728.39	728.32	0.07	0.03	0.01	3.83	972.86	399.31	299.18
Main Before D	139355	Q500	730.22	730.14	0.08	0.03	0.01	29.61	1352.88	714.51	364.07
Main Before D	139297	Q10	726.31	726.29	0.02	0.02	0.00		478.98	155.02	383.46
Main Before D	139297	Q50	727.73	727.70	0.03	0.03	0.01	4.51	746.13	369.36	460.47
Main Before D	139297	Q100	728.34	728.32	0.03	0.03	0.02	13.17	879.58	483.25	497.52
Main Before D	139297	Q500	730.17	730.15	0.03	0.03	0.03	85.14	1192.65	819.21	713.97
Main Before D	139256	Q10	726.28	726.22	0.06	0.00	0.00		634.00		76.18
Main Before D	139256	Q50	727.69	727.54	0.14				1120.00		211.14
Main Before D	139256	Q100	728.30	728.10	0.19				1376.00		295.60
Main Before D	139256	Q500	730.12	729.78	0.34	0.00	0.10		2097.00		512.45
Main Before D	139250		Bridge								
Main Before D	139206	Q10	726.23	726.14	0.10	0.07	0.03		634.00		37.82
Main Before D	139206	Q50	727.46	727.24	0.22	0.10	0.08		1120.00		225.72
Main Before D	139206	Q100	727.92	727.62	0.31	0.12	0.12		1376.00		285.35
Main Before D	139206	Q500	729.04	728.45	0.59	0.19	0.24		2097.00		427.59
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.09	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.64	13.05	367.20
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.49	56.14	440.38
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.19	242.28	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.39	0.61	180.07
Main Before D	137750	Q100	724.65	724.52	0.12	1.79	0.02		1409.38	2.62	192.64
Main Before D	137750	Q500	725.48	725.30	0.17	1.84	0.03	2.13	2132.19	15.67	232.04
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75



HEC-RAS Plan: G#3-propBR River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#3-propBR

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10

Errors Warnings and Notes for Plan : G#3-propBR (Continued)

Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139256 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100

Errors Warnings and Notes for Plan : G#3-propBR (Continued)

Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500
Warning:	The pressure flow/weir calculations did not converge within the given number of iterations.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139206 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q50
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : G#3-propBR (Continued)

Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X        X   X     X   X   X   X   X
X   X  X        X         X   X   X   X   X
XXXXXXXX XXXX   X         XXX XXXX   XXXXXX   XXXX
X   X  X        X         X   X   X   X   X
X   X  X        X   X     X   X   X   X   X
X   X  XXXXXX   XXXX       X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 8/29/2012 4:12:38 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#3-Permit Proposed BR  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p04

Geometry Title: Group #3- Permit ProposedBR  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g02

Flow Title : 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Description:

Existing Main Street Bridge, with Route 47 Culvert replaced with proposed open abutment Bridge.

Plan Summary Information:

Number of:	Cross Sections = 14	Multiple Openings = 0
	Culverts = 0	Inline Structures = 0
	Bridges = 2	Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 30
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	140600	638	1128	1384	2108
Blackberry Creek	Main Before D	140504	635	1123	1379	2100
Blackberry Creek	Main Before D	139750	634	1120	1376	2097
Blackberry Creek	Main Before D	139158	640	1132	1389	2117
Blackberry Creek	Main Before D	137750	651	1150	1412	2150
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
-------	-------	---------	----------	------------

Blackberry CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #3  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 2.2 1 2.2 1 2.2 1 2.2 1

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 2.35 1 2.35 1 2.35 1 2.35 1

GEOMETRY DATA

Geometry Title: Group #3- Permit ProposedBR  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g02

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.

Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 736 34.7 734 94.3 732 129.3 730 157 728		
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5		
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2		
671 732 763.7 732.8 825.4 734 914.1 736		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .09 277.6 .055 358.9 .09		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
277.6 358.9	1000 950 750	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25		
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54		
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88		

80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-186.58 .11 -158.42 .05 -122.47 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139750

INPUT  
Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-62 732 55 730 128 728 164.67 726.28 187.22 722.26  
188.68 719.95 194.07 719.27 197.43 719.21 202.31 719.2 205.58 719.81  
207.55 723.34 231.42 723.88 389 725.14 436.2 726.72 590.52 733.35

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-62 .11 164.67 .05 231.42 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
164.67 231.42 140 128 195 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139620

INPUT  
Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
bb\_Tinacii

Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -34.97 726.08  
-25.23 721.16 -18.63 721.09 -10.6 718.98 4.91 718.98 12.61 721.09  
19.2 721.16 28.97 726.05 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -34.97 .055 28.97 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-34.97 28.97 95 86 147 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-381 -41 733.65 F  
35 361.26 733.65 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139600

INPUT  
Description: Route 47 (IL), proposed open abutment bridge and increase in road  
profile.

Distance from Upstream XS = 1  
Deck/Roadway Width = 84  
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 11  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-300 734 -250 733.19 -162.82 733.34  
-67.02 734.33 -41 734.86 730 -22.94 735.09 730.3  
17.16 735.46 730.6 35 735.65 730.83 75.46 736.09  
225 736.75 360.24 737.36

Upstream Bridge Cross Section Data num= 15  
Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -34.97 726.08  
-25.23 721.16 -18.63 721.09 -10.6 718.98 4.91 718.98 12.61 721.09  
19.2 721.16 28.97 726.05 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -34.97 .055 28.97 .11

Bank Sta: Left Right Coeff Contr. Expan.  
-34.97 28.97 .3 .5

Ineffective Flow num= 2





-7.42 721.04 -.85 721.09 8.92 725.95 54.42 724.93 133.57 726.33  
133.58 726.33 257.19 729.13 319.25 731.55

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-451 .13 -54.84 .055 8.92 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-54.84 8.92 77 110 187 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-451 -60.98 733.65 F  
15.02 319.25 733.65 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data num= 17  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-306 734.1 0 730 47.71 728.07 82 726 119 724  
130 722 139.79 719.09 143.42 719.27 146.95 719.49 149.39 720.39  
152.54 723.2 186 724 221 726 271 728.2 302 730  
341 732.2 381 734.1

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-306 .13 82 .045 221 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
82 221 50 71 79 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St.  
2 extend pts on LHS elevation from bb\_tinascii

Station Elevation Data num= 19  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-45 730 -22 728.2 0 726.89 8.24 721.09 14.83 718.19  
19.06 717.29 22.63 718.59 26.26 719.99 29.19 721.09 33.26 723.79  
64.26 724.49 115.26 723.79 165.26 724.39 218.26 725.79 270.26 728.09  
320.26 730.19 375.26 732.29 425.26 734.39 485.26 736.89

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-45 .13 0 .045 64.26 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
0 64.26 30 38 166 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data num= 30  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 737 9.38 735.83 56.18 733.24 93.68 730.58 112.76 729.88  
218.8 729.2 261.72 728.55 264.05 728.97 295.19 728.74 399.61 726.49  
405.99 725.35 411.07 723.12 415.3 719.08 419.12 719.06 421.88 718.76  
428.79 719.03 431.19 719.41 434.55 719.99 435.59 722.94 439.23 723.11  
492.85 723.5 609.69 724.01 699.57 724.87 783.83 726.26 815.24 728.52  
822.44 731.3 835.91 732.5 913.06 733.22 935 736.2 956 738.5

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 399.61 .045 492.85 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
399.61 492.85 34 41 248 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139256

INPUT

Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.

Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-36.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	1.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-390	.13	-36.93	.055	1.08	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

-36.93	1.08	46	46	46	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-390	-36.72	729.85	F
0	530.99	729.85	F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139250

INPUT

Description: Main Street (IL USGS 2001)

Distance from Upstream XS = 1  
 Deck/Roadway Width = 44  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 17

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-445.77	737.76				-390.79	735.55				-378.64	735.05			
-340.19	733.53				-268.95	731.37				-213.37	729.84			
-212.94	729.83				-80.3	728.54				-36.93	728.56			
-36.93	729.92	726.56			0	729.92	726.56			1.08	729.92	726.56		
1.08	728.51				109.06	729.12				237.68	731.19			
367.33	735				532.98	740.54								

Upstream Bridge Cross Section Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-36.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	1.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-390	.13	-36.93	.055	1.08	.13

Bank Sta: Left Right Coeff Contr. Expan.

-36.93	1.08	.3	.5
--------	------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-390	-36.72	729.85	F
0	530.99	729.85	F

Downstream Deck/Roadway Coordinates num= 12

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-308.86	733				-165.48	729.24				-65.04	728.54			
-17.25	728.56				-17.25	729.92	726.56			0	729.92	726.56		
20.99	729.92	726.56			20.99	728.5				88.9	728.78			
218.32	730.49				367.76	734.45				511.92	739.44			

Downstream Bridge Cross Section Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val  
-332.9 .13 -17.25 .055 20.99 .13

Bank Sta: Left Right Coeff Contr. Expan.  
-17.25 20.99 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-332.9 -15.72 728.75 F  
20.53 475.96 728.75 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .95  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
Pier Station Upstream= -17.8 Downstream= 3  
Upstream num= 2  
Width Elev Width Elev  
1.5 714 1.5 728  
Downstream num= 2  
Width Elev Width Elev  
1.5 714 1.5 728

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
Energy  
Momentum Cd = 2  
Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
Pressure and Weir flow  
Submerged Inlet Cd =  
Submerged Inlet + Outlet Cd = .8  
Max Low Cord =

Additional Bridge Parameters  
Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139206

INPUT  
Description: USGS IL 2001. DSF Main Street.  
Station Elevation Data num= 26  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-332.9 733.91 -278.27 733.24 -215.95 730.89 -184.04 728.19 -17.39 726.75  
-17.25 727.74 -15.72 720.47 -10.58 720.32 -9.74 719.11 -8.05 719.18  
-7.21 720.34 -4.54 720.06 0 719.16 6.04 717.95 10.27 717.81  
17.13 718.76 20.53 719.49 20.99 727.54 23.13 726.61 70.91 726.7  
142.98 726.53 163.03 727.95 203.88 728.69 219.66 728.15 228.58 727.39  
475.96 735.66

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-332.9 .13 -17.25 .055 20.99 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-17.25 20.99 122 100 110 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-332.9 -15.72 728.75 F  
20.53 475.96 728.75 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139158

INPUT  
Description: USGS IL 2001. Departure of Main Street  
Station Elevation Data num= 22  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 735.77 99.86 731.62 124.22 728.63 195.07 728.14 207.18 726.09  
213.4 723.77 225.05 725.16 265.13 724.96 283.4 723.89 297.02 721.24  
299.85 719.15 302.84 719.02 305.57 719.24 310.13 718.93 315.62 719.84

319.11 723.31 331.28 723.07 388.49 723.98 418.69 726.97 468 728  
520 730 591 732

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 265.13 .055 388.49 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
265.13 388.49 740 690 550 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 740.2 123.43 736.04 259.45 732.01 402.74 728.09 487.45 726.01  
558.72 723.73 574 722 578 720 582 718 586 716  
590 718 594 720 596.52 722.18 600.58 722.32 609.11 724.95  
631.64 726.47 750.55 726 788.56 726 819.09 726 877.47 726  
958.19 728.02 1081.13 732.01 1198.01 737.76 1242.37 741.61 1308.9 745.98

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 487.45 .055 631.64 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
487.45 631.64 710 700 700 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730  
271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726  
450.5 724.6 476.8 722.6 485 720 489 718 493 716  
497 715 501 716 505 718 509 720 527.1 722  
586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1  
876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9  
1083.7 739.7

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 730.49 6 730.59 30 730.59 41 729.19 91 727.99  
125 727.29 190 726.59 235 725.69 282 724.09 330 721.79  
380 720.69 430 720.49 480 720.19 522 719.79 568 719.49  
571 717.79 571 716.49 575 714.29 578 713.99 579 714.39  
580 715.99 582 717.89 589 720.09 630 721.09 680 719.99  
725 720.29 770 720.89 812 722.19 840 723.29 880 726.09  
940 730.89 985 733.59

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 480 .055 630 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
480 630 9810 11021 10122 .1 .3

SUMMARY OF MANNING'S N VALUES

River:Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139620	.11	.055	.11
Main Before D	139600	Bridge		
Main Before D	139536	.13	.055	.13
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139256	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139206	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	140	128	195
Main Before D	139620	95	86	147
Main Before D	139600	Bridge		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	34	41	248
Main Before D	139256	46	46	46
Main Before D	139250	Bridge		
Main Before D	139206	122	100	110
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

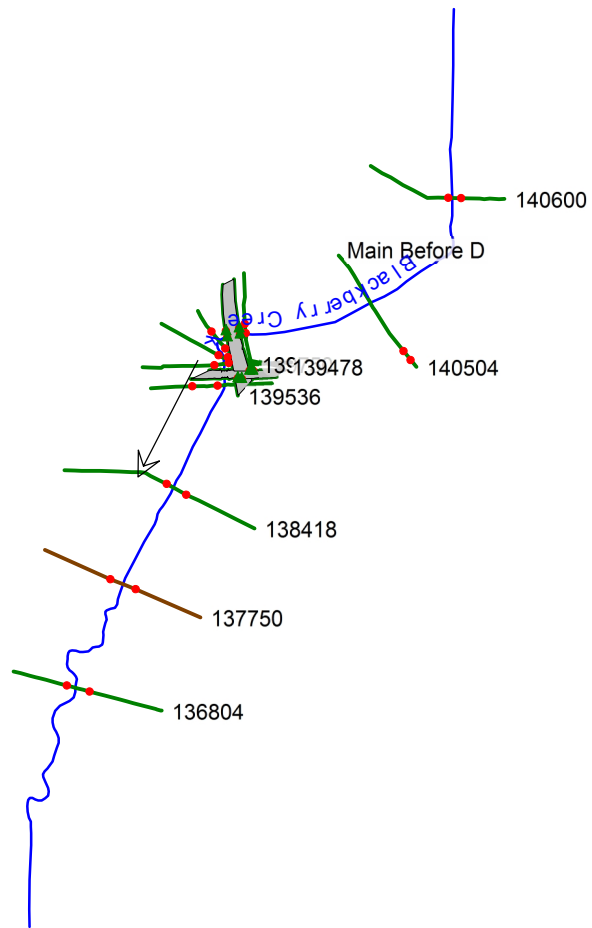
River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139620	.3	.5
Main Before D	139600	Bridge	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139256	.3	.5
Main Before D	139250	Bridge	
Main Before D	139206	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

HEC-RAS Model

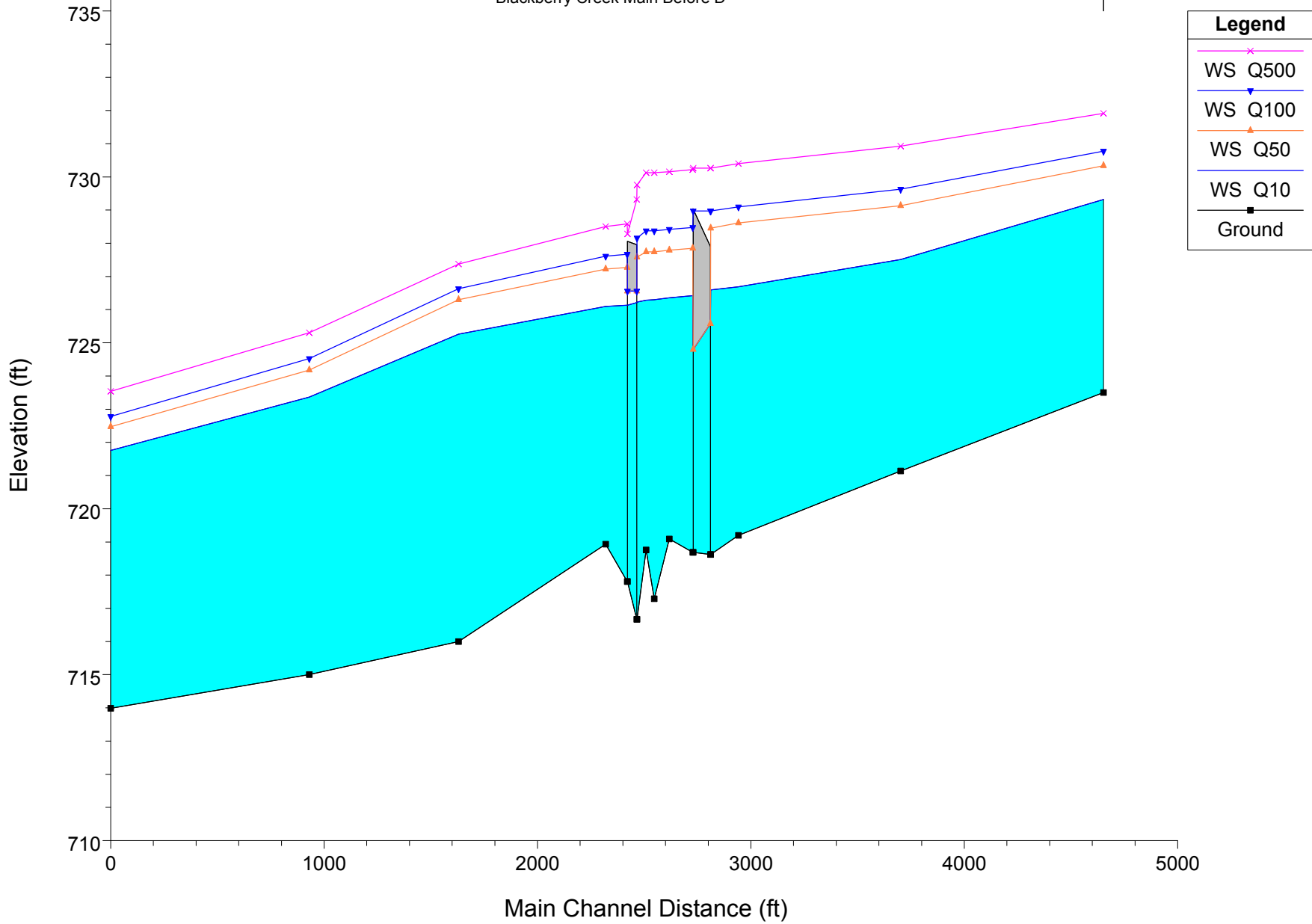
**DUPLICATE MODEL**

**FIS Trimmed model vs. FEMA WSEL**



1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)





HEC-RAS Plan: Duplicate River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002043	2.20	443.11	313.68	0.25
Main Before D	140600	Q50	1128.00	723.50	730.33		730.39	0.001434	2.32	802.52	400.70	0.22
Main Before D	140600	Q100	1384.00	723.50	730.78		730.83	0.001284	2.38	990.12	446.36	0.21
Main Before D	140600	Q500	2108.00	723.50	731.92		731.97	0.000965	2.44	1566.97	567.60	0.19
Main Before D	140504	Q10	635.00	721.14	727.51		727.62	0.001741	3.06	388.01	204.44	0.26
Main Before D	140504	Q50	1123.00	721.14	729.13		729.22	0.001142	3.07	770.95	258.92	0.22
Main Before D	140504	Q100	1379.00	721.14	729.63		729.73	0.001162	3.27	902.79	270.56	0.23
Main Before D	140504	Q500	2100.00	721.14	730.93		731.04	0.001128	3.65	1274.18	303.27	0.23
Main Before D	139750	Q10	634.00	719.20	726.69		726.72	0.000538	1.68	650.51	279.33	0.15
Main Before D	139750	Q50	1120.00	719.20	728.61		728.64	0.000320	1.69	1273.81	374.66	0.12
Main Before D	139750	Q100	1376.00	719.20	729.09		729.13	0.000347	1.85	1460.80	403.39	0.13
Main Before D	139750	Q500	2097.00	719.20	730.40		730.44	0.000364	2.14	2040.95	490.36	0.14
Main Before D	139620	Q10	634.00	718.62	726.59	720.83	726.65	0.000449	1.90	332.81	148.34	0.12
Main Before D	139620	Q50	1120.00	718.62	728.46	721.71	728.57	0.000673	2.70	414.91	296.88	0.16
Main Before D	139620	Q100	1376.00	718.62	728.97	722.10	729.06	0.000567	2.57	965.20	335.77	0.14
Main Before D	139620	Q500	2097.00	718.62	730.27	723.13	730.37	0.000656	3.00	1461.61	433.05	0.16
Main Before D	139600		Bridge									
Main Before D	139536	Q10	634.00	718.69	726.42	721.32	726.48	0.000516	1.97	441.64	198.61	0.13
Main Before D	139536	Q50	1120.00	718.69	727.85	722.19	727.93	0.000666	2.54	835.86	430.31	0.16
Main Before D	139536	Q100	1376.00	718.69	728.48	722.61	728.56	0.000665	2.66	1124.82	488.51	0.16
Main Before D	139536	Q500	2097.00	718.69	730.22	723.64	730.29	0.000510	2.63	2105.45	631.12	0.14
Main Before D	139478	Q10	634.00	719.09	726.35		726.40	0.000784	1.74	366.60	152.93	0.19
Main Before D	139478	Q50	1120.00	719.09	727.79		727.85	0.000555	1.96	626.64	209.34	0.17
Main Before D	139478	Q100	1376.00	719.09	728.42		728.48	0.000507	2.06	766.36	235.68	0.17
Main Before D	139478	Q500	2097.00	719.09	730.16		730.23	0.000383	2.21	1240.70	316.70	0.15
Main Before D	139355	Q10	634.00	717.29	726.30		726.35	0.000639	2.02	541.46	228.90	0.18
Main Before D	139355	Q50	1120.00	717.29	727.74		727.81	0.000586	2.36	902.85	276.73	0.18
Main Before D	139355	Q100	1376.00	717.29	728.37		728.44	0.000569	2.50	1085.27	301.23	0.18
Main Before D	139355	Q500	2097.00	717.29	730.12		730.20	0.000474	2.71	1668.42	363.68	0.17
Main Before D	139297	Q10	634.00	718.76	726.29		726.31	0.000309	1.37	872.58	383.47	0.12
Main Before D	139297	Q50	1120.00	718.76	727.74		727.76	0.000255	1.53	1481.12	462.68	0.12
Main Before D	139297	Q100	1376.00	718.76	728.37		728.40	0.000241	1.61	1786.56	500.92	0.12
Main Before D	139297	Q500	2097.00	718.76	730.13		730.16	0.000186	1.69	2861.31	713.47	0.11
Main Before D	139254	Q10	634.00	716.67	726.22	719.60	726.28	0.000306	1.98	319.86	76.18	0.12
Main Before D	139254	Q50	1120.00	716.67	727.58	720.58	727.72	0.000588	3.03	369.71	215.23	0.17
Main Before D	139254	Q100	1376.00	716.67	728.16	721.04	728.36	0.000737	3.52	390.99	306.45	0.19
Main Before D	139254	Q500	2097.00	716.67	729.76	722.18	730.10	0.001073	4.66	449.78	511.10	0.23
Main Before D	139250		Bridge									
Main Before D	139208	Q10	634.00	717.81	726.14	721.17	726.23	0.000657	2.48	255.96	37.82	0.16
Main Before D	139208	Q50	1120.00	717.81	727.27	722.17	727.47	0.001700	3.59	400.85	230.52	0.22
Main Before D	139208	Q100	1376.00	717.81	727.67	722.63	727.91	0.002064	4.05	505.18	294.93	0.25
Main Before D	139208	Q500	2097.00	717.81	728.59	723.79	728.90	0.002680	4.94	848.63	444.42	0.29
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.95	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003485	2.99	425.99	367.16	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003380	3.16	563.98	440.39	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.47	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002623	2.60	444.70	180.12	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002703	2.82	508.11	192.57	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.47	0.002802	3.35	672.95	232.02	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	721.00	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: Duplicate River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.75	0.01	155.53	445.64	36.84	313.68
Main Before D	140600	Q50	730.39	730.33	0.05	1.16	0.00	334.62	660.20	133.18	400.70
Main Before D	140600	Q100	730.83	730.78	0.05	1.10	0.00	424.05	762.01	197.94	446.36
Main Before D	140600	Q500	731.97	731.92	0.05	0.92	0.01	665.21	1008.46	434.33	567.60
Main Before D	140504	Q10	727.62	727.51	0.11	0.87	0.02	0.00	470.46	164.54	204.44
Main Before D	140504	Q50	729.22	729.13	0.09	0.56	0.02	0.56	651.61	470.83	258.92
Main Before D	140504	Q100	729.73	729.63	0.10	0.58	0.02	1.10	752.58	625.32	270.56
Main Before D	140504	Q500	731.04	730.93	0.11	0.58	0.02	3.54	1008.99	1087.48	303.27
Main Before D	139750	Q10	726.72	726.69	0.03	0.07	0.00	0.19	454.03	179.78	279.33
Main Before D	139750	Q50	728.64	728.61	0.03	0.06	0.01	15.02	670.55	434.43	374.66
Main Before D	139750	Q100	729.13	729.09	0.03	0.06	0.01	26.87	794.57	554.56	403.39
Main Before D	139750	Q500	730.44	730.40	0.04	0.07	0.01	83.24	1107.16	906.60	490.36
Main Before D	139620	Q10	726.65	726.59	0.06				634.00		148.34
Main Before D	139620	Q50	728.57	728.46	0.11				1120.00		296.88
Main Before D	139620	Q100	729.06	728.97	0.08			126.98	1123.94	125.08	335.77
Main Before D	139620	Q500	730.37	730.27	0.10			317.85	1482.39	296.77	433.05
Main Before D	139600	Bridge									
Main Before D	139536	Q10	726.48	726.42	0.06	0.07	0.01	1.71	601.13	31.16	198.61
Main Before D	139536	Q50	727.93	727.85	0.08	0.07	0.01	21.00	936.13	162.87	430.31
Main Before D	139536	Q100	728.56	728.48	0.09	0.07	0.01	68.09	1056.80	251.11	488.51
Main Before D	139536	Q500	730.29	730.22	0.07	0.05	0.00	297.12	1245.98	553.90	631.12
Main Before D	139478	Q10	726.40	726.35	0.05	0.05	0.00	0.10	633.75	0.14	152.93
Main Before D	139478	Q50	727.85	727.79	0.06	0.04	0.00	6.63	1104.28	9.10	209.34
Main Before D	139478	Q100	728.48	728.42	0.06	0.04	0.00	13.74	1342.63	19.63	235.68
Main Before D	139478	Q500	730.23	730.16	0.07	0.03	0.00	51.91	1974.41	70.69	316.70
Main Before D	139355	Q10	726.35	726.30	0.05	0.03	0.01		514.10	119.90	228.90
Main Before D	139355	Q50	727.81	727.74	0.06	0.03	0.01	0.96	818.45	300.60	276.73
Main Before D	139355	Q100	728.44	728.37	0.07	0.03	0.01	4.18	969.89	401.93	301.23
Main Before D	139355	Q500	730.20	730.12	0.08	0.03	0.01	29.29	1353.95	713.76	363.68
Main Before D	139297	Q10	726.31	726.29	0.02	0.02	0.00		478.94	155.06	383.47
Main Before D	139297	Q50	727.76	727.74	0.03	0.03	0.01	4.82	744.18	371.00	462.68
Main Before D	139297	Q100	728.40	728.37	0.03	0.03	0.02	14.00	876.46	485.53	500.92
Main Before D	139297	Q500	730.16	730.13	0.03	0.03	0.03	84.02	1194.03	818.95	713.47
Main Before D	139254	Q10	726.28	726.22	0.06	0.00	0.00		634.00		76.18
Main Before D	139254	Q50	727.72	727.58	0.14				1120.00		215.23
Main Before D	139254	Q100	728.36	728.16	0.19				1376.00		306.45
Main Before D	139254	Q500	730.10	729.76	0.34	0.00	0.10		2097.00		511.10
Main Before D	139250	Bridge									
Main Before D	139208	Q10	726.23	726.14	0.10	0.07	0.03		634.00		37.82
Main Before D	139208	Q50	727.47	727.27	0.19	0.12	0.07	3.03	1089.25	27.72	230.52
Main Before D	139208	Q100	727.91	727.67	0.24	0.15	0.09	15.19	1291.38	69.43	294.93
Main Before D	139208	Q500	728.90	728.59	0.32	0.19	0.11	117.10	1748.38	231.52	444.42
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.08	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.65	13.04	367.16
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.38	1330.47	56.16	440.39
Main Before D	138418	Q500	727.54	727.37	0.17	2.07	0.00	18.54	1856.17	242.29	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.10	1.76	0.02		1149.38	0.62	180.12
Main Before D	137750	Q100	724.65	724.52	0.12	1.80	0.02		1409.39	2.61	192.57
Main Before D	137750	Q500	725.47	725.30	0.17	1.84	0.03	2.13	2132.21	15.66	232.02
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75

HEC-RAS Plan: Duplicate River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

HEC-RAS Plan: Duplicate River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)
Main Before D	139750	Q10	726.72	726.69		0.07	0.00	279.33	0.19	454.03	179.78	1.68
Main Before D	139750	Q50	728.64	728.61		0.06	0.01	374.66	15.02	670.55	434.43	1.69
Main Before D	139750	Q100	729.13	729.09		0.06	0.01	403.39	26.87	794.57	554.56	1.85
Main Before D	139750	Q500	730.44	730.40		0.07	0.01	490.36	83.24	1107.16	906.60	2.14
Main Before D	139620	Q10	726.65	726.59	720.83			148.34		634.00		1.90
Main Before D	139620	Q50	728.57	728.46	721.71			296.88		1120.00		2.70
Main Before D	139620	Q100	729.06	728.97	722.10			335.77	126.98	1123.94	125.08	2.57
Main Before D	139620	Q500	730.37	730.27	723.13			433.05	317.85	1482.39	296.77	3.00
Main Before D	139600 BR U	Q10	726.65	725.58	720.98					634.00		2.43
Main Before D	139600 BR U	Q50	728.57	725.58	721.89					1120.00		4.29
Main Before D	139600 BR U	Q100	729.06	728.97	722.34			203.36	353.51	1021.49	0.48	3.69
Main Before D	139600 BR U	Q500	730.37	730.27	723.43			353.37	1183.63	706.88	198.14	2.11
Main Before D	139600 BR D	Q10	726.48	724.80	721.48					634.00		3.09
Main Before D	139600 BR D	Q50	727.93	724.80	722.41					1120.00		5.46
Main Before D	139600 BR D	Q100	729.06	728.97	722.84				353.51	1021.49	0.48	4.90
Main Before D	139600 BR D	Q500	730.37	730.27	723.93			290.38	1183.63	706.88	198.14	3.39
Main Before D	139536	Q10	726.48	726.42	721.32	0.07	0.01	198.61	1.71	601.13	31.16	1.97
Main Before D	139536	Q50	727.93	727.85	722.19	0.07	0.01	430.31	21.00	936.13	162.87	2.54
Main Before D	139536	Q100	728.56	728.48	722.61	0.07	0.01	488.51	68.09	1056.80	251.11	2.66
Main Before D	139536	Q500	730.29	730.22	723.64	0.05	0.00	631.12	297.12	1245.98	553.90	2.63
Main Before D	139478	Q10	726.40	726.35		0.05	0.00	152.93	0.10	633.75	0.14	1.74
Main Before D	139478	Q50	727.85	727.79		0.04	0.00	209.34	6.63	1104.28	9.10	1.96
Main Before D	139478	Q100	728.48	728.42		0.04	0.00	235.68	13.74	1342.63	19.63	2.06
Main Before D	139478	Q500	730.23	730.16		0.03	0.00	316.70	51.91	1974.41	70.69	2.21
Main Before D	139297	Q10	726.31	726.29		0.02	0.00	383.47		478.94	155.06	1.37
Main Before D	139297	Q50	727.76	727.74		0.03	0.01	462.68	4.82	744.18	371.00	1.53
Main Before D	139297	Q100	728.40	728.37		0.03	0.02	500.92	14.00	876.46	485.53	1.61
Main Before D	139297	Q500	730.16	730.13		0.03	0.03	713.47	84.02	1194.03	818.95	1.69
Main Before D	139254	Q10	726.28	726.22	719.60	0.00	0.00	76.18		634.00		1.98
Main Before D	139254	Q50	727.72	727.58	720.58			215.23		1120.00		3.03
Main Before D	139254	Q100	728.36	728.16	721.04			306.45		1376.00		3.52
Main Before D	139254	Q500	730.10	729.76	722.18	0.00	0.10	511.10		2097.00		4.66
Main Before D	139250 BR U	Q10	726.28	726.22	719.70	0.03	0.01	36.34		634.00		2.08
Main Before D	139250 BR U	Q50	727.72	726.56	720.68			36.38		1120.00		3.53
Main Before D	139250 BR U	Q100	728.35	726.56	721.16			36.38		1376.00		4.33
Main Before D	139250 BR U	Q500	730.00	729.32	722.35	0.67	0.08			2097.00		6.61
Main Before D	139250 BR D	Q10	726.24	726.13	721.27	0.00	0.00	36.32		634.00		2.59
Main Before D	139250 BR D	Q50	727.47	726.56	722.29			36.44		1120.00		4.32
Main Before D	139250 BR D	Q100	727.91	726.56	722.75			36.44		1376.00		5.31
Main Before D	139250 BR D	Q500	729.24	728.28	723.94	0.01	0.32	107.21	0.17	2086.74	10.09	7.88
Main Before D	139208	Q10	726.23	726.14	721.17	0.07	0.03	37.82		634.00		2.48
Main Before D	139208	Q50	727.47	727.27	722.17	0.12	0.07	230.52	3.03	1089.25	27.72	3.59
Main Before D	139208	Q100	727.91	727.67	722.63	0.15	0.09	294.93	15.19	1291.38	69.43	4.05
Main Before D	139208	Q500	728.90	728.59	723.79	0.19	0.11	444.42	117.10	1748.38	231.52	4.94
Main Before D	139158	Q10	726.13	726.10		0.76	0.01	202.78	22.21	610.84	6.95	1.52
Main Before D	139158	Q50	727.27	727.22		0.83	0.01	230.17	69.08	1043.19	19.72	1.93
Main Before D	139158	Q100	727.68	727.61		0.90	0.01	251.31	94.77	1266.64	27.59	2.15
Main Before D	139158	Q500	728.61	728.50		1.06	0.01	338.48	132.03	1912.97	72.01	2.74

Errors Warnings and Notes for Plan : Duplicate

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q50
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q10
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.

Errors Warnings and Notes for Plan : Duplicate (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139600 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q500
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Errors Warnings and Notes for Plan : Duplicate (Continued)

	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139254 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139254 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139254 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139254 Profile: Q500
Warning:	Multiple water surfaces were found that could balance the energy equation. The program selected the water surface whose main channel velocity head was the closest to the previously computed cross section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500
Warning:	The pressure flow/weir calculations did not converge within the given number of iterations.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.



Errors Warnings and Notes for Plan : Duplicate (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Downstream
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139208 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139208 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139208 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139208 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Errors Warnings and Notes for Plan : Duplicate (Continued)

Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX   XXXX   XX   XXXX
X   X  X       X   X   X   X   X   X
X   X  X       X   X   X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX XXXXXX XXXX
X   X  X       X   X   X   X   X   X
X   X  X       X   X   X   X   X   X
X   X  XXXXXX   XXXX   X   X   X   X XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 2/28/2012 5:44:49 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Duplicate Model  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p03

Geometry Title: Duplicate Model  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g03

Flow Title : 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Description:

Original FIS blackberry model trimmed to RS 136840 and 140600.

Plan Summary Information:

Number of:	Cross Sections =	14	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	30
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	140600	638	1128	1384	2108

Blackberry CreekMain Before D	140504	635	1123	1379	2100
Blackberry CreekMain Before D	139750	634	1120	1376	2097
Blackberry CreekMain Before D	139158	640	1132	1389	2117
Blackberry CreekMain Before D	137750	651	1150	1412	2150
Blackberry CreekMain Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain Before D	Q10		Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain Before D	Q50		Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain Before D	Q100		Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain Before D	Q500		Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #3  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 2.2 1 2.2 1 2.2 1 2.2 1

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht # Open Open Ht  
 2.35 1 2.35 1 2.35 1 2.35 1

GEOMETRY DATA

Geometry Title: Duplicate Model  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g03

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.

Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station	Elevation	Data	num=	19
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
0	736	34.7	734	94.3 732 129.3 730 157 728
277.6	727.9	319.7	727.1	325.5 725.7 330.8 723.6 337 723.5
340.2	726.9	358.9	728	425.8 728.9 495.6 730 598.3 731.2
671	732	763.7	732.8	825.4 734 914.1 736

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .09 277.6 .055 358.9 .09

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 277.6 358.9 1000 950 750 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS  
 Station Elevation Data num= 19  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25  
 -145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54  
 -122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88  
 80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -186.58 .11 -158.42 .05 -122.47 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8  
 Station Elevation Data num= 15  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -62 732 55 730 128 728 164.67 726.28 187.22 722.26  
 188.68 719.95 194.07 719.27 197.43 719.21 202.31 719.2 205.58 719.81  
 207.55 723.34 231.42 723.88 389 725.14 436.2 726.72 590.52 733.35

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -62 .11 164.67 .05 231.42 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 164.67 231.42 140 130 195 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139620

INPUT

Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
 bb\_Tinacii  
 Station Elevation Data num= 24  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -381 736.1 -342 734.4 -317 732 -67.23 726.39 -24.8 725.68  
 -24.12 720.07 -21.76 719.68 -19.69 719.17 -17.85 718.76 -14.09 718.63  
 -11.17 718.64 -6.74 718.63 -2.99 718.62 0 719.3 3.5 718.87  
 5.47 718.9 8.36 718.67 11.49 718.8 14.55 718.96 18.76 719.74  
 19.25 725.72 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -381 .11 -24.8 .055 19.25 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -24.8 19.25 95 84 147 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -381 -24.8 728.8 F  
 19.25 361.26 728.8 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139600

INPUT

Description: Route 47 (IL USGS 2001)  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 80  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates  
 num= 7

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-162.82	727.87		-67.02	727.98	725.58	-22.94	728.47	725.58
17.16	728.93	725.54	75.46	729.59	725.54	225	732.24	
360.24	734.67							

Upstream Bridge Cross Section Data

Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-381	736.1	-342	734.4	-317	732	-67.23	726.39	-24.8	725.68
-24.12	720.07	-21.76	719.68	-19.69	719.17	-17.85	718.76	-14.09	718.63
-11.17	718.64	-6.74	718.63	-2.99	718.62	0	719.3	3.5	718.87
5.47	718.9	8.36	718.67	11.49	718.8	14.55	718.96	18.76	719.74
19.25	725.72	88.65	726.87	222.37	731.21	361.26	734.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-381	.11	-24.8	.055	19.25	.11

Bank Sta: Left Right Coeff Contr. Expan.

	-24.8	19.25	.3	.5
--	-------	-------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-381	-24.8	728.8	F
19.25	361.26	728.8	F

Downstream Deck/Roadway Coordinates

num= 8

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-300	729		-188.23	729.21		-85.67	730.01	724.8
-41.76	730.42	724.8	0	730.81	724.62	127.79	732.5	
302.06	735.62		350	735.92				

Downstream Bridge Cross Section Data

Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-451	732	-333	730	-197.69	727.17	-123	727.85	-71.69	727.15
-44.48	725.27	-44.24	721.22	-39.28	720.17	-36.92	719.45	-29.35	719.41
-22.87	718.99	-16.64	718.88	-12.29	718.69	-6.19	719.71	-1.44	719.81
0	725.55	54.42	724.93	133.57	726.33	133.58	726.33	257.19	729.13
319.25	731.55								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-451	.13	-44.48	.055	0	.13

Bank Sta: Left Right Coeff Contr. Expan.

	-44.48	0	.3	.5
--	--------	---	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-451	-44.24	725.27	F
-1.44	319.25	725.27	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data

Pier Station Upstream= -13.627 Downstream= -33.672

Upstream	num=	Width	Elev	Width	Elev
	2	1.26	0	1.26	730
Downstream	num=	Width	Elev	Width	Elev
	2	1.26	0	1.26	730

Pier Data  
 Pier Station Upstream= -2.998 Downstream= -22.78  
 Upstream num= 2  
 Width Elev Width Elev  
 1.26 0 1.26 730  
 Downstream num= 2  
 Width Elev Width Elev  
 1.26 0 1.26 725

Pier Data  
 Pier Station Upstream= 7.897 Downstream= -11.63  
 Upstream num= 2  
 Width Elev Width Elev  
 1.26 0 1.26 730  
 Downstream num= 2  
 Width Elev Width Elev  
 1.26 0 1.26 725

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139536

INPUT  
 Description: USGS IL 2001. DSF of Rt47-8. 2 extend pts on LHS elevations from  
 bb\_tinascii  
 Station Elevation Data num= 21  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-451	732	-333	730	-197.69	727.17	-123	727.85	-71.69	727.15
-44.48	725.27	-44.24	721.22	-39.28	720.17	-36.92	719.45	-29.35	719.41
-22.87	718.99	-16.64	718.88	-12.29	718.69	-6.19	719.71	-1.44	719.81
0	725.55	54.42	724.93	133.57	726.33	133.58	726.33	257.19	729.13
319.25	731.55								

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-451	.13	-44.48	.055	0	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -44.48 0 77 110 187 .3 .5  
 Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
-451	-44.24	725.27	F
-1.44	319.25	725.27	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139478

INPUT  
 Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS  
 was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added  
 pts (not on ends). Removed last 5 points placed previously (not  
 from survey and not in GIS) and replaced them with 6 extend point  
 elevations from bb\_tinascii  
 Station Elevation Data num= 17  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-306	734.1	0	730	47.71	728.07	82	726	119	724

130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39
152.54	723.2	186	724	221	726	271	728.2	302	730
341	732.2	381	734.1						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -306 .13 82 .045 221 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 82 221 50 71 79 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139355

INPUT  
 Description: IDNR 1985. B13130, Reach length Not Including Main St.  
 2 extend

pts on LHS elevation from bb\_tinascii  
 Station Elevation Data num= 19  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -45 .13 0 .045 64.26 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 0 64.26 30 38 166 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139297

INPUT  
 Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data num= 30  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52
822.44	731.3	835.91	732.5	913.06	733.22	935	736.2	956	738.5

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 399.61 .045 492.85 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 399.61 492.85 36 43 250 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139254

INPUT  
 Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.

Station Elevation Data num= 32  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-36.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	1.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -390 .13 -36.93 .055 1.08 .13



Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -36.93 1.08 46 46 46 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -390 -36.72 729.85 F  
 0 530.99 729.85 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139250

INPUT

Description: Main Street (IL USGS 2001)  
 Distance from Upstream XS = 1  
 Deck/Roadway Width = 44  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates  
 num= 18

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-449.33	737		-445.77	736.9		-390.79	734.86	
-378.64	734.37		-340.19	732.36		-268.95	730.38	
-213.37	728.99		-212.94	728.99		-80.3	727.99	
-36.93	727.98		-36.93	729.92	726.56	0	729.92	726.56
1.08	729.92	726.56	1.08	727.96		109.06	728.53	
237.68	730.64		367.33	734.52		532.98	740.1	

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	32					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-36.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	1.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -390 .13 -36.93 .055 1.08 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -36.93 1.08 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -390 -36.72 729.85 F  
 0 530.99 729.85 F

Downstream Deck/Roadway Coordinates

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-308.86	733.09		-165.48	728.87		-65.04	728.43	
-17.25	728.19		-17.25	729.92	726.56	0	729.92	726.56
20.99	729.92	726.56	20.99	728.06		88.9	728.06	
218.32	729.36		367.76	732.93		511.92	738.03	

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	26					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -332.9 .13 -17.25 .055 20.99 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -17.25 20.99 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -15.72 726.75 F  
 20.53 475.96 726.75 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data  
 Pier Station Upstream= -17.76 Downstream= 2.923  
 Upstream num= 2  
 Width Elev Width Elev  
 1.5 714 1.5 728  
 Downstream num= 2  
 Width Elev Width Elev  
 1.5 714 1.5 728

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139208

INPUT

Description: USGS IL 2001. DSF Main Street.  
 Station Elevation Data num= 26  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-17.39	726.75
-17.25	727.74	-15.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
17.13	718.76	20.53	719.49	20.99	727.54	23.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-17.25	.055	20.99	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -17.25 20.99 122 100 110 .3 .5  
 Ineffective Flow num= 2  

Sta L	Sta R	Elev	Permanent
-332.9	-15.72	726.75	F
20.53	475.96	726.75	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139158

INPUT

Description: USGS IL 2001. Departure of Main Street  
 Station Elevation Data num= 22  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84
319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 265.13 .055 388.49 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 265.13 388.49 740 690 550 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT  
 Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 740.2 123.43 736.04 259.45 732.01 402.74 728.09 487.45 726.01  
 558.72 723.73 574 722 578 720 582 718 586 716  
 590 718 594 720 596.52 722.18 600.58 722.32 609.11 724.95  
 631.64 726.47 750.55 726 788.56 726 819.09 726 877.47 726  
 958.19 728.02 1081.13 732.01 1198.01 737.76 1242.37 741.61 1308.9 745.98

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 487.45 .055 631.64 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 487.45 631.64 710 700 700 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT  
 Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 734.2 65.5 732.1 121.8 730.1 174.4 730 236.3 730  
 271.4 730 296.2 729.4 331.4 728 359.2 727.1 410.2 726  
 450.5 724.6 476.8 722.6 485 720 489 718 493 716  
 497 715 501 716 505 718 509 720 527.1 722  
 586.6 722.1 624.8 723.7 678.7 726 771.5 728.2 819.9 730.1  
 876.9 731.8 903.1 733.5 939.2 735.8 994.8 737 1038.3 737.9  
 1083.7 739.7

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT  
 Description: IDNR 1985. B12885

Station Elevation Data num= 32  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 730.49 6 730.59 30 730.59 41 729.19 91 727.99  
 125 727.29 190 726.59 235 725.69 282 724.09 330 721.79  
 380 720.69 430 720.49 480 720.19 522 719.79 568 719.49  
 571 717.79 571 716.49 575 714.29 578 713.99 579 714.39  
 580 715.99 582 717.89 589 720.09 630 721.09 680 719.99  
 725 720.29 770 720.89 812 722.19 840 723.29 880 726.09  
 940 730.89 985 733.59

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val

0	.13	480	.055	630	.13				
Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	480	630		9810	11021	10122		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139620	.11	.055	.11
Main Before D	139600	Bridge		
Main Before D	139536	.13	.055	.13
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139254	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139208	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	140	130	195
Main Before D	139620	95	84	147
Main Before D	139600	Bridge		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	36	43	250
Main Before D	139254	46	46	46
Main Before D	139250	Bridge		
Main Before D	139208	122	100	110
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139620	.3	.5
Main Before D	139600	Bridge	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139254	.3	.5
Main Before D	139250	Bridge	
Main Before D	139208	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

## **15.4 Group #4 Supporting Calculations (Permit Models)**

15.4.A Group #3 WIT- Arch Culvert option, Backup Calculations, Waterway opening Plot, and and Created Head Tables

15.4.i Group #3 WIT- Bridge option, Backup Calculations, Waterway opening Plot, and and Created Head Tables

15.4.AA 10-yr Model Output Water Surface Elevation for all Group #4 plans

15.4.AB 50-yr Model Output Water Surface Elevation for all Group #4 plans

15.4.AC 100-yr Model Output Water Surface Elevation for all Group #4 plans

15.4.AD 500-yr Model Output Water Surface Elevation for all Group #4 plans

15.4.1 Natural Condition HEC-RAS Model

15.4.2 Existing Condition HEC-RAS Model

15.4.3 Proposed IL47 Arch Culvert Condition HEC-RAS Model

15.4.4 Proposed IL47 Bridge Condition HEC-RAS Model

# HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #4 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Arch, Proposed Main St bridge in place)

Route: IL Route 47  
 Waterway: Blackberry Creek - Main before D  
 Section: 107B-I-1  
 County: Kane

Existing S.N.: 045-2000  
 Proposed S.N.: 045-2050  
 Prepared By: SJS Date: Sep-14  
 Checked By: DH Date: Sep-14

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
Drainage Area = 11.32 sq mi				Existing Overtopping Elevation = 729.53 at Sta. 501+17		Proposed Overtopping Elevation = 733.97 at Sta. 501+17				
	10	634	634	203.2	330.8	726.56	0.03	0.00	726.59	726.54
DESIGN	50	1120	1120	203.2	371.2	727.79	0.44	0.15	728.23	727.94
BASE	100	1376	1376	203.2	395.6	728.28	0.72	0.23	729.00	728.51
MAX. CALC.	500	2097	2097	1053.4~	420.5	729.44	0.38	0.58	729.82	730.02

**Datum:** NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
 Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s  
 10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.92 ft/s  
 2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

## EXISTING STRUCTURE

**TYPE:** RC Box Culvert  
**LENGTH/WIDTH:** (2) 6.5' x 8.75' & (2) 6.5'x10.42'  
**# SPANS/CELLS:** 4  
**SKEW:** 0 (relative to road)  
**LOW EOP:** 728.59 @ 501+17 20' RT  
**FREEBOARD:** 0.11 ft  
**CULVERT INV.** 718.38 (U/S) 718.25 (D/S)

## PROPOSED STRUCTURE

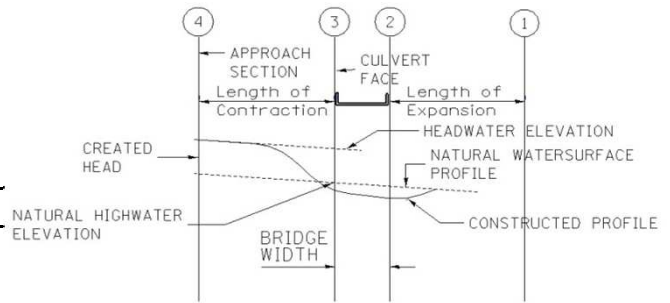
**3-SIDED CULVERT TYPE:** Pre-Cast Concrete Arch  
**LENGTH OF SPAN:** 54 ft  
**# CELLS:** 1  
**TOP OF CROWN ELEVATION:** 731.36  
**SKEW:** 0 (relative to road)  
**FLOWLINE ELEV:** 718.63 (u/s) 718.52 (d/s)  
**LOW EOP:** 733.52 @ 501+17 60' RT  
**FREEBOARD:** 5.62 ft

**NOTE:** Proposed structure details are preliminary. Subject to refinement in TS&L stage.  
 Waterway openings are based on the natural H.W.E.  
 Natural HWE taken from cross-section 139750 in Group #4 Natural Conditions model.  
 The existing head is the difference in water surface elevations between existing and natural conditions.  
 The proposed head is the difference in water surface elevations between proposed and natural conditions  
 The freeboard is calculated from the edge of the proposed shoulder at 500+17  
 Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.  
 ~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

**BACKUP CALCULATIONS: Group #4 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14  
 Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.29	726.56	726.56
50-year	727.53	727.79	727.79
100-year	728.01	728.28	728.28
500-year	729.15	729.44	729.44

Section #1 : 139478<sup>+</sup>  
 Section #2 : 139536  
 Section #3 : 139620  
 Section #4 : 139750

\*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sub>3</sub>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	726.59	726.54	0.03	-0.02
50-year	727.79	728.23	727.94	0.44	0.15
100-year	728.28	729	728.51	0.72	0.23
500-year	729.44	729.82	730.02	0.38	0.58

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	0.03	-0.02	726.59	726.54
50-year	727.79	0.44	0.15	728.23	727.94
100-year	728.28	0.72	0.23	729.00	728.51
500-year	729.44	0.38	0.58	729.82	730.02

<sup>1</sup> Natural Condition - Group #4 - Natural Conditions HEC-RAS Model.

<sup>2</sup> Existing Condition - Group #4 - Existing Conditions HEC-RAS Model.

<sup>3</sup> Proposed Condition - Group #4 - Proposed Condition HEC-RAS Model, does not include raised IL-47 profile.

<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.

**BACK-UP CALCULATIONS FOR WIT: Group #4 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
7.02	5.62	5.05	3.54
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
N/A	N/A	N/A	N/A

*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25	717.27	717.07
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	330.80	
50-YR	203.20	371.20	
100-YR	203.20	395.60	
500-YR	1053.40	420.50	

500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.





**Created Head - G#4 - Existing/Proposed Conditions - (Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.45	727.46	0.01	727.44	-0.01
Main Before D	139750		726.56	726.59	0.03	726.54	-0.02
Main Before D	139620						
<hr/>							
Main Before D	140600	50-yr	730.24	730.27	0.03	730.25	0.01
Main Before D	140504		728.64	728.89	0.25	728.71	0.07
Main Before D	139750		727.79	728.23	0.44	727.94	0.15
Main Before D	139620						
<hr/>							
Main Before D	140600	100-yr	730.65	730.75	0.10	730.67	0.02
Main Before D	140504		729.12	729.56	0.44	729.25	0.13
Main Before D	139750		728.28	729.00	0.72	728.51	0.23
Main Before D	139620						
<hr/>							
Main Before D	140600	500-yr	731.65	731.73	0.08	731.79	0.14
Main Before D	140504		730.28	730.52	0.24	730.65	0.37
Main Before D	139750		729.44	729.82	0.38	730.02	0.58
Main Before D	139620						

Natural condition contains Proposed Main St structure with 47 culvert removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

**Created Head - G#4 - Existing/Proposed Conditions - 10-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q10	729.32	729.32	0.00	729.32	0.00	729.32	0.00
Main Before D	140504	Q10	727.45	727.46	0.01	727.44	-0.01	727.45	0.00
Main Before D	139750	Q10	726.56	726.59	0.03	726.54	-0.02	726.56	0.00
Main Before D	139620	Q10							
Main Before D	139600								
Main Before D	139536	Q10							
Main Before D	139478	Q10	726.29	726.29	0.00	726.31	0.02	726.30	0.01
Main Before D	139355	Q10	726.23	726.23	0.00	726.25	0.02	726.24	0.01
Main Before D	139297	Q10	726.22	726.22	0.00	726.24	0.02	726.23	0.01
Main Before D	139256	Q10	726.19	726.18	-0.01	726.21	0.02	726.18	-0.01
Main Before D	139250								
Main Before D	139206	Q10	726.12	726.12	0.00	726.15	0.03	726.12	0.00
Main Before D	139158	Q10	726.1	726.1	0.00	726.10	0.00	726.10	0.00
Main Before D	138418	Q10	725.26	725.26	0.00	725.26	0.00	725.26	0.00
Main Before D	137750	Q10	723.37	723.37	0.00	723.37	0.00	723.37	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Proposed Main St structure with 47 culvert removed

Existing condition contains Proposed Main St structure and existing 47 culvert

Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#4 - Existing/Proposed Conditions - 50-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q50	730.24	730.27	0.03	730.25	0.01	730.25	0.01
Main Before D	140504	Q50	728.64	728.89	0.25	728.71	0.07	728.69	0.05
Main Before D	139750	Q50	727.79	728.23	0.44	727.94	0.15	727.89	0.10
Main Before D	139620	Q50							
Main Before D	139600								
Main Before D	139536	Q50							
Main Before D	139478	Q50	727.53	727.53	0.00	727.56	0.03	727.54	0.01
Main Before D	139355	Q50	727.47	727.47	0.00	727.50	0.03	727.48	0.01
Main Before D	139297	Q50	727.47	727.46	-0.01	727.50	0.03	727.47	0.00
Main Before D	139256	Q50	727.36	727.36	0.00	727.39	0.03	727.36	0.00
Main Before D	139250								
Main Before D	139206	Q50	727.23	727.23	0.00	727.27	0.04	727.23	0.00
Main Before D	139158	Q50	727.22	727.22	0.00	727.22	0.00	727.22	0.00
Main Before D	138418	Q50	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	137750	Q50	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Proposed Main St structure with 47 culvert removed

Existing condition contains Proposed Main St structure and existing 47 culvert

Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#4 - Existing/Proposed Conditions - 100-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q100	730.65	730.75	0.10	730.67	0.02	730.66	0.01
Main Before D	140504	Q100	729.12	729.56	0.44	729.25	0.13	729.20	0.08
Main Before D	139750	Q100	728.28	729	0.72	728.51	0.23	728.41	0.13
Main Before D	139620	Q100							
Main Before D	139600								
Main Before D	139536	Q100							
Main Before D	139478	Q100	728.01	728	-0.01	728.04	0.03	728.01	0.00
Main Before D	139355	Q100	727.94	727.94	0.00	727.98	0.04	727.95	0.01
Main Before D	139297	Q100	727.94	727.93	-0.01	727.97	0.03	727.95	0.01
Main Before D	139256	Q100	727.79	727.78	-0.01	727.83	0.04	727.78	-0.01
Main Before D	139250								
Main Before D	139206	Q100	727.62	727.61	-0.01	727.66	0.04	727.61	-0.01
Main Before D	139158	Q100	727.61	727.61	0.00	727.61	0.00	727.61	0.00
Main Before D	138418	Q100	726.63	726.63	0.00	726.63	0.00	726.63	0.00
Main Before D	137750	Q100	724.52	724.53	-0.01	724.52	0.00	724.52	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Proposed Main St structure with 47 culvert removed

Existing condition contains Proposed Main St structure and existing 47 culvert

Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

**Created Head - G#4 - Existing/Proposed Conditions - 500-yr event (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: Sep-14  
 Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q500	731.65	731.73	0.08	731.79	0.14	731.7	0.05
Main Before D	140504	Q500	730.28	730.52	0.24	730.65	0.37	730.43	0.15
Main Before D	139750	Q500	729.44	729.82	0.38	730.02	0.58	729.68	0.24
Main Before D	139620	Q500							
Main Before D	139600								
Main Before D	139536	Q500							
Main Before D	139478	Q500	729.15	729.13	-0.02	729.19	0.04	729.15	0.00
Main Before D	139355	Q500	729.08	729.07	-0.01	729.13	0.05	729.09	0.01
Main Before D	139297	Q500	729.08	729.07	-0.01	729.13	0.05	729.09	0.01
Main Before D	139256	Q500	728.79	728.77	-0.02	728.84	0.05	728.77	-0.02
Main Before D	139250								
Main Before D	139206	Q500	728.48	728.46	-0.02	728.53	0.05	728.46	-0.02
Main Before D	139158	Q500	728.5	728.5	0.00	728.50	0.00	728.50	0.00
Main Before D	138418	Q500	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	137750	Q500	725.3	725.3	0.00	725.30	0.00	725.30	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.

Natural condition contains Proposed Main St structure with 47 culvert removed

Existing condition contains Proposed Main St structure and existing 47 culvert

Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

## HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #4 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Bridge, with Proposed Main St bridge in place)

Route:	IL Route 47	Existing S.N.:	045-2000
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050
Section:	107B-I-1	Prepared By:	SJS Date: Jul-14
County:	Kane	Checked By:	DH Date: Jul-14

Drainage Area =		11.32 sq mi		Existing Overtopping Elevation =		729.53		at Sta. 501+17	
				Proposed Overtopping Elevation =		734.50		at Sta. 501+17	
Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.		Head (ft.)	
				Existing	Proposed	Existing	Proposed	Existing	Proposed
	10	634	634	203.2	354.0	726.56	726.56	0.03	0.00
DESIGN	50	1120	1120	203.2	438.2	727.79	727.89	0.44	0.10
BASE	100	1376	1376	203.2	473.4	728.28	728.41	0.72	0.13
MAX. CALC.	500	2097	2097	1053.4~	559.6	729.44	729.68	0.38	0.24

**Datum:** NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996  
 10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s  
 10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.80 ft/s  
 Surveyed Normal Water Level: 719.83 ft  
 2-Yr. Flow Rate = 265 ft<sup>3</sup>/s

### EXISTING STRUCTURE

**TYPE:** RC Box Culvert  
**LENGTH/WIDTH:** (2) 6.5' x 8.75' & (2) 6.5'x10.42'  
**# SPANS/CELLS:** 4  
**SKEW:** 0 (relative to road)  
**LOW EOP:** 728.59 @ 501+17 20' RT  
**FREEBOARD:** 0.11 ft  
**CULVERT INV.** 718.38 (U/S) 718.25 (D/S)

**NOTE:** Proposed structure details are preliminary. Subject to refinement in TS&L stage.  
 Waterway openings are based on the natural H.W.E.  
 Natural HWE taken from cross-section 139750 in Group #4 Natural Conditions model.  
 The existing head is the difference in water surface elevations between existing and natural conditions.  
 The proposed head is the difference in water surface elevations between proposed and natural conditions  
 The freeboard is calculated from the edge of the proposed shoulder at 501+17  
 Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.  
 ~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

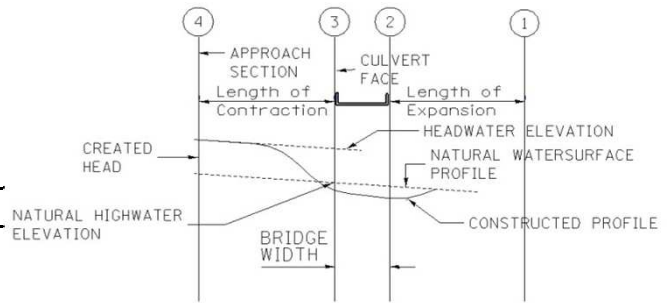
### PROPOSED STRUCTURE

**TYPE:** Open abutment with steel superstructure  
**LENGTH OF SPAN:** 76 ft  
**# SPANS:** 1  
**LOW CHORD:** 730.10  
**SKEW:** 0 (relative to road)  
**CLEARANCE:** 2.31 ft  
**BRIDGE FLOW LINE:** 718.7 (U/S) 718.62 (D/S)  
**LOW EOP:** 734.1 @501+17 22' RT  
**FREEBOARD:** 6.21 ft

**BACKUP CALCULATIONS: Group #4 WIT**

Route: IL Rte 47 @ Main Street  
 Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14  
 Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.29	726.56	726.56
50-year	727.53	727.79	727.79
100-year	728.01	728.28	728.28
500-year	729.15	729.44	729.44

Section #1 : 139478<sup>+</sup>  
 Section #2 : 139536  
 Section #3 : 139620  
 Section #4 : 139750

\*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 <sup>1</sup>	Ex. Cond. /Section #4 <sup>2</sup>	Proposed Cond./Section #4 <sub>3</sub>	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	726.59	726.56	0.03	0
50-year	727.79	728.23	727.89	0.44	0.1
100-year	728.28	729	728.41	0.72	0.13
500-year	729.44	729.82	729.68	0.38	0.24

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	0.03	0	726.59	726.56
50-year	727.79	0.44	0.1	728.23	727.89
100-year	728.28	0.72	0.13	729.00	728.41
500-year	729.44	0.38	0.24	729.82	729.68

<sup>1</sup> Natural Condition - Group #3 - Natural Conditions HEC-RAS Model.

<sup>2</sup> Existing Condition - Group #3 - Existing Conditions HEC-RAS Model.

<sup>3</sup> Proposed Condition - Group #3 - Proposed Condition HEC-RAS Model, with Raised 47 profile

<sup>+</sup> Section numbers listed at the top right represent stream stations in feet.



**BACK-UP CALCULATIONS FOR WIT: Group #4 (continued)**

*CALCULATE FREEBOARD AND CLEARANCE*

LOW ROAD ELEVATION (ft)			
Existing	Station	Proposed	Station
728.59	501+17	734.1	501+17
LOW BEAM ELEVATION (ft)			
Existing	Station	Proposed	Station
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
7.54	6.21	5.69	4.42
PROPOSED CLEARANCE (ft)			
10-Yr	50-Yr	100-Yr	500-Yr
3.54	2.31	1.82	0.66

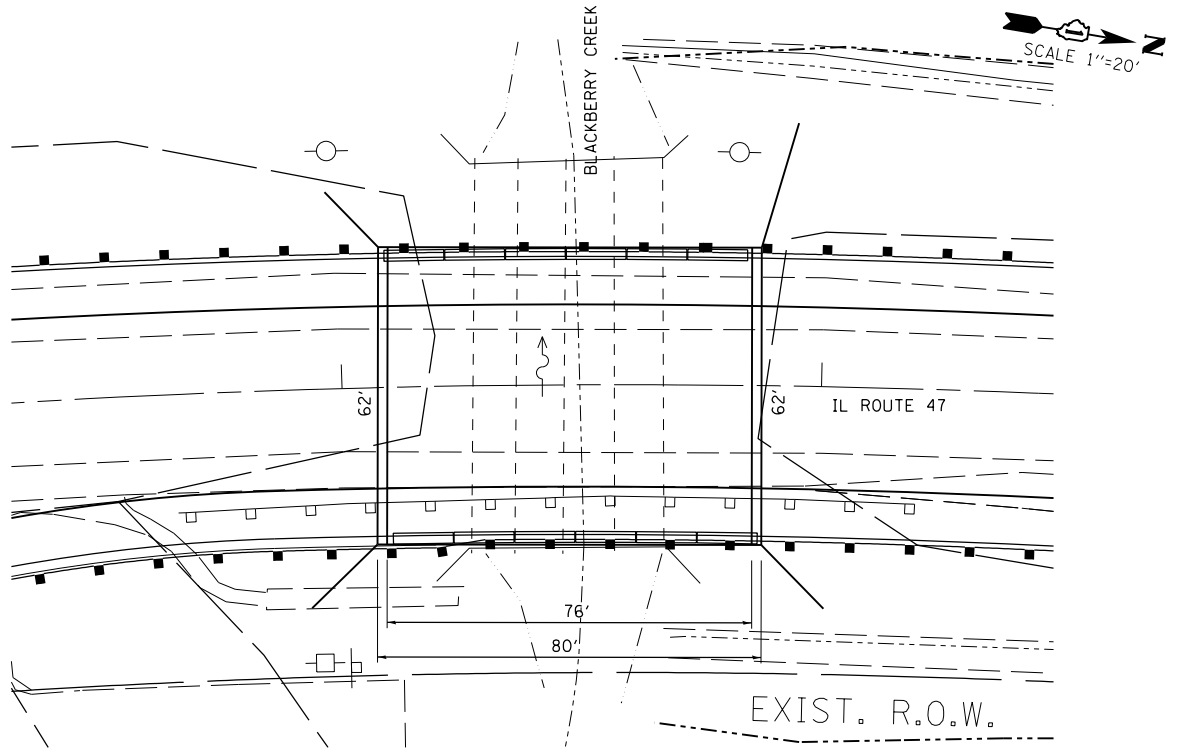
*CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT*

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	EXISTING HEIGHT	PROPOSED WIDTH	PROPOSED HEIGHT
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		PROPOSED	
U/S	D/S	U/S	D/S
718.38	718.25		
WATERWAY OPENING AREA (ft <sup>2</sup> )			
Frequency	EXISTING	PROPOSED	
10-YR	203.20	354.00	
50-YR	203.20	438.20	
100-YR	203.20	473.40	
500-YR	1053.40	559.60	

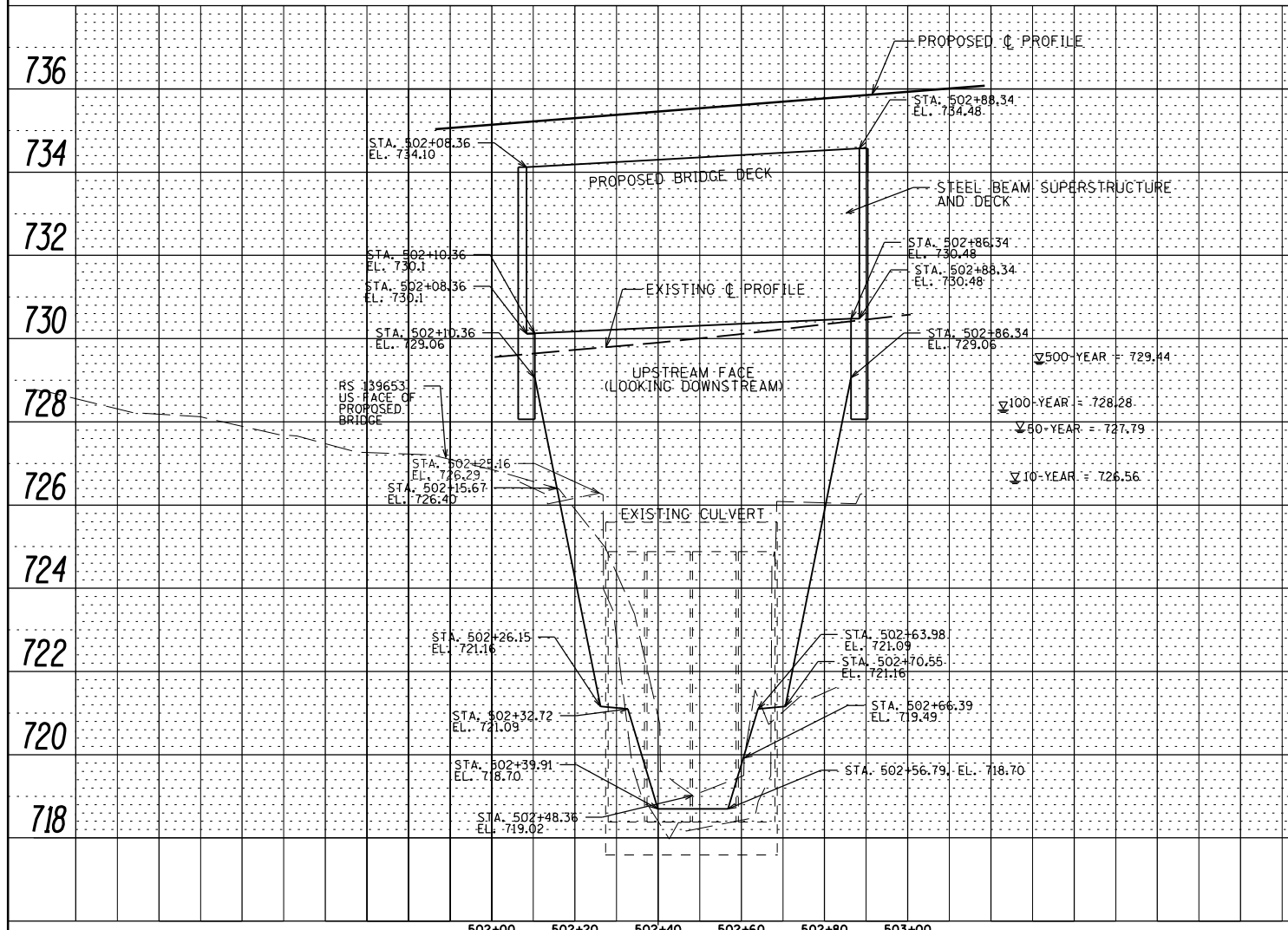
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is contained within the proposed Bridge, no overtopping of pavement is expected - area measured in Microstation

PLAN	DESIGNED	DATE
	BY	
	NOTED	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	
	NO.	



PROFILE	DESIGNED	DATE
	BY	
	NOTED	
	GRADES CHECKED	
	B.M. NOTED	
	STRUCTURE NOTATIONS CHECKED	
	NO.	



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\DI44909-sht-drain-struct-plnprf-bridge.dgn		DRAWN -	REVISED -
		CHECKED -	REVISED -
		DATE -	REVISED -

STATE OF  
DEPARTMENT OF

**Created Head - G#4 - Existing/Proposed Conditions - (Proposed Main St structure in Natural Cond)**

Project Route: IL 47 and Main St.  
 Project Limits: Intersection Improvements  
 County: Kane

By: SJS Date: July-14  
 Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta		WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.45	727.46	0.01	727.45	0.00
Main Before D	139750		726.56	726.59	0.03	726.56	0.00
Main Before D	139620			726.49		726.46	
Main Before D	140600	50-yr	730.24	730.27	0.03	730.25	0.01
Main Before D	140504		728.64	728.89	0.25	728.69	0.05
Main Before D	139750		727.79	728.23	0.44	727.89	0.10
Main Before D	139620			728.06		727.73	
Main Before D	140600	100-yr	730.65	730.75	0.10	730.66	0.01
Main Before D	140504		729.12	729.56	0.44	729.20	0.08
Main Before D	139750		728.28	729.00	0.72	728.41	0.13
Main Before D	139620			728.87		728.22	
Main Before D	140600	500-yr	731.65	731.73	0.08	731.7	0.05
Main Before D	140504		730.28	730.52	0.24	730.43	0.15
Main Before D	139750		729.44	729.82	0.38	729.68	0.24
Main Before D	139620			729.62		729.38	

Natural condition contains Proposed Main St structure with 47 bridge removed  
 Existing condition contains Proposed Main St structure and existing 47 culvert  
 Proposed condition contains Proposed Main St structure and proposed 47 bridge

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	G#4Prop	638.00	723.50	729.32		729.38	0.002039	2.20	443.48	313.77	0.25
Main Before D	140600	Q10	G#4-Existing	638.00	723.50	729.32		729.38	0.002041	2.20	443.30	313.73	0.25
Main Before D	140600	Q10	G#4-PerNatural	638.00	723.50	729.32		729.38	0.002040	2.20	443.40	313.75	0.25
Main Before D	140504	Q10	G#4Prop	635.00	721.14	727.44		727.56	0.001868	3.14	375.19	201.72	0.27
Main Before D	140504	Q10	G#4-Existing	635.00	721.14	727.46		727.58	0.001830	3.12	378.89	202.51	0.27
Main Before D	140504	Q10	G#4-PerNatural	635.00	721.14	727.45		727.57	0.001847	3.13	377.26	202.16	0.27
Main Before D	139750	Q10	G#4Prop	634.00	719.20	726.54		726.57	0.000633	1.78	608.65	271.55	0.16
Main Before D	139750	Q10	G#4-Existing	634.00	719.20	726.59		726.62	0.000599	1.75	622.49	274.15	0.16
Main Before D	139750	Q10	G#4-PerNatural	634.00	719.20	726.56		726.60	0.000618	1.77	614.78	272.71	0.16
Main Before D	139632	Q10	G#4Prop	634.00	718.63	726.44	721.70	726.50	0.000511	1.88	337.07	132.63	0.13
Main Before D	139620	Q10	G#4-Existing	634.00	718.62	726.49	720.83	726.55	0.000471	1.93	328.17	137.27	0.12
Main Before D	139600		Bridge										
Main Before D	139536	Q10	G#4Prop	634.00	718.52	726.38	721.59	726.43	0.000464	1.81	350.14	191.48	0.13
Main Before D	139536	Q10	G#4-Existing	634.00	718.69	726.36	721.32	726.42	0.000535	1.99	430.06	195.17	0.13
Main Before D	139478	Q10	G#4Prop	634.00	719.09	726.31		726.36	0.000826	1.77	360.35	151.31	0.19
Main Before D	139478	Q10	G#4-Existing	634.00	719.09	726.29		726.34	0.000850	1.78	357.06	150.46	0.20
Main Before D	139478	Q10	G#4-PerNatural	634.00	719.09	726.29		726.34	0.000849	1.78	357.29	150.52	0.20
Main Before D	139355	Q10	G#4Prop	634.00	717.29	726.25		726.31	0.000667	2.05	531.44	227.85	0.18
Main Before D	139355	Q10	G#4-Existing	634.00	717.29	726.23		726.29	0.000682	2.07	526.12	227.28	0.18
Main Before D	139355	Q10	G#4-PerNatural	634.00	717.29	726.23		726.29	0.000681	2.07	526.49	227.32	0.18
Main Before D	139297	Q10	G#4Prop	634.00	718.76	726.24		726.27	0.000323	1.39	855.59	381.81	0.13
Main Before D	139297	Q10	G#4-Existing	634.00	718.76	726.22		726.24	0.000331	1.40	846.59	380.25	0.13
Main Before D	139297	Q10	G#4-PerNatural	634.00	718.76	726.22		726.24	0.000330	1.40	847.21	380.36	0.13
Main Before D	139274	Q10	G#4Prop	634.00	716.67	726.21	719.48	726.25	0.000275	1.69	376.07	83.21	0.10
Main Before D	139274	Q10	G#4-Existing	634.00	716.67	726.18	719.48	726.23	0.000277	1.69	375.01	81.47	0.10
Main Before D	139274	Q10	G#4-PerNatural	634.00	716.67	726.19	719.49	726.23	0.000277	1.69	375.08	81.59	0.10
Main Before D	139250		Bridge										
Main Before D	139199	Q10	G#4Prop	634.00	717.81	726.15	721.02	726.22	0.000644	2.10	301.84	43.83	0.14
Main Before D	139199	Q10	G#4-Existing	634.00	717.81	726.12	721.02	726.19	0.000651	2.11	300.75	43.82	0.14
Main Before D	139199	Q10	G#4-PerNatural	634.00	717.81	726.12	721.03	726.19	0.000651	2.11	300.83	43.82	0.14
Main Before D	139158	Q10	G#4Prop	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q10	G#4-Existing	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q10	G#4-PerNatural	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	138418	Q10	G#4Prop	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q10	G#4-Existing	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q10	G#4-PerNatural	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	137750	Q10	G#4Prop	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q10	G#4-Existing	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q10	G#4-PerNatural	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	136804	Q10	G#4Prop	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q10	G#4-Existing	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q10	G#4-PerNatural	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q50	G#4Prop	1128.00	723.50	730.25		730.31	0.001595	2.41	768.63	391.89	0.23
Main Before D	140600	Q50	G#4-Existing	1128.00	723.50	730.27		730.33	0.001543	2.38	779.12	394.64	0.23
Main Before D	140600	Q50	G#4-PerNatural	1128.00	723.50	730.24		730.30	0.001613	2.42	765.34	391.02	0.23
Main Before D	140504	Q50	G#4Prop	1123.00	721.14	728.71		728.84	0.001639	3.50	664.60	249.13	0.26
Main Before D	140504	Q50	G#4-Existing	1123.00	721.14	728.89		728.99	0.001407	3.31	707.81	253.15	0.25
Main Before D	140504	Q50	G#4-PerNatural	1123.00	721.14	728.64		728.77	0.001758	3.59	645.57	247.34	0.27
Main Before D	139750	Q50	G#4Prop	1120.00	719.20	727.94		727.98	0.000534	2.01	1033.53	335.12	0.15
Main Before D	139750	Q50	G#4-Existing	1120.00	719.20	728.23		728.27	0.000424	1.85	1135.65	351.93	0.14
Main Before D	139750	Q50	G#4-PerNatural	1120.00	719.20	727.79		727.84	0.000601	2.09	985.30	328.64	0.16
Main Before D	139632	Q50	G#4Prop	1120.00	718.63	727.77	722.56	727.89	0.000838	2.74	408.93	244.95	0.18
Main Before D	139620	Q50	G#4-Existing	1120.00	718.62	728.06	721.71	728.18	0.000777	2.82	397.28	266.73	0.17
Main Before D	139600		Bridge										
Main Before D	139536	Q50	G#4Prop	1120.00	718.52	727.62	722.45	727.73	0.000778	2.66	422.26	367.60	0.17
Main Before D	139536	Q50	G#4-Existing	1120.00	718.69	727.60	722.19	727.70	0.000778	2.69	737.34	361.89	0.17
Main Before D	139478	Q50	G#4Prop	1120.00	719.09	727.56		727.63	0.000678	2.08	579.76	200.34	0.19
Main Before D	139478	Q50	G#4-Existing	1120.00	719.09	727.53		727.60	0.000698	2.10	573.30	199.07	0.19
Main Before D	139478	Q50	G#4-PerNatural	1120.00	719.09	727.53		727.60	0.000695	2.10	574.08	199.23	0.19
Main Before D	139355	Q50	G#4Prop	1120.00	717.29	727.50		727.58	0.000702	2.51	837.87	267.31	0.19
Main Before D	139355	Q50	G#4-Existing	1120.00	717.29	727.47		727.54	0.000721	2.53	828.80	265.97	0.20
Main Before D	139355	Q50	G#4-PerNatural	1120.00	717.29	727.47		727.55	0.000718	2.53	829.89	266.14	0.20
Main Before D	139297	Q50	G#4Prop	1120.00	718.76	727.50		727.53	0.000309	1.64	1371.35	448.15	0.13
Main Before D	139297	Q50	G#4-Existing	1120.00	718.76	727.46		727.49	0.000318	1.65	1356.01	446.08	0.13
Main Before D	139297	Q50	G#4-PerNatural	1120.00	718.76	727.47		727.50	0.000317	1.65	1357.84	446.32	0.13
Main Before D	139274	Q50	G#4Prop	1120.00	716.67	727.39	720.35	727.50	0.000587	2.62	428.15	194.88	0.15
Main Before D	139274	Q50	G#4-Existing	1120.00	716.67	727.36	720.35	727.46	0.000594	2.63	426.56	190.98	0.15
Main Before D	139274	Q50	G#4-PerNatural	1120.00	716.67	727.36	720.36	727.47	0.000593	2.62	426.74	191.43	0.15
Main Before D	139250		Bridge										
Main Before D	139199	Q50	G#4Prop	1120.00	717.81	727.27	721.91	727.42	0.001259	3.19	351.01	232.05	0.20
Main Before D	139199	Q50	G#4-Existing	1120.00	717.81	727.23	721.91	727.39	0.001278	3.21	349.34	227.19	0.20
Main Before D	139199	Q50	G#4-PerNatural	1120.00	717.81	727.23	721.92	727.39	0.001275	3.20	349.54	227.76	0.20
Main Before D	139158	Q50	G#4Prop	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q50	G#4-Existing	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q50	G#4-PerNatural	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	138418	Q50	G#4Prop	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q50	G#4-Existing	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q50	G#4-PerNatural	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	137750	Q50	G#4Prop	1150.00	715.00	724.18		724.29	0.002632	2.60	444.23	180.02	0.28
Main Before D	137750	Q50	G#4-Existing	1150.00	715.00	724.18		724.29	0.002629	2.60	444.40	180.06	0.28
Main Before D	137750	Q50	G#4-PerNatural	1150.00	715.00	724.18		724.29	0.002630	2.60	444.33	180.04	0.28
Main Before D	136804	Q50	G#4Prop	1156.00	713.99	722.47	720.81	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q50	G#4-Existing	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q50	G#4-PerNatural	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q100	G#4Prop	1384.00	723.50	730.67		730.73	0.001442	2.47	944.65	435.73	0.22
Main Before D	140600	Q100	G#4-Existing	1384.00	723.50	730.75		730.81	0.001317	2.40	979.87	443.99	0.21
Main Before D	140600	Q100	G#4-PerNatural	1384.00	723.50	730.65		730.71	0.001485	2.50	933.36	433.05	0.23
Main Before D	140504	Q100	G#4Prop	1379.00	721.14	729.25		729.38	0.001558	3.64	802.73	261.77	0.26
Main Before D	140504	Q100	G#4-Existing	1379.00	721.14	729.56		729.67	0.001221	3.33	885.25	269.04	0.23
Main Before D	140504	Q100	G#4-PerNatural	1379.00	721.14	729.12		729.26	0.001737	3.78	768.18	258.67	0.27
Main Before D	139750	Q100	G#4Prop	1376.00	719.20	728.51		728.56	0.000520	2.12	1235.69	368.53	0.15
Main Before D	139750	Q100	G#4-Existing	1376.00	719.20	729.00		729.03	0.000370	1.89	1422.95	397.74	0.13
Main Before D	139750	Q100	G#4-PerNatural	1376.00	719.20	728.28		728.33	0.000619	2.25	1150.63	354.46	0.17
Main Before D	139632	Q100	G#4Prop	1376.00	718.63	728.30	722.90	728.46	0.001007	3.14	437.88	285.13	0.19
Main Before D	139620	Q100	G#4-Existing	1376.00	718.62	728.87	722.10	728.96	0.000599	2.62	931.53	328.13	0.15
Main Before D	139600		Bridge										
Main Before D	139536	Q100	G#4Prop	1376.00	718.52	728.10	722.81	728.24	0.000951	3.06	449.86	453.46	0.19
Main Before D	139536	Q100	G#4-Existing	1376.00	718.69	728.08	722.61	728.19	0.000867	2.95	936.52	451.67	0.18
Main Before D	139478	Q100	G#4Prop	1376.00	719.09	728.04		728.12	0.000681	2.26	680.07	219.14	0.19
Main Before D	139478	Q100	G#4-Existing	1376.00	719.09	728.00		728.08	0.000702	2.28	671.57	217.61	0.19
Main Before D	139478	Q100	G#4-PerNatural	1376.00	719.09	728.01		728.08	0.000700	2.28	672.70	217.81	0.19
Main Before D	139355	Q100	G#4Prop	1376.00	717.29	727.98		728.07	0.000746	2.74	969.45	286.05	0.20
Main Before D	139355	Q100	G#4-Existing	1376.00	717.29	727.94		728.03	0.000768	2.77	957.79	284.44	0.21
Main Before D	139355	Q100	G#4-PerNatural	1376.00	717.29	727.94		728.03	0.000765	2.76	959.35	284.66	0.21
Main Before D	139297	Q100	G#4Prop	1376.00	718.76	727.97		728.01	0.000321	1.77	1592.41	476.97	0.13
Main Before D	139297	Q100	G#4-Existing	1376.00	718.76	727.93		727.97	0.000331	1.79	1572.78	474.48	0.14
Main Before D	139297	Q100	G#4-PerNatural	1376.00	718.76	727.94		727.97	0.000330	1.79	1575.42	474.81	0.14
Main Before D	139274	Q100	G#4Prop	1376.00	716.67	727.83	720.75	727.97	0.000766	3.08	447.27	243.86	0.17
Main Before D	139274	Q100	G#4-Existing	1376.00	716.67	727.78	720.75	727.93	0.000777	3.09	445.34	235.62	0.17
Main Before D	139274	Q100	G#4-PerNatural	1376.00	716.67	727.79	720.76	727.94	0.000775	3.09	445.59	236.69	0.17
Main Before D	139250		Bridge										
Main Before D	139199	Q100	G#4Prop	1376.00	717.81	727.66	722.32	727.87	0.001633	3.74	368.34	293.46	0.23
Main Before D	139199	Q100	G#4-Existing	1376.00	717.81	727.61	722.32	727.83	0.001662	3.76	366.28	285.54	0.23
Main Before D	139199	Q100	G#4-PerNatural	1376.00	717.81	727.62	722.31	727.84	0.001658	3.75	366.55	286.60	0.23
Main Before D	139158	Q100	G#4Prop	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q100	G#4-Existing	1389.00	718.93	727.61		727.68	0.000807	2.15	826.56	251.31	0.17
Main Before D	139158	Q100	G#4-PerNatural	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	138418	Q100	G#4Prop	1389.00	716.00	726.63		726.78	0.003380	3.16	563.95	440.39	0.33
Main Before D	138418	Q100	G#4-Existing	1389.00	716.00	726.63		726.78	0.003381	3.16	563.90	440.38	0.33
Main Before D	138418	Q100	G#4-PerNatural	1389.00	716.00	726.63		726.78	0.003380	3.16	563.95	440.39	0.33
Main Before D	137750	Q100	G#4Prop	1412.00	715.00	724.52		724.65	0.002700	2.82	508.34	192.61	0.29
Main Before D	137750	Q100	G#4-Existing	1412.00	715.00	724.53		724.65	0.002691	2.81	508.91	192.72	0.29
Main Before D	137750	Q100	G#4-PerNatural	1412.00	715.00	724.52		724.65	0.002701	2.82	508.25	192.59	0.29
Main Before D	136804	Q100	G#4Prop	1419.00	713.99	722.78	720.97	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q100	G#4-Existing	1419.00	713.99	722.78	720.98	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q100	G#4-PerNatural	1419.00	713.99	722.78	720.99	722.83	0.001294	2.05	1178.30	517.68	0.20

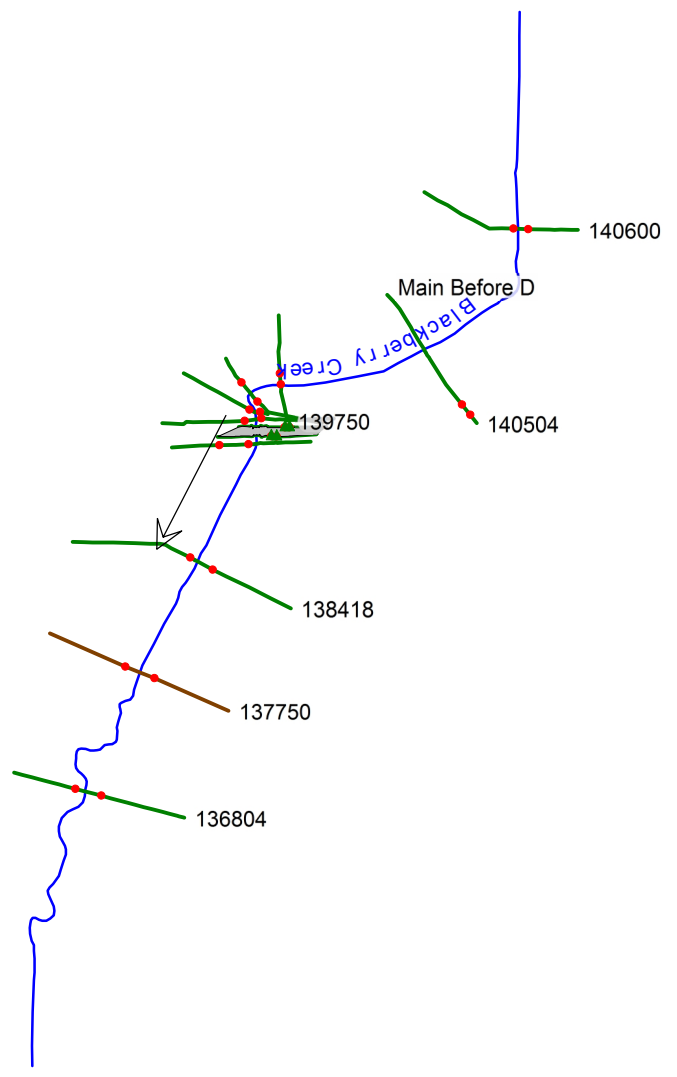
Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q500	G#4Prop	2108.00	723.50	731.79		731.85	0.001082	2.54	1495.62	553.81	0.20
Main Before D	140600	Q500	G#4-Existing	2108.00	723.50	731.73		731.79	0.001137	2.58	1465.53	547.89	0.21
Main Before D	140600	Q500	G#4-PerNatural	2108.00	723.50	731.65		731.71	0.001234	2.66	1417.43	538.29	0.21
Main Before D	140504	Q500	G#4Prop	2100.00	721.14	730.65		730.78	0.001331	3.86	1192.31	294.52	0.25
Main Before D	140504	Q500	G#4-Existing	2100.00	721.14	730.52		730.65	0.001454	3.99	1151.73	291.28	0.26
Main Before D	140504	Q500	G#4-PerNatural	2100.00	721.14	730.28		730.43	0.001696	4.22	1084.35	285.82	0.28
Main Before D	139750	Q500	G#4Prop	2097.00	719.20	730.02		730.07	0.000452	2.31	1860.35	459.25	0.15
Main Before D	139750	Q500	G#4-Existing	2097.00	719.20	729.82		729.87	0.000511	2.41	1767.43	446.52	0.16
Main Before D	139750	Q500	G#4-PerNatural	2097.00	719.20	729.44		729.51	0.000643	2.60	1605.61	424.31	0.18
Main Before D	139632	Q500	G#4Prop	2097.00	718.63	729.70	723.80	729.96	0.001373	4.08	513.75	390.43	0.23
Main Before D	139620	Q500	G#4-Existing	2097.00	718.62	729.62	723.13	729.76	0.000925	3.42	1198.75	384.62	0.19
Main Before D	139600		Bridge										
Main Before D	139536	Q500	G#4Prop	2097.00	718.52	729.23	723.69	729.49	0.001403	4.07	515.81	556.07	0.24
Main Before D	139536	Q500	G#4-Existing	2097.00	718.69	729.23	723.64	729.35	0.000948	3.36	1516.27	555.60	0.19
Main Before D	139478	Q500	G#4Prop	2097.00	719.09	729.19		729.30	0.000686	2.66	961.22	268.12	0.20
Main Before D	139478	Q500	G#4-Existing	2097.00	719.09	729.13		729.24	0.000712	2.69	945.92	265.72	0.20
Main Before D	139478	Q500	G#4-PerNatural	2097.00	719.09	729.15		729.26	0.000706	2.68	949.48	266.28	0.20
Main Before D	139355	Q500	G#4Prop	2097.00	717.29	729.13		729.24	0.000825	3.26	1322.79	328.82	0.22
Main Before D	139355	Q500	G#4-Existing	2097.00	717.29	729.07		729.19	0.000855	3.30	1303.19	326.63	0.22
Main Before D	139355	Q500	G#4-PerNatural	2097.00	717.29	729.08		729.20	0.000848	3.29	1307.75	327.14	0.22
Main Before D	139297	Q500	G#4Prop	2097.00	718.76	729.13		729.17	0.000338	2.07	2198.81	593.44	0.14
Main Before D	139297	Q500	G#4-Existing	2097.00	718.76	729.07		729.11	0.000352	2.10	2163.18	589.30	0.14
Main Before D	139297	Q500	G#4-PerNatural	2097.00	718.76	729.08		729.13	0.000349	2.09	2171.50	590.27	0.14
Main Before D	139274	Q500	G#4Prop	2097.00	716.67	728.84	721.77	729.12	0.001297	4.27	491.76	430.92	0.22
Main Before D	139274	Q500	G#4-Existing	2097.00	716.67	728.77	721.77	729.06	0.001322	4.29	488.88	421.06	0.23
Main Before D	139274	Q500	G#4-PerNatural	2097.00	716.67	728.79	721.76	729.07	0.001317	4.28	489.53	423.55	0.23
Main Before D	139250		Bridge										
Main Before D	139199	Q500	G#4Prop	2097.00	717.81	728.53	723.36	728.95	0.002723	5.15	407.16	437.67	0.30
Main Before D	139199	Q500	G#4-Existing	2097.00	717.81	728.46	723.36	728.88	0.002796	5.19	403.95	428.51	0.30
Main Before D	139199	Q500	G#4-PerNatural	2097.00	717.81	728.48	723.35	728.89	0.002779	5.18	404.68	430.60	0.30
Main Before D	139158	Q500	G#4Prop	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	139158	Q500	G#4-Existing	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	139158	Q500	G#4-PerNatural	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q500	G#4Prop	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	138418	Q500	G#4-Existing	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	138418	Q500	G#4-PerNatural	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q500	G#4Prop	2150.00	715.00	725.30		725.48	0.002793	3.35	673.71	232.18	0.31
Main Before D	137750	Q500	G#4-Existing	2150.00	715.00	725.30		725.47	0.002801	3.35	673.01	232.03	0.31
Main Before D	137750	Q500	G#4-PerNatural	2150.00	715.00	725.30		725.48	0.002798	3.35	673.31	232.10	0.31
Main Before D	136804	Q500	G#4Prop	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.74	550.09	0.21
Main Before D	136804	Q500	G#4-Existing	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.74	550.09	0.21
Main Before D	136804	Q500	G#4-PerNatural	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Model

**GROUP #4 - PERMIT NATURAL CONDITIONS**

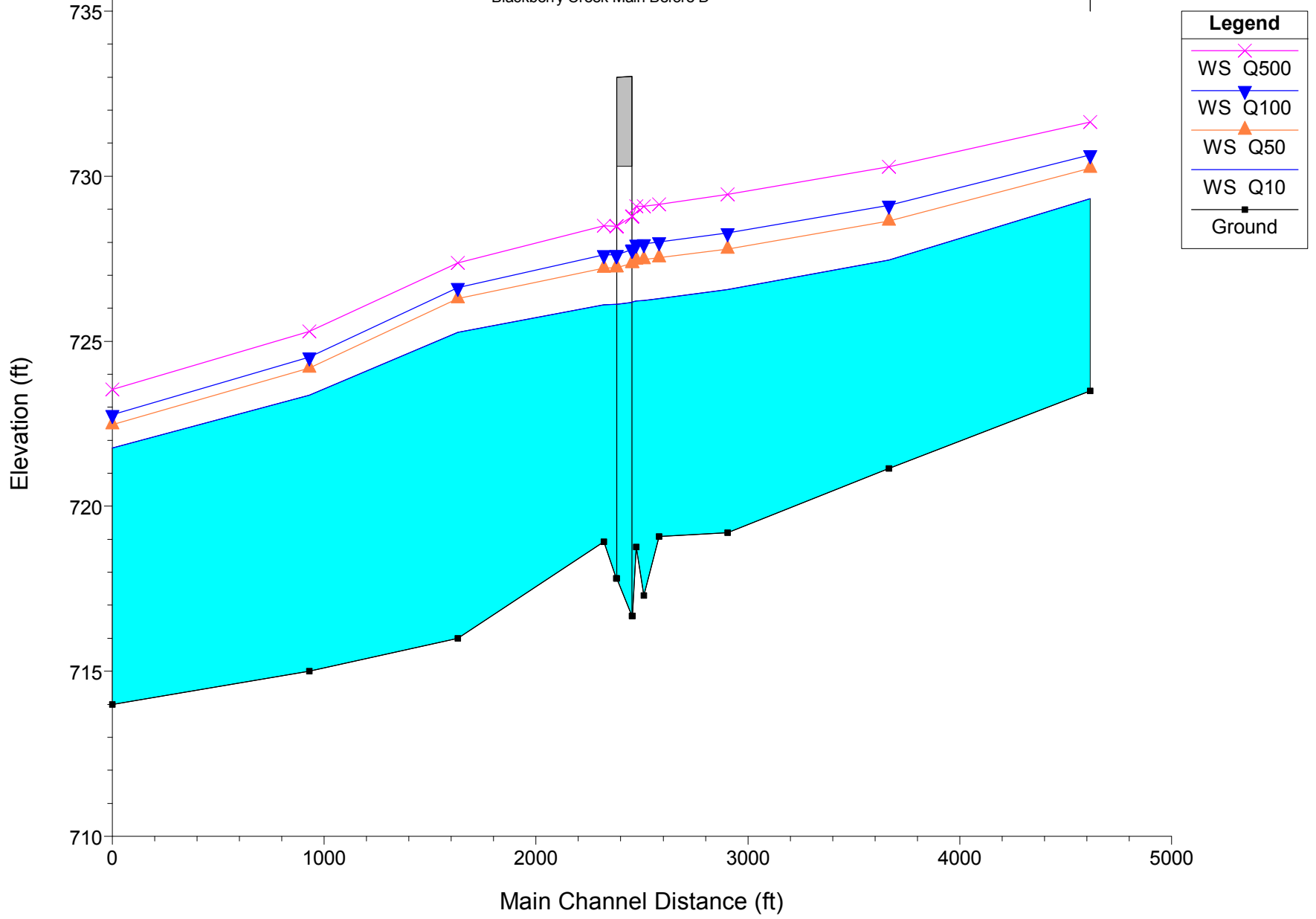
**No Rte 47 Culvert, Proposed Main St**





1 of the 12 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#4-PerNatural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002040	2.20	443.40	313.75	0.25
Main Before D	140600	Q50	1128.00	723.50	730.24		730.30	0.001613	2.42	765.34	391.02	0.23
Main Before D	140600	Q100	1384.00	723.50	730.65		730.71	0.001485	2.50	933.36	433.05	0.23
Main Before D	140600	Q500	2108.00	723.50	731.65		731.71	0.001234	2.66	1417.43	538.29	0.21
Main Before D	140504	Q10	635.00	721.14	727.45		727.57	0.001847	3.13	377.26	202.16	0.27
Main Before D	140504	Q50	1123.00	721.14	728.64		728.77	0.001758	3.59	645.57	247.34	0.27
Main Before D	140504	Q100	1379.00	721.14	729.12		729.26	0.001737	3.78	768.18	258.67	0.27
Main Before D	140504	Q500	2100.00	721.14	730.28		730.43	0.001696	4.22	1084.35	285.82	0.28
Main Before D	139750	Q10	634.00	719.20	726.56		726.60	0.000618	1.77	614.78	272.71	0.16
Main Before D	139750	Q50	1120.00	719.20	727.79		727.84	0.000601	2.09	985.30	328.64	0.16
Main Before D	139750	Q100	1376.00	719.20	728.28		728.33	0.000619	2.25	1150.63	354.46	0.17
Main Before D	139750	Q500	2097.00	719.20	729.44		729.51	0.000643	2.60	1605.61	424.31	0.18
Main Before D	139478	Q10	634.00	719.09	726.29		726.34	0.000849	1.78	357.29	150.52	0.20
Main Before D	139478	Q50	1120.00	719.09	727.53		727.60	0.000695	2.10	574.08	199.23	0.19
Main Before D	139478	Q100	1376.00	719.09	728.01		728.08	0.000700	2.28	672.70	217.81	0.19
Main Before D	139478	Q500	2097.00	719.09	729.15		729.26	0.000706	2.68	949.48	266.28	0.20
Main Before D	139355	Q10	634.00	717.29	726.23		726.29	0.000681	2.07	526.49	227.32	0.18
Main Before D	139355	Q50	1120.00	717.29	727.47		727.55	0.000718	2.53	829.89	266.14	0.20
Main Before D	139355	Q100	1376.00	717.29	727.94		728.03	0.000765	2.76	959.35	284.66	0.21
Main Before D	139355	Q500	2097.00	717.29	729.08		729.20	0.000848	3.29	1307.75	327.14	0.22
Main Before D	139297	Q10	634.00	718.76	726.22		726.24	0.000330	1.40	847.21	380.36	0.13
Main Before D	139297	Q50	1120.00	718.76	727.47		727.50	0.000317	1.65	1357.84	446.32	0.13
Main Before D	139297	Q100	1376.00	718.76	727.94		727.97	0.000330	1.79	1575.42	474.81	0.14
Main Before D	139297	Q500	2097.00	718.76	729.08		729.13	0.000349	2.09	2171.50	590.27	0.14
Main Before D	139274	Q10	634.00	716.67	726.19	719.49	726.23	0.000277	1.69	375.08	81.59	0.10
Main Before D	139274	Q50	1120.00	716.67	727.36	720.36	727.47	0.000593	2.62	426.74	191.43	0.15
Main Before D	139274	Q100	1376.00	716.67	727.79	720.76	727.94	0.000775	3.09	445.59	236.69	0.17
Main Before D	139274	Q500	2097.00	716.67	728.79	721.76	729.07	0.001317	4.28	489.53	423.55	0.23
Main Before D	139250		Bridge									
Main Before D	139199	Q10	634.00	717.81	726.12	721.03	726.19	0.000651	2.11	300.83	43.82	0.14
Main Before D	139199	Q50	1120.00	717.81	727.23	721.92	727.39	0.001275	3.20	349.54	227.76	0.20
Main Before D	139199	Q100	1376.00	717.81	727.62	722.31	727.84	0.001658	3.75	366.55	286.60	0.23
Main Before D	139199	Q500	2097.00	717.81	728.48	723.35	728.89	0.002779	5.18	404.68	430.60	0.30
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003380	3.16	563.95	440.39	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002630	2.60	444.33	180.04	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002701	2.82	508.25	192.59	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.48	0.002798	3.35	673.31	232.10	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.99	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.30	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#4-PerNatural River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.80	0.01	155.58	445.55	36.87	313.75
Main Before D	140600	Q50	730.30	730.24	0.06	1.53	0.01	331.47	669.16	127.38	391.02
Main Before D	140600	Q100	730.71	730.65	0.06	1.44	0.01	420.84	775.39	187.77	433.05
Main Before D	140600	Q500	731.71	731.65	0.06	1.27	0.01	663.59	1040.86	403.56	538.29
Main Before D	140504	Q10	727.57	727.45	0.12	0.94	0.02	0.00	474.64	160.36	202.16
Main Before D	140504	Q50	728.77	728.64	0.13	0.91	0.03	0.28	698.64	424.08	247.34
Main Before D	140504	Q100	729.26	729.12	0.14	0.91	0.03	0.68	801.28	577.04	258.67
Main Before D	140504	Q500	730.43	730.28	0.15	0.90	0.03	2.63	1068.74	1028.63	285.82
Main Before D	139750	Q10	726.60	726.56	0.04	0.25	0.00	0.08	460.73	173.20	272.71
Main Before D	139750	Q50	727.84	727.79	0.05	0.23	0.00	6.67	717.31	396.02	328.64
Main Before D	139750	Q100	728.33	728.28	0.05	0.24	0.00	13.68	846.02	516.30	354.46
Main Before D	139750	Q500	729.51	729.44	0.06	0.25	0.00	51.77	1180.67	864.56	424.31
Main Before D	139478	Q10	726.34	726.29	0.05	0.05	0.00	0.07	633.84	0.09	150.52
Main Before D	139478	Q50	727.60	727.53	0.07	0.05	0.00	4.91	1108.36	6.73	199.23
Main Before D	139478	Q100	728.08	728.01	0.08	0.05	0.00	10.08	1352.08	13.84	217.81
Main Before D	139478	Q500	729.26	729.15	0.11	0.06	0.00	33.37	2016.75	46.89	266.28
Main Before D	139355	Q10	726.29	726.23	0.05	0.03	0.01		517.13	116.87	227.32
Main Before D	139355	Q50	727.55	727.47	0.07	0.04	0.01	0.39	832.10	287.51	266.14
Main Before D	139355	Q100	728.03	727.94	0.09	0.04	0.02	1.92	993.59	380.49	284.66
Main Before D	139355	Q500	729.20	729.08	0.12	0.05	0.02	14.27	1424.18	658.55	327.14
Main Before D	139297	Q10	726.24	726.22	0.02	0.01	0.00		482.38	151.62	380.36
Main Before D	139297	Q50	727.50	727.47	0.03	0.02	0.01	2.79	759.08	358.12	446.32
Main Before D	139297	Q100	727.97	727.94	0.03	0.02	0.01	8.16	901.60	466.24	474.81
Main Before D	139297	Q500	729.13	729.08	0.04	0.03	0.02	36.10	1277.43	783.48	590.27
Main Before D	139274	Q10	726.23	726.19	0.04	0.00	0.00	0.00	634.00		81.59
Main Before D	139274	Q50	727.47	727.36	0.11	0.00	0.00	0.02	1119.98		191.43
Main Before D	139274	Q100	727.94	727.79	0.15	0.00	0.00	0.04	1375.96		236.69
Main Before D	139274	Q500	729.07	728.79	0.29	0.00	0.00	0.12	2096.88		423.55
Main Before D	139250		Bridge								
Main Before D	139199	Q10	726.19	726.12	0.07	0.04	0.02		634.00		43.82
Main Before D	139199	Q50	727.39	727.23	0.16	0.06	0.05	0.00	1120.00		227.76
Main Before D	139199	Q100	727.84	727.62	0.22	0.08	0.08	0.00	1376.00		286.60
Main Before D	139199	Q500	728.89	728.48	0.42	0.13	0.16	0.03	2096.98		430.60
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.09	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.64	13.05	367.20
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.48	56.15	440.39
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.19	242.28	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.39	0.61	180.04
Main Before D	137750	Q100	724.65	724.52	0.12	1.80	0.02		1409.39	2.61	192.59
Main Before D	137750	Q500	725.48	725.30	0.17	1.84	0.03	2.14	2132.17	15.69	232.10
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#4-PerNatural

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X        X   X       X  X   X  X   X
X   X  X        X         X   X   X  X   X
XXXXXXXX XXXX   X         XXX XXXX  XXXXXX  XXXX
X   X  X        X         X  X   X   X   X
X   X  X        X   X       X  X   X   X   X
X   X  XXXXXX   XXXX       X   X   X   X  XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPPermit.prj  
 Run Date and Time: 11/21/2013 11:27:33 AM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#4-Permit Natural Condition  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.p12

Geometry Title: Group#4-Natural Conditions

Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g12

Flow Title : 2005Flows for trimmed FIS

Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.f03

Plan Summary Information:

Number of: Cross Sections = 12 Multiple Openings = 0  
 Culverts = 0 Inline Structures = 0  
 Bridges = 1 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01  
 Critical depth calculation tolerance = 0.01  
 Maximum number of iterations = 30  
 Maximum difference tolerance = 0.3  
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry CreekMain	Before D	140600	638	1128	1384	2108
Blackberry CreekMain	Before D	140504	635	1123	1379	2100
Blackberry CreekMain	Before D	139750	634	1120	1376	2097
Blackberry CreekMain	Before D	139158	640	1132	1389	2117
Blackberry CreekMain	Before D	137750	651	1150	1412	2150
Blackberry CreekMain	Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Blackberry CreekMain	Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain	Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain	Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain	Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

```

River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    1     1     1     1     1     1     1     1     1
River = Blackberry Creek
Reach = Podolski          RS = 9000
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    1     1     1     1     1     1     1     1     1
River = Blackberry Creek
Reach = ER_North         RS = 63593
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Blackberry Creek
Reach = ER_North         RS = 63593
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Blackberry Creek
Reach = ER_North         RS = 63593
Gate = Gate #3
  # Open Open Ht # Open Open Ht # Open Open Ht
    .5    3     .5    3     .5    3     .5    3
River = Chain_of_Lakes
Reach = 1                 RS = 11108.
Gate = Gate #2
  # Open Open Ht # Open Open Ht # Open Open Ht
    2.2    1     2.2    1     2.2    1     2.2    1
River = Chain_of_Lakes
Reach = 1                 RS = 11108.
Gate = Gate #1
  # Open Open Ht # Open Open Ht # Open Open Ht
    2.35    1     2.35    1     2.35    1     2.35    1

```

GEOMETRY DATA

Geometry Title: Group#4-Natural Conditions  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g12

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.  
 Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data		num= 19							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	736	34.7	734	94.3	732	129.3	730	157	728
277.6	727.9	319.7	727.1	325.5	725.7	330.8	723.6	337	723.5
340.2	726.9	358.9	728	425.8	728.9	495.6	730	598.3	731.2
671	732	763.7	732.8	825.4	734	914.1	736		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.09	277.6	.055	358.9	.09

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	277.6	358.9		1000	950	750	.1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data		num= 19							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-186.58	738.19	-179.19	734.75	-162.13	730.81	-158.42	727.39	-145.96	724.25
-145.33	722.69	-139.49	721.34	-134.16	721.17	-128.02	721.14	-124.82	722.54
-122.47	725.97	-97.85	725.68	-60.35	725.83	0	725.95	19.51	726.88
80.96	728.34	138.26	730.91	192.26	731.35	242.79	732.36		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
-186.58	.11	-158.42	.05	-122.47	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-62	732	55	730	128	728	164.67	726.28	187.22	722.26
188.68	719.95	194.07	719.27	197.43	719.21	202.31	719.2	205.58	719.81
207.55	723.34	231.42	723.88	389	725.14	436.2	726.72	590.52	733.35

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-62	.11	164.67	.05	231.42	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 164.67 231.42 312 324 529 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data num= 17  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-306	734.1	0	730	47.71	728.07	82	726	119	724
130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39
152.54	723.2	186	724	221	726	271	728.2	302	730
341	732.2	381	734.1						

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-306	.13	82	.045	221	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 82 221 50 71 79 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend

pts on LHS elevation from bb\_tinascii  
 Station Elevation Data num= 19  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89		

Manning's n Values num= 3  

Sta	n Val	Sta	n Val	Sta	n Val
-45	.13	0	.045	64.26	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 0 64.26 30 38 166 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data num= 30  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52



822.44 731.3 835.91 732.5 913.06 733.22 935 736.2 956 738.5

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 399.61 .045 492.85 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
399.61 492.85 11 18 225 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139274

INPUT  
Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.  
Station Elevation Data num= 33  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-390 734.9 -378 734.4 -340 732.4 -270 730.4 -212 729  
-74.53 727.78 -51.77 726.46 -48.39 726 -39.87 726.18 -39.76 727.23  
-39.66 718.93 -32.86 718.23 -29.51 719.03 -26.64 718.3 -21.75 717.06  
-16.78 716.67 -11.45 716.8 -5.91 716.94 0 717.73 4.2 718  
4.24 726.5 13.18 725.45 18.68 725.9 58.97 726.62 90.61 726.99  
153.05 727.68 235.29 728.78 353.86 732.39 374.96 733.94 392.25 734.44  
399 734.18 415.18 734.59 530.99 738.51

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-390 .13 -39.87 .055 4.24 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-39.87 4.24 75 75 75 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-390 -39.93 730.9 F  
4.08 530.99 730.9 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139250

INPUT  
Description: Main Street (IL USGS 2001)  
Distance from Upstream XS = 2  
Deck/Roadway Width = 72  
Weir Coefficient = 2.6  
Upstream Deck/Roadway Coordinates num= 16  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-445.77 739.81 -390.79 738.26 -378.64 737.95  
-340.19 737.02 -268.95 735.58 -213.37 734.7  
-212.94 734.69 -80.3 733.497 -38.96 733.3 730.3  
0 733.12 730.12 5.04 733.11 730.11 55.03 733.02  
109.06 733.12 237.68 734.16 367.33 736.34  
532.98 740.7

Upstream Bridge Cross Section Data  
Station Elevation Data num= 33  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-390 734.9 -378 734.4 -340 732.4 -270 730.4 -212 729  
-74.53 727.78 -51.77 726.46 -48.39 726 -39.87 726.18 -39.76 727.23  
-39.66 718.93 -32.86 718.23 -29.51 719.03 -26.64 718.3 -21.75 717.06  
-16.78 716.67 -11.45 716.8 -5.91 716.94 0 717.73 4.2 718  
4.24 726.5 13.18 725.45 18.68 725.9 58.97 726.62 90.61 726.99  
153.05 727.68 235.29 728.78 353.86 732.39 374.96 733.94 392.25 734.44  
399 734.18 415.18 734.59 530.99 738.51

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-390 .13 -39.87 .055 4.24 .13

Bank Sta: Left Right Coeff Contr. Expan.  
-39.87 4.24 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-390 -39.93 730.9 F  
4.08 530.99 730.9 F

Downstream Deck/Roadway Coordinates num= 12  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-308.86 736.5 -165.48 734.5 -65.04 733.7  
-20.37 733.3 -20.37 733.3 730.3 1.93 733.2 730.2  
23.93 733.11 730.11 53 733 88.9 733.12  
218.32 734.16 367.76 736.34 511.92 740.3

Downstream Bridge Cross Section Data

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-20.25	.055	23.99	.13

Bank Sta: Left Right Coeff Contr. Expan.  
 -20.25 23.99 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-332.9	-20.37	733	F
23.93	475.96	733	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
 Momentum Cd = 2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139199

INPUT

Description: USGS IL 2001. DSF Main Street.

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-20.25	.055	23.99	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -20.25 23.99 81 59 559 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-332.9	-20.37	733	F
23.93	475.96	733	F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139158

INPUT

Description: USGS IL 2001. Departure of Main Street

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84

319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 265.13 .055 388.49 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 265.13 388.49 740 690 550 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT  
 Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01
558.72	723.73	574	722	578	720	582	718	586	716
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 487.45 .055 631.64 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 487.45 631.64 710 700 700 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT  
 Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT  
 Description: IDNR 1985. B12885

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09
940	730.89	985	733.59						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 480 .055 630 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 480 630 9810 11021 10122 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139274	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139199	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	312	324	529
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	11	18	225
Main Before D	139274	75	75	75
Main Before D	139250	Bridge		
Main Before D	139199	81	59	559
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

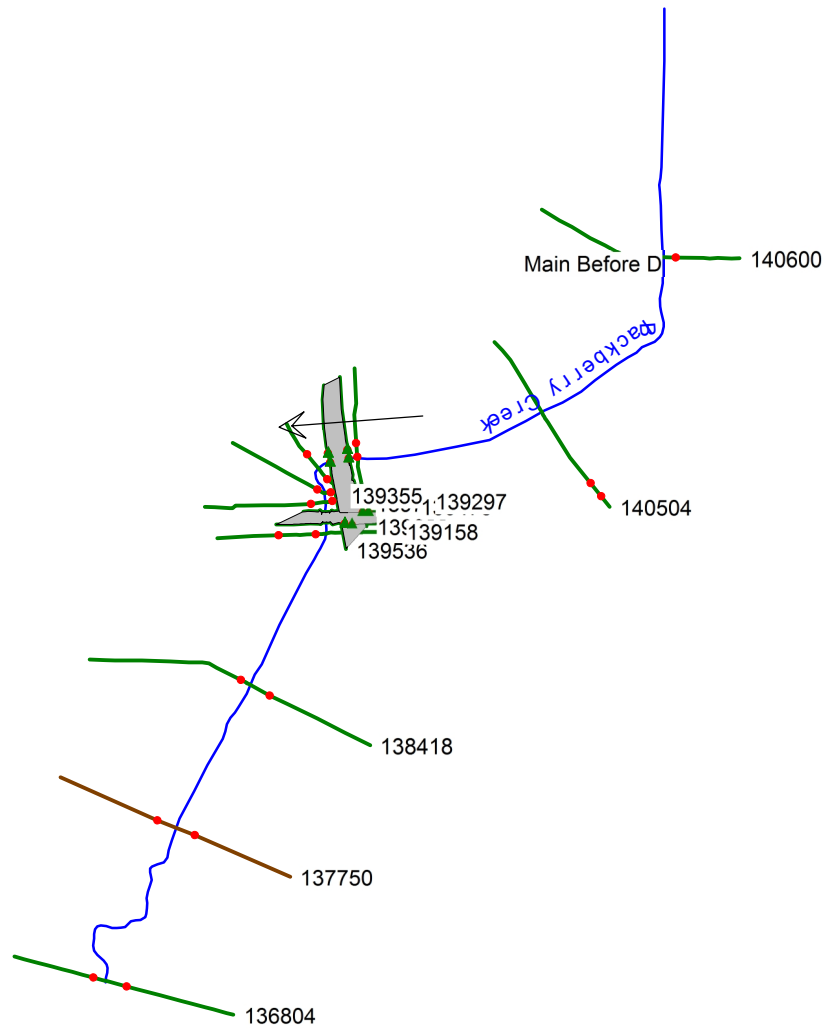
Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139274	.3	.5
Main Before D	139250	Bridge	
Main Before D	139199	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

## HEC-RAS Model

### **GROUP #4 - PERMIT EXISTING CONDITIONS**

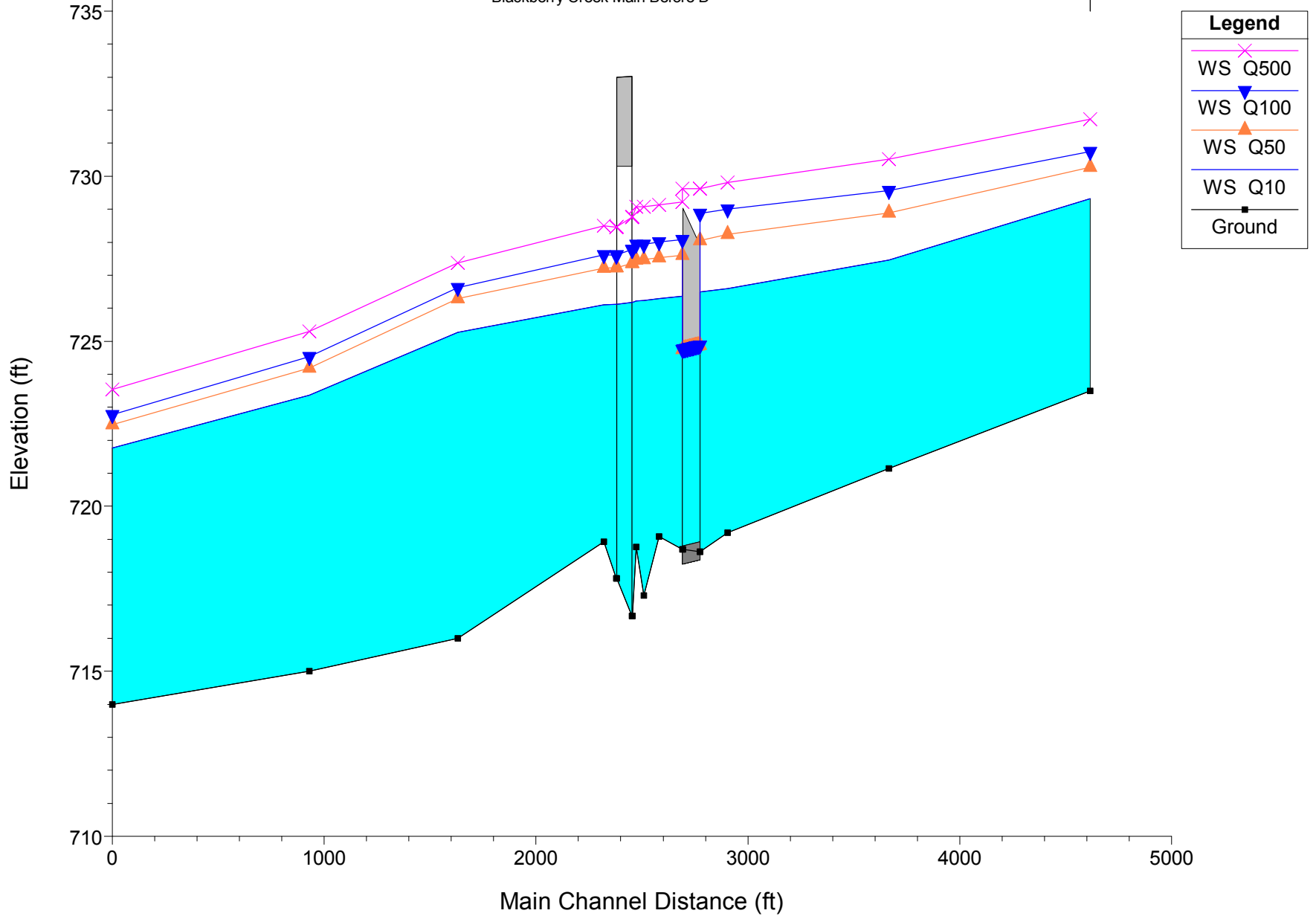
#### **Existing Rte 47 Culvert, Proposed Main St**

The modeled bridge for Route 47 was revised with the existing culvert geometry.



1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#4-Existing River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002041	2.20	443.30	313.73	0.25
Main Before D	140600	Q50	1128.00	723.50	730.27		730.33	0.001543	2.38	779.12	394.64	0.23
Main Before D	140600	Q100	1384.00	723.50	730.75		730.81	0.001317	2.40	979.87	443.99	0.21
Main Before D	140600	Q500	2108.00	723.50	731.73		731.79	0.001137	2.58	1465.53	547.89	0.21
Main Before D	140504	Q10	635.00	721.14	727.46		727.58	0.001830	3.12	378.89	202.51	0.27
Main Before D	140504	Q50	1123.00	721.14	728.89		728.99	0.001407	3.31	707.81	253.15	0.25
Main Before D	140504	Q100	1379.00	721.14	729.56		729.67	0.001221	3.33	885.25	269.04	0.23
Main Before D	140504	Q500	2100.00	721.14	730.52		730.65	0.001454	3.99	1151.73	291.28	0.26
Main Before D	139750	Q10	634.00	719.20	726.59		726.62	0.000599	1.75	622.49	274.15	0.16
Main Before D	139750	Q50	1120.00	719.20	728.23		728.27	0.000424	1.85	1135.65	351.93	0.14
Main Before D	139750	Q100	1376.00	719.20	729.00		729.03	0.000370	1.89	1422.95	397.74	0.13
Main Before D	139750	Q500	2097.00	719.20	729.82		729.87	0.000511	2.41	1767.43	446.52	0.16
Main Before D	139620	Q10	634.00	718.62	726.49	720.83	726.55	0.000471	1.93	328.17	137.27	0.12
Main Before D	139620	Q50	1120.00	718.62	728.06	721.71	728.18	0.000777	2.82	397.28	266.73	0.17
Main Before D	139620	Q100	1376.00	718.62	728.87	722.10	728.96	0.000599	2.62	931.53	328.13	0.15
Main Before D	139620	Q500	2097.00	718.62	729.62	723.13	729.76	0.000925	3.42	1198.75	384.62	0.19
Main Before D	139600		Culvert									
Main Before D	139536	Q10	634.00	718.69	726.36	721.32	726.42	0.000535	1.99	430.06	195.17	0.13
Main Before D	139536	Q50	1120.00	718.69	727.60	722.19	727.70	0.000778	2.69	737.34	361.89	0.17
Main Before D	139536	Q100	1376.00	718.69	728.08	722.61	728.19	0.000867	2.95	936.52	451.67	0.18
Main Before D	139536	Q500	2097.00	718.69	729.23	723.64	729.35	0.000948	3.36	1516.27	555.60	0.19
Main Before D	139478	Q10	634.00	719.09	726.29		726.34	0.000850	1.78	357.06	150.46	0.20
Main Before D	139478	Q50	1120.00	719.09	727.53		727.60	0.000698	2.10	573.30	199.07	0.19
Main Before D	139478	Q100	1376.00	719.09	728.00		728.08	0.000702	2.28	671.57	217.61	0.19
Main Before D	139478	Q500	2097.00	719.09	729.13		729.24	0.000712	2.69	945.92	265.72	0.20
Main Before D	139355	Q10	634.00	717.29	726.23		726.29	0.000682	2.07	526.12	227.28	0.18
Main Before D	139355	Q50	1120.00	717.29	727.47		727.54	0.000721	2.53	828.80	265.97	0.20
Main Before D	139355	Q100	1376.00	717.29	727.94		728.03	0.000768	2.77	957.79	284.44	0.21
Main Before D	139355	Q500	2097.00	717.29	729.07		729.19	0.000855	3.30	1303.19	326.63	0.22
Main Before D	139297	Q10	634.00	718.76	726.22		726.24	0.000331	1.40	846.59	380.25	0.13
Main Before D	139297	Q50	1120.00	718.76	727.46		727.49	0.000318	1.65	1356.01	446.08	0.13
Main Before D	139297	Q100	1376.00	718.76	727.93		727.97	0.000331	1.79	1572.78	474.48	0.14
Main Before D	139297	Q500	2097.00	718.76	729.07		729.11	0.000352	2.10	2163.18	589.30	0.14
Main Before D	139274	Q10	634.00	716.67	726.18	719.48	726.23	0.000277	1.69	375.01	81.47	0.10
Main Before D	139274	Q50	1120.00	716.67	727.36	720.35	727.46	0.000594	2.63	426.56	190.98	0.15
Main Before D	139274	Q100	1376.00	716.67	727.78	720.75	727.93	0.000777	3.09	445.34	235.62	0.17
Main Before D	139274	Q500	2097.00	716.67	728.77	721.77	729.06	0.001322	4.29	488.88	421.06	0.23
Main Before D	139250		Bridge									
Main Before D	139199	Q10	634.00	717.81	726.12	721.02	726.19	0.000651	2.11	300.75	43.82	0.14
Main Before D	139199	Q50	1120.00	717.81	727.23	721.91	727.39	0.001278	3.21	349.34	227.19	0.20
Main Before D	139199	Q100	1376.00	717.81	727.61	722.32	727.83	0.001662	3.76	366.28	285.54	0.23
Main Before D	139199	Q500	2097.00	717.81	728.46	723.36	728.88	0.002796	5.19	403.95	428.51	0.30
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.56	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003381	3.16	563.90	440.38	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002629	2.60	444.40	180.06	0.28
Main Before D	137750	Q100	1412.00	715.00	724.53		724.65	0.002691	2.81	508.91	192.72	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.47	0.002801	3.35	673.01	232.03	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.79	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.98	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.74	550.09	0.21



HEC-RAS Plan: G#4-Existing River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.79	0.01	155.56	445.58	36.86	313.73
Main Before D	140600	Q50	730.33	730.27	0.06	1.34	0.00	332.69	665.78	129.53	394.64
Main Before D	140600	Q100	730.81	730.75	0.06	1.14	0.00	423.52	764.36	196.12	443.99
Main Before D	140600	Q500	731.79	731.73	0.06	1.13	0.01	664.28	1030.04	413.68	547.89
Main Before D	140504	Q10	727.58	727.46	0.11	0.93	0.02	0.00	474.00	161.00	202.51
Main Before D	140504	Q50	728.99	728.89	0.11	0.70	0.02	0.41	673.80	448.79	253.15
Main Before D	140504	Q100	729.67	729.56	0.10	0.61	0.02	1.04	758.30	619.66	269.04
Main Before D	140504	Q500	730.65	730.52	0.13	0.76	0.02	2.99	1044.83	1052.18	291.28
Main Before D	139750	Q10	726.62	726.59	0.04	0.07	0.00	0.10	459.24	174.67	274.15
Main Before D	139750	Q50	728.27	728.23	0.03	0.08	0.01	10.71	690.98	418.31	351.93
Main Before D	139750	Q100	729.03	729.00	0.03	0.07	0.01	25.08	800.13	550.79	397.74
Main Before D	139750	Q500	729.87	729.82	0.05	0.10	0.01	64.35	1150.32	882.33	446.52
Main Before D	139620	Q10	726.55	726.49	0.06				634.00		137.27
Main Before D	139620	Q50	728.18	728.06	0.12				1120.00		266.73
Main Before D	139620	Q100	728.96	728.87	0.09			120.59	1136.08	119.32	328.13
Main Before D	139620	Q500	729.76	729.62	0.14			256.36	1595.13	245.52	384.62
Main Before D	139600		Culvert								
Main Before D	139536	Q10	726.42	726.36	0.06	0.07	0.00	1.51	603.65	28.84	195.17
Main Before D	139536	Q50	727.70	727.60	0.10	0.08	0.01	13.56	961.98	144.46	361.89
Main Before D	139536	Q100	728.19	728.08	0.11	0.09	0.02	38.58	1117.75	219.67	451.67
Main Before D	139536	Q500	729.35	729.23	0.12	0.10	0.01	191.55	1443.53	461.92	555.60
Main Before D	139478	Q10	726.34	726.29	0.05	0.05	0.00	0.06	633.85	0.09	150.46
Main Before D	139478	Q50	727.60	727.53	0.07	0.05	0.00	4.88	1108.42	6.70	199.07
Main Before D	139478	Q100	728.08	728.00	0.08	0.05	0.00	10.03	1352.20	13.77	217.61
Main Before D	139478	Q500	729.24	729.13	0.11	0.06	0.00	33.11	2017.31	46.57	265.72
Main Before D	139355	Q10	726.29	726.23	0.05	0.03	0.01		517.21	116.79	227.28
Main Before D	139355	Q50	727.54	727.47	0.08	0.04	0.01	0.38	832.31	287.31	265.97
Main Before D	139355	Q100	728.03	727.94	0.09	0.04	0.02	1.90	993.91	380.19	284.44
Main Before D	139355	Q500	729.19	729.07	0.12	0.05	0.02	14.10	1425.18	657.72	326.63
Main Before D	139297	Q10	726.24	726.22	0.02	0.01	0.00		482.45	151.55	380.25
Main Before D	139297	Q50	727.49	727.46	0.03	0.02	0.01	2.77	759.32	357.91	446.08
Main Before D	139297	Q100	727.97	727.93	0.03	0.02	0.01	8.09	901.94	465.97	474.48
Main Before D	139297	Q500	729.11	729.07	0.04	0.03	0.02	35.53	1278.65	782.81	589.30
Main Before D	139274	Q10	726.23	726.18	0.04	0.00	0.00		634.00		81.47
Main Before D	139274	Q50	727.46	727.36	0.11	0.00	0.00	0.02	1119.98		190.98
Main Before D	139274	Q100	727.93	727.78	0.15	0.00	0.00	0.04	1375.96		235.62
Main Before D	139274	Q500	729.06	728.77	0.29	0.00	0.00	0.12	2096.88		421.06
Main Before D	139250		Bridge								
Main Before D	139199	Q10	726.19	726.12	0.07	0.04	0.02		634.00		43.82
Main Before D	139199	Q50	727.39	727.23	0.16	0.06	0.05	0.00	1120.00		227.19
Main Before D	139199	Q100	727.83	727.61	0.22	0.07	0.08	0.00	1376.00		285.54
Main Before D	139199	Q500	728.88	728.46	0.42	0.11	0.16	0.02	2096.98		428.51
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.09	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.64	13.05	367.20
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.50	56.13	440.38
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.19	242.28	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.39	0.61	180.06
Main Before D	137750	Q100	724.65	724.53	0.12	1.79	0.02		1409.36	2.64	192.72
Main Before D	137750	Q500	725.47	725.30	0.17	1.84	0.03	2.13	2132.20	15.67	232.03
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75

HEC-RAS Plan: G#4-Existing River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#4-Existing

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X       X   X       X  X   X  X   X
X   X  X       X           X  X   X  X   X
XXXXXXXX XXXX   X           XXX XXXX   XXXXXX   XXXX
X   X  X       X           X  X   X  X       X
X   X  X       X   X       X  X   X  X   X
X   X  XXXXXX   XXXX       X   X   X  X   XXXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 11/21/2013 1:28:42 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#4-Permit Existing  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p11

Geometry Title: Group #4- Permit Existing  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g11

Flow Title : 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Description:

FIS model with proposed Main Street geometry in place and the existing Route 47 Culvert.

Plan Summary Information:

Number of:	Cross Sections =	14	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	30
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	140600	638	1128	1384	2108
Blackberry Creek	Main Before D	140504	635	1123	1379	2100
Blackberry Creek	Main Before D	139750	634	1120	1376	2097
Blackberry Creek	Main Before D	139158	640	1132	1389	2117
Blackberry Creek	Main Before D	137750	651	1150	1412	2150
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
-------	-------	---------	----------	------------

Blackberry CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #1

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
1	1	1	1	1	1	1	1

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #2

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
1	1	1	1	1	1	1	1

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #1

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
.5	3	.5	3	.5	3	.5	3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #2

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
.5	3	.5	3	.5	3	.5	3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #3

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
.5	3	.5	3	.5	3	.5	3

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #2

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
2.2	1	2.2	1	2.2	1	2.2	1

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #1

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
2.35	1	2.35	1	2.35	1	2.35	1

GEOMETRY DATA

Geometry Title: Group #4- Permit Existing  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g11

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.

Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 736 34.7 734 94.3 732 129.3 730 157 728		
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5		
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2		
671 732 763.7 732.8 825.4 734 914.1 736		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .09 277.6 .055 358.9 .09		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
277.6	358.9	1000	950	750	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25		
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54		
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88		

80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-186.58 .11 -158.42 .05 -122.47 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-62 732 55 730 128 728 164.67 726.28 187.22 722.26  
188.68 719.95 194.07 719.27 197.43 719.21 202.31 719.2 205.58 719.81  
207.55 723.34 231.42 723.88 389 725.14 436.2 726.72 590.52 733.35

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-62 .11 164.67 .05 231.42 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
164.67 231.42 140 130 195 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139620

INPUT

Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
bb\_Tinacii

Station Elevation Data num= 24  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -24.8 725.68  
-24.12 720.07 -21.76 719.68 -19.69 719.17 -17.85 718.76 -14.09 718.63  
-11.17 718.64 -6.74 718.63 -2.99 718.62 0 719.3 3.5 718.87  
5.47 718.9 8.36 718.67 11.49 718.8 14.55 718.96 18.76 719.74  
19.25 725.72 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -24.8 .055 19.25 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-24.8 19.25 95 84 147 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-381 -24.8 728.8 F  
19.25 361.26 728.8 F

CULVERT

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139600

INPUT

Description: Route 47 (IL USGS 2001)

Distance from Upstream XS = 2  
Deck/Roadway Width = 80  
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 7  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-162.82 727.87 -67.02 727.98 -22.94 728.47  
17.16 728.93 75.46 729.59 225 732.24  
360.24 734.67

Upstream Bridge Cross Section Data  
Station Elevation Data num= 24  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -24.8 725.68  
-24.12 720.07 -21.76 719.68 -19.69 719.17 -17.85 718.76 -14.09 718.63  
-11.17 718.64 -6.74 718.63 -2.99 718.62 0 719.3 3.5 718.87  
5.47 718.9 8.36 718.67 11.49 718.8 14.55 718.96 18.76 719.74  
19.25 725.72 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -24.8 .055 19.25 .11

Bank Sta: Left Right Coeff Contr. Expan.

-24.8 19.25 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -381 -24.8 728.8 F  
 19.25 361.26 728.8 F

Downstream Deck/Roadway Coordinates  
 num= 8  
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
 -300 729 -188.23 729.21 -85.67 730.01  
 -41.76 730.42 0 730.81 127.79 732.5  
 302.06 735.62 350 735.92

Downstream Bridge Cross Section Data  
 Station Elevation Data num= 21  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -451 732 -333 730 -197.69 727.17 -123 727.85 -71.69 727.15  
 -44.48 725.27 -44.24 721.22 -39.28 720.17 -36.92 719.45 -29.35 719.41  
 -22.87 718.99 -16.64 718.88 -12.29 718.69 -6.19 719.71 -1.44 719.81  
 0 725.55 54.42 724.93 133.57 726.33 133.58 726.33 257.19 729.13  
 319.25 731.55

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -451 .13 -44.48 .055 0 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -44.48 0 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -451 -44.24 725.27 F  
 -1.44 319.25 725.27 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span  
 Rte 47 8.75W Box 6.5 8.75  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 2 82 .012 .012 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 -18.306 12.995  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 -38.505 -7.205

Culvert Name Shape Rise Span  
 RTE 47 10.4W Box 6.5 10.4  
 FHWA Chart # 8 - flared wingwalls  
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.  
 Solution Criteria = Highest U.S. EG  
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef Exit Loss Coef  
 2 82 .012 .012 .55 .4 1

Number of Barrels = 2  
 Upstream Elevation = 718.38  
 Centerline Stations  
 Sta. Sta.  
 -8.417 2.83  
 Downstream Elevation = 718.25  
 Centerline Stations  
 Sta. Sta.  
 -28.34 -17.363

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139536

INPUT

Description: USGS IL 2001. DSF of Rt47-8. 2 extend pts on LHS elevations from  
 bb\_tinascii

Station Elevation Data num= 21  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 -451 732 -333 730 -197.69 727.17 -123 727.85 -71.69 727.15  
 -44.48 725.27 -44.24 721.22 -39.28 720.17 -36.92 719.45 -29.35 719.41

-22.87	718.99	-16.64	718.88	-12.29	718.69	-6.19	719.71	-1.44	719.81
0	725.55	54.42	724.93	133.57	726.33	133.58	726.33	257.19	729.13
319.25	731.55								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -451 .13 -44.48 .055 0 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -44.48 0 77 110 187 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -451 -44.24 725.27 F  
 -1.44 319.25 725.27 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139478

INPUT  
 Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data num= 17									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-306	734.1	0	730	47.71	728.07	82	726	119	724
130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39
152.54	723.2	186	724	221	726	271	728.2	302	730
341	732.2	381	734.1						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -306 .13 82 .045 221 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 82 221 50 71 79 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139355

INPUT  
 Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend pts on LHS elevation from bb\_tinascii

Station Elevation Data num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -45 .13 0 .045 64.26 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 0 64.26 30 38 166 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139297

INPUT  
 Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data num= 30									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52
822.44	731.3	835.91	732.5	913.06	733.22	935	736.2	956	738.5

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 399.61 .045 492.85 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 399.61 492.85 11 18 225 .1 .3

CROSS SECTION





Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -332.9 .13 -20.25 .055 23.99 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -20.25 23.99 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -20.37 730.9 F  
 23.93 475.96 730.9 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139199

INPUT  
 Description: USGS IL 2001. DSF Main Street.  
 Station Elevation Data num= 26  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -332.9 .13 -20.25 .055 23.99 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -20.25 23.99 81 59 59 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -20.37 730.9 F  
 23.93 475.96 730.9 F

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139158

INPUT  
 Description: USGS IL 2001. Departure of Main Street  
 Station Elevation Data num= 22  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84
319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 265.13 .055 388.49 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 265.13 388.49 740 690 550 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01
558.72	723.73	574	722	578	720	582	718	586	716
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	487.45	.055	631.64	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	487.45	631.64		710	700		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09
940	730.89	985	733.59						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	480	.055	630	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	480	630		9810	11021		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139620	.11	.055	.11

Main Before D	139600	Culvert		
Main Before D	139536	.13	.055	.13
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139274	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139199	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	140	130	195
Main Before D	139620	95	84	147
Main Before D	139600	Culvert		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	11	18	225
Main Before D	139274	75	75	75
Main Before D	139250	Bridge		
Main Before D	139199	81	59	59
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

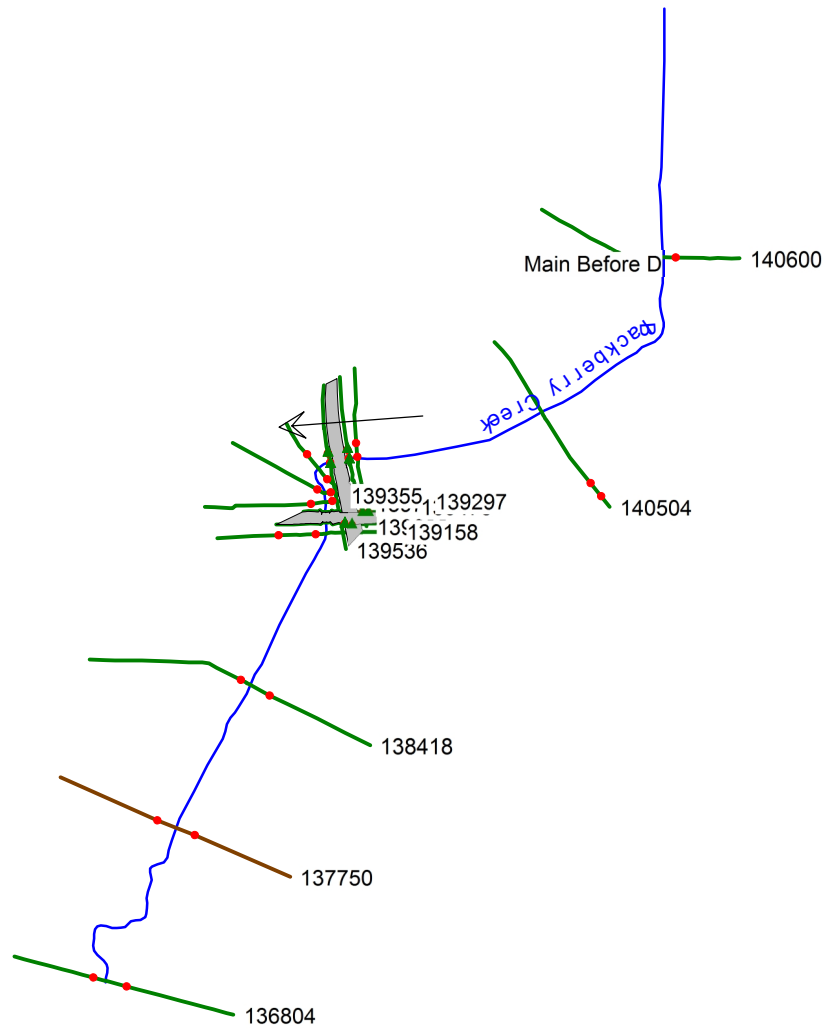
Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139620	.3	.5
Main Before D	139600	Culvert	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139274	.3	.5
Main Before D	139250	Bridge	
Main Before D	139199	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

## HEC-RAS Model

### **GROUP #4-PERMIT PROPOSED CONDITIONS**

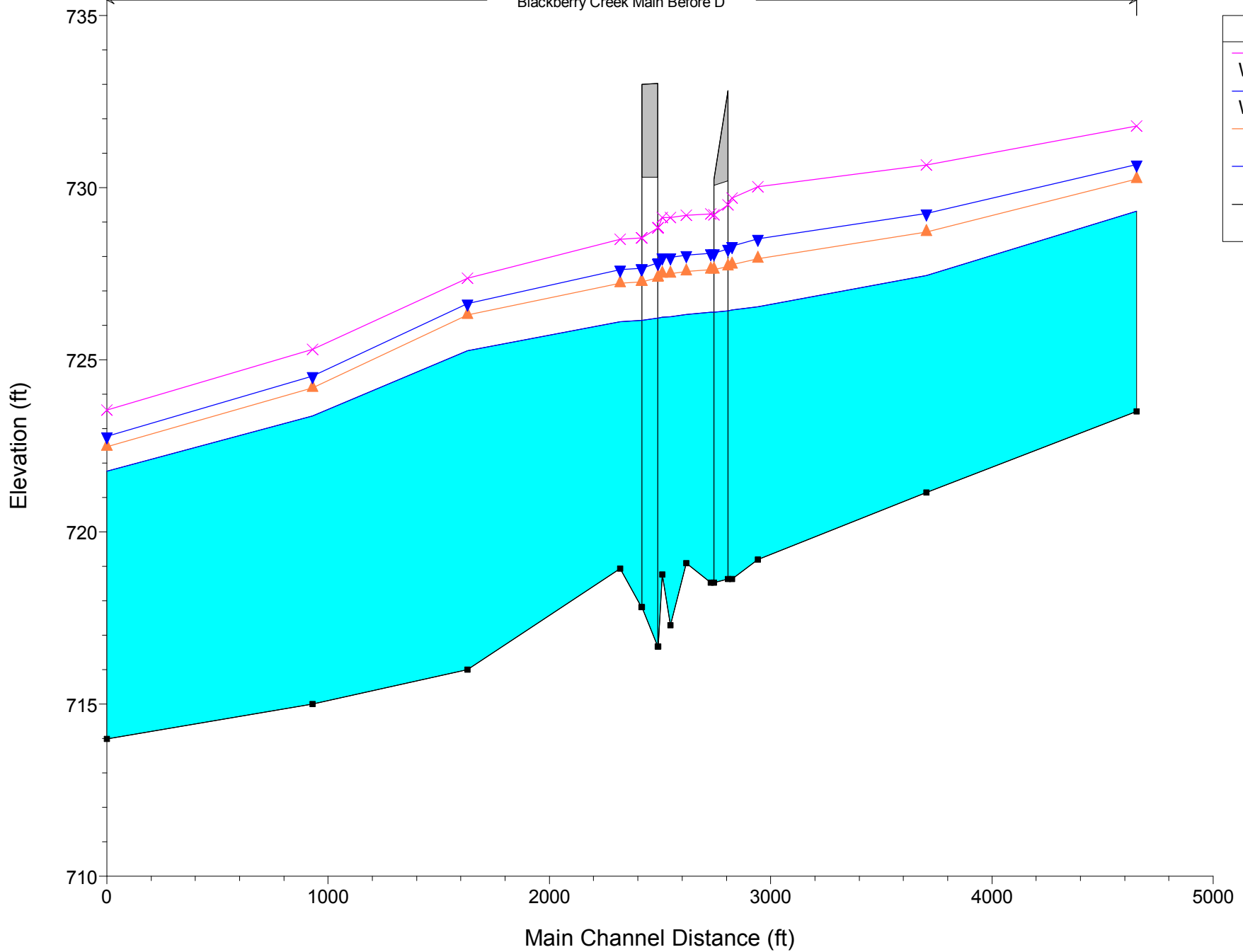
#### **Proposed Rte 47 Arch Culvert, Proposed Main St**

The structures modeled are the Proposed Main St Bridge and Rte 47 Arch Culvert.



1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#4Prop River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002039	2.20	443.48	313.77	0.25
Main Before D	140600	Q50	1128.00	723.50	730.25		730.31	0.001595	2.41	768.63	391.89	0.23
Main Before D	140600	Q100	1384.00	723.50	730.67		730.73	0.001442	2.47	944.65	435.73	0.22
Main Before D	140600	Q500	2108.00	723.50	731.79		731.85	0.001082	2.54	1495.62	553.81	0.20
Main Before D	140504	Q10	635.00	721.14	727.44		727.56	0.001868	3.14	375.19	201.72	0.27
Main Before D	140504	Q50	1123.00	721.14	728.71		728.84	0.001639	3.50	664.60	249.13	0.26
Main Before D	140504	Q100	1379.00	721.14	729.25		729.38	0.001558	3.64	802.73	261.77	0.26
Main Before D	140504	Q500	2100.00	721.14	730.65		730.78	0.001331	3.86	1192.31	294.52	0.25
Main Before D	139750	Q10	634.00	719.20	726.54		726.57	0.000633	1.78	608.65	271.55	0.16
Main Before D	139750	Q50	1120.00	719.20	727.94		727.98	0.000534	2.01	1033.53	335.12	0.15
Main Before D	139750	Q100	1376.00	719.20	728.51		728.56	0.000520	2.12	1235.69	368.53	0.15
Main Before D	139750	Q500	2097.00	719.20	730.02		730.07	0.000452	2.31	1860.35	459.25	0.15
Main Before D	139632	Q10	634.00	718.63	726.44	721.70	726.50	0.000511	1.88	337.07	132.63	0.13
Main Before D	139632	Q50	1120.00	718.63	727.77	722.56	727.89	0.000838	2.74	408.93	244.95	0.18
Main Before D	139632	Q100	1376.00	718.63	728.30	722.90	728.46	0.001007	3.14	437.88	285.13	0.19
Main Before D	139632	Q500	2097.00	718.63	729.70	723.80	729.96	0.001373	4.08	513.75	390.43	0.23
Main Before D	139600		Bridge									
Main Before D	139536	Q10	634.00	718.52	726.38	721.59	726.43	0.000464	1.81	350.14	191.48	0.13
Main Before D	139536	Q50	1120.00	718.52	727.62	722.45	727.73	0.000778	2.66	422.26	367.60	0.17
Main Before D	139536	Q100	1376.00	718.52	728.10	722.81	728.24	0.000951	3.06	449.86	453.46	0.19
Main Before D	139536	Q500	2097.00	718.52	729.23	723.69	729.49	0.001403	4.07	515.81	556.07	0.24
Main Before D	139478	Q10	634.00	719.09	726.31		726.36	0.000826	1.77	360.35	151.31	0.19
Main Before D	139478	Q50	1120.00	719.09	727.56		727.63	0.000678	2.08	579.76	200.34	0.19
Main Before D	139478	Q100	1376.00	719.09	728.04		728.12	0.000681	2.26	680.07	219.14	0.19
Main Before D	139478	Q500	2097.00	719.09	729.19		729.30	0.000686	2.66	961.22	268.12	0.20
Main Before D	139355	Q10	634.00	717.29	726.25		726.31	0.000667	2.05	531.44	227.85	0.18
Main Before D	139355	Q50	1120.00	717.29	727.50		727.58	0.000702	2.51	837.87	267.31	0.19
Main Before D	139355	Q100	1376.00	717.29	727.98		728.07	0.000746	2.74	969.45	286.05	0.20
Main Before D	139355	Q500	2097.00	717.29	729.13		729.24	0.000825	3.26	1322.79	328.82	0.22
Main Before D	139297	Q10	634.00	718.76	726.24		726.27	0.000323	1.39	855.59	381.81	0.13
Main Before D	139297	Q50	1120.00	718.76	727.50		727.53	0.000309	1.64	1371.35	448.15	0.13
Main Before D	139297	Q100	1376.00	718.76	727.97		728.01	0.000321	1.77	1592.41	476.97	0.13
Main Before D	139297	Q500	2097.00	718.76	729.13		729.17	0.000338	2.07	2198.81	593.44	0.14
Main Before D	139274	Q10	634.00	716.67	726.21	719.48	726.25	0.000275	1.69	376.07	83.21	0.10
Main Before D	139274	Q50	1120.00	716.67	727.39	720.35	727.50	0.000587	2.62	428.15	194.88	0.15
Main Before D	139274	Q100	1376.00	716.67	727.83	720.75	727.97	0.000766	3.08	447.27	243.86	0.17
Main Before D	139274	Q500	2097.00	716.67	728.84	721.77	729.12	0.001297	4.27	491.76	430.92	0.22
Main Before D	139250		Bridge									
Main Before D	139199	Q10	634.00	717.81	726.15	721.02	726.22	0.000644	2.10	301.84	43.83	0.14
Main Before D	139199	Q50	1120.00	717.81	727.27	721.91	727.42	0.001259	3.19	351.01	232.05	0.20
Main Before D	139199	Q100	1376.00	717.81	727.66	722.32	727.87	0.001633	3.74	368.34	293.46	0.23
Main Before D	139199	Q500	2097.00	717.81	728.53	723.36	728.95	0.002723	5.15	407.16	437.67	0.30
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003380	3.16	563.95	440.39	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002632	2.60	444.23	180.02	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002700	2.82	508.34	192.61	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.48	0.002793	3.35	673.71	232.18	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.81	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.97	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.28	723.60	0.001312	2.39	1584.74	550.09	0.21



HEC-RAS Plan: G#4Prop River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E. G. Elev (ft)	W. S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.81	0.01	155.59	445.53	36.88	313.77
Main Before D	140600	Q50	730.31	730.25	0.06	1.47	0.01	331.76	668.35	127.89	391.89
Main Before D	140600	Q100	730.73	730.67	0.06	1.35	0.01	421.52	772.66	189.82	435.73
Main Before D	140600	Q500	731.85	731.79	0.06	1.06	0.01	664.63	1023.47	419.90	553.81
Main Before D	140504	Q10	727.56	727.44	0.12	0.96	0.02	0.00	475.46	159.54	201.72
Main Before D	140504	Q50	728.84	728.71	0.12	0.83	0.02	0.32	690.69	431.98	249.13
Main Before D	140504	Q100	729.38	729.25	0.12	0.80	0.02	0.78	787.64	590.58	261.77
Main Before D	140504	Q500	730.78	730.65	0.12	0.69	0.02	3.22	1031.42	1065.37	294.52
Main Before D	139750	Q10	726.57	726.54	0.04	0.07	0.00	0.06	461.93	172.01	271.55
Main Before D	139750	Q50	727.98	727.94	0.04	0.08	0.01	8.04	708.22	403.74	335.12
Main Before D	139750	Q100	728.56	728.51	0.04	0.09	0.01	16.89	830.41	528.70	368.53
Main Before D	139750	Q500	730.07	730.02	0.05	0.09	0.02	71.50	1134.37	891.13	459.25
Main Before D	139632	Q10	726.50	726.44	0.05	0.01	0.00		634.00		132.63
Main Before D	139632	Q50	727.89	727.77	0.12	0.02	0.01		1120.00		244.95
Main Before D	139632	Q100	728.46	728.30	0.15	0.02	0.01		1376.00		285.13
Main Before D	139632	Q500	729.96	729.70	0.26	0.04	0.04		2097.00		390.43
Main Before D	139600		Bridge								
Main Before D	139536	Q10	726.43	726.38	0.05	0.07	0.00	0.01	633.99		191.48
Main Before D	139536	Q50	727.73	727.62	0.11	0.08	0.02	0.26	1119.75		367.60
Main Before D	139536	Q100	728.24	728.10	0.15	0.09	0.03	0.44	1375.56		453.46
Main Before D	139536	Q500	729.49	729.23	0.26	0.12	0.08	1.13	2095.87		556.07
Main Before D	139478	Q10	726.36	726.31	0.05	0.05	0.00	0.08	633.82	0.11	151.31
Main Before D	139478	Q50	727.63	727.56	0.07	0.05	0.00	5.09	1107.93	6.98	200.34
Main Before D	139478	Q100	728.12	728.04	0.08	0.05	0.00	10.40	1351.33	14.27	219.14
Main Before D	139478	Q500	729.30	729.19	0.11	0.05	0.00	34.21	2014.87	47.92	268.12
Main Before D	139355	Q10	726.31	726.25	0.05	0.03	0.01		516.12	117.88	227.85
Main Before D	139355	Q50	727.58	727.50	0.07	0.04	0.01	0.44	830.54	289.03	267.31
Main Before D	139355	Q100	728.07	727.98	0.09	0.04	0.02	2.07	991.55	382.38	286.05
Main Before D	139355	Q500	729.24	729.13	0.11	0.05	0.02	14.85	1420.89	661.27	328.82
Main Before D	139297	Q10	726.27	726.24	0.02	0.01	0.00		481.34	152.66	381.81
Main Before D	139297	Q50	727.53	727.50	0.03	0.02	0.01	2.99	757.36	359.64	448.15
Main Before D	139297	Q100	728.01	727.97	0.03	0.02	0.01	8.59	899.42	467.99	476.97
Main Before D	139297	Q500	729.17	729.13	0.04	0.03	0.02	37.96	1273.43	785.61	593.44
Main Before D	139274	Q10	726.25	726.21	0.04	0.00	0.00	0.00	634.00		83.21
Main Before D	139274	Q50	727.50	727.39	0.11	0.00	0.00	0.02	1119.98		194.88
Main Before D	139274	Q100	727.97	727.83	0.15	0.00	0.00	0.04	1375.96		243.86
Main Before D	139274	Q500	729.12	728.84	0.28	0.00	0.00	0.13	2096.87		430.92
Main Before D	139250		Bridge								
Main Before D	139199	Q10	726.22	726.15	0.07	0.06	0.02		634.00		43.83
Main Before D	139199	Q50	727.42	727.27	0.16	0.10	0.05	0.00	1120.00		232.05
Main Before D	139199	Q100	727.87	727.66	0.22	0.12	0.08	0.00	1376.00		293.46
Main Before D	139199	Q500	728.95	728.53	0.41	0.18	0.15	0.03	2096.97		437.67
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.09	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.64	13.05	367.20
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.48	56.15	440.39
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.19	242.28	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.39	0.61	180.02
Main Before D	137750	Q100	724.65	724.52	0.12	1.80	0.02		1409.39	2.61	192.61
Main Before D	137750	Q500	725.48	725.30	0.17	1.84	0.03	2.15	2132.12	15.73	232.18

HEC-RAS Plan: G#4Prop River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09



Errors Warnings and Notes for Plan : G#4Prop (Continued)

Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139297 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q50
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q100
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q500
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The

Errors Warnings and Notes for Plan : G#4Prop (Continued)

	momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q50 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q100 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Upstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q500 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q100
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q500
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

Errors Warnings and Notes for Plan : G#4Prop (Continued)

	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q50
Warning:	Divided flow computed for this cross-section.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q100
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q500
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q50
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q100
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q500
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

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X   X  XXXXXX   XXXX       XXXX   XX   XXXX
X   X  X       X   X       X  X   X  X   X
X   X  X       X           X  X   X  X   X
XXXXXXXX XXXX   X           XXX XXXX XXXXXX XXXX
X   X  X       X           X  X   X  X       X
X   X  X       X   X       X  X   X  X   X
X   X  XXXXXX   XXXX       X   X   X   X XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 9/2/2014 2:23:06 PM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#4-Permit Prop  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p10

Geometry Title: Group #4- Permit Proposed MnSt  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g10

Flow Title : 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Description:

Permit model with Route 47 culvert replaced with 3-sided arch culvert, Main St replaced with proposed geometry from EXP.

Plan Summary Information:

Number of:	Cross Sections =	14	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	30
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary  
 Conveyance Calculation Method: At breaks in n values only  
 Friction Slope Method: Program Selects Appropriate method  
 Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS  
 Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	140600	638	1128	1384	2108
Blackberry Creek	Main Before D	140504	635	1123	1379	2100
Blackberry Creek	Main Before D	139750	634	1120	1376	2097
Blackberry Creek	Main Before D	139158	640	1132	1389	2117
Blackberry Creek	Main Before D	137750	651	1150	1412	2150
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
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Blackberry CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #3  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 2.2 1 2.2 1 2.2 1 2.2 1

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 2.35 1 2.35 1 2.35 1 2.35 1

GEOMETRY DATA

Geometry Title: Group #4- Permit Proposed MnSt  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g10

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.

Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 736 34.7 734 94.3 732 129.3 730 157 728		
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5		
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2		
671 732 763.7 732.8 825.4 734 914.1 736		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .09 277.6 .055 358.9 .09		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
277.6 358.9	1000 950 750	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25		
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54		
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88		



80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-186.58 .11 -158.42 .05 -122.47 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139750

INPUT  
Description: USGS IL 2001. Approach Rt47-8  
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-62	732	55	730	128	728	164.67	726.28	187.22	722.26
188.68	719.95	194.07	719.27	197.43	719.21	202.31	719.2	205.58	719.81
207.55	723.34	231.42	723.88	389	725.14	436.2	726.72	590.52	733.35

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-62 .11 164.67 .05 231.42 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
164.67 231.42 128 118 183 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139632

INPUT  
Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
bb\_Tinacii

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-381	736.1	-342	734.4	-317	732	-67.23	726.39	-29.69	725.76
-29.49	722	-18.89	721.2	-11.2	718.63	5.8	718.63	13.48	721.2
24.09	722	24.23	725.8	24.59	725.81	88.65	726.87	222.37	731.21
361.26	734.09								

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -29.69 .055 24.59 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-29.69 24.59 107 96 159 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-381 -29.69 733 F  
24.59 361.26 733 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139600

INPUT  
Description: Route 47 (IL USGS 2001), proposed Concrete Arch and increase in  
road profile.

Distance from Upstream XS = 18  
Deck/Roadway Width = 64  
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates  
num= 22  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-447.1 732.85 -395.1 732.69 -251.34 732.95  
-201.1 733.01 -101.1 733.8 -51.1 734.04  
-29.69 734.02 717.2 -29.68 734.01 720.78 -28.87 734.01 723.48  
-26.609 734 725.68 -24.929 734 726.5 -23.17 734 727.14  
-18.89 734 728.6 -13.04 734 729.43 -3 733.99 730.2  
7.64 733.99 729.43 13.13 733.99 728.53 17.77 733.99 727.14  
19.72 733.99 725.68 21.4 733.99 723.47 23.66 733.99 720.78  
346.13 735.61

Upstream Bridge Cross Section Data  
Station Elevation Data num= 16  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -29.69 725.76  
-29.49 722 -18.89 721.2 -11.2 718.63 5.8 718.63 13.48 721.2  
24.09 722 24.23 725.8 24.59 725.81 88.65 726.87 222.37 731.21  
361.26 734.09

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-381	.11	-29.69	.055	24.59	.11

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	-29.69	24.59	.3	.5	

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
-381	-29.69	733	F
24.59	361.26	733	F

Downstream Deck/Roadway Coordinates  
num= 23

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-534.52	733.38		-471.24	732.86	-371.24	732.53								
-271.24	732.8		-171.24	733.57	-71.24	734.68								
-49.87	734.87	717.07	-49.86	734.87	720.65	-49.05	734.88	723.35						
-46.789	734.9	725.55	-45.109	734.92	726.37	-43.35	734.94	727.01						
-39.93	734.98	728.47	-33.22	735.05	729.3	-22.88	735.15	730.07						
-12.54	735.29	729.3	-6.63	735.35	728.4	-2.41	735.4	727.01						
-4.46	735.43	725.55	1.22	735.45	723.34	3.48	735.47	720.65						
35.48	735.81		285.71	737.01										

Downstream Bridge Cross Section Data  
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-451	732	-333	730	-197.69	727.17	-123	727.85	-71.69	727.15
-49.48	726.07	-49.36	721.89	-38.76	721.09	-31.07	718.52	-14.07	718.52
-6.39	721.09	4.22	721.89	8.17	725.05	54.42	724.93	133.57	726.33
133.58	726.33	257.19	729.13	319.25	731.55				

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
-451	.13	-49.48	.055	8.17	.13

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	-49.48	8.17	.3	.5	

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
-451	-49.87	733	F
8.17	319.25	733	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data  
 Energy  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method  
 Energy Only

Additional Bridge Parameters  
 Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139536

INPUT  
 Description: USGS IL 2001. DSF of Rt47-8. 2 extend pts on LHS elevations from  
 bb\_tinascii

Station	Elevation	Data	num=	18					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-451	732	-333	730	-197.69	727.17	-123	727.85	-71.69	727.15
-49.48	726.07	-49.36	721.89	-38.76	721.09	-31.07	718.52	-14.07	718.52
-6.39	721.09	4.22	721.89	8.17	725.05	54.42	724.93	133.57	726.33
133.58	726.33	257.19	729.13	319.25	731.55				

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
-451	.13	-49.48	.055	8.17	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	-49.48	8.17	77	110	187	.3	.5	

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
-451	-49.87	733	F

8.17 319.25 733 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data		num= 17									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-306	734.1	0	730	47.71	728.07	82	726	119	724		
130	722	139.79	719.09	143.42	719.27	146.95	719.49	149.39	720.39		
152.54	723.2	186	724	221	726	271	728.2	302	730		
341	732.2	381	734.1								

Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-306	.13	82	.045	221	.13				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	82	221		50	71		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend

Station Elevation Data		num= 19									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	730	-22	728.2	0	726.89	8.24	721.09	14.83	718.19		
19.06	717.29	22.63	718.59	26.26	719.99	29.19	721.09	33.26	723.79		
64.26	724.49	115.26	723.79	165.26	724.39	218.26	725.79	270.26	728.09		
320.26	730.19	375.26	732.29	425.26	734.39	485.26	736.89				

Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-45	.13	0	.045	64.26	.13				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	64.26		30	38		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data		num= 30									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	737	9.38	735.83	56.18	733.24	93.68	730.58	112.76	729.88		
218.8	729.2	261.72	728.55	264.05	728.97	295.19	728.74	399.61	726.49		
405.99	725.35	411.07	723.12	415.3	719.08	419.12	719.06	421.88	718.76		
428.79	719.03	431.19	719.41	434.55	719.99	435.59	722.94	439.23	723.11		
492.85	723.5	609.69	724.01	699.57	724.87	783.83	726.26	815.24	728.52		
822.44	731.3	835.91	732.5	913.06	733.22	935	736.2	956	738.5		

Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.13	399.61	.045	492.85	.13				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	399.61	492.85		11	18		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139274

INPUT

Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.

Station Elevation Data		num= 33									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729		
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-39.76	727.23		
-39.66	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06		

-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	4.2	718
4.24	726.5	13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99
153.05	727.68	235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44
399	734.18	415.18	734.59	530.99	738.51				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -390 .13 -39.87 .055 4.24 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 -39.87 4.24 75 75 75 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -390 -39.93 733 F  
 4.08 530.99 733 F

BRIDGE

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139250

INPUT

Description: Main Street (IL USGS 2001)  
 Distance from Upstream XS = 2  
 Deck/Roadway Width = 72  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 16  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-445.77	739.81				-390.79	738.26				-378.64	737.95			
-340.19	737.02				-268.95	735.58				-213.37	734.7			
-212.94	734.69				-80.3	733.497				-38.96	733.3	730.3		
0	733.12	730.12			5.04	733.11	730.11			55.03	733.02			
109.06	733.12				237.68	734.16				367.33	736.34			
532.98	740.7													

Upstream Bridge Cross Section Data

Station Elevation Data num= 33  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-39.87	726.18	-39.76	727.23
-39.66	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	0	717.73	4.2	718
4.24	726.5	13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99
153.05	727.68	235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44
399	734.18	415.18	734.59	530.99	738.51				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -390 .13 -39.87 .055 4.24 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -39.87 4.24 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -390 -39.93 733 F  
 4.08 530.99 733 F

Downstream Deck/Roadway Coordinates

num= 12  

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-308.86	736.5				-165.48	734.5				-65.04	733.7			
-20.37	733.3				-20.37	733.3	730.3			1.93	733.2	730.2		
23.93	733.11	730.11			53	733				88.9	733.12			
218.32	734.16				367.76	736.34				511.92	740.3			

Downstream Bridge Cross Section Data

Station Elevation Data num= 26  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 -332.9 .13 -20.25 .055 23.99 .13

Bank Sta: Left Right Coeff Contr. Expan.  
 -20.25 23.99 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 -332.9 -20.37 730.9 F  
 23.93 475.96 730.9 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy  
 Momentum Cd = 2  
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow  
 Submerged Inlet Cd =  
 Submerged Inlet + Outlet Cd = .8  
 Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth  
 inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139199

INPUT

Description: USGS IL 2001. DSF Main Street.

Station Elevation Data num= 26									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-20.25	.055	23.99	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	-20.25	23.99		115	97	103	.3	.5
Ineffective Flow num= 2								
Sta L	Sta R	Elev	Permanent					
-332.9	-20.37	730.9	F					
23.93	475.96	730.9	F					

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139158

INPUT

Description: USGS IL 2001. Departure of Main Street

Station Elevation Data num= 22									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84
319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	265.13	.055	388.49	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	265.13	388.49		740	690	550	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01
558.72	723.73	574	722	578	720	582	718	586	716
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 487.45 .055 631.64 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 487.45 631.64 710 700 700 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT  
 Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730		
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726		
450.5	724.6	476.8	722.6	485	720	489	718	493	716		
497	715	501	716	505	718	509	720	527.1	722		
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1		
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9		
1083.7	739.7										

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 450.5 .055 624.8 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 450.5 624.8 760 930 720 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT  
 Description: IDNR 1985. B12885  
 Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99		
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79		
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49		
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39		
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99		
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09		
940	730.89	985	733.59								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .13 480 .055 630 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 480 630 9810 11021 10122 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139632	.11	.055	.11
Main Before D	139600	Bridge		
Main Before D	139536	.13	.055	.13
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139274	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139199	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	128	118	183
Main Before D	139632	107	96	159
Main Before D	139600	Bridge		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	11	18	205
Main Before D	139274	75	75	75
Main Before D	139250	Bridge		
Main Before D	139199	115	97	103
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139632	.3	.5
Main Before D	139600	Bridge	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139274	.3	.5
Main Before D	139250	Bridge	
Main Before D	139199	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3

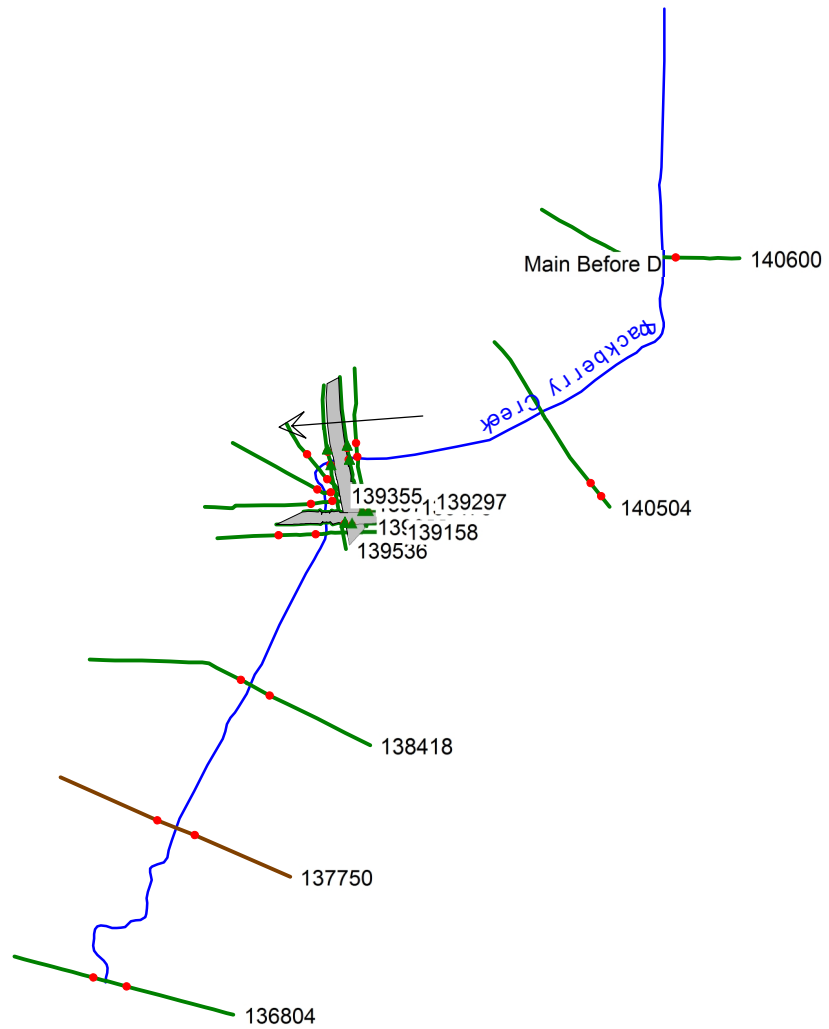
## HEC-RAS Model

# **GROUP #4-PERMIT PROPOSED CONDITION**

## **Proposed Rte 47 Bridge, Proposed Main St**

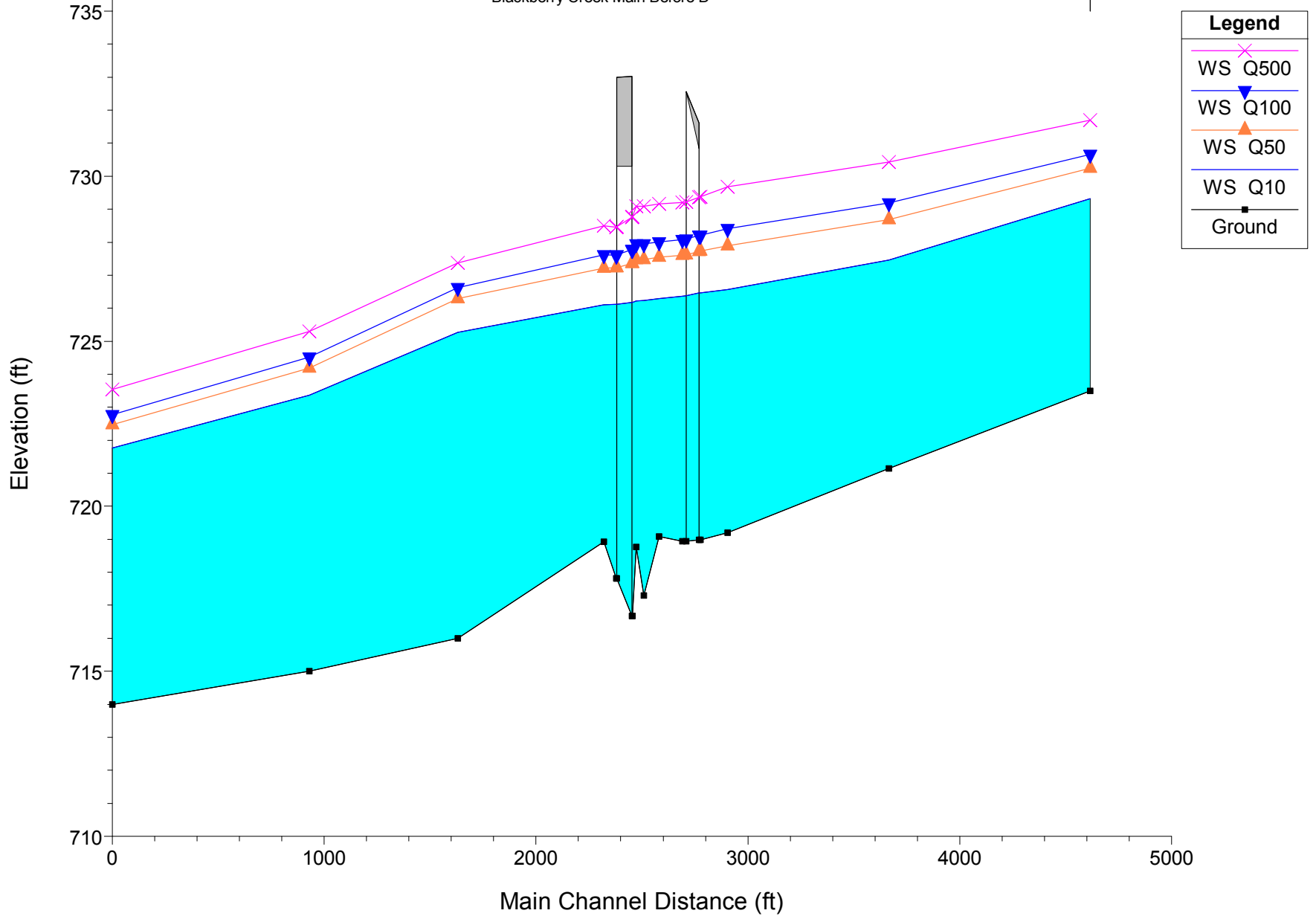
The structures modeled are the Proposed Main St Bridge and Rte 47 Bridge Alternate





1 of the 14 XS's are not Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

Blackberry Creek Main Before D



HEC-RAS Plan: G#4-Prop BR River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Main Before D	140600	Q10	638.00	723.50	729.32		729.38	0.002040	2.20	443.40	313.75	0.25
Main Before D	140600	Q50	1128.00	723.50	730.25		730.30	0.001601	2.41	767.46	391.58	0.23
Main Before D	140600	Q100	1384.00	723.50	730.66		730.72	0.001461	2.49	939.58	434.53	0.22
Main Before D	140600	Q500	2108.00	723.50	731.70		731.76	0.001175	2.61	1445.87	543.99	0.21
Main Before D	140504	Q10	635.00	721.14	727.45		727.57	0.001847	3.13	377.25	202.16	0.27
Main Before D	140504	Q50	1123.00	721.14	728.69		728.81	0.001678	3.53	658.16	248.53	0.27
Main Before D	140504	Q100	1379.00	721.14	729.20		729.33	0.001631	3.70	787.89	260.45	0.27
Main Before D	140504	Q500	2100.00	721.14	730.43		730.57	0.001539	4.07	1126.26	289.23	0.27
Main Before D	139750	Q10	634.00	719.20	726.56		726.60	0.000618	1.77	614.72	272.69	0.16
Main Before D	139750	Q50	1120.00	719.20	727.89		727.93	0.000555	2.04	1017.50	332.98	0.16
Main Before D	139750	Q100	1376.00	719.20	728.41		728.46	0.000559	2.18	1199.78	362.66	0.16
Main Before D	139750	Q500	2097.00	719.20	729.68		729.74	0.000555	2.48	1707.56	438.44	0.16
Main Before D	139620	Q10	634.00	718.98	726.46	721.85	726.52	0.000527	1.85	347.55	129.48	0.14
Main Before D	139620	Q50	1120.00	718.98	727.73	722.70	727.83	0.000799	2.62	443.64	241.81	0.18
Main Before D	139620	Q100	1376.00	718.98	728.22	723.10	728.35	0.000945	2.98	480.77	278.62	0.20
Main Before D	139620	Q500	2097.00	718.98	729.38	724.05	729.61	0.001304	3.88	569.25	366.32	0.24
Main Before D	139600		Bridge									
Main Before D	139536	Q10	634.00	718.94	726.37	721.81	726.42	0.000539	1.86	344.42	195.75	0.14
Main Before D	139536	Q50	1120.00	718.94	727.60	722.67	727.71	0.000830	2.65	438.30	362.90	0.18
Main Before D	139536	Q100	1376.00	718.94	728.08	723.03	728.22	0.000988	3.03	474.21	451.60	0.20
Main Before D	139536	Q500	2097.00	718.94	729.20	724.01	729.44	0.001380	3.96	560.00	554.04	0.24
Main Before D	139478	Q10	634.00	719.09	726.30		726.35	0.000844	1.78	357.94	150.68	0.20
Main Before D	139478	Q50	1120.00	719.09	727.54		727.61	0.000691	2.10	575.42	199.49	0.19
Main Before D	139478	Q100	1376.00	719.09	728.01		728.09	0.000695	2.27	674.40	218.12	0.19
Main Before D	139478	Q500	2097.00	719.09	729.15		729.26	0.000703	2.68	951.19	266.55	0.20
Main Before D	139355	Q10	634.00	717.29	726.24		726.29	0.000678	2.07	527.53	227.43	0.18
Main Before D	139355	Q50	1120.00	717.29	727.48		727.56	0.000714	2.52	831.77	266.41	0.20
Main Before D	139355	Q100	1376.00	717.29	727.95		728.04	0.000760	2.76	961.70	284.98	0.21
Main Before D	139355	Q500	2097.00	717.29	729.09		729.21	0.000844	3.29	1309.93	327.38	0.22
Main Before D	139297	Q10	634.00	718.76	726.23		726.25	0.000329	1.40	848.96	380.66	0.13
Main Before D	139297	Q50	1120.00	718.76	727.47		727.50	0.000315	1.65	1361.03	446.76	0.13
Main Before D	139297	Q100	1376.00	718.76	727.95		727.98	0.000328	1.79	1579.33	475.31	0.14
Main Before D	139297	Q500	2097.00	718.76	729.09		729.13	0.000347	2.09	2175.42	590.73	0.14
Main Before D	139274	Q10	634.00	716.67	726.18	719.49	726.23	0.000363	1.77	359.03	74.86	0.11
Main Before D	139274	Q50	1120.00	716.67	727.36	720.42	727.47	0.000765	2.73	410.32	190.07	0.16
Main Before D	139274	Q100	1376.00	716.67	727.78	720.84	727.94	0.000999	3.21	429.40	235.52	0.18
Main Before D	139274	Q500	2097.00	716.67	728.77	721.92	729.08	0.001681	4.44	473.80	420.59	0.24
Main Before D	139250		Bridge									
Main Before D	139199	Q10	634.00	717.81	726.12	721.02	726.19	0.000651	2.11	300.75	43.82	0.14
Main Before D	139199	Q50	1120.00	717.81	727.23	721.91	727.39	0.001278	3.21	349.34	227.19	0.20
Main Before D	139199	Q100	1376.00	717.81	727.61	722.32	727.83	0.001662	3.76	366.28	285.54	0.23
Main Before D	139199	Q500	2097.00	717.81	728.46	723.36	728.88	0.002796	5.19	403.95	428.51	0.30
Main Before D	139158	Q10	640.00	718.93	726.10		726.13	0.000668	1.52	493.55	202.78	0.15
Main Before D	139158	Q50	1132.00	718.93	727.22		727.27	0.000729	1.93	731.96	230.17	0.16
Main Before D	139158	Q100	1389.00	718.93	727.61		727.68	0.000807	2.15	826.57	251.31	0.17
Main Before D	139158	Q500	2117.00	718.93	728.50		728.61	0.001042	2.74	1077.78	338.48	0.20
Main Before D	138418	Q10	640.00	716.00	725.26		725.37	0.003131	2.62	243.82	102.87	0.30
Main Before D	138418	Q50	1132.00	716.00	726.30		726.43	0.003484	2.99	426.04	367.20	0.32
Main Before D	138418	Q100	1389.00	716.00	726.63		726.78	0.003380	3.16	563.95	440.39	0.33
Main Before D	138418	Q500	2117.00	716.00	727.37		727.54	0.003098	3.51	912.44	500.18	0.32
Main Before D	137750	Q10	651.00	715.00	723.37		723.44	0.002354	2.10	309.97	150.13	0.26
Main Before D	137750	Q50	1150.00	715.00	724.18		724.29	0.002630	2.60	444.33	180.04	0.28
Main Before D	137750	Q100	1412.00	715.00	724.52		724.65	0.002700	2.82	508.30	192.60	0.29
Main Before D	137750	Q500	2150.00	715.00	725.30		725.48	0.002795	3.35	673.51	232.14	0.31
Main Before D	136804	Q10	655.00	713.99	721.76	720.31	721.79	0.001257	1.56	675.00	466.75	0.19
Main Before D	136804	Q50	1156.00	713.99	722.47	720.81	722.51	0.001280	1.90	1020.02	503.32	0.20
Main Before D	136804	Q100	1419.00	713.99	722.78	720.95	722.83	0.001294	2.05	1178.30	517.68	0.20
Main Before D	136804	Q500	2161.00	713.99	723.54	721.27	723.60	0.001312	2.39	1584.74	550.09	0.21

HEC-RAS Plan: G#4-Prop BR River: Blackberry Creek Reach: Main Before D

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	140600	Q10	729.38	729.32	0.06	1.80	0.01	155.58	445.55	36.87	313.75
Main Before D	140600	Q50	730.30	730.25	0.06	1.49	0.01	331.66	668.63	127.71	391.58
Main Before D	140600	Q100	730.72	730.66	0.06	1.39	0.01	421.22	773.88	188.90	434.53
Main Before D	140600	Q500	731.76	731.70	0.06	1.18	0.01	664.02	1034.41	409.57	543.99
Main Before D	140504	Q10	727.57	727.45	0.12	0.94	0.02	0.00	474.64	160.36	202.16
Main Before D	140504	Q50	728.81	728.69	0.12	0.86	0.02	0.31	693.35	429.35	248.53
Main Before D	140504	Q100	729.33	729.20	0.13	0.84	0.02	0.74	793.39	584.87	260.45
Main Before D	140504	Q500	730.57	730.43	0.14	0.81	0.03	2.86	1053.61	1043.53	289.23
Main Before D	139750	Q10	726.60	726.56	0.04	0.08	0.00	0.08	460.74	173.19	272.69
Main Before D	139750	Q50	727.93	727.89	0.04	0.09	0.01	7.57	711.18	401.25	332.98
Main Before D	139750	Q100	728.46	728.41	0.05	0.10	0.01	15.49	836.84	523.68	362.66
Main Before D	139750	Q500	729.74	729.68	0.06	0.11	0.02	59.66	1161.17	876.17	438.44
Main Before D	139620	Q10	726.52	726.46	0.05			0.33	633.31	0.36	129.48
Main Before D	139620	Q50	727.83	727.73	0.11			5.13	1109.64	5.23	241.81
Main Before D	139620	Q100	728.35	728.22	0.14			8.67	1358.55	8.79	278.62
Main Before D	139620	Q500	729.61	729.38	0.23			21.20	2054.41	21.39	366.32
Main Before D	139600		Bridge								
Main Before D	139536	Q10	726.42	726.37	0.05	0.07	0.00	0.10	633.41	0.49	195.75
Main Before D	139536	Q50	727.71	727.60	0.11	0.08	0.02	3.61	1111.42	4.96	362.90
Main Before D	139536	Q100	728.22	728.08	0.14	0.09	0.03	6.36	1361.52	8.12	451.60
Main Before D	139536	Q500	729.44	729.20	0.24	0.12	0.07	16.42	2061.42	19.16	554.04
Main Before D	139478	Q10	726.35	726.30	0.05	0.05	0.00	0.07	633.84	0.09	150.68
Main Before D	139478	Q50	727.61	727.54	0.07	0.05	0.00	4.95	1108.26	6.79	199.49
Main Before D	139478	Q100	728.09	728.01	0.08	0.05	0.00	10.15	1351.91	13.94	218.12
Main Before D	139478	Q500	729.26	729.15	0.11	0.06	0.00	33.49	2016.47	47.04	266.55
Main Before D	139355	Q10	726.29	726.24	0.05	0.03	0.01		516.92	117.08	227.43
Main Before D	139355	Q50	727.56	727.48	0.07	0.04	0.01	0.40	831.73	287.87	266.41
Main Before D	139355	Q100	728.04	727.95	0.09	0.04	0.02	1.96	993.12	380.93	284.98
Main Before D	139355	Q500	729.21	729.09	0.12	0.05	0.02	14.35	1423.70	658.95	327.38
Main Before D	139297	Q10	726.25	726.23	0.02	0.01	0.00		482.16	151.84	380.66
Main Before D	139297	Q50	727.50	727.47	0.03	0.02	0.01	2.84	758.68	358.48	446.76
Main Before D	139297	Q100	727.98	727.95	0.03	0.03	0.01	8.26	901.09	466.65	475.31
Main Before D	139297	Q500	729.13	729.09	0.04	0.03	0.03	36.37	1276.85	783.79	590.73
Main Before D	139274	Q10	726.23	726.18	0.05	0.00	0.00		634.00		74.86
Main Before D	139274	Q50	727.47	727.36	0.12	0.00	0.00		1120.00	0.00	190.07
Main Before D	139274	Q100	727.94	727.78	0.16	0.00	0.00		1375.95	0.05	235.52
Main Before D	139274	Q500	729.08	728.77	0.31	0.00	0.00		2096.30	0.70	420.59
Main Before D	139250		Bridge								
Main Before D	139199	Q10	726.19	726.12	0.07	0.04	0.02		634.00		43.82
Main Before D	139199	Q50	727.39	727.23	0.16	0.06	0.05	0.00	1120.00		227.19
Main Before D	139199	Q100	727.83	727.61	0.22	0.07	0.08	0.00	1376.00		285.54
Main Before D	139199	Q500	728.88	728.46	0.42	0.11	0.16	0.02	2096.98		428.51
Main Before D	139158	Q10	726.13	726.10	0.03	0.76	0.01	22.21	610.84	6.95	202.78
Main Before D	139158	Q50	727.27	727.22	0.05	0.83	0.01	69.09	1043.19	19.72	230.17
Main Before D	139158	Q100	727.68	727.61	0.07	0.90	0.01	94.77	1266.64	27.59	251.31
Main Before D	139158	Q500	728.61	728.50	0.11	1.06	0.01	132.03	1912.97	72.01	338.48
Main Before D	138418	Q10	725.37	725.26	0.11	1.92	0.01		640.00		102.87
Main Before D	138418	Q50	726.43	726.30	0.14	2.14	0.01	0.31	1118.64	13.05	367.20
Main Before D	138418	Q100	726.78	726.63	0.15	2.13	0.01	2.37	1330.48	56.15	440.39
Main Before D	138418	Q500	727.54	727.37	0.17	2.06	0.00	18.54	1856.19	242.28	500.18
Main Before D	137750	Q10	723.44	723.37	0.07	1.64	0.01		651.00		150.13
Main Before D	137750	Q50	724.29	724.18	0.11	1.76	0.02		1149.39	0.61	180.04
Main Before D	137750	Q100	724.65	724.52	0.12	1.80	0.02		1409.39	2.61	192.60
Main Before D	137750	Q500	725.48	725.30	0.17	1.84	0.03	2.15	2132.15	15.71	232.14
Main Before D	136804	Q10	721.79	721.76	0.03			64.94	500.00	90.05	466.75

HEC-RAS Plan: G#4-Prop BR River: Blackberry Creek Reach: Main Before D (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Main Before D	136804	Q50	722.51	722.47	0.04			150.77	813.64	191.59	503.32
Main Before D	136804	Q100	722.83	722.78	0.05			198.71	971.98	248.31	517.68
Main Before D	136804	Q500	723.60	723.54	0.06			340.65	1402.14	418.21	550.09

Errors Warnings and Notes for Plan : G#4-Prop BR

Location:	River: Blackberry Creek Reach: Main Before D RS: 140600 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 140504 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139620 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139536 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139355 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139274 Profile: Q10
Warning:	Divided flow computed for this cross-section.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139250 Profile: Q10 Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139199 Profile: Q10
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Location:	River: Blackberry Creek Reach: Main Before D RS: 139158 Profile: Q10
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 138418 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Location:	River: Blackberry Creek Reach: Main Before D RS: 137750 Profile: Q10
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps of Engineers  
 Hydrologic Engineering Center  
 609 Second Street  
 Davis, California

```

X   X   XXXXXX   XXXX       XXXX   XX   XXXX
X   X   X       X   X       X   X   X   X   X
X   X   X       X           X   X   X   X   X
XXXXXXXX XXXX   X           XXX XXXX   XXXXXX   XXXX
X   X   X       X           X   X   X   X   X
X   X   X       X   X       X   X   X   X   X
X   X   XXXXXX   XXXX       X   X   X   X   XXXXX
  
```

PROJECT DATA

Project Title: IL-47 and Main Permit Model  
 Project File : IL47MNPermit.prj  
 Run Date and Time: 11/21/2013 8:58:50 AM

Project in English units

Project Description:

Blackberry Creek model with interpolation updated to 2004 DEM.

PLAN DATA

Plan Title: Group#4-Permit Proposed BR  
 Plan File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.p09

Geometry Title: Group #4- Permit ProposedBR

Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.g09

Flow Title : 2005Flows for trimmed FIS

Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Plan Description:

Proposed Main Street Bridge, with Route 47 Culvert replaced with proposed open abutment Bridge.

Plan Summary Information:

Number of:	Cross Sections =	14	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	30
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 2005Flows for trimmed FIS

Flow File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPermit.f03

Flow Data (cfs)

River	Reach	RS	Q10	Q50	Q100	Q500
Blackberry Creek	Main Before D	140600	638	1128	1384	2108
Blackberry Creek	Main Before D	140504	635	1123	1379	2100
Blackberry Creek	Main Before D	139750	634	1120	1376	2097
Blackberry Creek	Main Before D	139158	640	1132	1389	2117
Blackberry Creek	Main Before D	137750	651	1150	1412	2150
Blackberry Creek	Main Before D	136804	655	1156	1419	2161

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
-------	-------	---------	----------	------------

Blackberry CreekMain Before D	Q10	Known WS = 729.32	Known WS = 721.76
Blackberry CreekMain Before D	Q50	Known WS = 730.33	Known WS = 722.47
Blackberry CreekMain Before D	Q100	Known WS = 730.77	Known WS = 722.78
Blackberry CreekMain Before D	Q500	Known WS = 731.92	Known WS = 723.54

Inline Structure Gate Openings

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = Podolski RS = 9000  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 1 1 1 1 1 1 1 1 1

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Blackberry Creek  
 Reach = ER\_North RS = 63593  
 Gate = Gate #3  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 .5 3 .5 3 .5 3 .5 3

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #2  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 2.2 1 2.2 1 2.2 1 2.2 1

River = Chain\_of\_Lakes  
 Reach = 1 RS = 11108.  
 Gate = Gate #1  
 # Open Open Ht # Open Open Ht # Open Open Ht  
 2.35 1 2.35 1 2.35 1 2.35 1

GEOMETRY DATA

Geometry Title: Group #4- Permit ProposedBR  
 Geometry File : p:\projects\09020\200\C\IL47\Data\Drainage\Kane County HEC-RAS\PermitHEC-RASmodels\IL47MNPPermit.g09

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140600

INPUT

Description: Interpolated cross section for mapping purpose. The channel is copied from CS 140504 and adjusted for bed elevation linearly between the 143160 and 140504. The floodplain elevations are read off the 2-foot contour.

Updated with floodplain data from the 2004 TIN but previously channel data was maintained by BW 1-27-05

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 736 34.7 734 94.3 732 129.3 730 157 728		
277.6 727.9 319.7 727.1 325.5 725.7 330.8 723.6 337 723.5		
340.2 726.9 358.9 728 425.8 728.9 495.6 730 598.3 731.2		
671 732 763.7 732.8 825.4 734 914.1 736		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .09 277.6 .055 358.9 .09		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
277.6 358.9	1000 950 750	.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 140504

INPUT

Description: Smith Engrg 2001. MAIN-N-XS

Station Elevation Data	num=	19
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
-186.58 738.19 -179.19 734.75 -162.13 730.81 -158.42 727.39 -145.96 724.25		
-145.33 722.69 -139.49 721.34 -134.16 721.17 -128.02 721.14 -124.82 722.54		
-122.47 725.97 -97.85 725.68 -60.35 725.83 0 725.95 19.51 726.88		



80.96 728.34 138.26 730.91 192.26 731.35 242.79 732.36

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-186.58 .11 -158.42 .05 -122.47 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-158.42 -122.47 832 760 780 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139750

INPUT

Description: USGS IL 2001. Approach Rt47-8

Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-62 732 55 730 128 728 164.67 726.28 187.22 722.26  
188.68 719.95 194.07 719.27 197.43 719.21 202.31 719.2 205.58 719.81  
207.55 723.34 231.42 723.88 389 725.14 436.2 726.72 590.52 733.35

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-62 .11 164.67 .05 231.42 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
164.67 231.42 140 128 195 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139620

INPUT

Description: USGS IL 2001. USF of Rt47-8. 3 extend pts on LHS, elevation from  
bb\_Tinacii

Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -34.97 726.08  
-25.23 721.16 -18.63 721.09 -10.6 718.98 4.91 718.98 12.61 721.09  
19.2 721.16 28.97 726.05 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -34.97 .055 28.97 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-34.97 28.97 95 86 147 .3 .5

Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-381 -41 733.65 F  
35 361.26 733.65 F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139600

INPUT

Description: Route 47 (IL), proposed open abutment bridge and increase in road  
profile.

Distance from Upstream XS = 7  
Deck/Roadway Width = 62  
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 11  
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
-300 734 -250 733.19 -162.82 733.34  
-67.02 734.33 -41 734.86 730 -22.94 735.09 730.3  
17.16 735.46 730.6 35 735.65 730.83 75.46 736.09  
225 736.75 360.24 737.36

Upstream Bridge Cross Section Data num= 15  
Station Elevation Data num= 15  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-381 736.1 -342 734.4 -317 732 -67.23 726.39 -34.97 726.08  
-25.23 721.16 -18.63 721.09 -10.6 718.98 4.91 718.98 12.61 721.09  
19.2 721.16 28.97 726.05 88.65 726.87 222.37 731.21 361.26 734.09

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-381 .11 -34.97 .055 28.97 .11

Bank Sta: Left Right Coeff Contr. Expan.  
-34.97 28.97 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-381	-41	733.65	F
35	361.26	733.65	F

Downstream Deck/Roadway Coordinates

num=	Sta Hi	Cord	Lo Cord	Sta Hi	Cord	Lo Cord	Sta Hi	Cord	Lo Cord
10	-350	734		-300	733		-188.23	733.2	
	-85.67	735.54		-60.98	735.72	731.72	-41.76	736.13	732.18
	15.02	736.59	732.56	127.79	738.57		302.06	739.363	
	350	740.27							

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
			18								
-451	732	-333		730	-197.69	727.17	-123	727.85	-71.69	727.15	
-54.84	725.97	-45.25		721.09	-38.67	721.04	-30.62	718.94	-15.12	718.94	
-7.42	721.04	-.85		721.09	8.92	725.95	54.42	724.93	133.57	726.33	
133.58	726.33	257.19		729.13	319.25	731.55					

Manning's n Values

num=	Sta	n Val	Sta	n Val	Sta	n Val
3	-451	.13	-54.84	.055	8.92	.13

Bank Sta: Left Right Coeff Contr. Expan.

-54.84	8.92	.3	.5
--------	------	----	----

Ineffective Flow num=

num=	Sta L	Sta R	Elev	Permanent
2	-451	-60.98	733.65	F
	15.02	319.25	733.65	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Maximum allowable submergence for weir flow = .95  
 Elevation at which weir flow begins =  
 Energy head used in spillway design =  
 Spillway height used in design =  
 Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data

Upstream	num=	Sta	Elev	Sta	Elev
	2	-41.1	730.1	-34.97	725
Downstream	num=	Sta	Elev	Sta	Elev
	2	-60.98	730.1	-54.84	725.97

Abutment Data

Upstream	num=	Sta	Elev	Sta	Elev
	2	28.97	726.05	35.05	730.1
Downstream	num=	Sta	Elev	Sta	Elev
	2	9.07	725	15.3	730.1

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy	
Momentum	Cd = 2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow	
Submerged Inlet Cd	=
Submerged Inlet + Outlet Cd	= .8
Max Low Cord	=

Additional Bridge Parameters

Add Friction component to Momentum  
 Do not add Weight component to Momentum  
 Class B flow critical depth computations use critical depth inside the bridge at the upstream end  
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 139536

INPUT

Description: USGS IL 2001. DSF of Rt47-8. 2 extend pts on LHS elevations from  
 bb\_tinascii

Station	Elevation	Data	num=	Sta	Elev	Sta	Elev	Sta	Elev	
			18							
-451	732	-333		730	-197.69	727.17	-123	727.85	-71.69	727.15
-54.84	725.97	-45.25		721.09	-38.67	721.04	-30.62	718.94	-15.12	718.94

-7.42 721.04 -.85 721.09 8.92 725.95 54.42 724.93 133.57 726.33  
133.58 726.33 257.19 729.13 319.25 731.55

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-451 .13 -54.84 .055 8.92 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
-54.84 8.92 77 110 187 .3 .5  
Ineffective Flow num= 2  
Sta L Sta R Elev Permanent  
-451 -60.98 733.65 F  
15.02 319.25 733.65 F

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139478

INPUT

Description: USGS IL 2001. Departure of Rt47-8; 1st survey pt elevation on LHS was replaced with bb\_tinascii elev, 1 extend pt on LHS, 3 added pts (not on ends). removed last 5 points placed previously (not from survey and not in GIS) and replaced them with 6 extend point elevations from bb\_tinascii

Station Elevation Data num= 17  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-306 734.1 0 730 47.71 728.07 82 726 119 724  
130 722 139.79 719.09 143.42 719.27 146.95 719.49 149.39 720.39  
152.54 723.2 186 724 221 726 271 728.2 302 730  
341 732.2 381 734.1

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-306 .13 82 .045 221 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
82 221 50 71 79 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139355

INPUT

Description: IDNR 1985. B13130, Reach length Not Including Main St. 2 extend pts on LHS elevation from bb\_tinascii

Station Elevation Data num= 19  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
-45 730 -22 728.2 0 726.89 8.24 721.09 14.83 718.19  
19.06 717.29 22.63 718.59 26.26 719.99 29.19 721.09 33.26 723.79  
64.26 724.49 115.26 723.79 165.26 724.39 218.26 725.79 270.26 728.09  
320.26 730.19 375.26 732.29 425.26 734.39 485.26 736.89

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
-45 .13 0 .045 64.26 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
0 64.26 30 38 166 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139297

INPUT

Description: USGS IL 2001. Approach Main Street; 2 extend pts added on RHS

Station Elevation Data num= 30  
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
0 737 9.38 735.83 56.18 733.24 93.68 730.58 112.76 729.88  
218.8 729.2 261.72 728.55 264.05 728.97 295.19 728.74 399.61 726.49  
405.99 725.35 411.07 723.12 415.3 719.08 419.12 719.06 421.88 718.76  
428.79 719.03 431.19 719.41 434.55 719.99 435.59 722.94 439.23 723.11  
492.85 723.5 609.69 724.01 699.57 724.87 783.83 726.26 815.24 728.52  
822.44 731.3 835.91 732.5 913.06 733.22 935 736.2 956 738.5

Manning's n Values num= 3  
Sta n Val Sta n Val Sta n Val  
0 .13 399.61 .045 492.85 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
399.61 492.85 11 18 225 .1 .3

CROSS SECTION

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139274

INPUT

Description: USGS IL 2001. USF of Main Street. 5 points from LHS added back in from survey; these are road pts.

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-42.87	726.18	-39.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	3	717.73	4.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-390	.13	-39.93	.055	4.08	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	-39.93	4.08		75	75	75		.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
-390	-39.93	733	F
5.04	530.99	733	F

BRIDGE

RIVER: Blackberry Creek  
REACH: Main Before D RS: 139250

INPUT

Description: Main Street (IL USGS 2001)

Distance from Upstream XS = 2  
Deck/Roadway Width = 72  
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 16														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-445.77	739.81		-390.79	738.26	-378.64	737.95								
-340.19	737.02		-268.95	735.58	-213.37	734.7								
-212.94	734.69		-80.3	733.497	-38.96	733.3	730.3							
0	733.12	730.12	5.04	733.11	730.11	55.03	733.02							
109.06	733.12		237.68	734.16	367.33	736.34								
532.98	740.7													

Upstream Bridge Cross Section Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-390	734.9	-378	734.4	-340	732.4	-270	730.4	-212	729
-74.53	727.78	-51.77	726.46	-48.39	726	-42.87	726.18	-39.93	727.23
-36.72	718.93	-32.86	718.23	-29.51	719.03	-26.64	718.3	-21.75	717.06
-16.78	716.67	-11.45	716.8	-5.91	716.94	3	717.73	4.08	727.56
13.18	725.45	18.68	725.9	58.97	726.62	90.61	726.99	153.05	727.68
235.29	728.78	353.86	732.39	374.96	733.94	392.25	734.44	399	734.18
415.18	734.59	530.99	738.51						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
-390	.13	-39.93	.055	4.08	.13

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	-39.93	4.08		.3	.5

Ineffective Flow num= 2			
Sta L	Sta R	Elev	Permanent
-390	-39.93	733	F
5.04	530.99	733	F

Downstream Deck/Roadway Coordinates num= 12														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
-308.86	736.5		-165.48	734.5	-65.04	733.7								
-20.37	733.3		-20.37	733.3	730.3	1.93	733.2	730.2						
23.93	733.11	730.11	53	733	88.9	733.12								
218.32	734.16		367.76	736.34	511.92	740.3								

Downstream Bridge Cross Section Data num= 26									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values num= 3					
---------------------------	--	--	--	--	--

Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-20.25	.055	23.99	.13

Bank Sta: Left	Right	Coeff	Contr.	Expan.
-20.25	23.99	.3		.5

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
-332.9	-20.37	730.9	F
23.93	475.96	730.9	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
Downstream Embankment side slope = 0 horiz. to 1.0 vertical  
Maximum allowable submergence for weir flow = .95  
Elevation at which weir flow begins =  
Energy head used in spillway design =  
Spillway height used in design =  
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy		
Momentum	Cd =	2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow		
Submerged Inlet Cd	=	
Submerged Inlet + Outlet Cd	=	.8
Max Low Cord	=	

Additional Bridge Parameters

Add Friction component to Momentum  
Do not add Weight component to Momentum  
Class B flow critical depth computations use critical depth  
inside the bridge at the upstream end  
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139199

INPUT

Description: USGS IL 2001. DSF Main Street.

Station Elevation Data	num=	26							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-332.9	733.91	-278.27	733.24	-215.95	730.89	-184.04	728.19	-20.39	726.75
-20.25	727.74	-18.72	720.47	-10.58	720.32	-9.74	719.11	-8.05	719.18
-7.21	720.34	-4.54	720.06	0	719.16	6.04	717.95	10.27	717.81
20.13	718.76	23.53	719.49	23.99	727.54	24.13	726.61	70.91	726.7
142.98	726.53	163.03	727.95	203.88	728.69	219.66	728.15	228.58	727.39
475.96	735.66								

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
-332.9	.13	-20.25	.055	23.99	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
-20.25	23.99	81	59	59	.3		.5

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
-332.9	-20.37	730.9	F
23.93	475.96	730.9	F

CROSS SECTION

RIVER: Blackberry Creek

REACH: Main Before D RS: 139158

INPUT

Description: USGS IL 2001. Departure of Main Street

Station Elevation Data	num=	22							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	735.77	99.86	731.62	124.22	728.63	195.07	728.14	207.18	726.09
213.4	723.77	225.05	725.16	265.13	724.96	283.4	723.89	297.02	721.24
299.85	719.15	302.84	719.02	305.57	719.24	310.13	718.93	315.62	719.84
319.11	723.31	331.28	723.07	388.49	723.98	418.69	726.97	468	728
520	730	591	732						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	265.13	.055	388.49	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
265.13	388.49	740	690	550	.1		.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 138418

INPUT

Description: Interpolated cross-section. Floodplain and channel were determined from TOPO map and manual interpolations, determined the bottom of the channel to be 716 ft above msl. Revised using 2004 TIN for floodplain data by Woodworth Jan 2005

Station Elevation Data num= 25									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	740.2	123.43	736.04	259.45	732.01	402.74	728.09	487.45	726.01
558.72	723.73	574	722	578	720	582	718	586	716
590	718	594	720	596.52	722.18	600.58	722.32	609.11	724.95
631.64	726.47	750.55	726	788.56	726	819.09	726	877.47	726
958.19	728.02	1081.13	732.01	1198.01	737.76	1242.37	741.61	1308.9	745.98

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	487.45	.055	631.64	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	487.45	631.64		710	700		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 137750

INPUT

Description: interpolated by DS in GIS; floodplain data from the 2004 TIN and the channel data was interpolated based on the surrounding xs by BW 2-18-05

Station Elevation Data num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	734.2	65.5	732.1	121.8	730.1	174.4	730	236.3	730
271.4	730	296.2	729.4	331.4	728	359.2	727.1	410.2	726
450.5	724.6	476.8	722.6	485	720	489	718	493	716
497	715	501	716	505	718	509	720	527.1	722
586.6	722.1	624.8	723.7	678.7	726	771.5	728.2	819.9	730.1
876.9	731.8	903.1	733.5	939.2	735.8	994.8	737	1038.3	737.9
1083.7	739.7								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	450.5	.055	624.8	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	450.5	624.8		760	930		.1	.3

CROSS SECTION

RIVER: Blackberry Creek  
 REACH: Main Before D RS: 136804

INPUT

Description: IDNR 1985. B12885

Station Elevation Data num= 32									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	730.49	6	730.59	30	730.59	41	729.19	91	727.99
125	727.29	190	726.59	235	725.69	282	724.09	330	721.79
380	720.69	430	720.49	480	720.19	522	719.79	568	719.49
571	717.79	571	716.49	575	714.29	578	713.99	579	714.39
580	715.99	582	717.89	589	720.09	630	721.09	680	719.99
725	720.29	770	720.89	812	722.19	840	723.29	880	726.09
940	730.89	985	733.59						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.13	480	.055	630	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	480	630		9810	11021		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Blackberry Creek

Reach	River Sta.	n1	n2	n3
Main Before D	140600	.09	.055	.09
Main Before D	140504	.11	.05	.11
Main Before D	139750	.11	.05	.11
Main Before D	139620	.11	.055	.11
Main Before D	139600	Bridge		

Main Before D	139536	.13	.055	.13
Main Before D	139478	.13	.045	.13
Main Before D	139355	.13	.045	.13
Main Before D	139297	.13	.045	.13
Main Before D	139274	.13	.055	.13
Main Before D	139250	Bridge		
Main Before D	139199	.13	.055	.13
Main Before D	139158	.13	.055	.13
Main Before D	138418	.13	.055	.13
Main Before D	137750	.13	.055	.13
Main Before D	136804	.13	.055	.13

SUMMARY OF REACH LENGTHS

River: Blackberry Creek

Reach	River Sta.	Left	Channel	Right
Main Before D	140600	1000	950	750
Main Before D	140504	832	760	780
Main Before D	139750	140	128	195
Main Before D	139620	95	86	147
Main Before D	139600	Bridge		
Main Before D	139536	77	110	187
Main Before D	139478	50	71	79
Main Before D	139355	30	38	166
Main Before D	139297	11	18	225
Main Before D	139274	75	75	75
Main Before D	139250	Bridge		
Main Before D	139199	81	59	59
Main Before D	139158	740	690	550
Main Before D	138418	710	700	700
Main Before D	137750	760	930	720
Main Before D	136804	9810	11021	10122

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Blackberry Creek

Reach	River Sta.	Contr.	Expan.
Main Before D	140600	.1	.3
Main Before D	140504	.1	.3
Main Before D	139750	.1	.3
Main Before D	139620	.3	.5
Main Before D	139600	Bridge	
Main Before D	139536	.3	.5
Main Before D	139478	.1	.3
Main Before D	139355	.1	.3
Main Before D	139297	.1	.3
Main Before D	139274	.3	.5
Main Before D	139250	Bridge	
Main Before D	139199	.3	.5
Main Before D	139158	.1	.3
Main Before D	138418	.1	.3
Main Before D	137750	.1	.3
Main Before D	136804	.1	.3