

## HYDROLOGY REPORT

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In accordance with the USGS StreamStats, the watershed at the U.S. 2 & S.R. 23 Bridge No. 2120 Canaan, Maine is 53 square miles, including 15.61% comprised of storage areas.

The flows for the project were determined using the USGS StreamStats website. The design discharges for the U.S. 2 & S.R. 23 Bridge over Carrabassett Stream are summarized below and miscellaneous Hydrology information is included in Appendix E. The average peak flows were used in the hydraulic model.

SUMMARY		
Drainage Area	53	mi <sup>2</sup>
Q1.1	515	ft <sup>3</sup> /s
Q10	100	ft <sup>3</sup> /s
Q25	2100	ft <sup>3</sup> /s
Q50	2410	ft <sup>3</sup> /s
Q100	2740	ft <sup>3</sup> /s
Q500	3520	ft <sup>3</sup> /s

Reported by: Chris Sichak  
Date: July 5, 2017

Note: All elevations based on North American Vertical Datum (NAVD) of 1988.

## HYDRAULIC REPORT

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The existing Bridge No. 2120 is 28 ft long between abutment bearings and is on a 0° skew. The bridge is 40 ft wide, and the approach roadway width is 30 ft. The hydraulic opening of the bridge is approximately 485 square feet. Carrabassett Stream enters the U.S. 2 & S.R. 23 Bridge from a slight skew upstream. The channel is aligned well with the bridge opening. The existing structure is a reinforced concrete rigid frame structure that is founded on bedrock.

Bridge 2120 is located within a FEMA Zone A approximate Study area as shown on the Flood Insurance Rate Map for the Town of Canaan, ME, effective September 27, 1985 (included in Appendix E). FEMA will allow up to 1.00 ft of increase in the 100-year water surface elevation without requiring a Conditional Letter of Map Revision.

The U.S. Army Corp of Engineers HEC-RAS Version 5.0.3 was used to model the hydraulics at the U.S. 2 & S.R. 23 Bridge. The existing conditions were modeled using MDOT's survey data of the channel, floodplain, and existing bridge and the flow data (average estimate) presented in the Hydrology section. Manning's  $n$  values were estimated based on photographs and channel bottom descriptions from the HEC-RAS Hydraulic Reference Manual Version 5.0, February 2016, Table 3-1 in conjunction with Jarretts Equation applicable to higher gradient streams. A main channel Manning's  $n$  of 0.085 was determined as the channel appears to be clean with no rifts or deep pools, and some sizable stones. The floodplain has thick woods with some undergrowth and a Manning's  $n$  of 0.1 was selected.

The survey information provided by MDOT includes 262 ft (+/-) of channel and floodplain along Carrabassett Stream. The slope of the channel is irregular, particularly downstream of the bridge, creating difficulty in the selection of a downstream boundary condition. For the existing and proposed conditions model, normal depth boundary conditions were selected. However, the extents of the model are such that the selected boundary condition has very little effect on the water surface elevation at the bridge.

The low chord elevation for the existing bridge is 231.34 ft and 232.41 ft at the upstream and downstream fascias of the bridge, respectively. The high chord for the existing bridge (elevation of the bridge deck) is 235.5 ft. The existing conditions analysis was performed primarily using a subcritical flow regime and slopes of 0.012 ft/ft and 0.02 ft/ft were used for the upstream and downstream normal depth boundary conditions in conformance with the actual stream slope. Energy was selected for both the low flow and high flow bridge modeling approach. The resulting water surface profiles show that all flows are conveyed through the existing bridge opening with 3.81 ft and 2.89 ft of freeboard over the 50-year and 100-year flood events, respectively.

According to information obtained at the public meeting, there is no history of the bridge having ever been overtopped or come into contact with the bridge superstructure at the project location. The existing conditions hydraulic model agrees with the local testimony.

The proposed replacement structure will be located along the same horizontal alignment as the existing structure. The vertical profile will be raised slightly through the site. The proposed structure will be 60 ft long, 40.25 ft wide, have a clear span of 58 ft, and a total hydraulic opening of approximately 670 square feet. The superstructure will consist of 36" deep NEXT Beams with an integral top flange/concrete deck and 3" asphalt wearing surface supported on reinforced concrete abutments.

The approximate low chord elevation for the proposed bridge is 230.79 ft and 231.32 ft at the west and east abutments, respectively. The proposed hydraulic model was analyzed using the same assumptions for Manning's n values, downstream boundary condition, flow regime, and bridge modeling approach as the existing hydraulic model.

The results from the proposed conditions model shows that the water surface elevations for all flow events are lower than existing conditions. The hydraulic analysis summary from the existing and proposed hydraulic models is shown on the following page.

## SUMMARY

		Existing Structure	Recommended Structure		
Total Area of Waterway Opening	ft <sup>2</sup>	485	670		
Headwater elevation @ Q <sub>1.1</sub>	ft	220.87	220.42		
Headwater elevation @ Q <sub>10</sub>	ft	225.24	223.25		
Headwater elevation @ Q <sub>25</sub>	ft	226.62	224		
Headwater elevation @ Q <sub>50</sub>	ft	227.53	224.55		
Headwater elevation @ Q <sub>100</sub>	ft	228.45	225.09		
Headwater elevation @ Q <sub>500</sub>	ft	230.84	226.16		
Freeboard @ Q <sub>50</sub>	ft	3.81	6.24		
Freeboard @ Q <sub>100</sub>	ft	2.89	5.7		
Outlet Velocity @ Q <sub>1.1</sub>	ft/s	4.6	5.38		
Outlet Velocity @ Q <sub>10</sub>	ft/s	6.03	8.38		
Outlet Velocity @ Q <sub>25</sub>	ft/s	6.13	9.05		
Outlet Velocity @ Q <sub>50</sub>	ft/s	6.26	9.5		
Outlet Velocity @ Q <sub>100</sub>	ft/s	6.40	9.95		
Outlet Velocity @ Q <sub>500</sub>	ft/s	6.52	11.07		

Reported by: Chris Sichak

Date: May 3, 2019

Note: All elevations based on North American Vertical Datum (NAVD) of 1988.

Headwater elevation and velocity information was taken from the upstream bounding bridge cross section (Section 1161) in the hydraulic models for the existing and proposed bridges. The maximum proposed freeboard for the design 50-year and check 100-year events indicates the difference of the water surface elevation and low chord elevation at the west abutment, which is the minimum low chord elevation of both bridges.

The hydraulic analysis summary shows that the proposed structure will lower headwater elevations upstream and immediately downstream of Bridge 2120. However, by the time the stream traverses over the downstream waterfall, the water surface elevations of the existing and proposed models are equivalent. Therefore, the downstream effects of the lower water surface elevations are expected to be minimal.

## SCOUR

There appears to be no evidence of significant scour or erosion at the site as the footings are noted to be founded on bedrock and the bridge appraisal scour rating (item 113) is 8 – “stable for scour conditions”.

The proposed bridge abutments will also be founded on bedrock. Scour protection will be placed around the proposed abutments and the existing footings will be retained to protect the stream bank as an added scour countermeasure.

JOINS 07

ZONE A

ZONE C

ZONE C

ROUTE 2

CARRABASSETT

STREAM

PITSEEN

APPROXIMATE SCALE

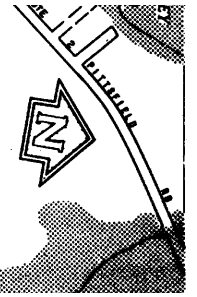
1000 0 1000 2000 3000 FEET

federal emergency management agency

**TOWN OF CANAAN, ME**  
**SOMERSET COUNTY**

EFFECTIVE DATE

**SEPTEMBER 27, 1985**



08

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

WIN:	21878.00
Town:	Canaan
Route No.	ME 23
Asset ID:	2120
Lat:	44.7622
	Long: -69.56122

Project Name:	Canaan - Canaan Bridge
Stream Name:	Carrabasset River
Bridge Name:	Canaan Bridge
Analysis by:	CSH
Date:	5/19/2017

## Peak Flow Calculations by USGS Regression Equations (Hodgkins, 1999 & Lombard/Hodgkins, 2015)

Enter data in blue cells only!

Enter data in [mi<sup>2</sup>]

A	km <sup>2</sup>	mi <sup>2</sup>	ac
W	137.27	53.00	33920.0
	21.43	8.3	5294.9

Watershed Area *DRNAREA*  
Wetlands area (by NWI)

P <sub>c</sub>	457999	4961693
County	Somerset S	
pptA	39.5	
SG	0.04	

watershed centroid (E, N; UTM 19N; meters)  
choose county from drop-down menu  
mean annual precipitation (inches; by look-up)  
sand & gravel aquifer as decimal fraction of watershed A

A (km <sup>2</sup> )	137.27
W (%)	15.61

Conf Lvl 0.67

NWI Wetlands % *STORNWI*

### References:

Hodgkins, G.A., 1999.  
Estimating the magnitude of peak flows for streams  
in Maine for selected recurrence intervals  
*WRI/R 99-4008*, USGS Augusta, ME

Ret Pd	Peak Flow Estimate
T (yr)	Lower Q <sub>T</sub> (m <sup>3</sup> /s) Upper

1.1	14.60	
2	26.84	
5	39.24	
10	48.06	
25	59.50	
50	68.24	
100	77.56	
500	99.81	

Q<sub>T</sub> (ft<sup>3</sup>/s)

515.4
947.9
1385.5
1696.9
2101.0
2409.5
2738.5
3524.3

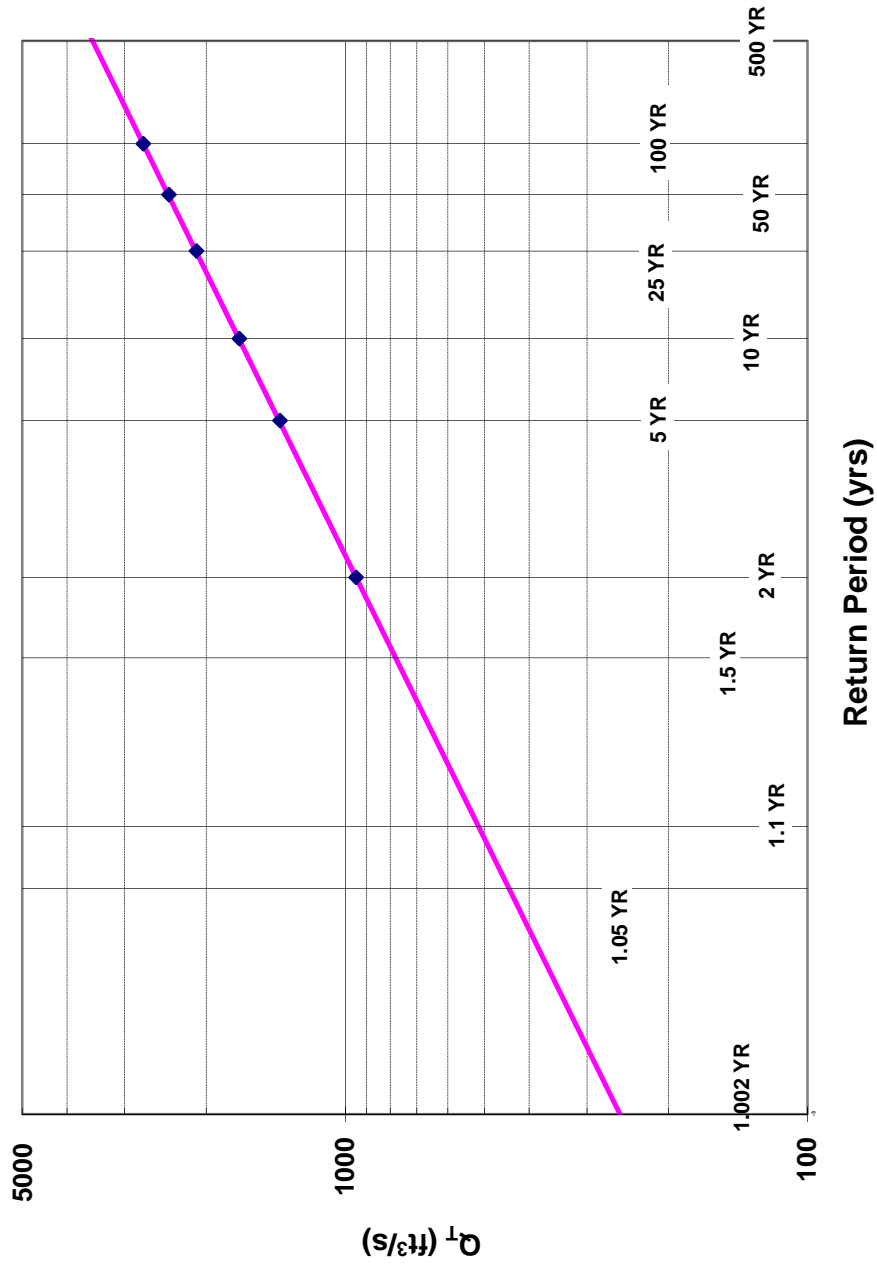
Lombard, P.J. & G.A. Hodgkins, 2015.

Peak flow regression equations for small, ungaged streams in  
Maine - Comparing map-based to field-based variables  
*SIR 2015-4059*, USGS, Augusta, ME

$$Q_T = b \times A^a \times 10^{-WW}$$

**Worksheet prepared by:**  
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Maine Dept. Transportation  
Augusta, ME 04333-0016  
207-557-1052  
[Charles.Hebson@maine.gov](mailto:Charles.Hebson@maine.gov)  
ver. 2016 Feb 05

# Log-Normal Probability Plot



WIN:	21878.00
Town:	Canaan
Route No.	ME 23
Asset ID:	2120
Lat:	44.76220
Long:	-69.56122

Project Name:	Canaan - Canaan Bridge
Stream Name:	Carabbasset River
Bridge Name:	Canaan Bridge
Analysis by:	CSH
Date:	5/19/2017

**DO NOT ENTER ANY DATA ON THIS PAGE; EVERYTHING IS CALCULATED**

# MAINE MONTHLY MEDIAN FLOWS and HYDRAULIC GEOMETRY BY USGS REGRESSION EQUATIONS (2004)

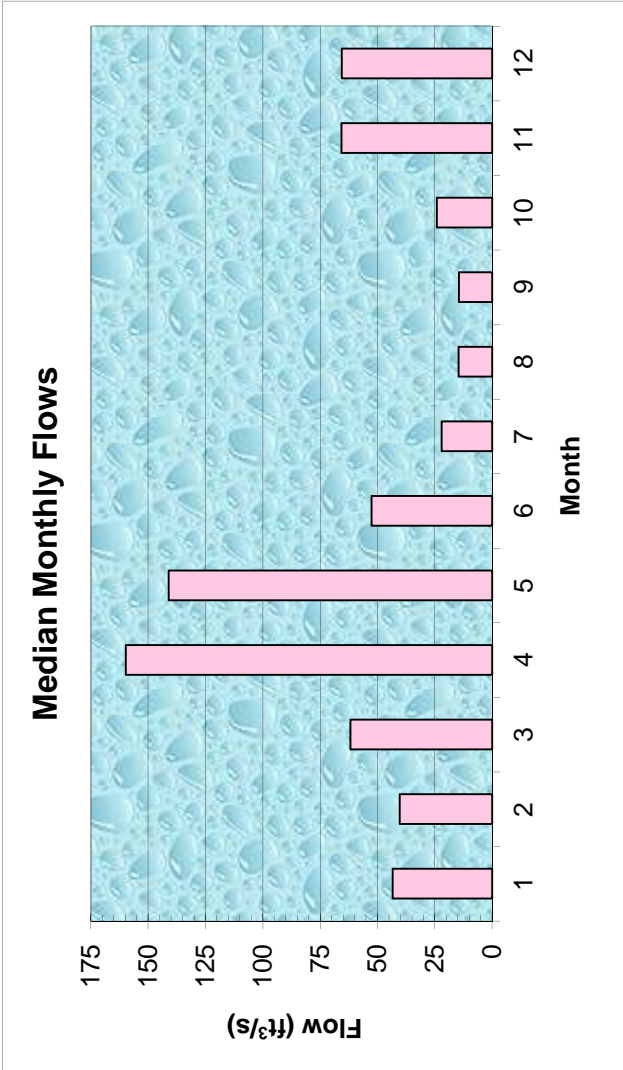
Value	Variable	Explanation
53.00	A	Area (mi <sup>2</sup> )
457998.7	P <sub>c</sub>	Watershed centroid (E,N; UTM; Zone 19; meters)
83.60	DIST	Distance from Coastal reference line (mi)
39.5	pptA	Mean Annual Precipitation (inches)
0.04	SG	Sand & Gravel Aquifer (decimal fraction of watershed area)

Month	Q <sub>median</sub> (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)
Jan	43.43	1.2308
Feb	40.33	1.1428
Mar	61.87	1.7534
Apr	159.79	4.5282
May	141.06	3.9975
Jun	52.60	1.4907
Jul	22.09	0.6260
Aug	14.64	0.4148
Sep	14.54	0.4120
Oct	24.18	0.6852
Nov	65.80	1.8648
Dec	65.67	1.8610

Q <sub>bf</sub>	335.5
ann avg	99.3
ann med	47.4
Q <sub>1,002</sub>	254.7
Q <sub>1,01</sub>	327.1
Q <sub>1,05</sub>	442.4
Q <sub>bf</sub>	554.0

assume v = 4ft/s

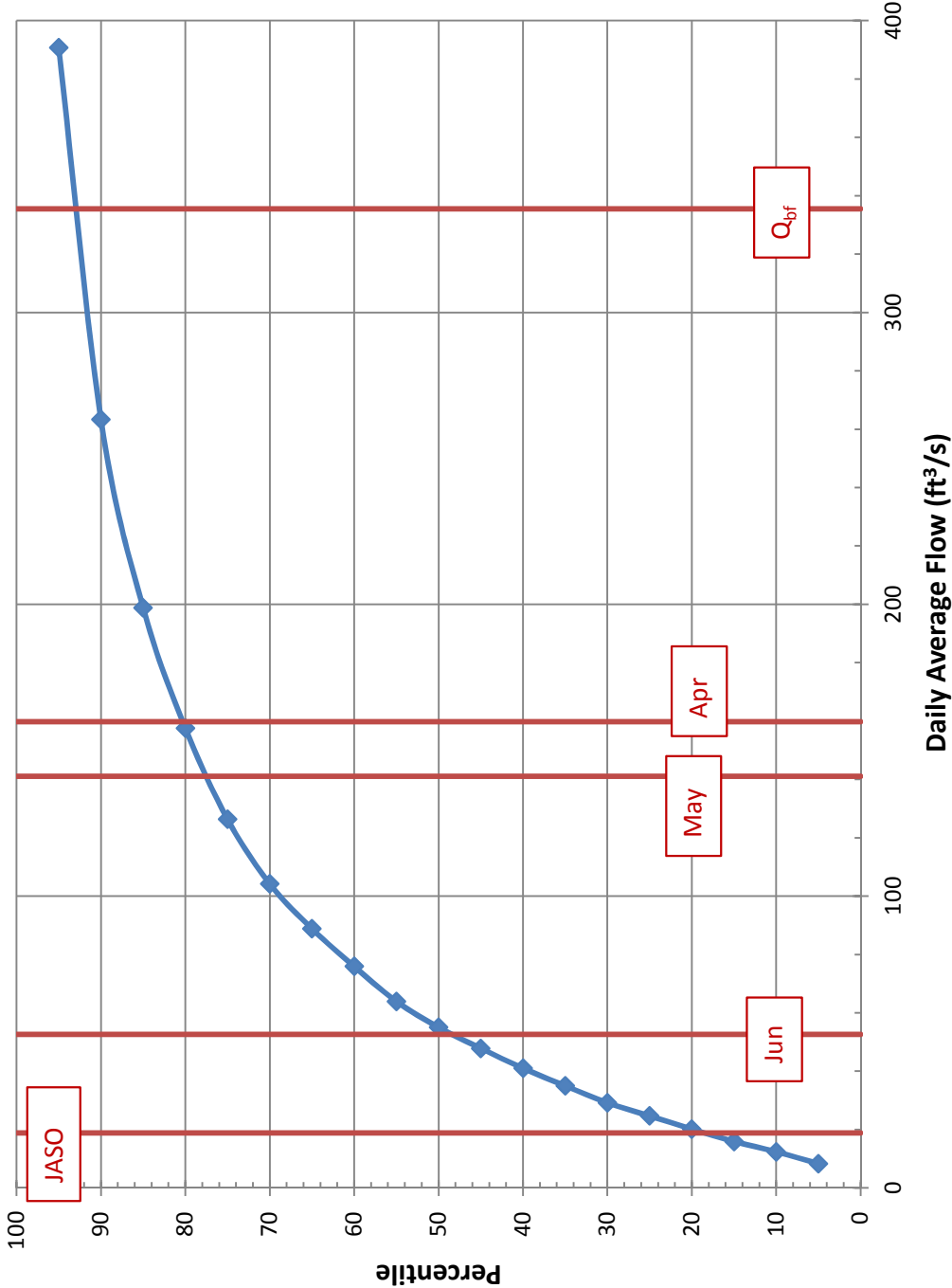
W <sub>bf</sub>	60.5	estimated bankfull width (ft)
d <sub>bf</sub>	2.3	estimated bankfull depth (ft)
A <sub>bf</sub>	138.3	estimated bankfull flow area (ft <sup>2</sup> )



## References

- Dudley, R.W., 2004. Hydraulic Geometry Relations ..., SIR 2004-5042
- Dudley, R.W., 2004. Estimating Monthly Streamflows ..., SIR 2004-5026

# Daily Average Flow Distribution



Daily Avg Flow Dist

A<sub>ws</sub> = (mi<sup>2</sup>)

53.0

Q (ft<sup>3</sup>/s)

Pctl	Median	84 <sup>th</sup> pctl
5	8.34	13.43
10	12.39	18.63
15	15.93	23.27
20	20.17	28.21
25	24.68	33.07
30	29.20	37.67
35	34.98	43.05
40	41.02	49.51
45	47.82	55.98
50	55.05	66.09
55	63.93	76.92
60	75.93	90.29
65	88.83	105.19
70	104.20	122.73
75	126.31	147.58
80	157.53	176.21
85	198.76	225.81
90	263.29	303.21
95	390.75	471.52

Q<sub>bf</sub>

335.5

Q<sub>1,002</sub>

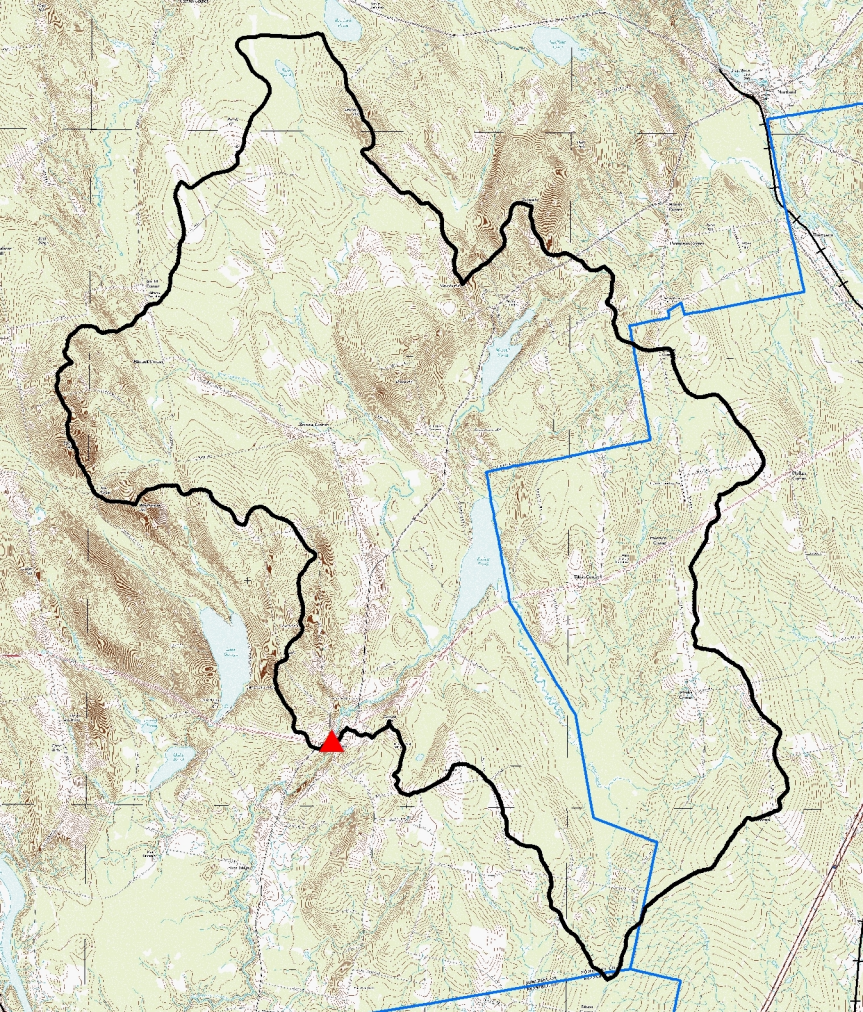
254.7

Q<sub>1,1</sub>

515.4

Q<sub>2</sub>

947.9



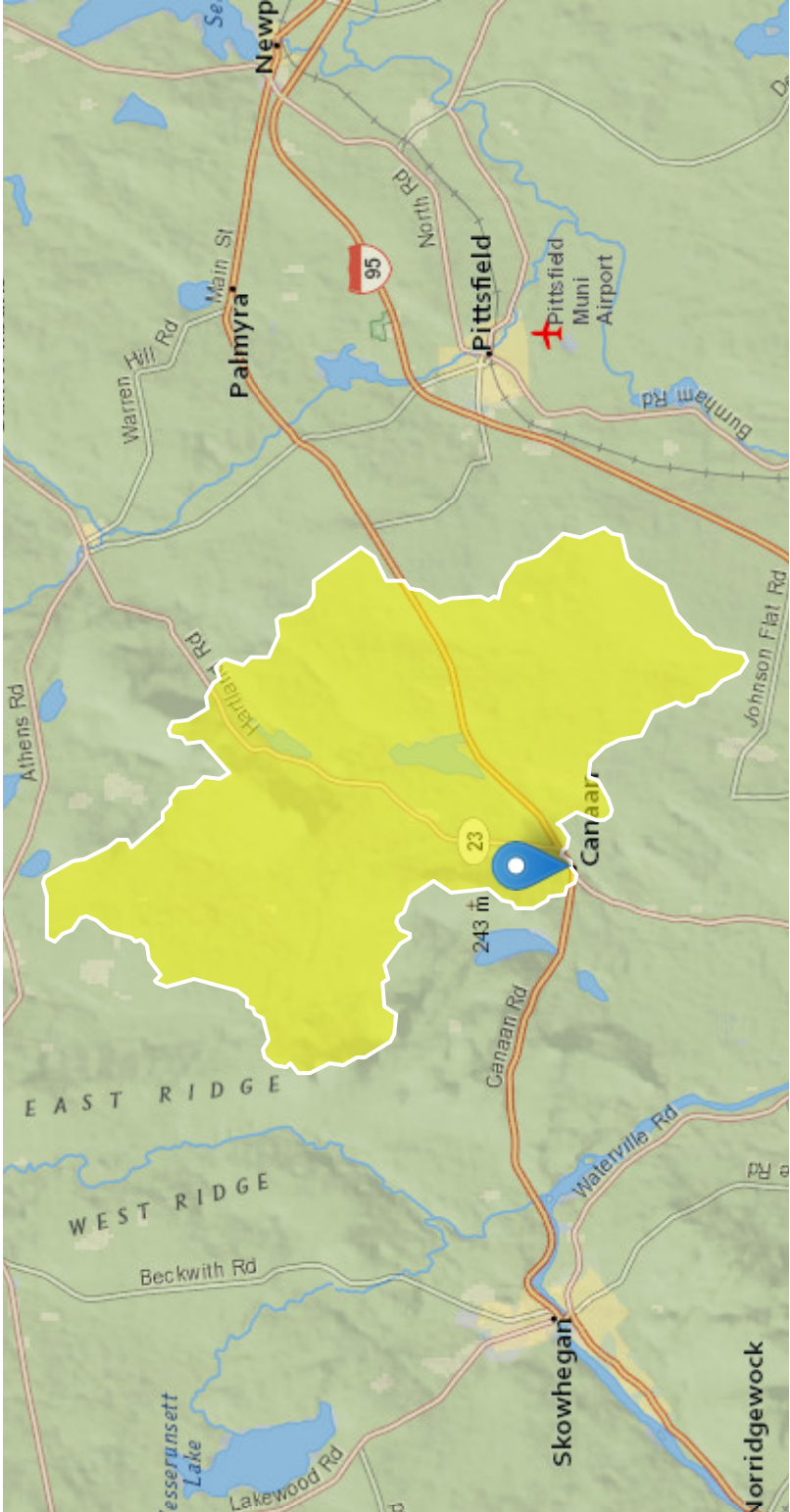
**Canaan 21878 Canaan Bridge #2120**

**Region ID:**  
ME

**Workspace ID:**  
ME20170519085634143000

**Clicked Point (Latitude, Longitude):**  
44.76220, -69.56122

**Time:**  
2017-05-19 10:57:00 -0400



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	53	square miles
STORNWI	Percentage of storage (combined water bodies and wetlands) from the National Wetlands Inventory	15.61	percent
ELEV	Mean Basin Elevation	351.8	feet
PRECIP	Mean Annual Precipitation	41.8	inches
SANDGRAVAP	Percentage of land surface underlain by sand and gravel aquifers	3.97	percent
COASTDIST	Shortest distance from the coastline to the basin centroid	84.8	miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	457998.74	State plane coordinates
CENTROIDY	Basin centroid vertical (y) location in state plane units	4961692.72	State plane coordinates
SANDGRAVAF	Fraction of land surface underlain by sand and gravel aquifers	0.04	dimensionless
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.67	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	3.82	percent
LC06WATER	Percent of open water, class 11, from NLCD 2006	1.7	percent
ELEVMAX	Maximum basin elevation	874.1	feet
BSLDEM10M	Mean basin slope computed from 10 m DEM	4.76	percent
STATSGOA	Percentage of area of Hydrologic Soil Type A from STATSGO	1.82	percent

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	53	square miles	2.92	298

Bankfull Statistics Flow Report [100 Percent (53 square miles) Central and Coastal Bankfull 2004 5042]

Statistic	Value	Unit	Average standard error of estimate
Bankfull Streamflow	335	ft^3/s	54.1
Bankfull Width	60.5	ft	33
Bankfull Depth	2.29	ft	26.2
Bankfull Area	138	ft^2	57.4

Bankfull Statistics Citations

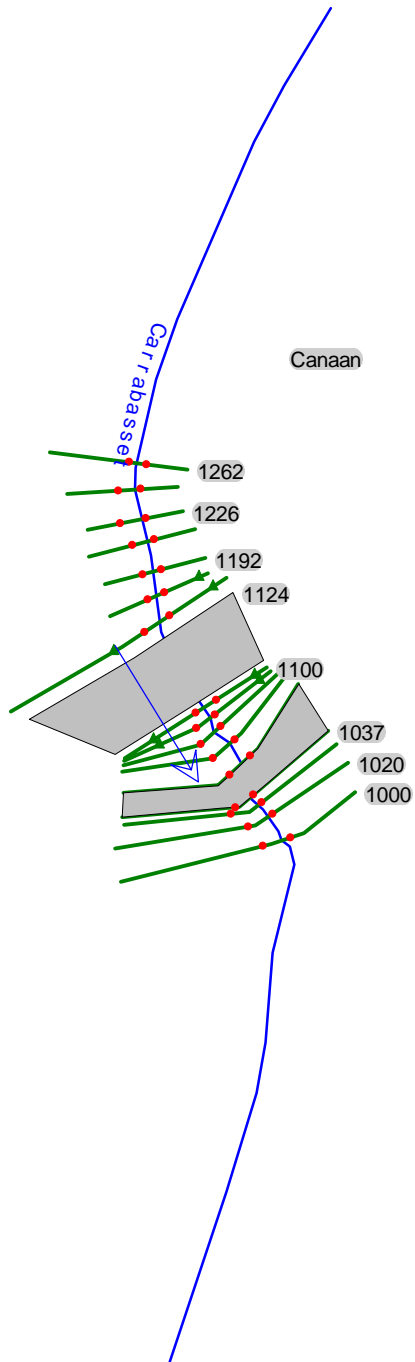
Dudley, R.W.,2004, Hydraulic-Geometry Relations for Rivers in Coastal and Central Maine: U.S. Geological Survey Scientific Investigations Report 2004-5042, 30 p (<http://pubs.usgs.gov/sir/2004/5042/pdf/sir2004-5042.pdf>)

Peak-Flow Statistics Parameters [100 Percent (53 square miles) Statewide Peak Flow Full GT 12sqmi WRI 99 4008]					
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	53	square miles	0.93	1653
STORNWI	Percentage of Storage from NWI	15.61	percent	0.7	26.7

Peak-Flow Statistics Flow Report [100 Percent (53 square miles) Statewide Peak Flow Full GT 12sqmi WRI 99 4008]

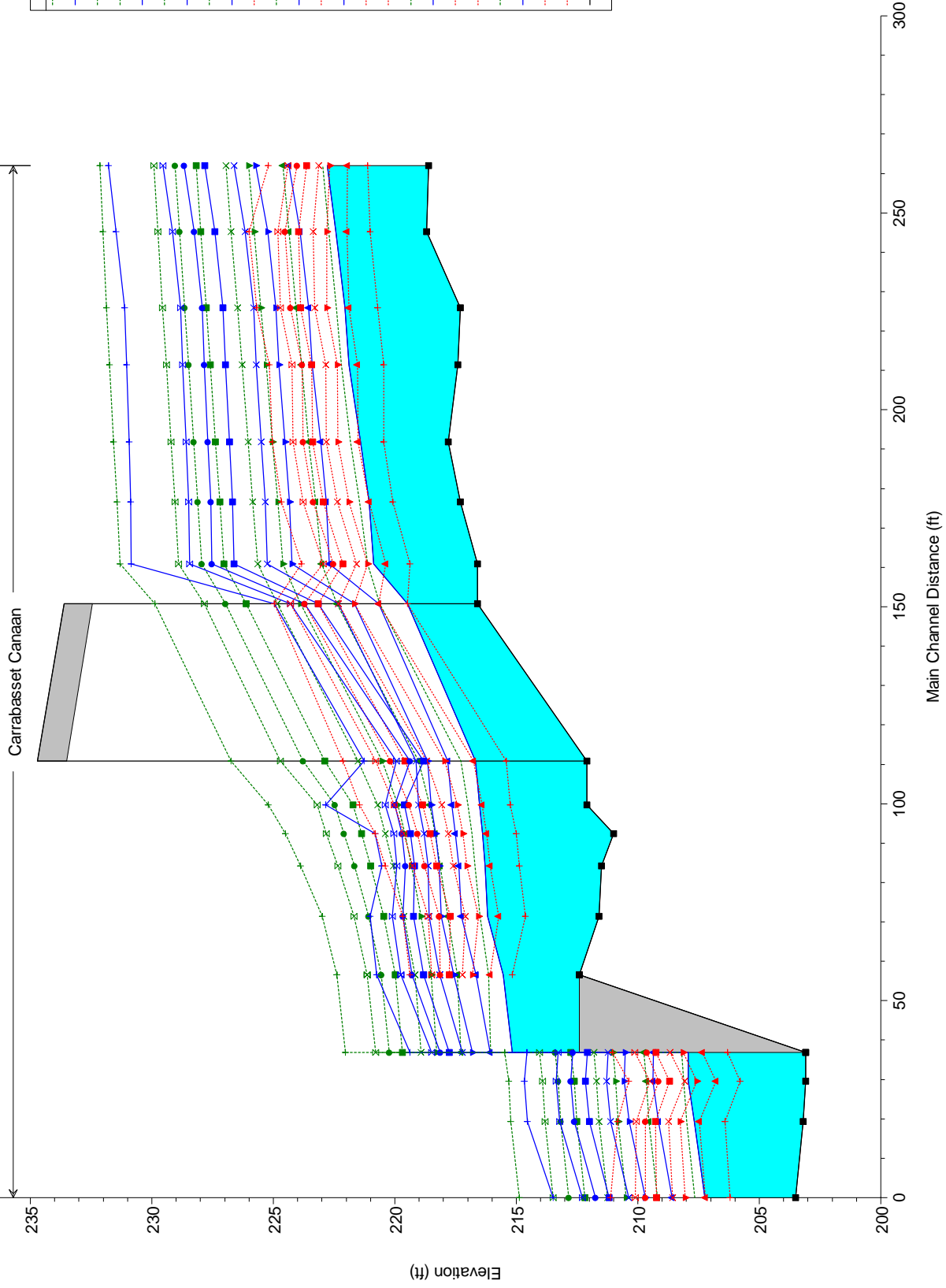
Statistic	Value	Unit	Average standard error (of either estimate or prediction)	Equivalent years of record	Lower Prediction Interval	Upper Prediction Interval
2 Year Peak Flood	948	ft^3/s	35.1	1.8	530	1700

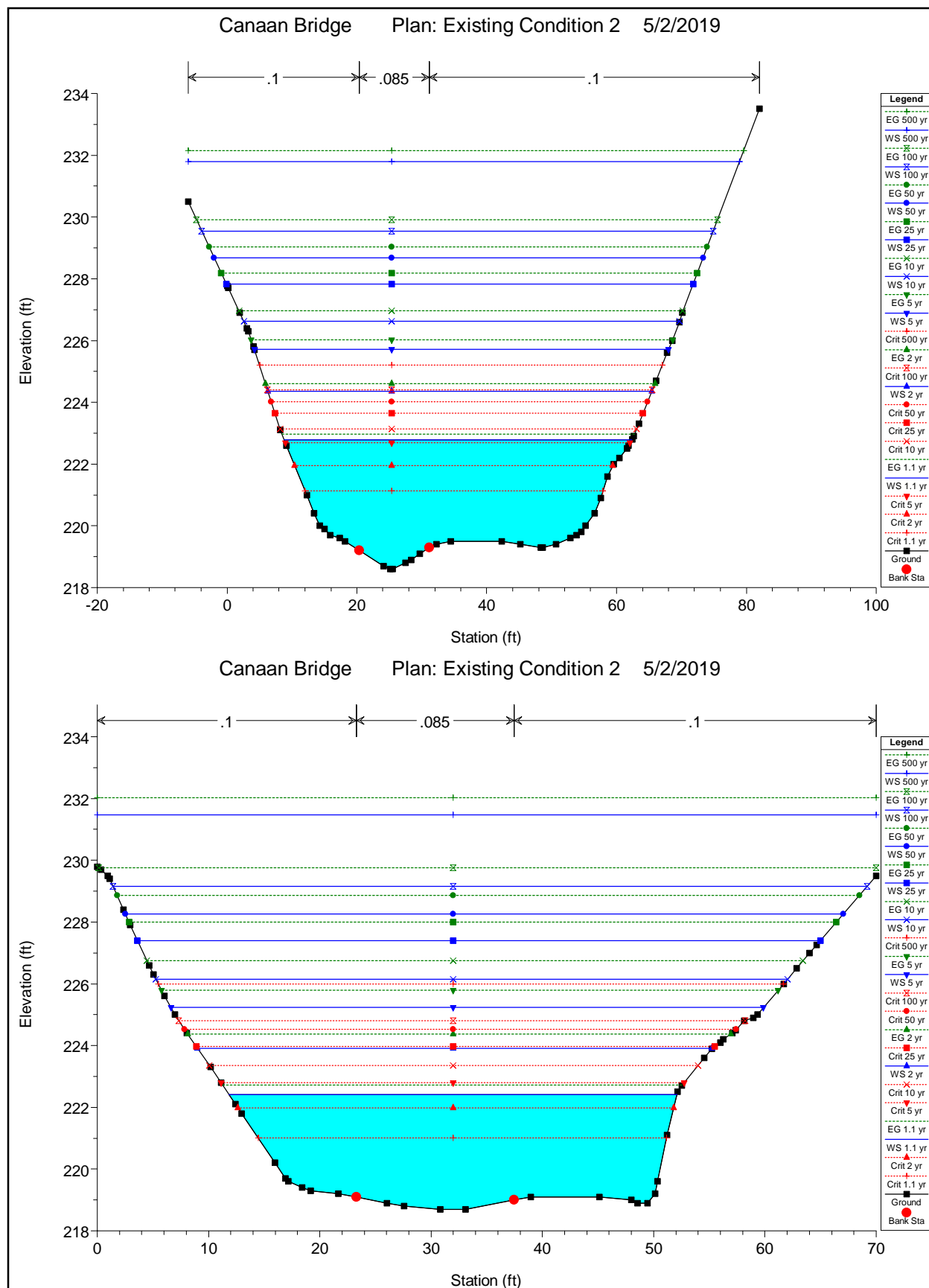
Statistic	Value	Unit	Average standard error (of either estimate or prediction)	Equivalent years of record	Lower Prediction Interval	Upper Prediction Interval
5 Year Peak Flood	1390	ft^3/s	36.1	2.5	768	2500
10 Year Peak Flood	1700	ft^3/s	36.8	3.2	926	3110
25 Year Peak Flood	2100	ft^3/s	38.6	4.1	1120	3950
50 Year Peak Flood	2410	ft^3/s	39.9	4.8	1260	4620
100 Year Peak Flood	2740	ft^3/s	41.2	5.4	1400	5360
500 Year Peak Flood	3520	ft^3/s	44.9	6.4	1700	7300
Peak-Flow Statistics Citations						
Hodgkins, G. A.,1999, Estimating the Magnitude of Peak Flows for Streams in Maine for Selected Recurrence Intervals: U.S. Geological Survey Water-Resources Investigations Report 99-4008, 45 p. ( <a href="http://me.water.usgs.gov/99-4008.pdf">http://me.water.usgs.gov/99-4008.pdf</a> )						



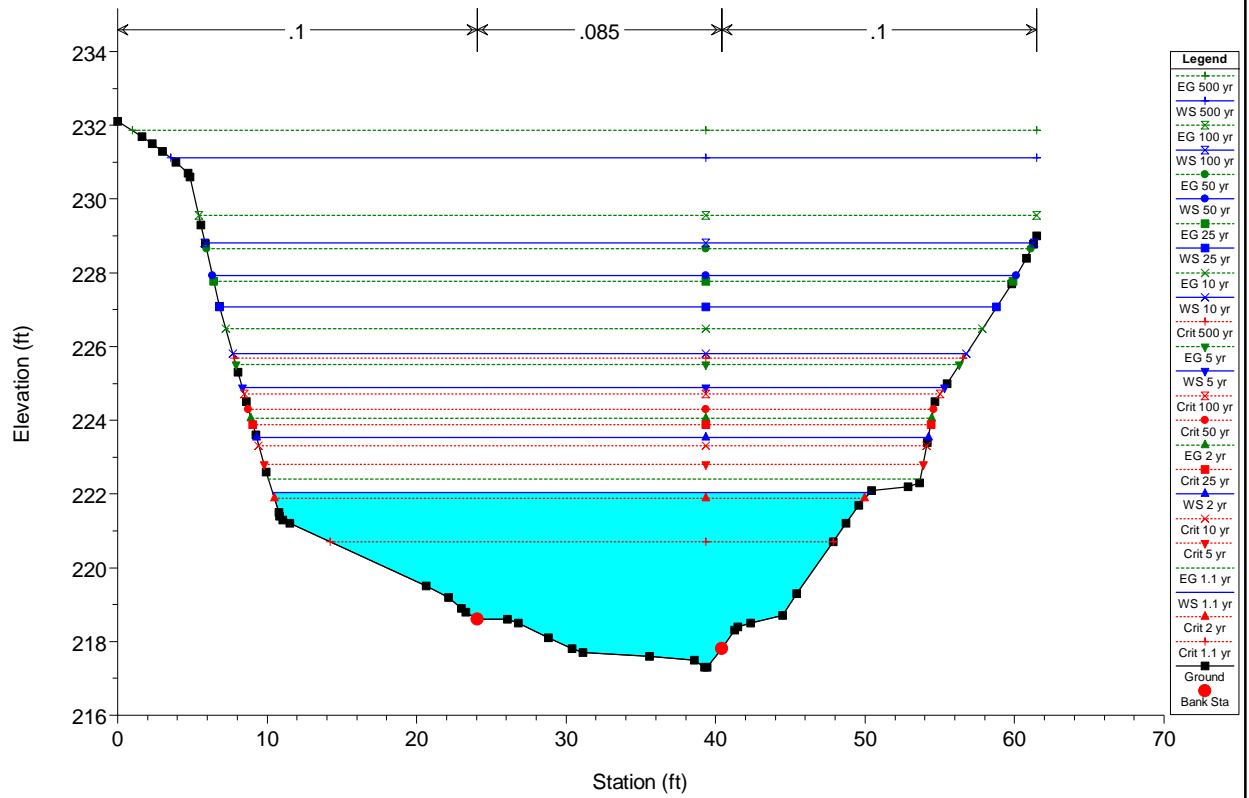
Some schematic data outside default extents (see View/Set Schematic Plot Extents...)

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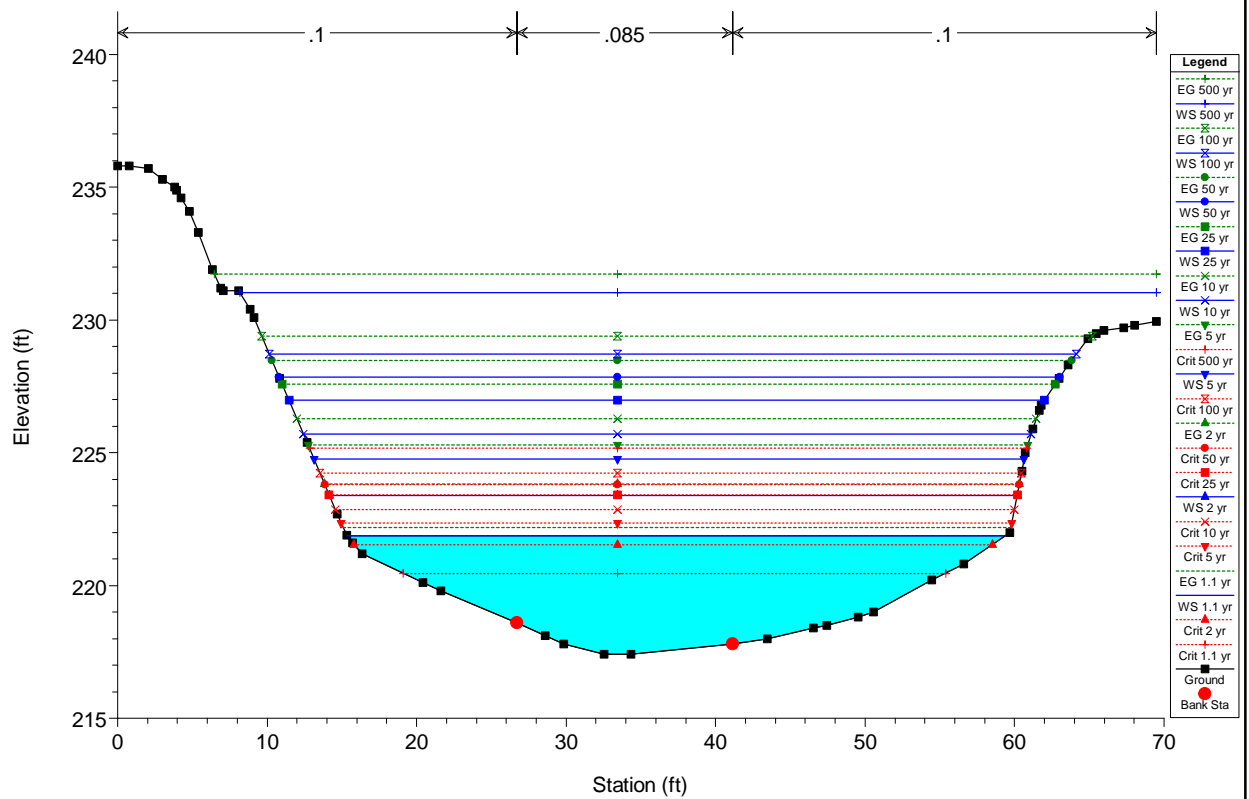




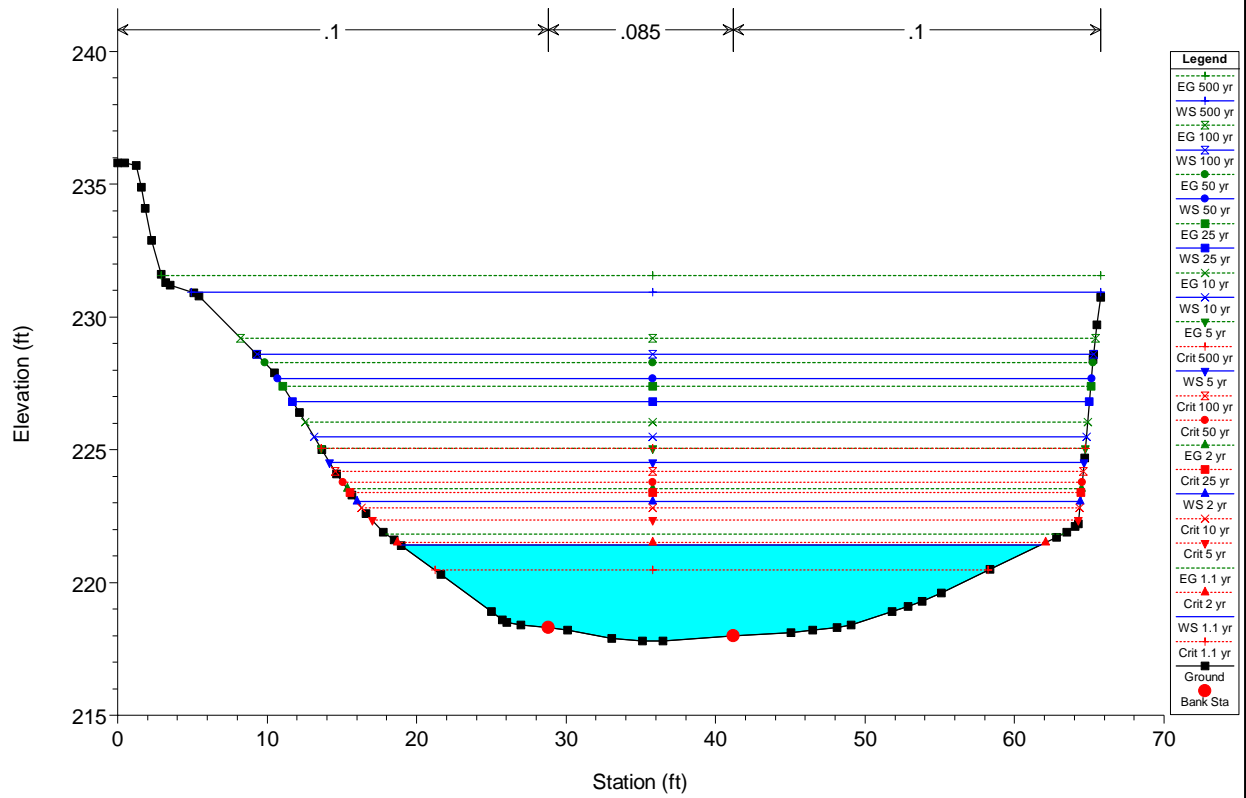
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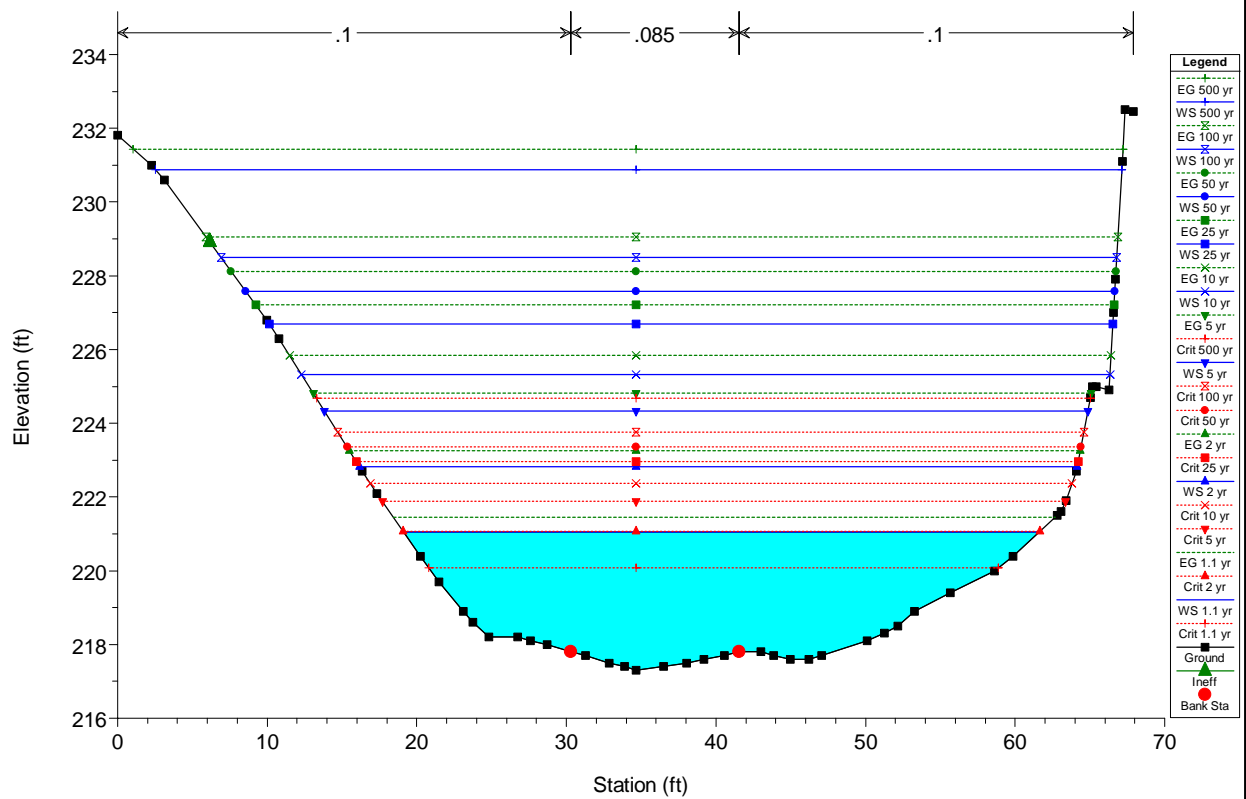
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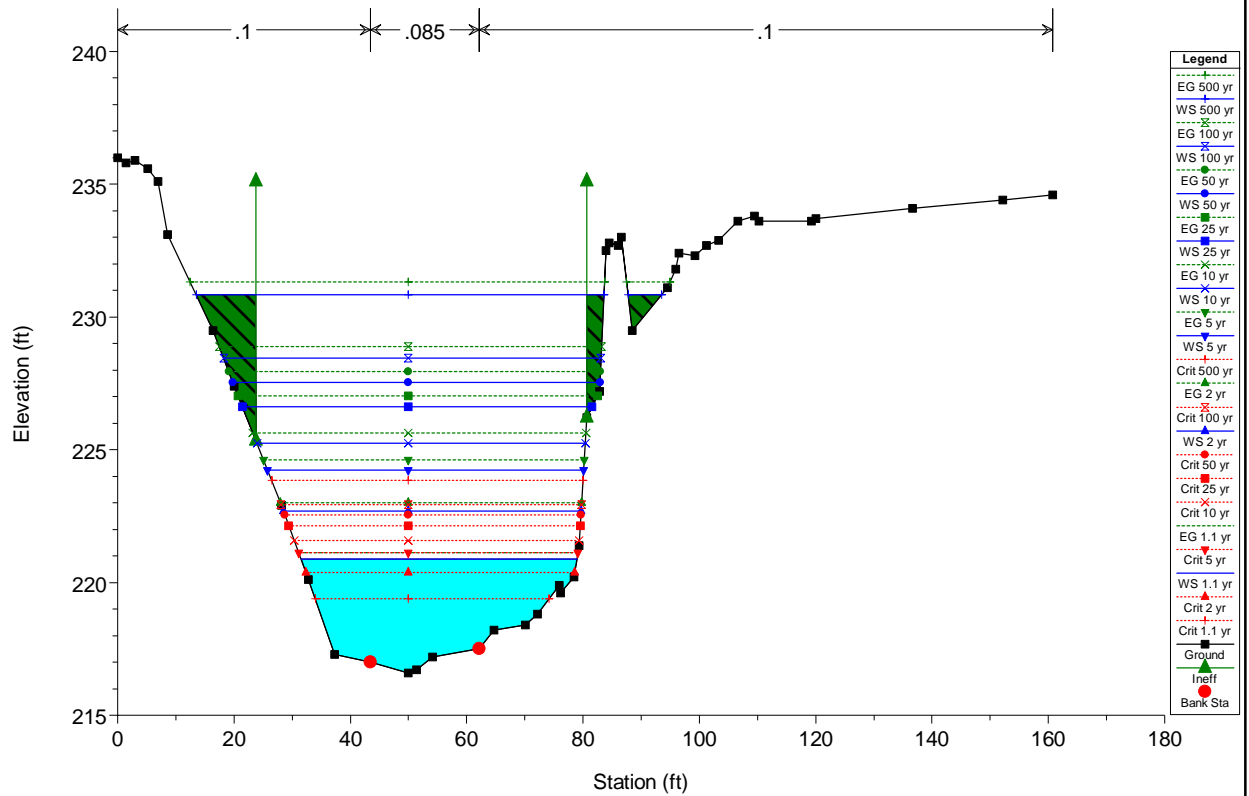
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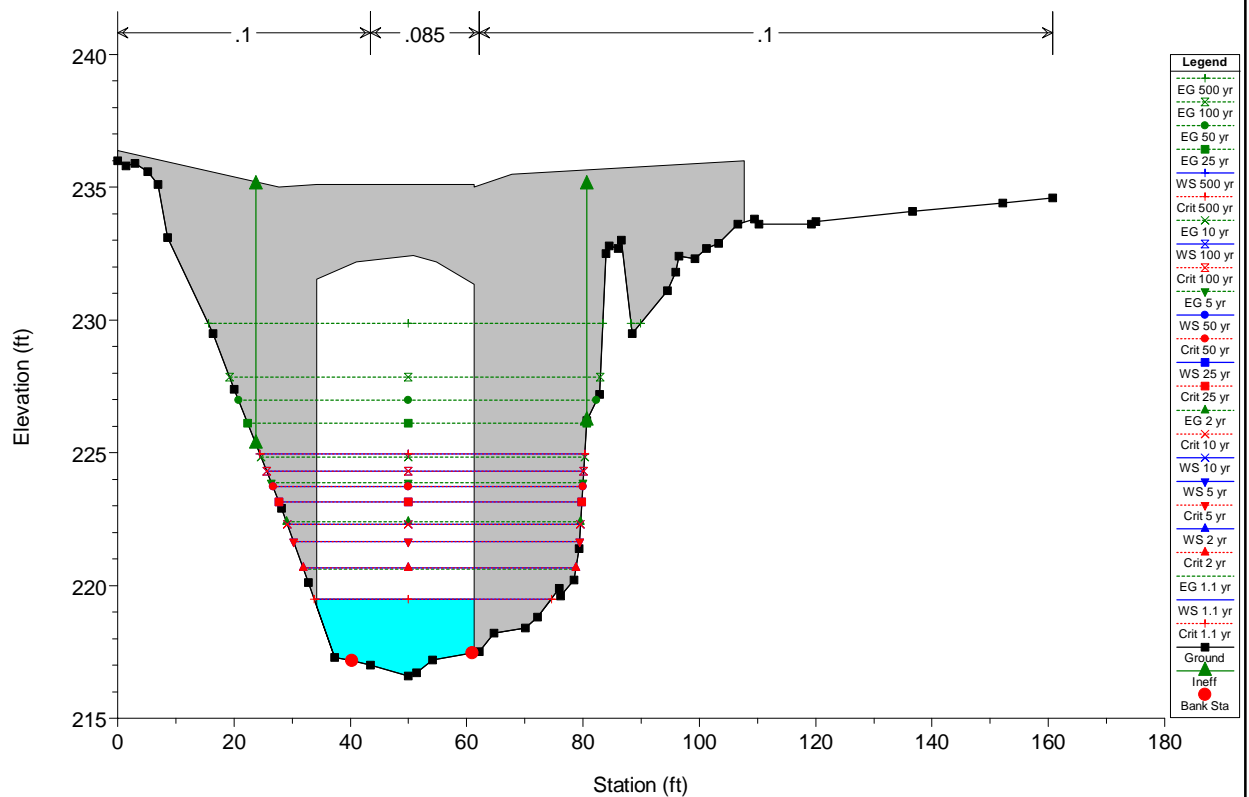
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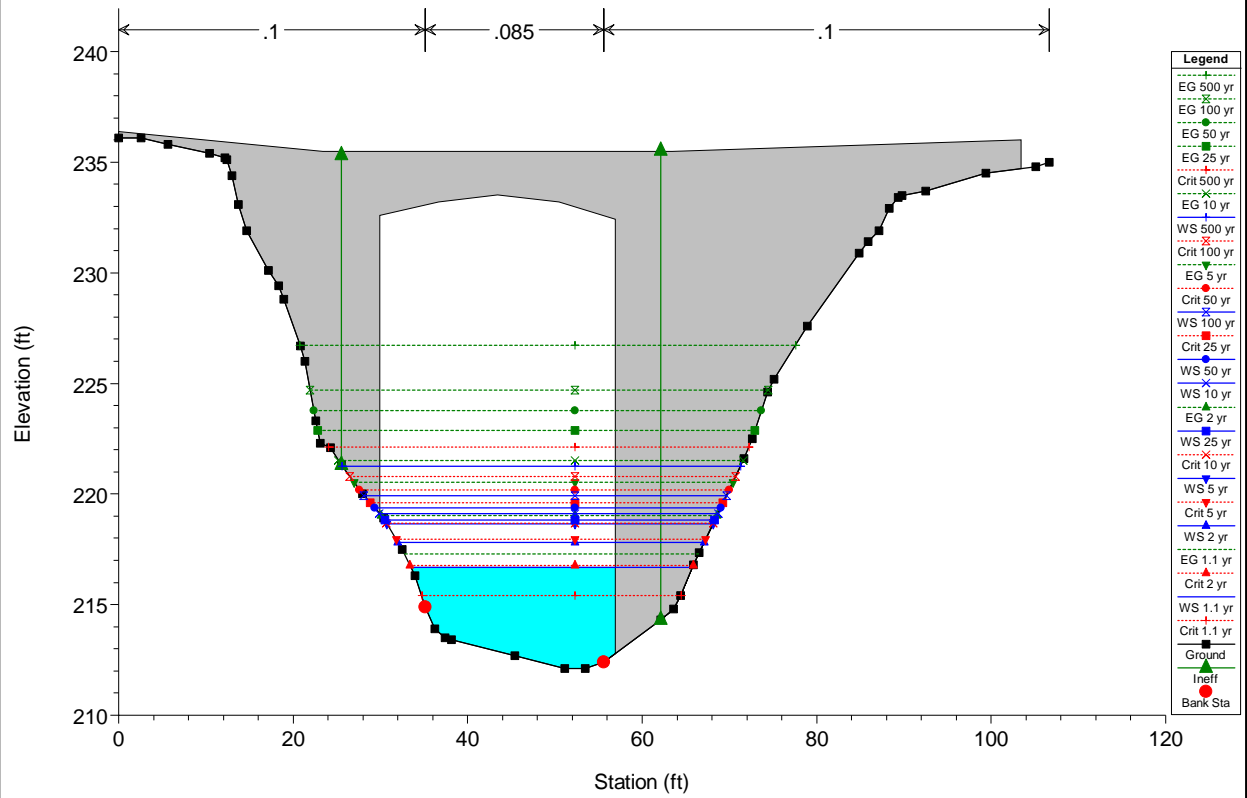
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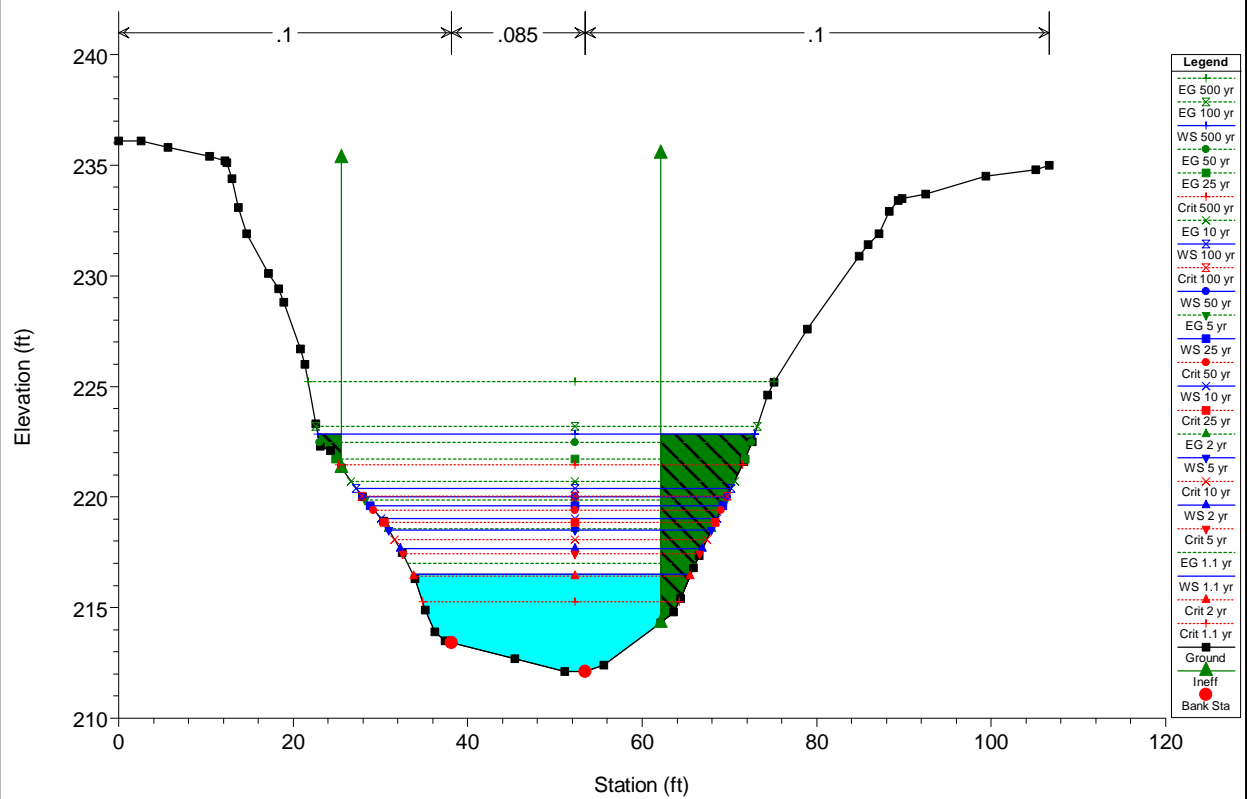
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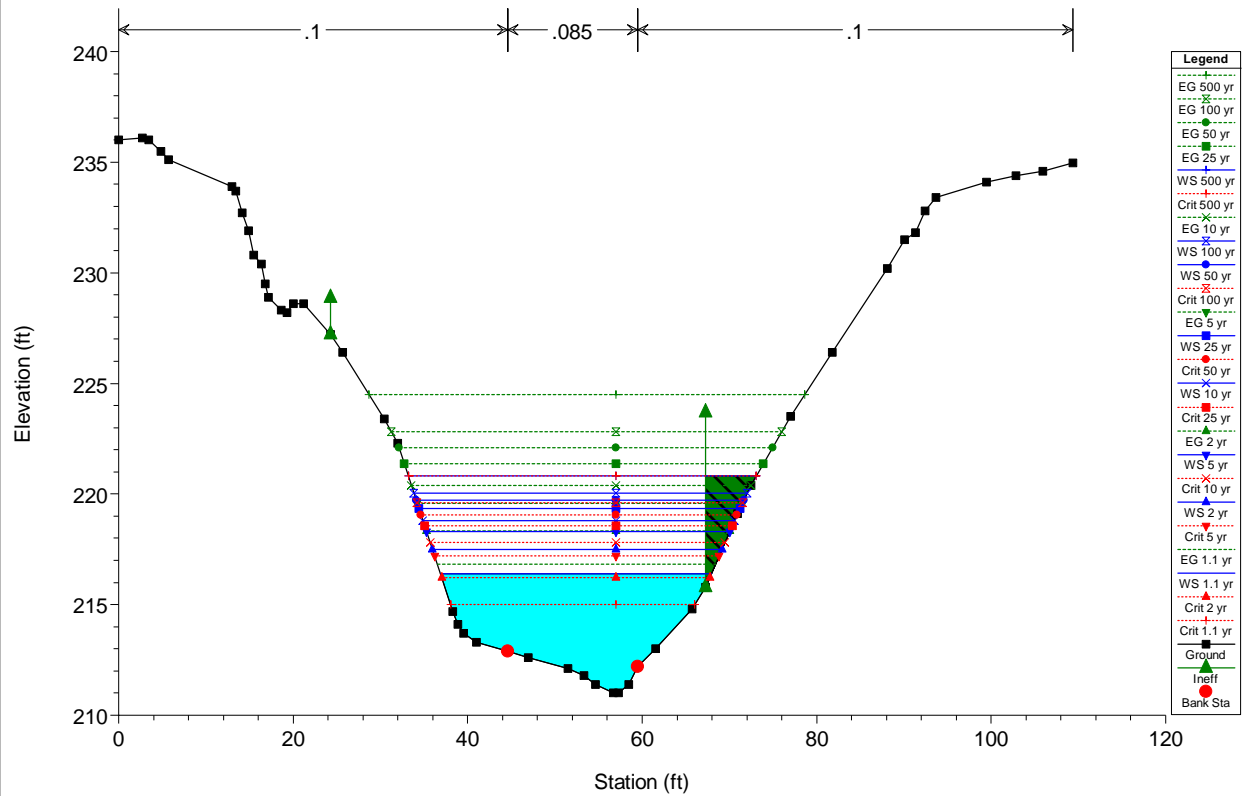
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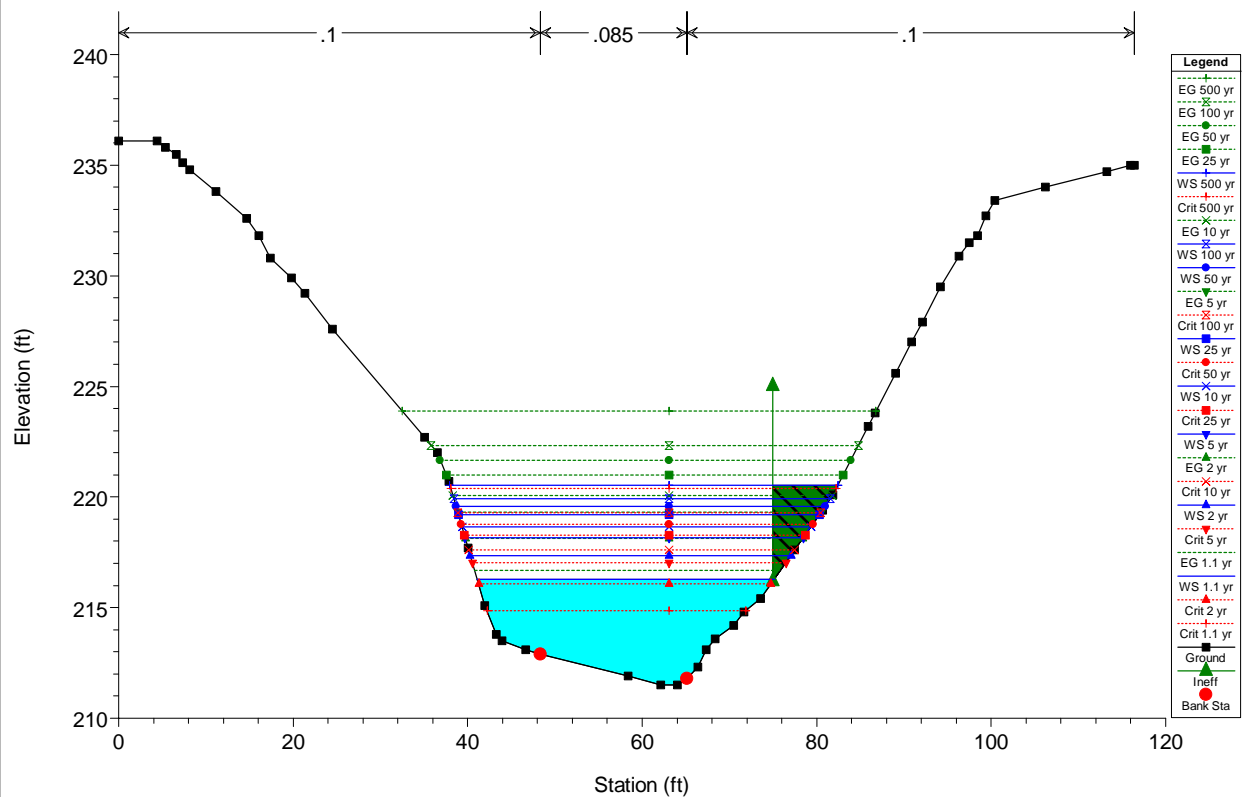
Canaan Bridge Plan: Existing Condition 2 5/2/2019



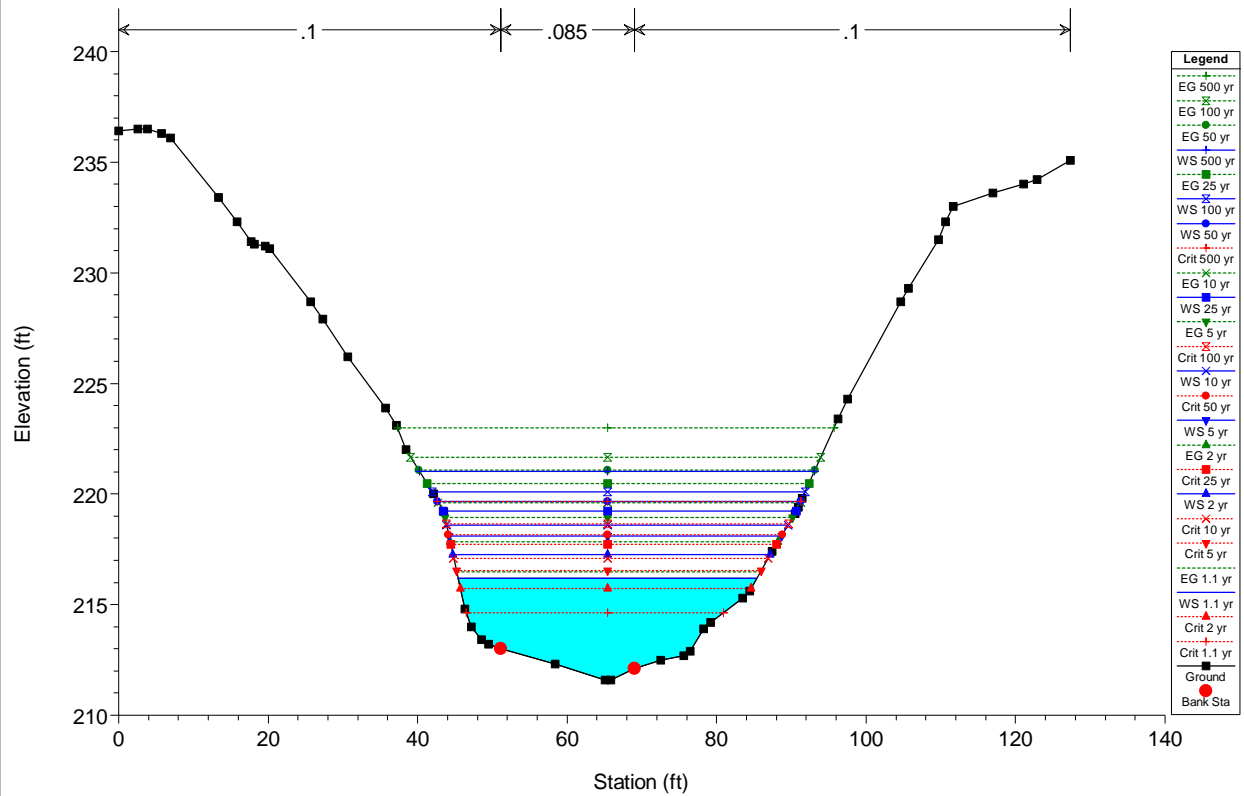
Canaan Bridge Plan: Existing Condition 2 5/2/2019



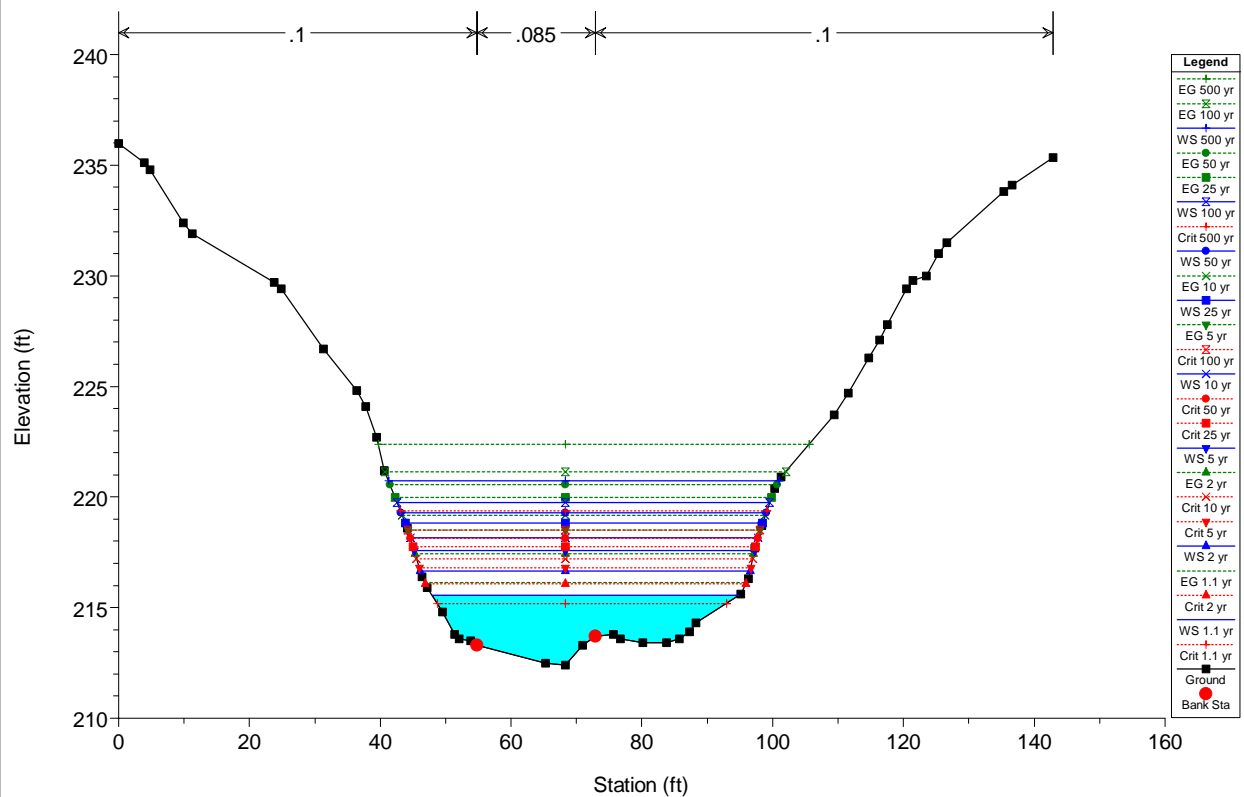
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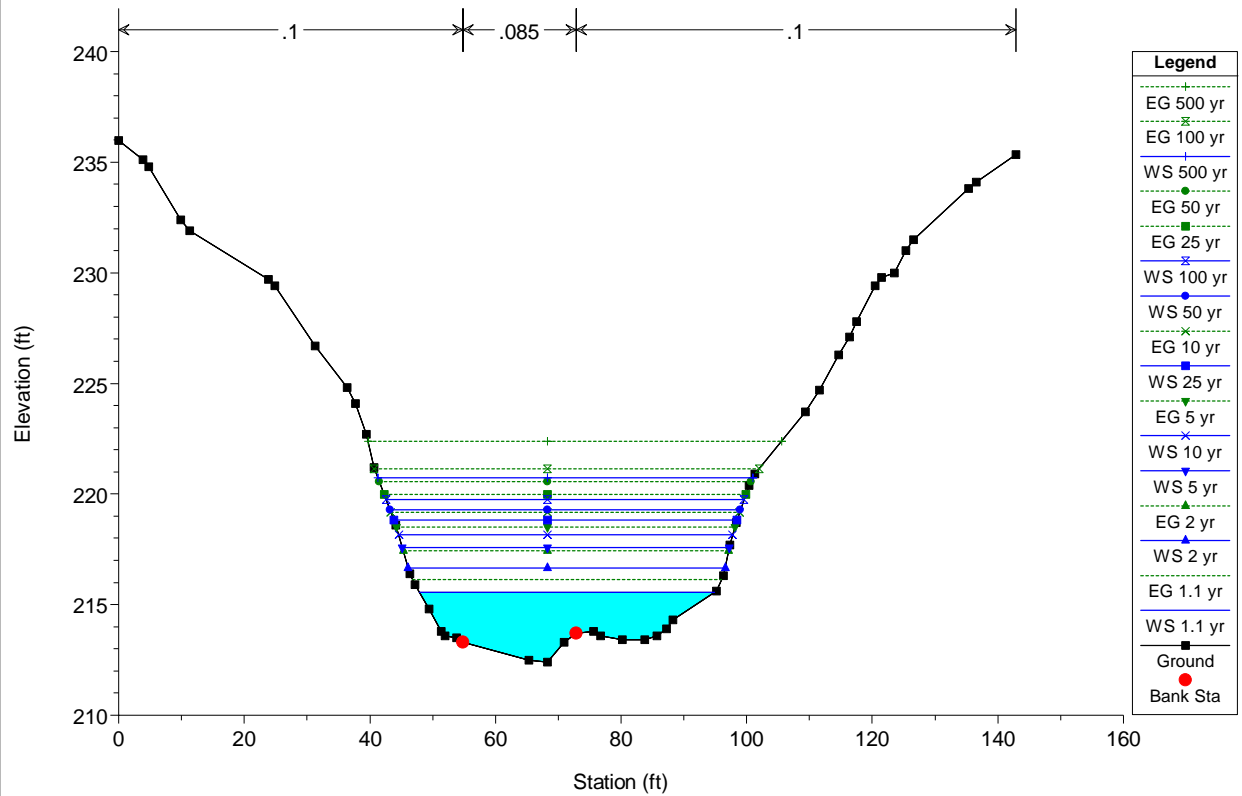
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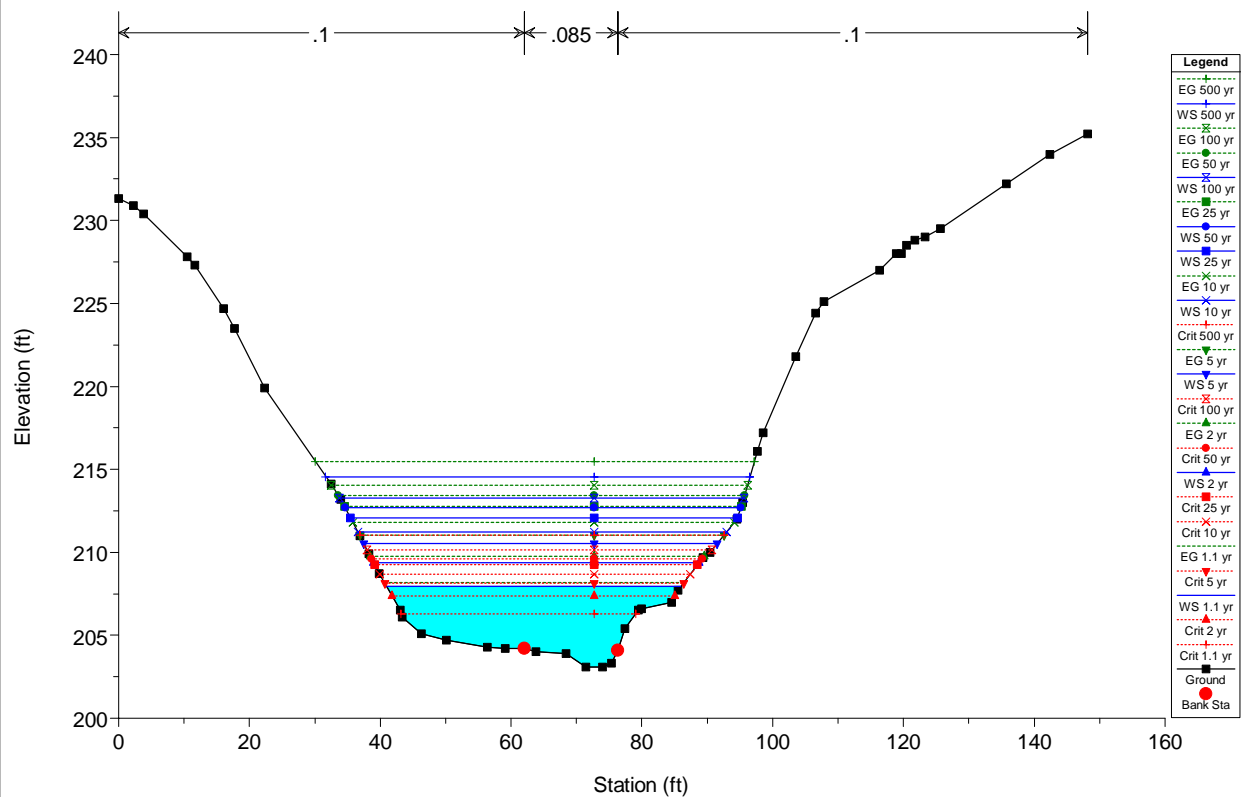
Canaan Bridge Plan: Existing Condition 2 5/2/2019

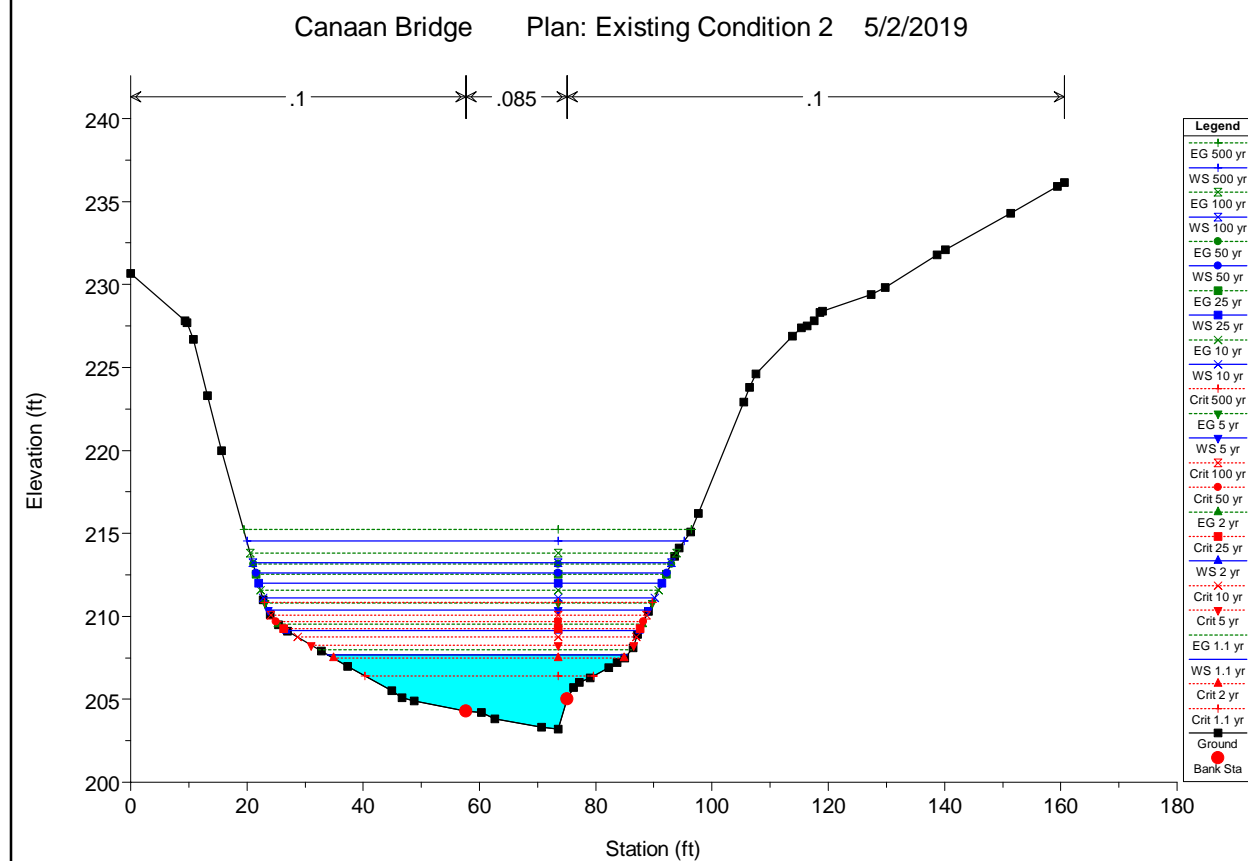
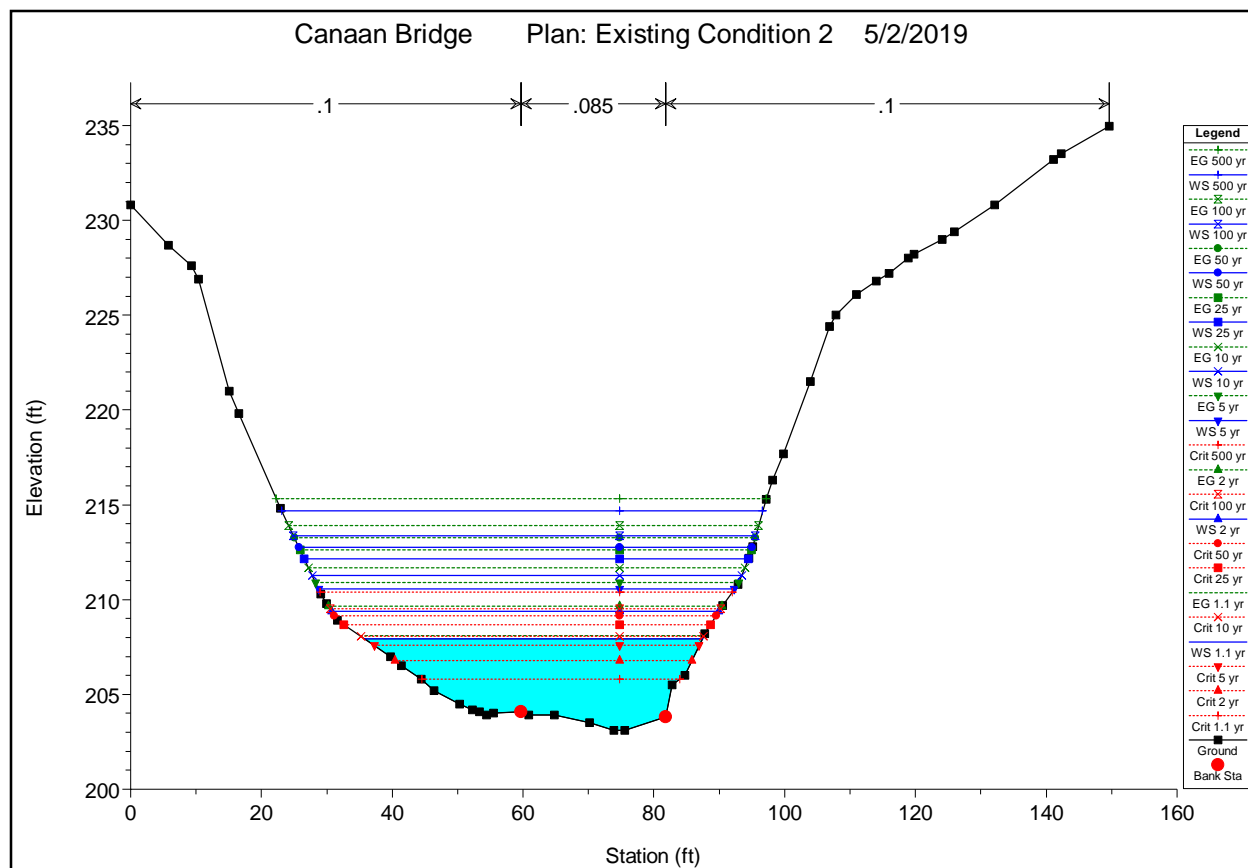


Canaan Bridge Plan: Existing Condition 2 5/2/2019

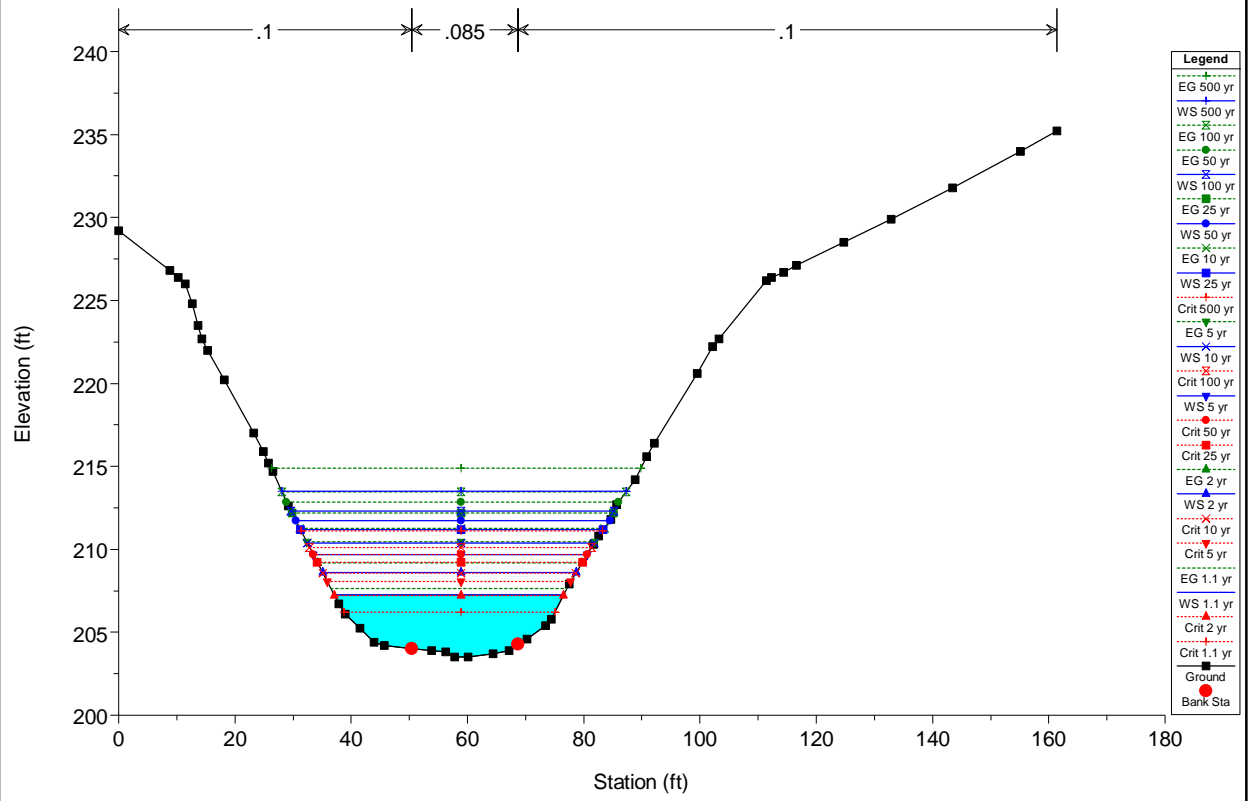


Canaan Bridge Plan: Existing Condition 2 5/2/2019





# Canaan Bridge Plan: Existing Condition 2 5/2/2019



HEC-RAS Plan: EX 2 River: Carrabasset Reach: Canaan

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
Canaan	1262	1.1 yr	515.40	218.60	222.78	221.12	222.97	0.010137	4.33	158.28	53.59	0.39
Canaan	1262	2 yr	947.90	218.60	224.35	221.94	224.61	0.009134	5.15	246.78	59.13	0.39
Canaan	1262	5 yr	1385.50	218.60	225.72	222.69	226.02	0.008280	5.69	330.60	63.83	0.38
Canaan	1262	10 yr	1696.90	218.60	226.62	223.14	226.96	0.007704	5.97	390.01	67.13	0.38
Canaan	1262	25 yr	2101.00	218.60	227.83	223.64	228.18	0.006785	6.17	473.94	71.94	0.36
Canaan	1262	50 yr	2409.50	218.60	228.68	224.03	229.04	0.006308	6.32	536.08	75.31	0.36
Canaan	1262	100 yr	2738.50	218.60	229.55	224.40	229.92	0.005854	6.44	603.32	78.80	0.35
Canaan	1262	500 yr	3524.30	218.60	231.79	225.20	232.15	0.004550	6.45	788.04	84.92	0.32
Canaan	1245	1.1 yr	515.40	218.70	222.42	221.01	222.72	0.015912	5.16	123.20	40.26	0.48
Canaan	1245	2 yr	947.90	218.70	223.90	221.98	224.37	0.016010	6.52	187.31	46.21	0.51
Canaan	1245	5 yr	1385.50	218.70	225.23	222.79	225.79	0.014916	7.35	253.51	53.25	0.51
Canaan	1245	10 yr	1696.90	218.70	226.15	223.36	226.74	0.013370	7.61	304.23	56.77	0.50
Canaan	1245	25 yr	2101.00	218.70	227.40	223.97	227.99	0.011142	7.72	378.06	61.39	0.46
Canaan	1245	50 yr	2409.50	218.70	228.27	224.52	228.86	0.010080	7.83	432.38	64.53	0.45
Canaan	1245	100 yr	2738.50	218.70	229.16	224.81	229.76	0.009138	7.92	491.29	67.76	0.43
Canaan	1245	500 yr	3524.30	218.70	231.46	226.00	232.02	0.006659	7.73	652.13	70.00	0.38
Canaan	1226	1.1 yr	515.40	217.30	222.05	220.70	222.41	0.014772	5.45	118.45	39.98	0.47
Canaan	1226	2 yr	947.90	217.30	223.54	221.88	224.06	0.014660	6.66	183.92	44.97	0.49
Canaan	1226	5 yr	1385.50	217.30	224.89	222.81	225.51	0.013415	7.35	246.01	46.96	0.49
Canaan	1226	10 yr	1696.90	217.30	225.81	223.30	226.48	0.012546	7.72	290.15	49.06	0.48
Canaan	1226	25 yr	2101.00	217.30	227.07	223.87	227.77	0.010951	7.95	353.75	51.96	0.46
Canaan	1226	50 yr	2409.50	217.30	227.93	224.30	228.65	0.010234	8.16	399.12	53.78	0.45
Canaan	1226	100 yr	2738.50	217.30	228.81	224.72	229.56	0.009563	8.34	447.40	55.45	0.44
Canaan	1226	500 yr	3524.30	217.30	231.11	225.68	231.86	0.007679	8.49	577.09	57.96	0.41
Canaan	1212	1.1 yr	515.40	217.40	221.88	220.46	222.19	0.013367	5.21	128.36	44.05	0.45
Canaan	1212	2 yr	947.90	217.40	223.40	221.54	223.83	0.012761	6.26	197.02	46.02	0.46
Canaan	1212	5 yr	1385.50	217.40	224.77	222.36	225.30	0.011774	6.94	261.37	47.51	0.46
Canaan	1212	10 yr	1696.90	217.40	225.71	222.85	226.28	0.011076	7.31	306.18	48.68	0.46
Canaan	1212	25 yr	2101.00	217.40	226.98	223.42	227.59	0.009830	7.60	369.29	50.53	0.44
Canaan	1212	50 yr	2409.50	217.40	227.84	223.81	228.48	0.009364	7.87	413.49	52.21	0.44
Canaan	1212	100 yr	2738.50	217.40	228.73	224.24	229.40	0.008920	8.12	460.48	54.01	0.43
Canaan	1212	500 yr	3524.30	217.40	231.03	225.17	231.74	0.007516	8.47	594.89	61.30	0.41
Canaan	1192	1.1 yr	515.40	217.80	221.41	220.46	221.83	0.024447	6.24	108.05	42.78	0.59
Canaan	1192	2 yr	947.90	217.80	223.05	221.51	223.54	0.017499	6.84	184.21	48.40	0.53
Canaan	1192	5 yr	1385.50	217.80	224.52	222.35	225.05	0.013841	7.20	256.76	50.46	0.50
Canaan	1192	10 yr	1696.90	217.80	225.49	222.82	226.05	0.012274	7.43	306.36	51.67	0.48
Canaan	1192	25 yr	2101.00	217.80	226.81	223.39	227.38	0.010309	7.59	375.63	53.31	0.45
Canaan	1192	50 yr	2409.50	217.80	227.69	223.78	228.28	0.009577	7.79	423.03	54.42	0.44
Canaan	1192	100 yr	2738.50	217.80	228.59	224.18	229.21	0.008998	8.01	472.64	55.96	0.43
Canaan	1192	500 yr	3524.30	217.80	230.94	225.04	231.57	0.007303	8.24	609.49	60.87	0.40
Canaan	1177	1.1 yr	515.40	217.30	221.06	220.08	221.45	0.022798	6.09	111.44	42.51	0.57
Canaan	1177	2 yr	947.90	217.30	222.82	221.07	223.26	0.015569	6.60	191.84	47.98	0.51
Canaan	1177	5 yr	1385.50	217.30	224.34	221.88	224.82	0.012474	6.99	267.08	51.03	0.47
Canaan	1177	10 yr	1696.90	217.30	225.33	222.37	225.85	0.011385	7.31	318.98	54.04	0.46
Canaan	1177	25 yr	2101.00	217.30	226.69	222.95	227.21	0.009436	7.41	393.90	56.38	0.43
Canaan	1177	50 yr	2409.50	217.30	227.58	223.35	228.12	0.008734	7.58	445.15	58.10	0.42
Canaan	1177	100 yr	2738.50	217.30	228.50	223.77	229.05	0.008143	7.76	499.10	59.88	0.41
Canaan	1177	500 yr	3524.30	217.30	230.88	224.68	231.44	0.006485	7.90	647.43	64.60	0.38
Canaan	1161	1.1 yr	515.40	216.60	220.87	219.38	221.13	0.011604	4.60	139.42	47.42	0.41
Canaan	1161	2 yr	947.90	216.60	222.70	220.38	223.01	0.008934	5.23	229.49	51.18	0.39
Canaan	1161	5 yr	1385.50	216.60	224.24	221.12	224.61	0.007796	5.74	310.94	54.36	0.38
Canaan	1161	10 yr	1696.90	216.60	225.24	221.59	225.64	0.007238	6.03	366.48	56.43	0.37
Canaan	1161	25 yr	2101.00	216.60	226.62	222.14	227.03	0.006083	6.13	444.72	60.10	0.35
Canaan	1161	50 yr	2409.50	216.60	227.53	222.54	227.95	0.005624	6.26	496.17	63.07	0.34
Canaan	1161	100 yr	2738.50	216.60	228.45	222.94	228.89	0.005250	6.40	548.57	64.86	0.33
Canaan	1161	500 yr	3524.30	216.60	230.84	223.84	231.31	0.004224	6.52	684.84	75.96	0.31
Canaan	1124		Bridge									
Canaan	1100	1.1 yr	515.40	212.10	216.51	215.26	216.99	0.019516	5.98	97.62	31.87	0.54
Canaan	1100	2 yr	947.90	212.10	217.65	216.41	218.56	0.026471	8.28	130.84	34.64	0.65
Canaan	1100	5 yr	1385.50	212.10	218.51	217.43	219.87	0.032364	10.18	156.96	36.99	0.74
Canaan	1100	10 yr	1696.90	212.10	219.01	218.08	220.71	0.036207	11.37	172.92	38.46	0.80
Canaan	1100	25 yr	2101.00	212.10	219.60	218.86	221.73	0.040716	12.79	191.92	40.44	0.86
Canaan	1100	50 yr	2409.50	212.10	220.00	219.42	222.46	0.043721	13.76	205.62	41.83	0.90
Canaan	1100	100 yr	2738.50	212.10	220.39	220.03	223.21	0.047003	14.76	218.87	43.00	0.94
Canaan	1100	500 yr	3524.30	212.10	222.85	221.46	225.20	0.027786	13.65	308.37	50.08	0.75
Canaan	1093	1.1 yr	515.40	211.00	216.40	215.00	216.83	0.015930	5.83	106.17	31.07	0.49
Canaan	1093	2 yr	947.90	211.00	217.50	216.23	218.34	0.023231	8.16	140.17	33.20	0.61

HEC-RAS Plan: EX 2 River: Carrabasset Reach: Canaan (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
Canaan	1093	5 yr	1385.50	211.00	218.32	217.19	219.59	0.029668	10.11	166.03	34.79	0.71
Canaan	1093	10 yr	1696.90	211.00	218.79	217.80	220.39	0.034017	11.35	181.38	35.71	0.77
Canaan	1093	25 yr	2101.00	211.00	219.35	218.55	221.38	0.039087	12.82	199.44	36.80	0.83
Canaan	1093	50 yr	2409.50	211.00	219.72	219.07	222.09	0.042921	13.88	211.66	37.55	0.88
Canaan	1093	100 yr	2738.50	211.00	220.05	219.62	222.82	0.047505	15.02	222.73	38.21	0.93
Canaan	1093	500 yr	3524.30	211.00	220.81	220.81	224.51	0.056678	17.41	248.24	39.85	1.03
Canaan	1085	1.1 yr	515.40	211.50	216.29	214.87	216.70	0.015315	5.60	110.63	34.06	0.48
Canaan	1085	2 yr	947.90	211.50	217.36	216.07	218.13	0.021747	7.77	147.42	36.76	0.60
Canaan	1085	5 yr	1385.50	211.50	218.17	217.04	219.31	0.027250	9.56	175.58	38.79	0.68
Canaan	1085	10 yr	1696.90	211.50	218.64	217.60	220.07	0.030943	10.71	192.31	39.99	0.74
Canaan	1085	25 yr	2101.00	211.50	219.20	218.29	220.99	0.035032	12.04	212.32	41.40	0.80
Canaan	1085	50 yr	2409.50	211.50	219.57	218.78	221.66	0.038049	12.99	226.02	42.33	0.84
Canaan	1085	100 yr	2738.50	211.50	219.91	219.28	222.34	0.041749	14.01	238.40	43.13	0.88
Canaan	1085	500 yr	3524.30	211.50	220.54	220.39	223.88	0.052130	16.48	261.46	44.48	1.00
Canaan	1072	1.1 yr	515.40	211.60	216.19	214.63	216.49	0.012751	4.95	126.64	40.00	0.44
Canaan	1072	2 yr	947.90	211.60	217.26	215.73	217.83	0.017802	6.85	170.80	42.48	0.54
Canaan	1072	5 yr	1385.50	211.60	218.09	216.55	218.93	0.021707	8.37	206.91	44.51	0.61
Canaan	1072	10 yr	1696.90	211.60	218.60	217.09	219.62	0.024042	9.30	229.71	45.75	0.65
Canaan	1072	25 yr	2101.00	211.60	219.22	217.73	220.46	0.026101	10.32	258.82	47.27	0.69
Canaan	1072	50 yr	2409.50	211.60	219.67	218.17	221.07	0.027407	11.01	280.01	48.63	0.71
Canaan	1072	100 yr	2738.50	211.60	220.10	218.64	221.67	0.028729	11.70	301.30	49.95	0.73
Canaan	1072	500 yr	3524.30	211.60	221.02	219.67	222.99	0.031465	13.18	348.80	52.85	0.78
Canaan	1057	1.1 yr	515.40	212.40	215.55	215.18	216.13	0.044074	6.99	92.08	46.95	0.76
Canaan	1057	2 yr	947.90	212.40	216.66	216.08	217.42	0.036860	8.08	146.96	50.46	0.73
Canaan	1057	5 yr	1385.50	212.40	217.58	216.80	218.50	0.033952	8.96	193.80	52.06	0.73
Canaan	1057	10 yr	1696.90	212.40	218.14	217.22	219.18	0.033055	9.54	223.58	53.17	0.73
Canaan	1057	25 yr	2101.00	212.40	218.81	217.76	219.99	0.032378	10.22	259.56	54.60	0.74
Canaan	1057	50 yr	2409.50	212.40	219.29	218.13	220.57	0.032057	10.71	285.65	55.80	0.75
Canaan	1057	100 yr	2738.50	212.40	219.75	218.50	221.14	0.032011	11.21	311.67	56.98	0.75
Canaan	1057	500 yr	3524.30	212.40	220.74	219.38	222.40	0.032325	12.32	369.42	59.76	0.77
Canaan	1048		Inl Struct									
Canaan	1037	1.1 yr	515.40	203.10	207.93	206.30	208.19	0.010960	4.75	138.39	45.00	0.40
Canaan	1037	2 yr	947.90	203.10	209.36	207.35	209.76	0.011893	5.99	206.10	49.76	0.44
Canaan	1037	5 yr	1385.50	203.10	210.51	208.14	211.03	0.012360	6.90	265.98	54.02	0.46
Canaan	1037	10 yr	1696.90	203.10	211.23	208.66	211.82	0.012538	7.42	305.59	56.38	0.47
Canaan	1037	25 yr	2101.00	203.10	212.08	209.25	212.75	0.012644	8.00	354.85	59.17	0.49
Canaan	1037	50 yr	2409.50	203.10	212.68	209.62	213.40	0.012648	8.38	390.77	60.51	0.49
Canaan	1037	100 yr	2738.50	203.10	213.27	210.13	214.05	0.012725	8.76	426.73	61.80	0.50
Canaan	1037	500 yr	3524.30	203.10	214.56	211.03	215.47	0.012892	9.59	508.31	64.89	0.51
Canaan	1030	1.1 yr	515.40	203.10	207.93	205.79	208.11	0.006527	3.76	168.34	51.67	0.32
Canaan	1030	2 yr	947.90	203.10	209.38	206.79	209.65	0.007324	4.82	249.06	59.19	0.35
Canaan	1030	5 yr	1385.50	203.10	210.55	207.58	210.91	0.007533	5.53	321.31	63.58	0.37
Canaan	1030	10 yr	1696.90	203.10	211.29	208.07	211.69	0.007598	5.93	368.72	65.68	0.38
Canaan	1030	25 yr	2101.00	203.10	212.16	208.68	212.62	0.007640	6.39	426.75	67.91	0.38
Canaan	1030	50 yr	2409.50	203.10	212.76	209.15	213.27	0.007671	6.70	468.58	69.34	0.39
Canaan	1030	100 yr	2738.50	203.10	213.36	209.51	213.91	0.007742	7.02	510.43	70.65	0.40
Canaan	1030	500 yr	3524.30	203.10	214.67	210.38	215.32	0.007866	7.70	604.86	73.51	0.41
Canaan	1020	1.1 yr	515.40	203.20	207.68	206.41	207.99	0.014416	5.08	130.36	51.60	0.45
Canaan	1020	2 yr	947.90	203.20	209.15	207.47	209.54	0.012959	5.95	212.87	60.71	0.45
Canaan	1020	5 yr	1385.50	203.20	210.36	208.26	210.80	0.011579	6.43	289.63	65.41	0.44
Canaan	1020	10 yr	1696.90	203.20	211.11	208.74	211.59	0.010929	6.71	339.67	67.40	0.44
Canaan	1020	25 yr	2101.00	203.20	212.00	209.28	212.52	0.010349	7.04	400.31	69.33	0.43
Canaan	1020	50 yr	2409.50	203.20	212.62	209.68	213.17	0.010067	7.29	443.72	70.68	0.43
Canaan	1020	100 yr	2738.50	203.20	213.22	210.06	213.81	0.009912	7.56	486.87	72.00	0.43
Canaan	1020	500 yr	3524.30	203.20	214.55	210.84	215.22	0.009675	8.14	584.25	75.24	0.44
Canaan	1000	1.1 yr	515.40	203.50	207.24	206.21	207.65	0.020015	5.66	109.29	39.47	0.53
Canaan	1000	2 yr	947.90	203.50	208.60	207.22	209.20	0.020025	7.05	165.41	43.61	0.57
Canaan	1000	5 yr	1385.50	203.50	209.69	208.05	210.47	0.020000	8.07	215.26	47.13	0.58
Canaan	1000	10 yr	1696.90	203.50	210.37	208.57	211.26	0.020020	8.68	248.03	49.31	0.60
Canaan	1000	25 yr	2101.00	203.50	211.18	209.22	212.18	0.020013	9.37	288.64	52.07	0.61
Canaan	1000	50 yr	2409.50	203.50	211.74	209.68	212.84	0.020009	9.84	318.42	54.08	0.61
Canaan	1000	100 yr	2738.50	203.50	212.29	210.11	213.48	0.020002	10.28	348.65	55.56	0.62
Canaan	1000	500 yr	3524.30	203.50	213.49	211.13	214.88	0.020021	11.23	417.56	59.26	0.63

HEC-RAS Plan: EX 2 River: Carrabasset Reach: Canaan

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)
Canaan	1262	1.1 yr	222.97	222.78	0.19	0.24	0.01	69.14	181.74	264.52	53.59
Canaan	1262	2 yr	224.61	224.35	0.26	0.22	0.02	143.30	303.45	501.15	59.13
Canaan	1262	5 yr	226.02	225.72	0.31	0.20	0.03	225.10	418.98	741.43	63.83
Canaan	1262	10 yr	226.96	226.62	0.33	0.19	0.03	285.25	497.69	913.96	67.13
Canaan	1262	25 yr	228.18	227.83	0.35	0.16	0.02	366.36	594.93	1139.71	71.94
Canaan	1262	50 yr	229.04	228.68	0.36	0.15	0.02	433.10	666.72	1309.68	75.31
Canaan	1262	100 yr	229.92	229.55	0.37	0.14	0.02	508.27	740.59	1489.65	78.80
Canaan	1262	500 yr	232.15	231.79	0.36	0.10	0.02	722.46	897.38	1904.46	84.92
Canaan	1245	1.1 yr	222.72	222.42	0.31	0.30	0.01	84.71	262.74	167.95	40.26
Canaan	1245	2 yr	224.37	223.90	0.46	0.30	0.01	178.60	469.73	299.57	46.21
Canaan	1245	5 yr	225.79	225.23	0.56	0.28	0.01	286.93	668.17	430.40	53.25
Canaan	1245	10 yr	226.74	226.15	0.59	0.26	0.01	367.33	791.62	537.95	56.77
Canaan	1245	25 yr	227.99	227.40	0.59	0.22	0.01	477.01	939.74	684.26	61.39
Canaan	1245	50 yr	228.86	228.27	0.60	0.20	0.01	561.29	1048.73	799.48	64.53
Canaan	1245	100 yr	229.76	229.16	0.60	0.19	0.01	651.85	1160.50	926.15	67.76
Canaan	1245	500 yr	232.02	231.46	0.56	0.14	0.02	869.19	1386.57	1268.55	70.00
Canaan	1226	1.1 yr	222.41	222.05	0.37	0.21	0.02	71.01	370.90	73.49	39.98
Canaan	1226	2 yr	224.06	223.54	0.52	0.20	0.03	175.67	615.92	156.31	44.97
Canaan	1226	5 yr	225.51	224.89	0.61	0.18	0.03	287.56	842.73	255.21	46.96
Canaan	1226	10 yr	226.48	225.81	0.67	0.17	0.03	369.98	1000.72	326.20	49.06
Canaan	1226	25 yr	227.77	227.07	0.69	0.15	0.03	479.04	1195.15	426.81	51.96
Canaan	1226	50 yr	228.65	227.93	0.72	0.14	0.02	561.58	1340.58	507.34	53.78
Canaan	1226	100 yr	229.56	228.81	0.74	0.14	0.02	648.47	1491.28	598.75	55.45
Canaan	1226	500 yr	231.86	231.11	0.75	0.11	0.01	842.40	1836.95	844.95	57.96
Canaan	1212	1.1 yr	222.19	221.88	0.31	0.35	0.01	53.84	313.78	147.78	44.05
Canaan	1212	2 yr	223.83	223.40	0.43	0.29	0.01	133.29	514.45	300.15	46.02
Canaan	1212	5 yr	225.30	224.77	0.52	0.25	0.00	221.25	708.79	455.46	47.51
Canaan	1212	10 yr	226.28	225.71	0.57	0.23	0.00	287.17	845.05	564.68	48.68
Canaan	1212	25 yr	227.59	226.98	0.61	0.20	0.01	377.65	1018.33	705.02	50.53
Canaan	1212	50 yr	228.48	227.84	0.64	0.18	0.01	447.94	1152.26	809.31	52.21
Canaan	1212	100 yr	229.40	228.73	0.67	0.17	0.02	524.08	1292.93	921.49	54.01
Canaan	1212	500 yr	231.74	231.03	0.70	0.14	0.02	718.69	1629.45	1176.16	61.30
Canaan	1192	1.1 yr	221.83	221.41	0.42	0.38	0.01	64.73	266.95	183.72	42.78
Canaan	1192	2 yr	223.54	223.05	0.49	0.26	0.01	144.56	431.35	371.99	48.40
Canaan	1192	5 yr	225.05	224.52	0.53	0.21	0.01	236.75	584.70	564.05	50.46
Canaan	1192	10 yr	226.05	225.49	0.56	0.19	0.01	307.29	692.99	696.62	51.67
Canaan	1192	25 yr	227.38	226.81	0.57	0.16	0.01	405.57	831.11	864.33	53.31
Canaan	1192	50 yr	228.28	227.69	0.59	0.15	0.02	482.38	938.04	989.08	54.42
Canaan	1192	100 yr	229.21	228.59	0.62	0.14	0.02	563.64	1053.57	1121.29	55.96
Canaan	1192	500 yr	231.57	230.94	0.63	0.11	0.02	777.91	1323.50	1422.89	60.87
Canaan	1177	1.1 yr	221.45	221.06	0.39	0.25	0.07	93.08	241.18	181.14	42.51
Canaan	1177	2 yr	223.26	222.82	0.44	0.19	0.06	187.34	391.87	368.69	47.98
Canaan	1177	5 yr	224.82	224.34	0.49	0.16	0.06	291.25	534.56	559.69	51.03
Canaan	1177	10 yr	225.85	225.33	0.52	0.14	0.06	374.15	640.46	682.29	54.04
Canaan	1177	25 yr	227.21	226.69	0.52	0.12	0.05	483.55	761.95	855.50	56.38
Canaan	1177	50 yr	228.12	227.58	0.54	0.11	0.06	569.44	856.48	983.58	58.10
Canaan	1177	100 yr	229.05	228.50	0.56	0.10	0.05	665.93	956.24	1116.33	59.88
Canaan	1177	500 yr	231.44	230.88	0.56	0.08	0.05	924.48	1184.72	1415.10	64.60
Canaan	1161	1.1 yr	221.13	220.87	0.25	0.24	0.26	98.58	329.60	87.22	47.42
Canaan	1161	2 yr	223.01	222.70	0.31	0.20	0.42	185.50	553.65	208.75	51.18
Canaan	1161	5 yr	224.61	224.24	0.37	0.17	0.55	282.33	773.50	329.67	54.36
Canaan	1161	10 yr	225.64	225.24	0.40	0.16	0.64	357.16	926.33	413.41	56.43
Canaan	1161	25 yr	227.03	226.62	0.41	0.14	0.77	483.13	1100.19	517.68	60.10
Canaan	1161	50 yr	227.95	227.53	0.43	0.13	0.85	576.77	1229.66	603.07	63.07
Canaan	1161	100 yr	228.89	228.45	0.45	0.13	0.93	677.12	1367.22	694.16	64.86
Canaan	1161	500 yr	231.31	230.84	0.47	0.11	1.33	924.68	1685.27	914.35	75.96
Canaan	1124		Bridge								
Canaan	1100	1.1 yr	216.99	216.51	0.48	0.13	0.02	24.72	352.95	137.73	31.87
Canaan	1100	2 yr	218.56	217.65	0.91	0.19	0.03	55.48	633.67	258.76	34.64
Canaan	1100	5 yr	219.87	218.51	1.36	0.24	0.04	92.38	912.31	380.81	36.99

HEC-RAS Plan: EX 2 River: Carrabasset Reach: Canaan (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)
Canaan	1100	10 yr	220.71	219.01	1.69	0.27	0.05	121.65	1108.05	467.21	38.46
Canaan	1100	25 yr	221.73	219.60	2.13	0.30	0.05	162.29	1359.77	578.95	40.44
Canaan	1100	50 yr	222.46	220.00	2.46	0.33	0.04	196.90	1549.15	663.45	41.83
Canaan	1100	100 yr	223.21	220.39	2.82	0.36	0.03	237.33	1748.59	752.58	43.00
Canaan	1100	500 yr	225.20	222.85	2.35	0.29	0.40	451.11	2133.75	939.44	50.08
Canaan	1093	1.1 yr	216.83	216.40	0.44	0.13	0.01	64.86	384.86	65.68	31.07
Canaan	1093	2 yr	218.34	217.50	0.84	0.19	0.02	131.48	672.45	143.97	33.20
Canaan	1093	5 yr	219.59	218.32	1.27	0.24	0.04	202.44	955.55	227.52	34.79
Canaan	1093	10 yr	220.39	218.79	1.60	0.27	0.05	254.43	1154.14	288.32	35.71
Canaan	1093	25 yr	221.38	219.35	2.03	0.31	0.07	323.71	1408.60	368.70	36.80
Canaan	1093	50 yr	222.09	219.72	2.37	0.34	0.08	377.55	1601.37	430.58	37.55
Canaan	1093	100 yr	222.82	220.05	2.77	0.38	0.10	435.31	1806.72	496.47	38.21
Canaan	1093	500 yr	224.51	220.81	3.70	0.46	0.11	577.59	2290.09	656.61	39.85
Canaan	1085	1.1 yr	216.70	216.29	0.41	0.17	0.03	55.84	396.19	63.37	34.06
Canaan	1085	2 yr	218.13	217.36	0.77	0.24	0.06	111.83	689.96	146.11	36.76
Canaan	1085	5 yr	219.31	218.17	1.15	0.29	0.09	170.94	978.79	235.77	38.79
Canaan	1085	10 yr	220.07	218.64	1.43	0.33	0.12	214.06	1181.43	301.40	39.99
Canaan	1085	25 yr	220.99	219.20	1.80	0.36	0.17	271.39	1440.79	388.82	41.40
Canaan	1085	50 yr	221.66	219.57	2.09	0.38	0.21	315.90	1637.21	456.40	42.33
Canaan	1085	100 yr	222.34	219.91	2.42	0.41	0.25	363.60	1846.58	528.32	43.13
Canaan	1085	500 yr	223.88	220.54	3.34	0.47	0.41	478.36	2346.17	699.77	44.48
Canaan	1072	1.1 yr	216.49	216.19	0.30	0.33	0.03	35.09	352.62	127.69	40.00
Canaan	1072	2 yr	217.83	217.26	0.57	0.39	0.02	71.64	619.16	257.10	42.48
Canaan	1072	5 yr	218.93	218.09	0.83	0.42	0.01	110.51	880.71	394.28	44.51
Canaan	1072	10 yr	219.62	218.60	1.02	0.44	0.00	138.94	1063.02	494.93	45.75
Canaan	1072	25 yr	220.46	219.22	1.24	0.46	0.02	176.65	1293.99	630.37	47.27
Canaan	1072	50 yr	221.07	219.67	1.40	0.47	0.04	203.10	1467.89	738.51	48.63
Canaan	1072	100 yr	221.67	220.10	1.58	0.48	0.05	232.98	1650.59	854.93	49.95
Canaan	1072	500 yr	222.99	221.02	1.97	0.50	0.09	310.57	2077.31	1136.43	52.85
Canaan	1057	1.1 yr	216.13	215.55	0.59			37.21	336.99	141.20	46.95
Canaan	1057	2 yr	217.42	216.66	0.76			83.51	553.15	311.24	50.46
Canaan	1057	5 yr	218.50	217.58	0.92			136.26	761.48	487.75	52.06
Canaan	1057	10 yr	219.18	218.14	1.03			175.44	908.35	613.10	53.17
Canaan	1057	25 yr	219.99	218.81	1.18			227.57	1097.21	776.22	54.60
Canaan	1057	50 yr	220.57	219.29	1.28			268.22	1240.56	900.71	55.80
Canaan	1057	100 yr	221.14	219.75	1.39			312.82	1392.16	1033.53	56.98
Canaan	1057	500 yr	222.40	220.74	1.66			425.01	1751.52	1347.77	59.76
Canaan	1048		Inl Struct								
Canaan	1037	1.1 yr	208.19	207.93	0.26	0.06	0.03	197.93	291.53	25.94	45.00
Canaan	1037	2 yr	209.76	209.36	0.40	0.07	0.04	378.06	489.84	80.00	49.76
Canaan	1037	5 yr	211.03	210.51	0.51	0.07	0.05	561.37	677.93	146.20	54.02
Canaan	1037	10 yr	211.82	211.23	0.58	0.07	0.05	690.52	805.52	200.86	56.38
Canaan	1037	25 yr	212.75	212.08	0.67	0.07	0.06	856.63	965.70	278.68	59.17
Canaan	1037	50 yr	213.40	212.68	0.72	0.07	0.06	981.53	1082.84	345.13	60.51
Canaan	1037	100 yr	214.05	213.27	0.78	0.07	0.07	1114.71	1206.28	417.51	61.80
Canaan	1037	500 yr	215.47	214.56	0.91	0.07	0.08	1430.68	1496.44	597.17	64.89
Canaan	1030	1.1 yr	208.11	207.93	0.18	0.10	0.01	138.48	361.92	15.00	51.67
Canaan	1030	2 yr	209.65	209.38	0.28	0.10	0.01	290.05	618.07	39.78	59.19
Canaan	1030	5 yr	210.91	210.55	0.36	0.10	0.01	461.48	852.49	71.53	63.58
Canaan	1030	10 yr	211.69	211.29	0.40	0.10	0.01	586.45	1011.01	99.43	65.68
Canaan	1030	25 yr	212.62	212.16	0.46	0.10	0.01	750.30	1210.96	139.74	67.91
Canaan	1030	50 yr	213.27	212.76	0.50	0.09	0.00	876.24	1360.38	172.89	69.34
Canaan	1030	100 yr	213.91	213.36	0.55	0.09	0.00	1011.05	1517.84	209.61	70.65
Canaan	1030	500 yr	215.32	214.67	0.65	0.09	0.00	1336.76	1886.05	301.48	73.51
Canaan	1020	1.1 yr	207.99	207.68	0.31	0.34	0.01	142.65	349.57	23.18	51.60
Canaan	1020	2 yr	209.54	209.15	0.39	0.32	0.02	305.67	560.13	82.10	60.71
Canaan	1020	5 yr	210.80	210.36	0.44	0.30	0.03	497.43	740.98	147.09	65.41
Canaan	1020	10 yr	211.59	211.11	0.48	0.29	0.04	640.86	861.25	194.80	67.40
Canaan	1020	25 yr	212.52	212.00	0.52	0.28	0.05	829.54	1012.47	258.99	69.33
Canaan	1020	50 yr	213.17	212.62	0.55	0.28	0.05	973.32	1126.39	309.79	70.68

HEC-RAS Plan: EX 2 River: Carrabasset Reach: Canaan (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)
Canaan	1020	100 yr	213.81	213.22	0.59	0.28	0.06	1125.98	1247.25	365.26	72.00
Canaan	1020	500 yr	215.22	214.55	0.68	0.27	0.07	1491.60	1531.67	501.03	75.24
Canaan	1000	1.1 yr	207.65	207.24	0.40			111.86	360.05	43.49	39.47
Canaan	1000	2 yr	209.20	208.60	0.60			226.01	622.52	99.37	43.61
Canaan	1000	5 yr	210.47	209.69	0.77			346.12	875.37	164.01	47.13
Canaan	1000	10 yr	211.26	210.37	0.88			433.46	1049.33	214.11	49.31
Canaan	1000	25 yr	212.18	211.18	1.01			549.06	1269.56	282.37	52.07
Canaan	1000	50 yr	212.84	211.74	1.10			638.55	1433.62	337.34	54.08
Canaan	1000	100 yr	213.48	212.29	1.19			733.36	1602.27	402.87	55.56
Canaan	1000	500 yr	214.88	213.49	1.39			968.49	1997.40	558.40	59.26

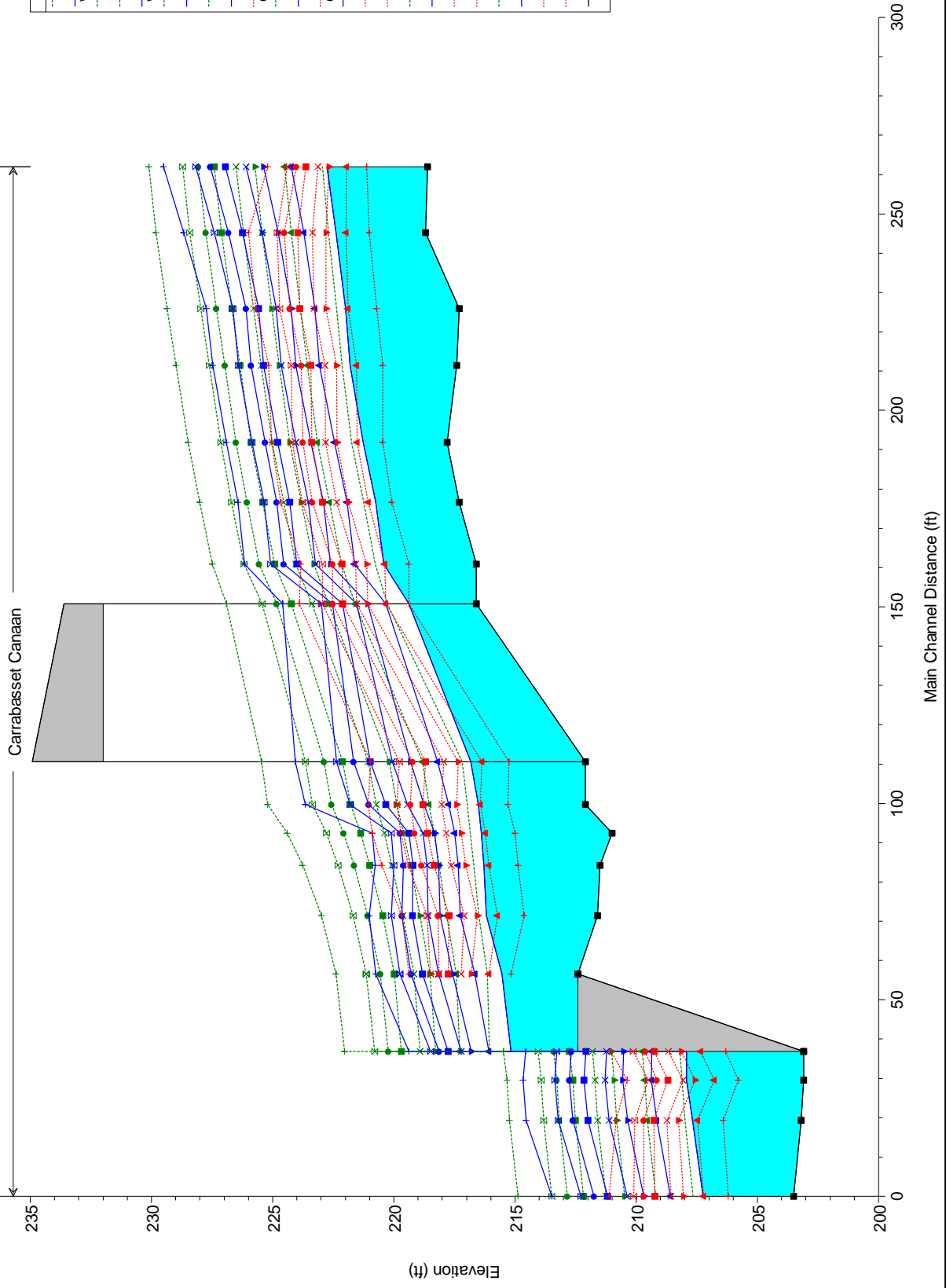
Plan: EX 2 Carrabasset Canaan RS: 1161 Profile: 50 yr

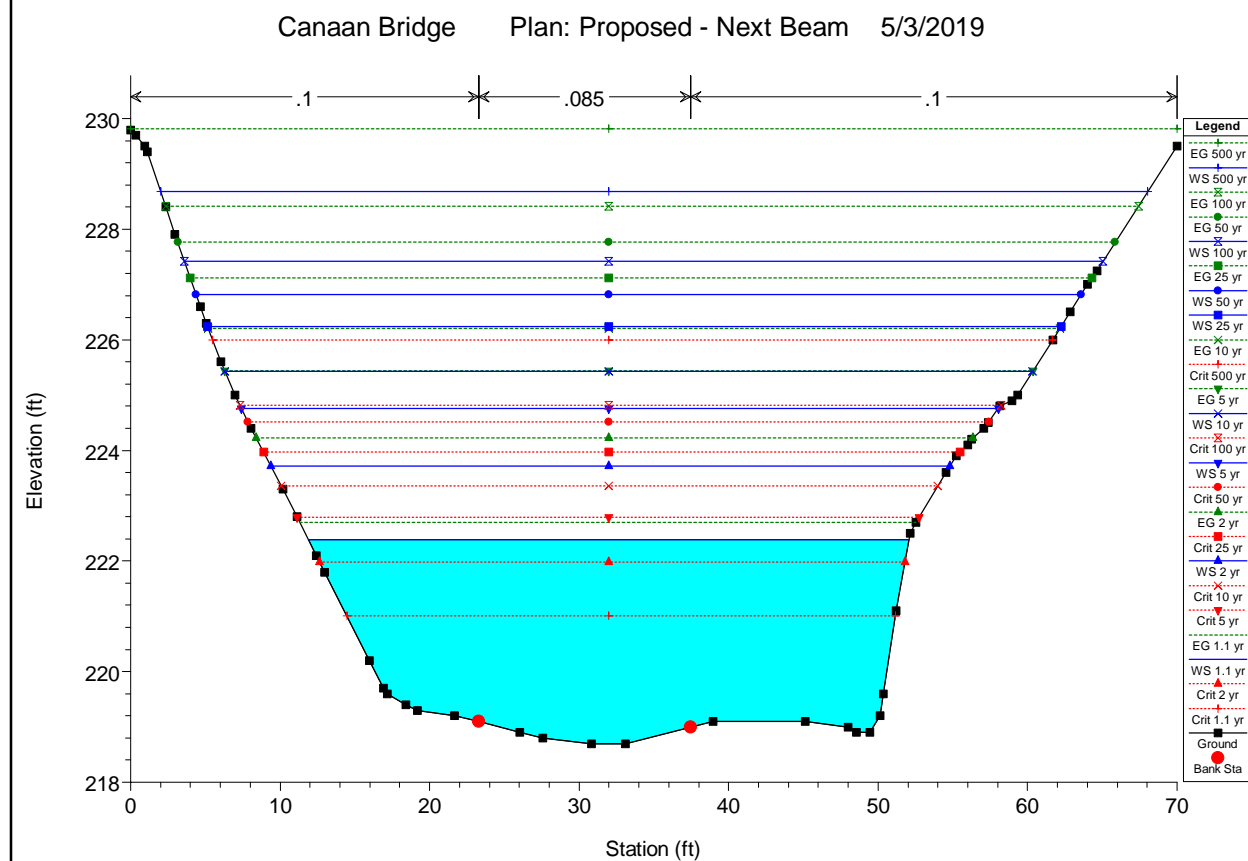
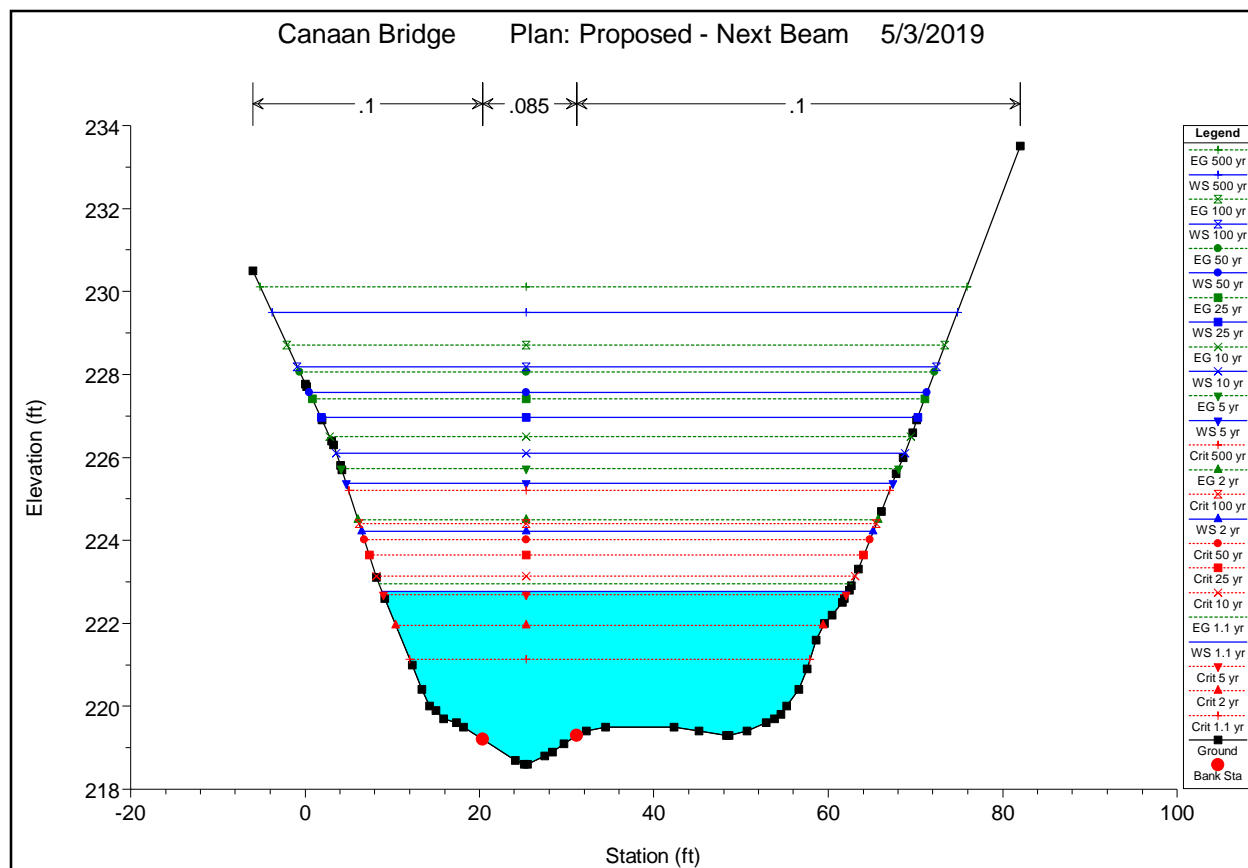
E.G. Elev (ft)	227.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.100	0.085	0.100
W.S. Elev (ft)	227.53	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	222.54	Flow Area (sq ft)	145.95	196.31	153.91
E.G. Slope (ft/ft)	0.005624	Area (sq ft)	150.25	196.31	155.74
Q Total (cfs)	2409.50	Flow (cfs)	576.77	1229.66	603.07
Top Width (ft)	63.07	Top Width (ft)	23.57	18.73	20.77
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	3.95	6.26	3.92
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)	7.43	10.48	8.32
Conv. Total (cfs)	32129.0	Conv. (cfs)	7690.8	16396.7	8041.5
Length Wtd. (ft)	10.00	Wetted Per. (ft)	21.86	18.80	23.34
Min Ch El (ft)	216.60	Shear (lb/sq ft)	2.34	3.67	2.32
Alpha	1.17	Stream Power (lb/ft s)	9.27	22.97	9.07
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.26	0.62	0.18
C & E Loss (ft)	0.85	Cum SA (acres)	0.06	0.07	0.05

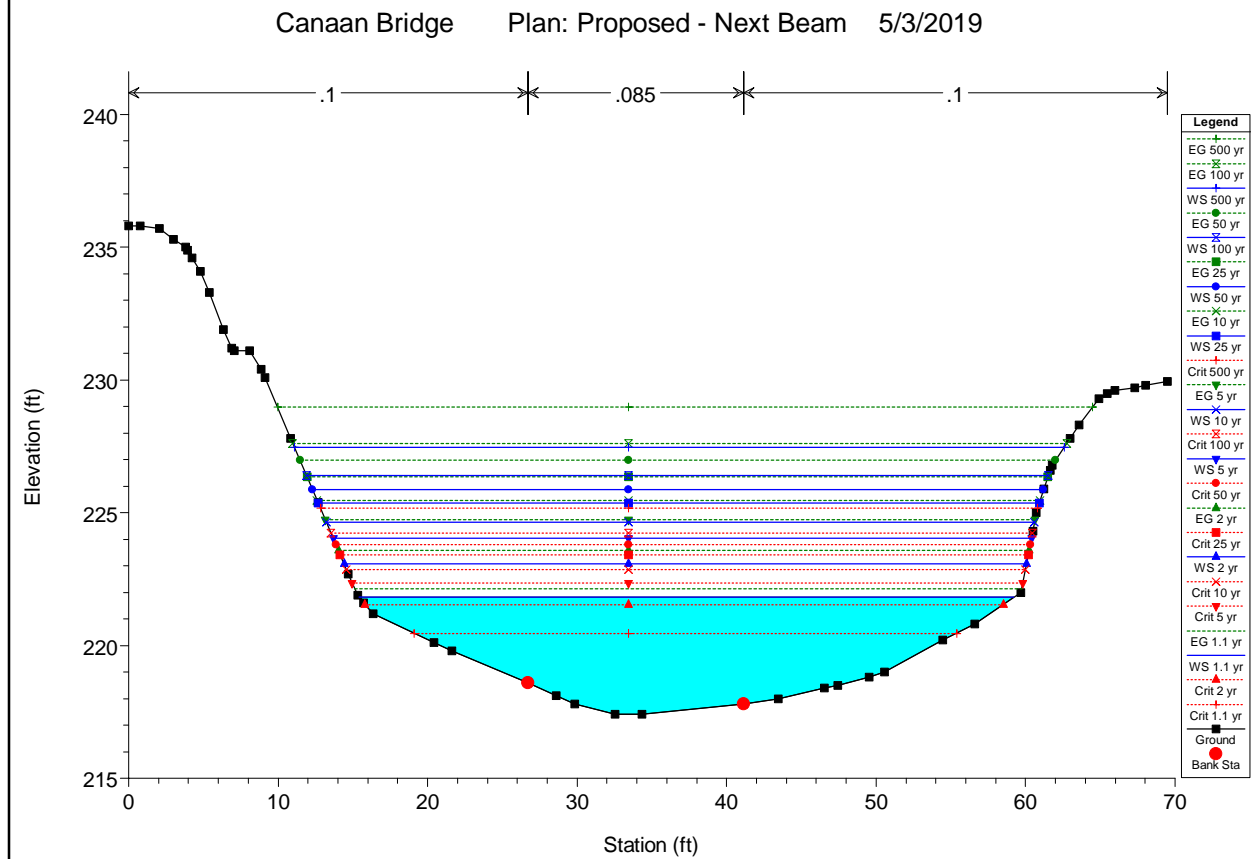
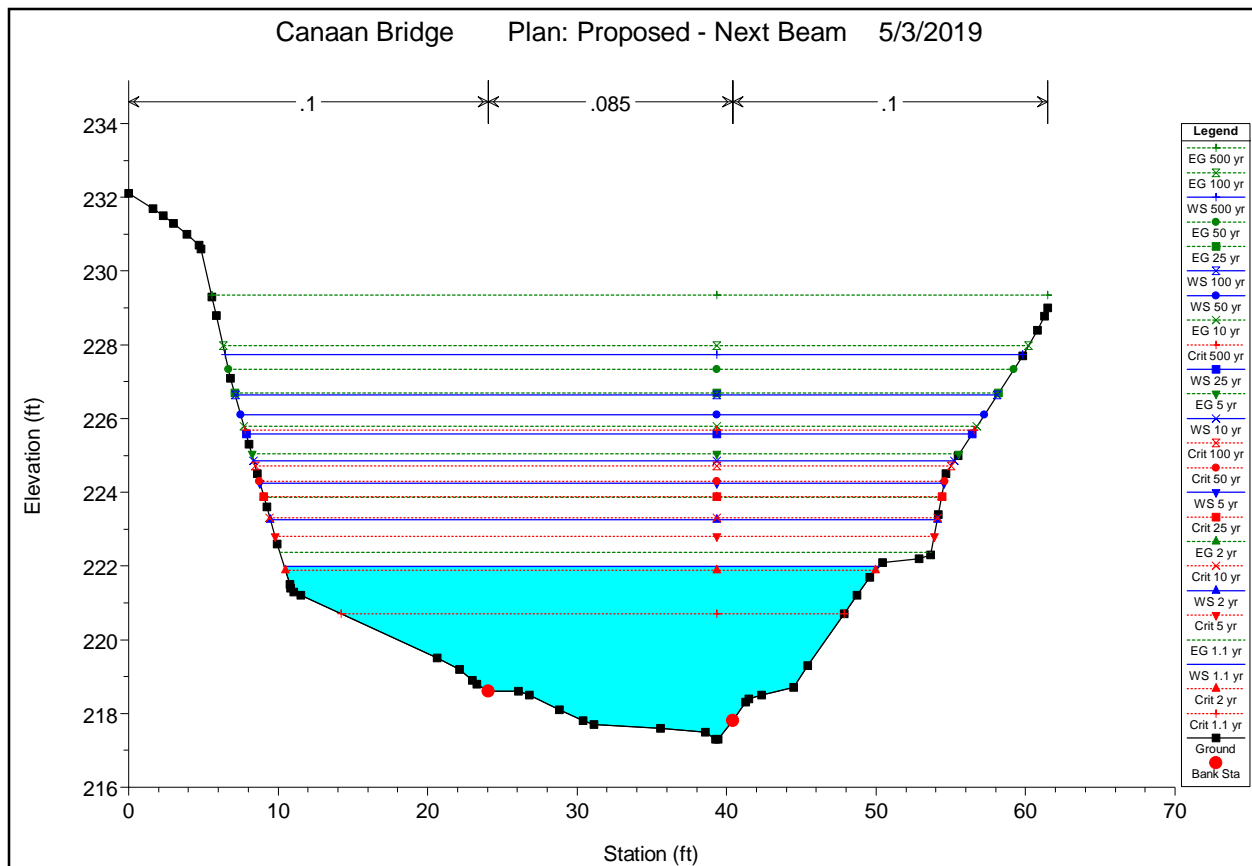
Plan: EX 2 Carrabasset Canaan RS: 1161 Profile: 100 yr

E.G. Elev (ft)	228.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.100	0.085	0.100
W.S. Elev (ft)	228.45	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	222.94	Flow Area (sq ft)	164.05	213.57	170.95
E.G. Slope (ft/ft)	0.005250	Area (sq ft)	172.70	213.57	174.96
Q Total (cfs)	2738.50	Flow (cfs)	677.12	1367.22	694.16
Top Width (ft)	64.86	Top Width (ft)	25.16	18.73	20.97
Vel Total (ft/s)	4.99	Avg. Vel. (ft/s)	4.13	6.40	4.06
Max Chl Dpth (ft)	11.85	Hydr. Depth (ft)	8.35	11.40	9.24
Conv. Total (cfs)	37793.3	Conv. (cfs)	9344.7	18868.6	9579.9
Length Wtd. (ft)	10.00	Wetted Per. (ft)	21.86	18.80	23.34
Min Ch El (ft)	216.60	Shear (lb/sq ft)	2.46	3.72	2.40
Alpha	1.16	Stream Power (lb/ft s)	10.16	23.84	9.75
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.29	0.66	0.20
C & E Loss (ft)	0.93	Cum SA (acres)	0.06	0.07	0.05

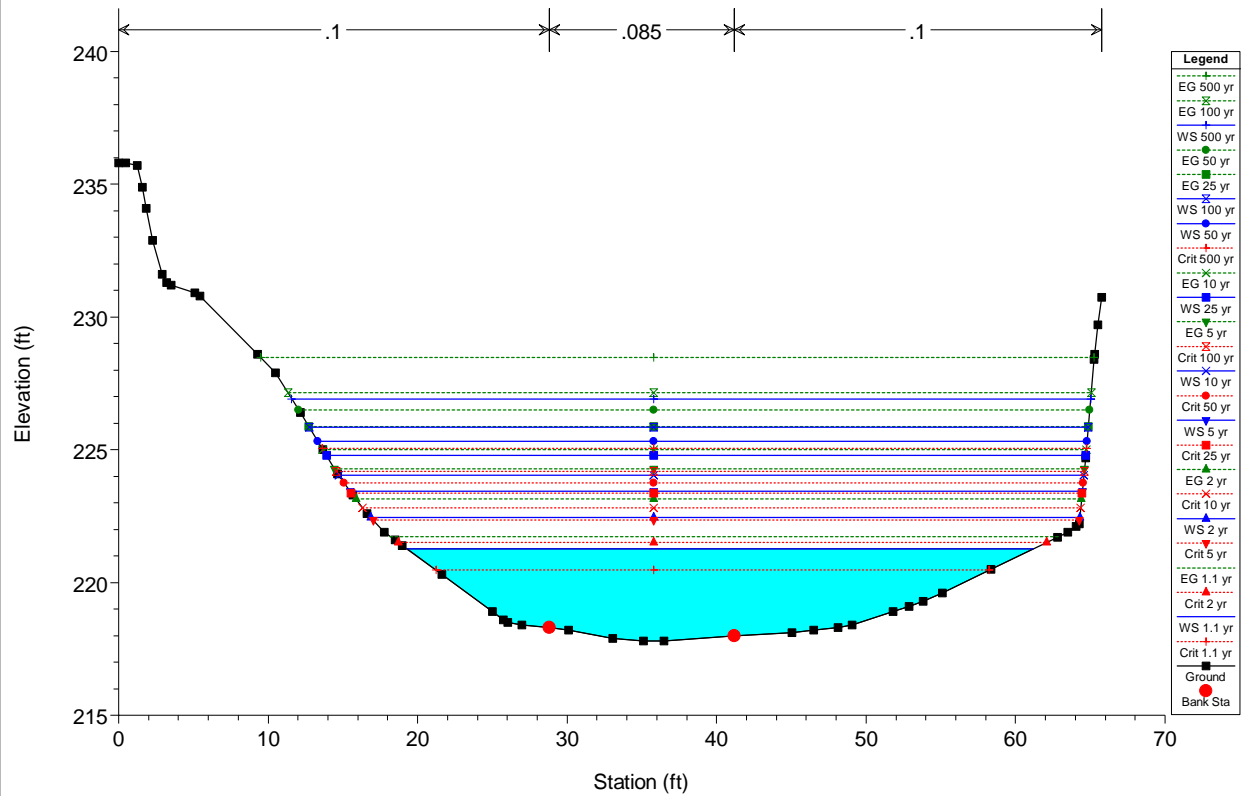
Canaan Bridge Plan: Proposed - Next Beam 5/3/2019



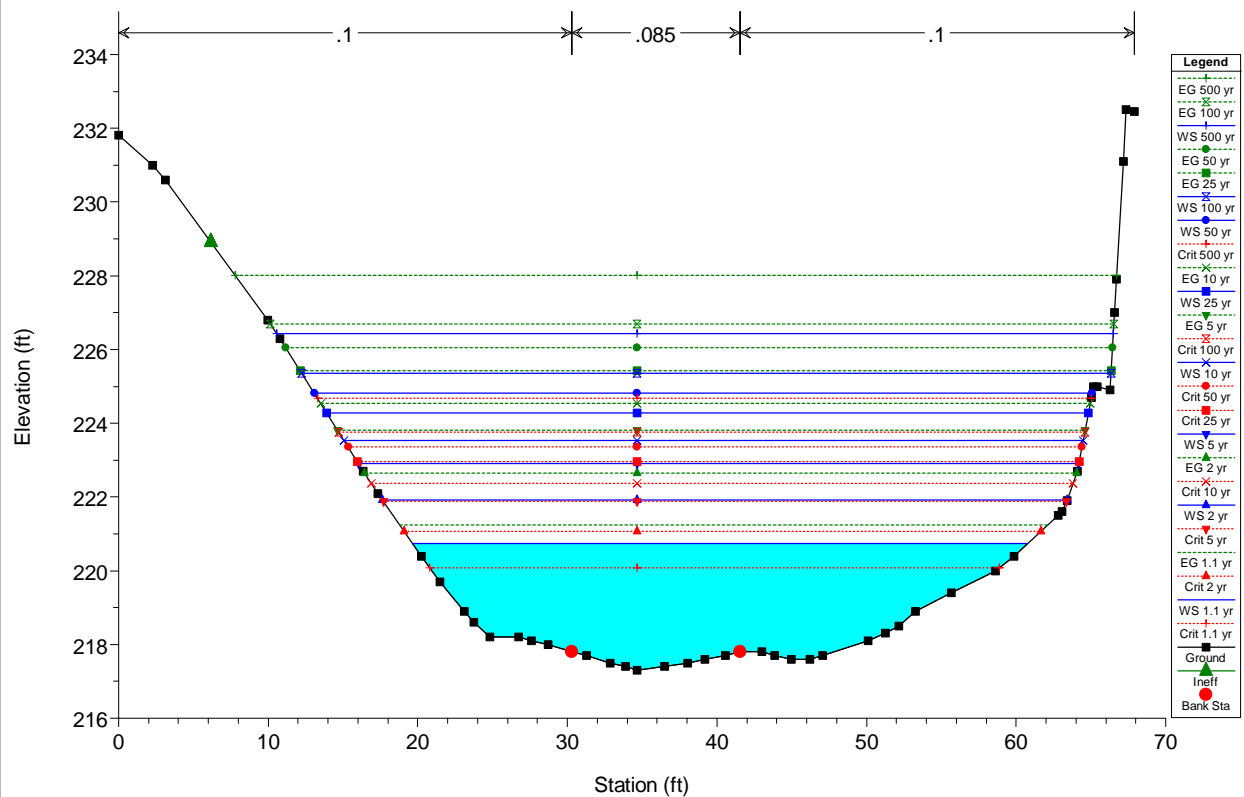




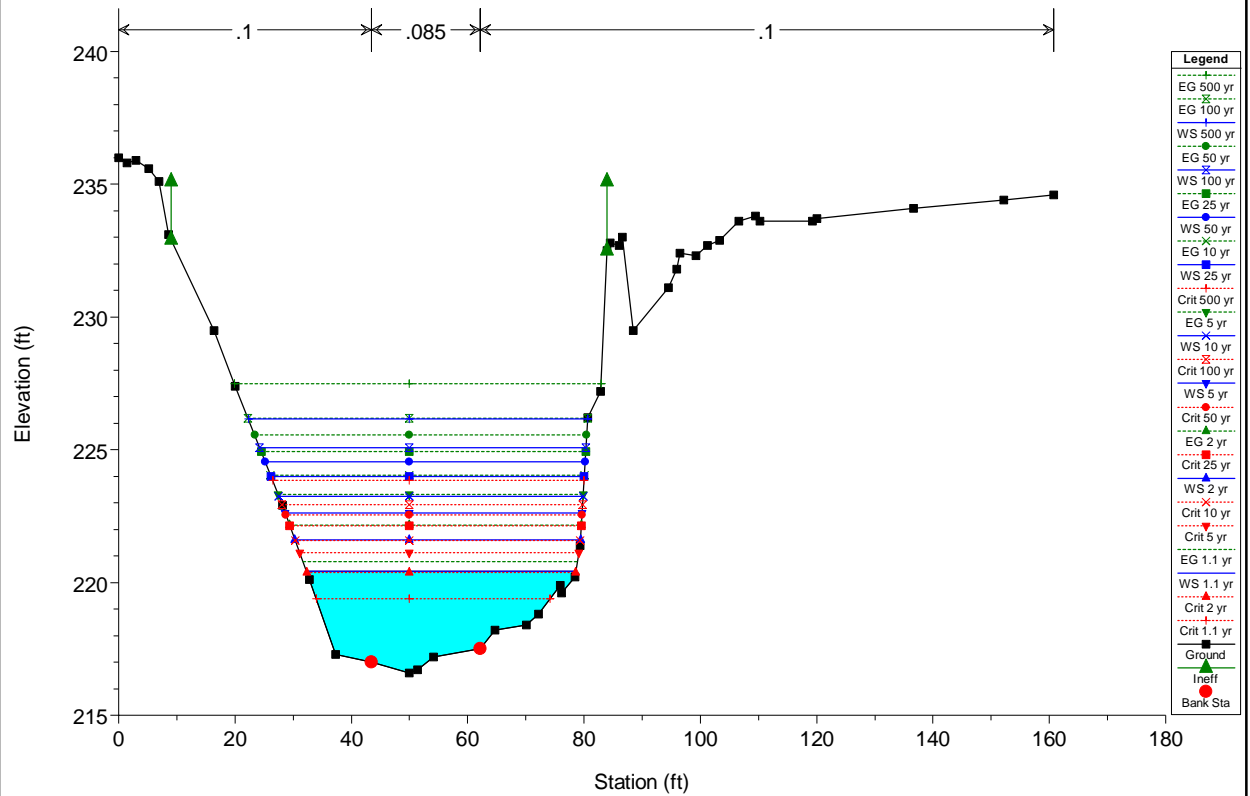
Canaan Bridge Plan: Proposed - Next Beam 5/3/2019



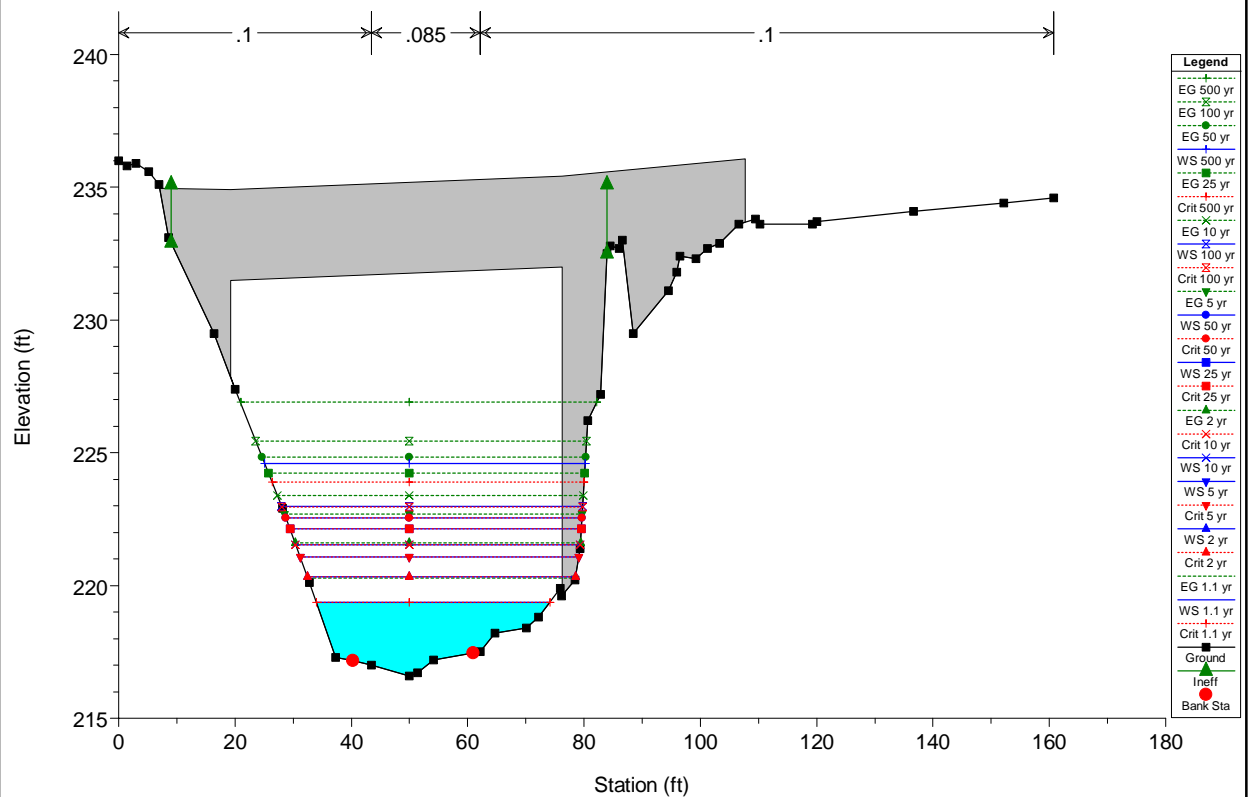
Canaan Bridge Plan: Proposed - Next Beam 5/3/2019



Canaan Bridge Plan: Proposed - Next Beam 5/3/2019

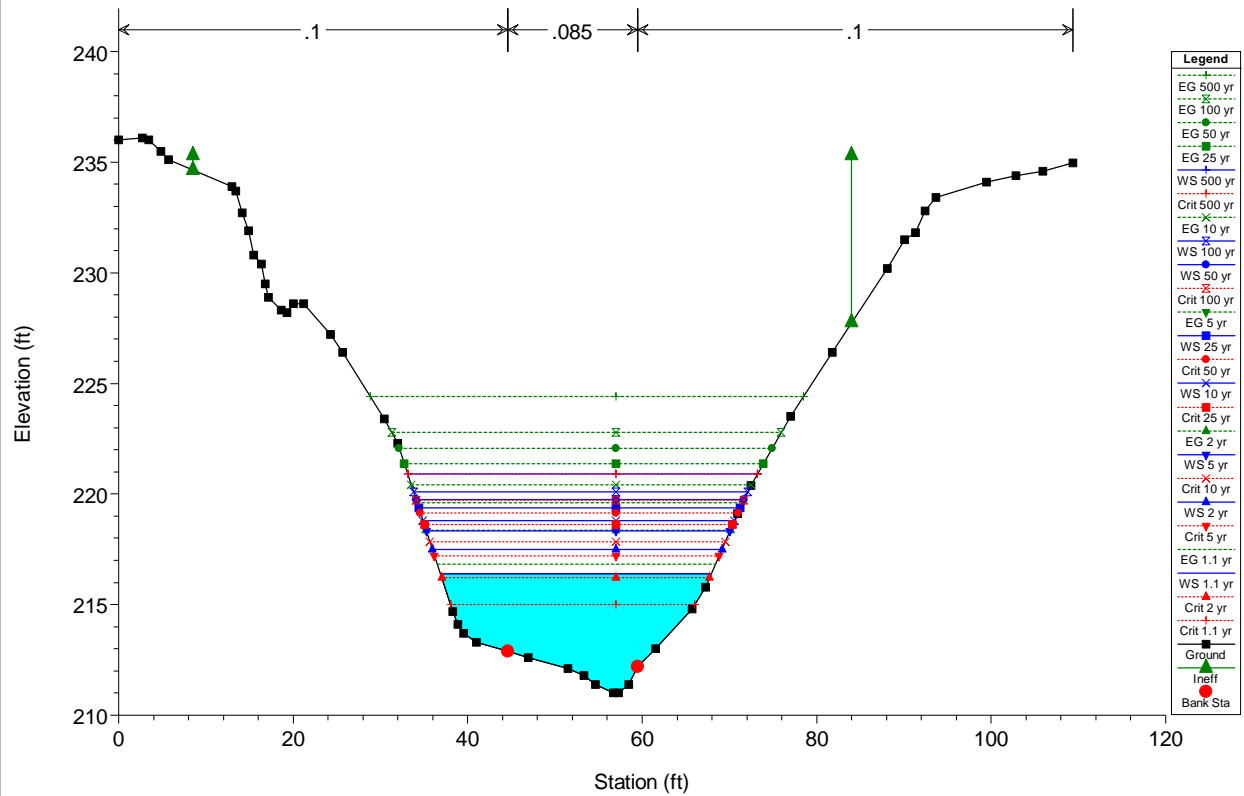


Canaan Bridge Plan: Proposed - Next Beam 5/3/2019

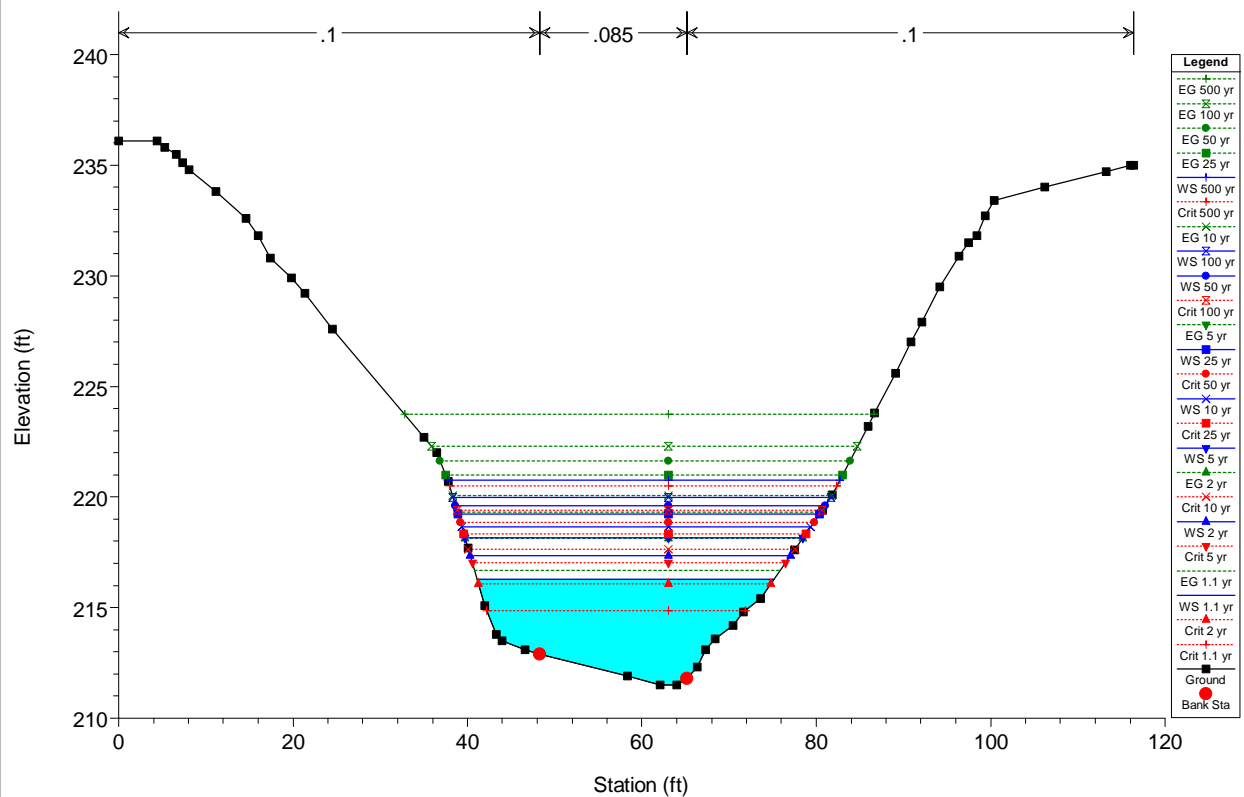


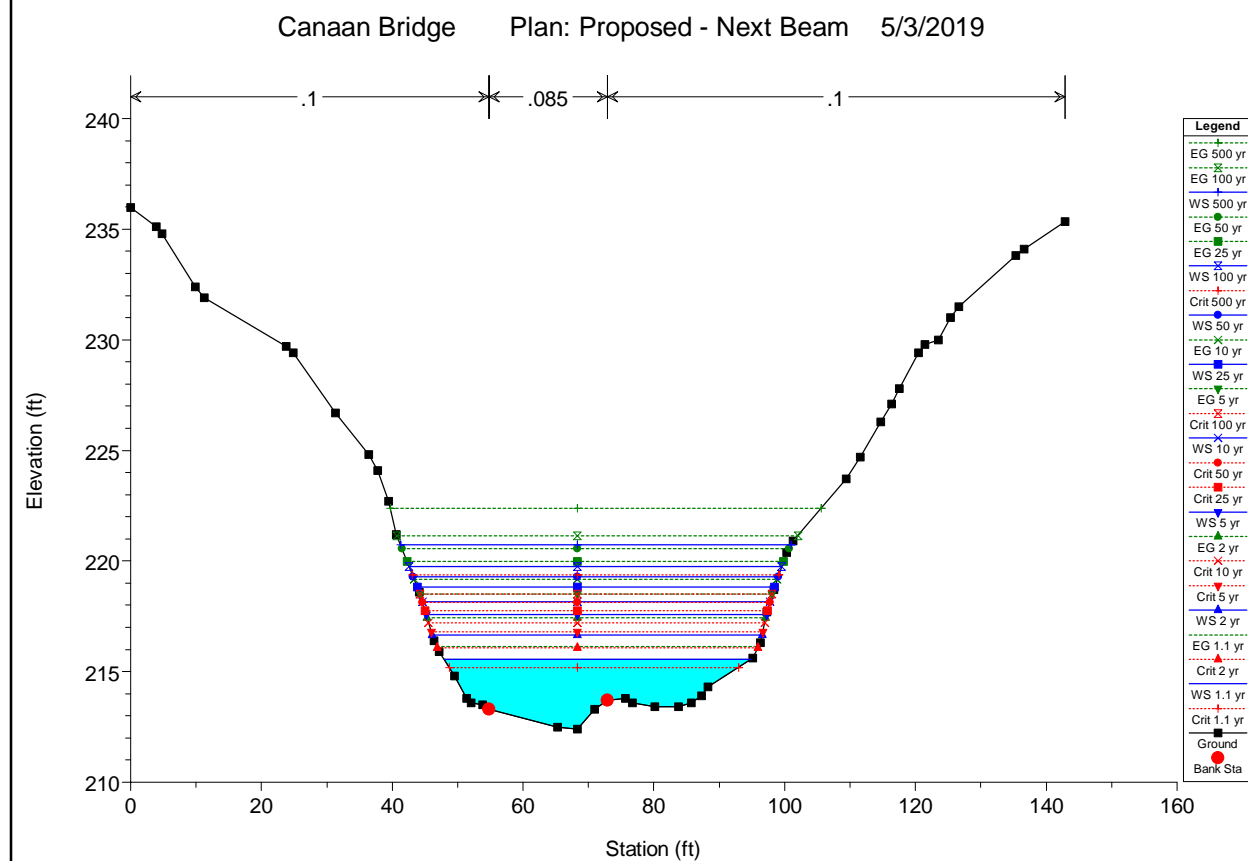
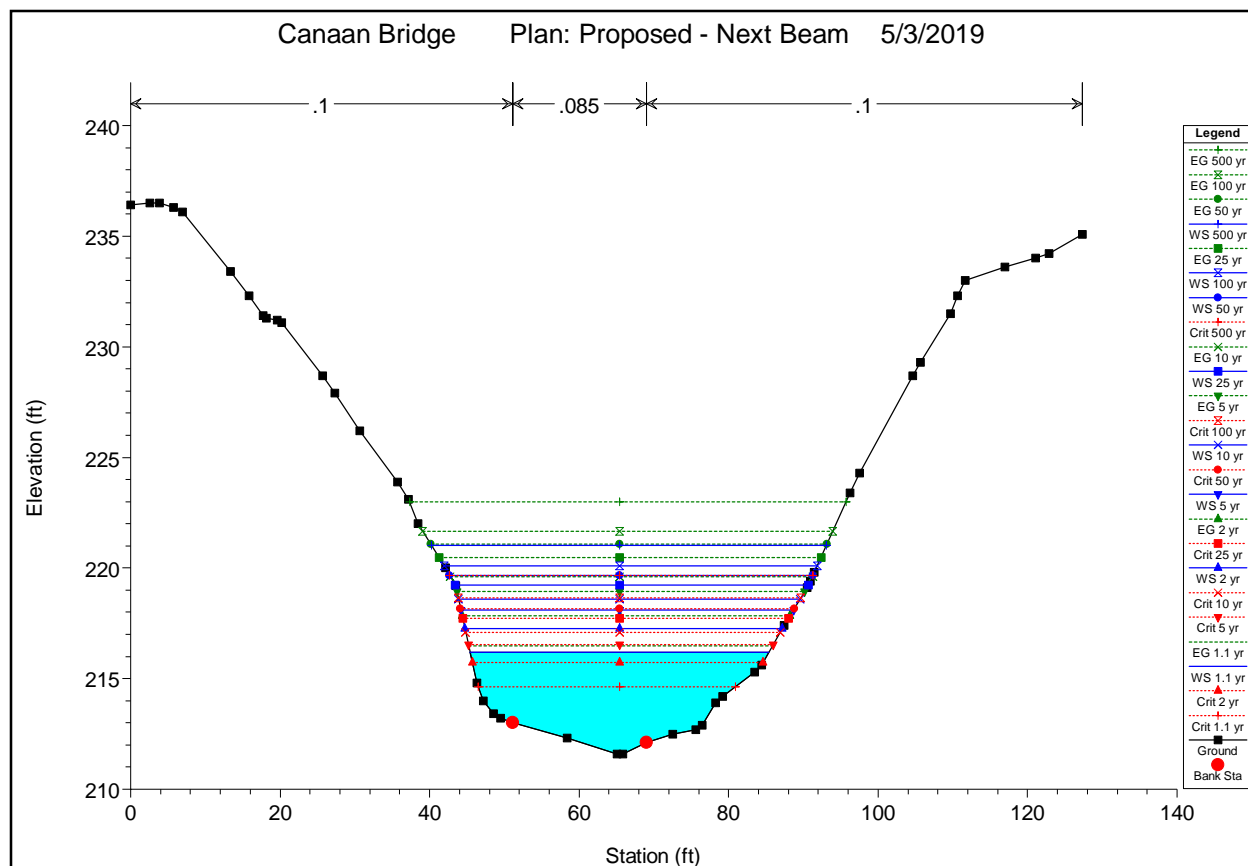


Canaan Bridge Plan: Proposed - Next Beam 5/3/2019

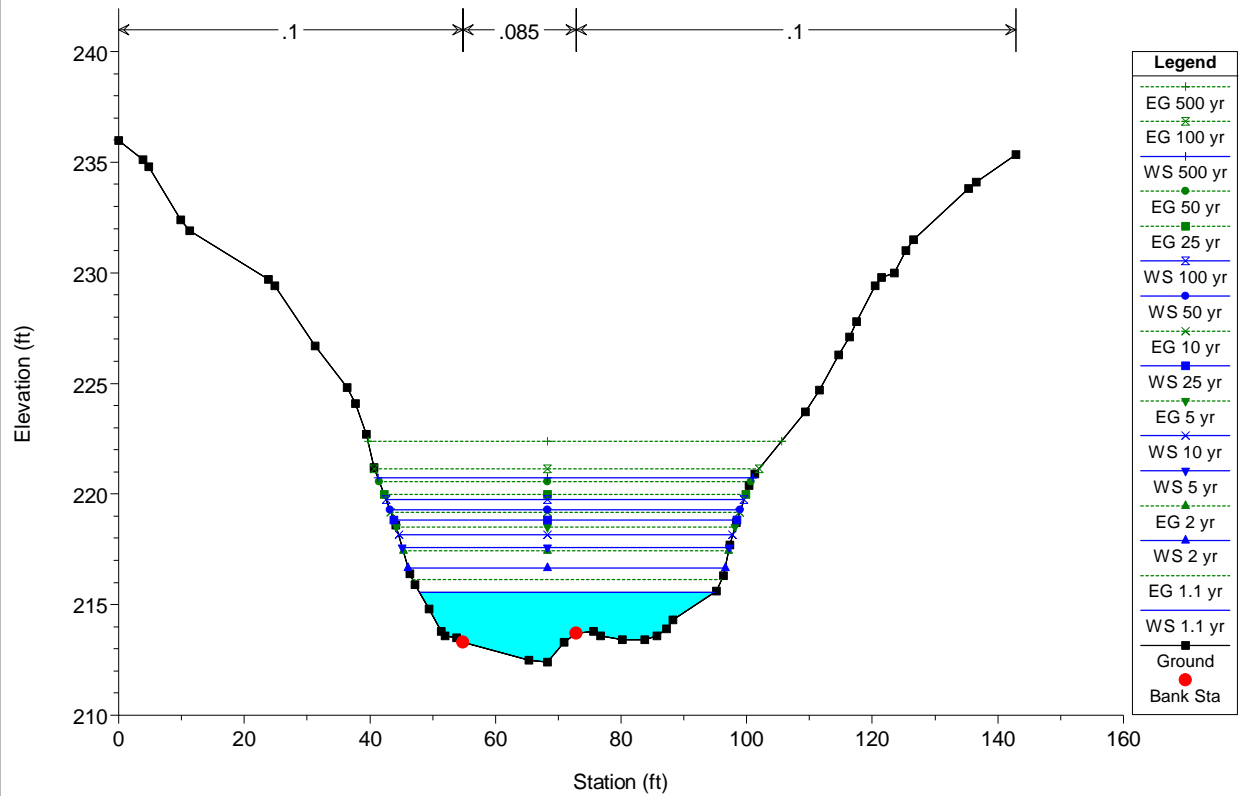


Canaan Bridge Plan: Proposed - Next Beam 5/3/2019

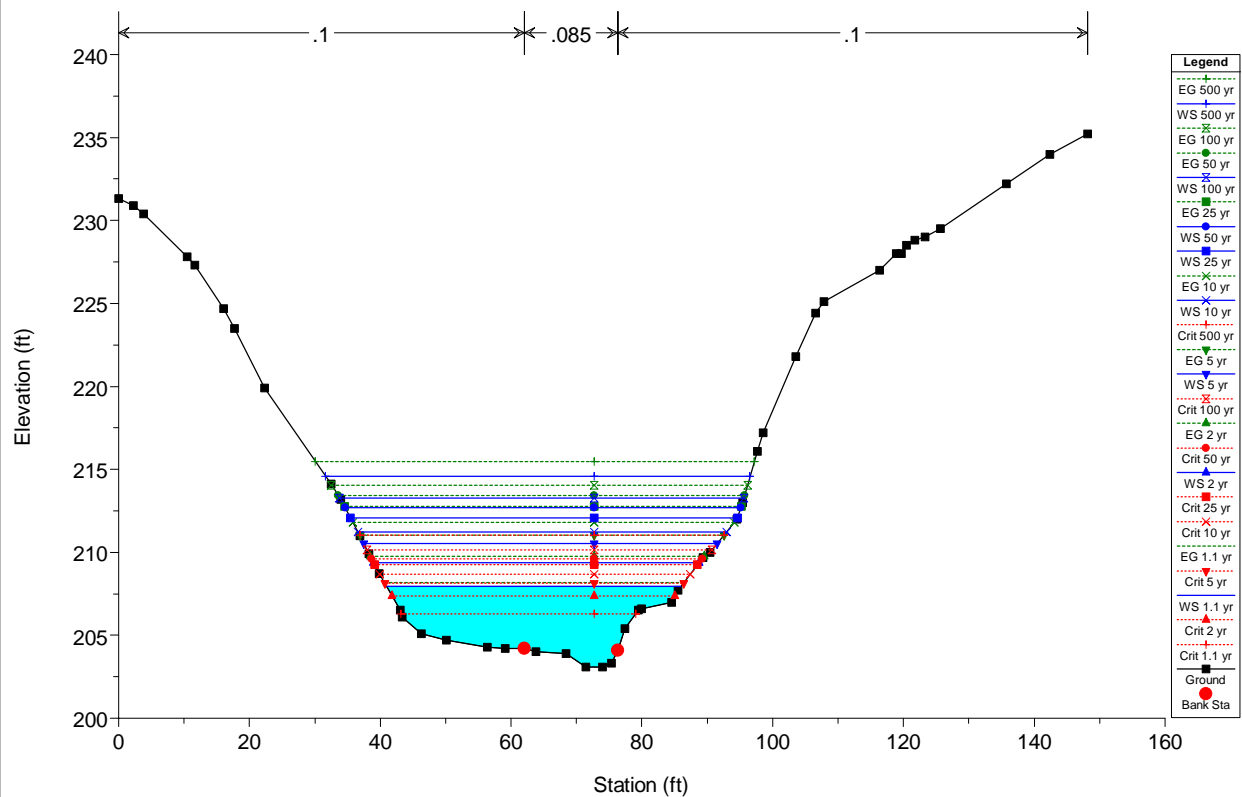


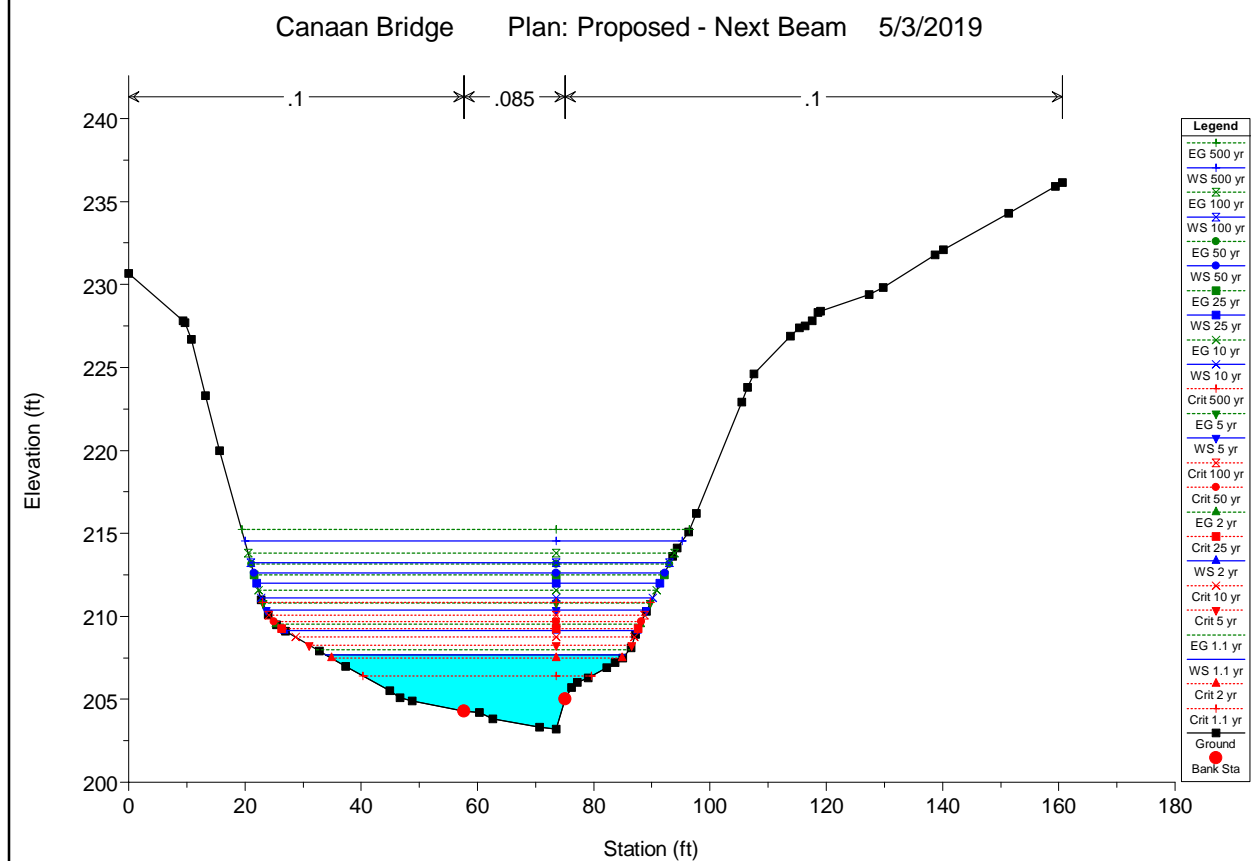
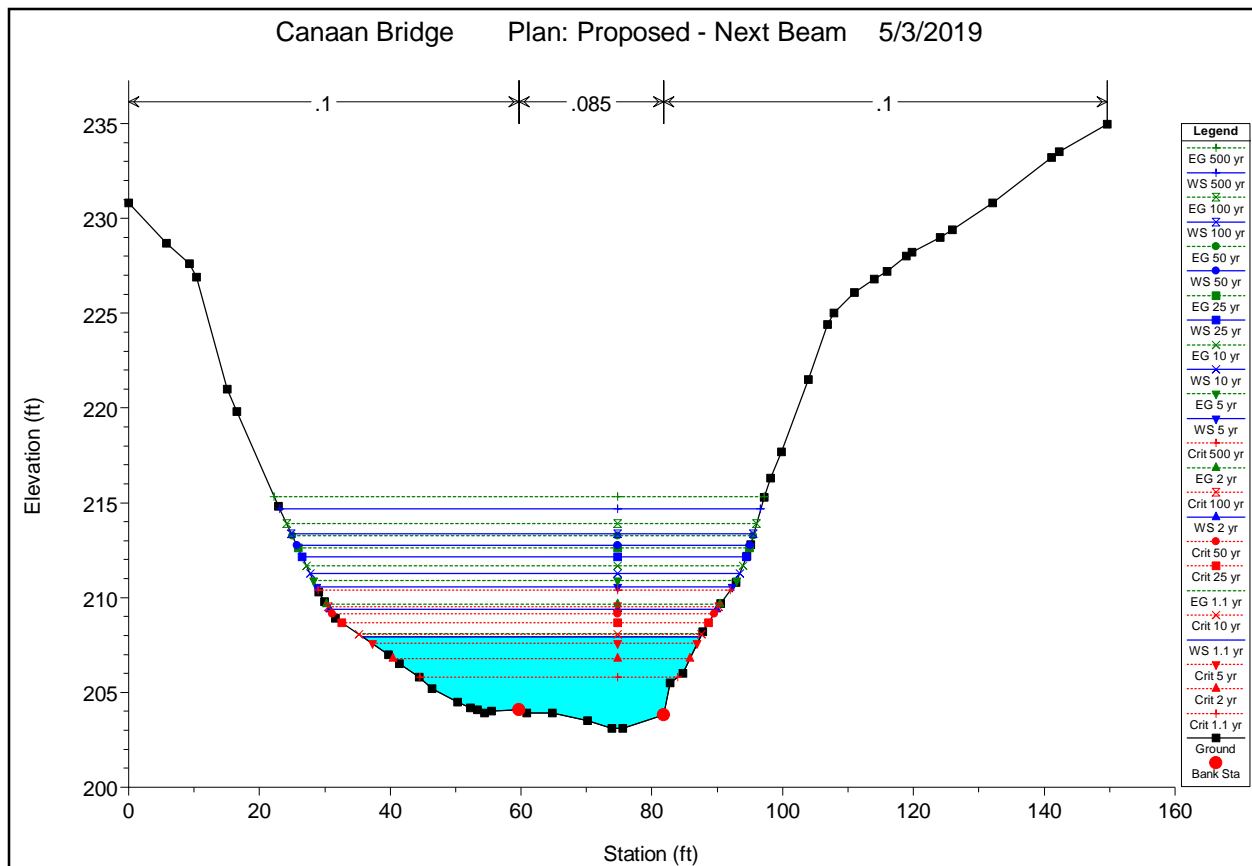


Canaan Bridge Plan: Proposed - Next Beam 5/3/2019

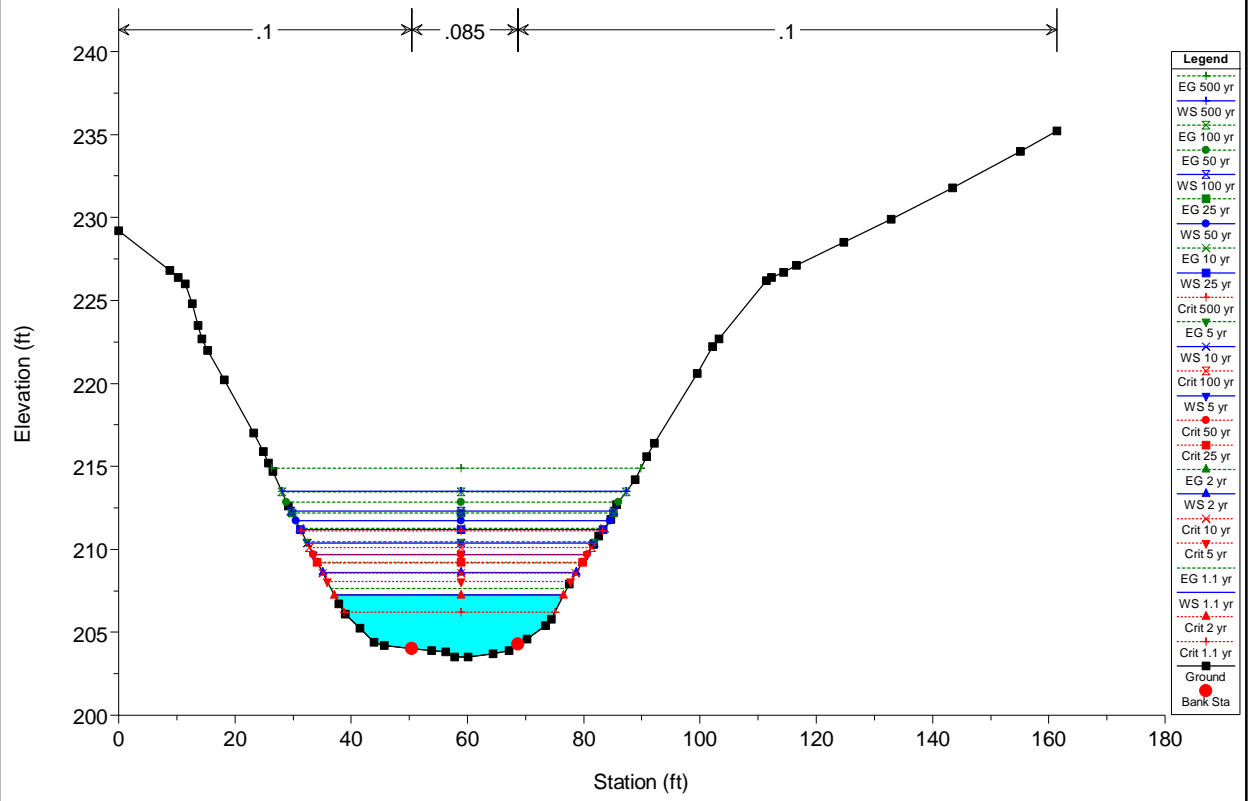


Canaan Bridge Plan: Proposed - Next Beam 5/3/2019





# Canaan Bridge Plan: Proposed - Next Beam 5/3/2019



HEC-RAS Plan: Prop - NB River: Carrabasset Reach: Canaan

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
Canaan	1262	1.1 yr	515.40	218.60	222.76	221.12	222.95	0.010361	4.36	157.10	53.48	0.39
Canaan	1262	2 yr	947.90	218.60	224.22	221.94	224.50	0.010029	5.31	239.10	58.68	0.41
Canaan	1262	5 yr	1385.50	218.60	225.38	222.69	225.73	0.010050	6.06	309.33	62.67	0.42
Canaan	1262	10 yr	1696.90	218.60	226.11	223.14	226.50	0.010043	6.51	355.73	65.21	0.43
Canaan	1262	25 yr	2101.00	218.60	226.96	223.64	227.42	0.010036	7.01	412.77	68.40	0.44
Canaan	1262	50 yr	2409.50	218.60	227.56	224.03	228.06	0.010023	7.35	454.85	70.85	0.44
Canaan	1262	100 yr	2738.50	218.60	228.18	224.40	228.71	0.009962	7.67	499.11	73.33	0.44
Canaan	1262	500 yr	3524.30	218.60	229.49	225.20	230.11	0.009895	8.35	598.92	78.58	0.45
Canaan	1245	1.1 yr	515.40	218.70	222.39	221.01	222.70	0.016428	5.21	121.91	40.17	0.49
Canaan	1245	2 yr	947.90	218.70	223.72	221.98	224.23	0.018262	6.80	178.85	45.43	0.54
Canaan	1245	5 yr	1385.50	218.70	224.76	222.79	225.44	0.019656	8.02	228.97	50.65	0.58
Canaan	1245	10 yr	1696.90	218.70	225.43	223.36	226.21	0.019913	8.67	264.18	54.03	0.60
Canaan	1245	25 yr	2101.00	218.70	226.24	223.97	227.12	0.019572	9.29	309.25	57.10	0.60
Canaan	1245	50 yr	2409.50	218.70	226.82	224.52	227.76	0.019247	9.68	342.94	59.23	0.60
Canaan	1245	100 yr	2738.50	218.70	227.41	224.81	228.41	0.018838	10.05	378.72	61.43	0.60
Canaan	1245	500 yr	3524.30	218.70	228.68	226.00	229.81	0.018247	10.84	459.20	66.02	0.61
Canaan	1226	1.1 yr	515.40	217.30	221.99	220.70	222.37	0.015559	5.54	116.30	39.82	0.48
Canaan	1226	2 yr	947.90	217.30	223.25	221.88	223.86	0.018108	7.15	171.07	44.64	0.54
Canaan	1226	5 yr	1385.50	217.30	224.24	222.81	225.04	0.019615	8.33	215.80	45.77	0.58
Canaan	1226	10 yr	1696.90	217.30	224.86	223.30	225.79	0.020525	9.06	244.32	46.88	0.60
Canaan	1226	25 yr	2101.00	217.30	225.59	223.87	226.69	0.021480	9.90	279.14	48.54	0.63
Canaan	1226	50 yr	2409.50	217.30	226.11	224.30	227.33	0.022029	10.47	304.57	49.73	0.64
Canaan	1226	100 yr	2738.50	217.30	226.63	224.72	227.97	0.022427	11.01	331.18	50.95	0.66
Canaan	1226	500 yr	3524.30	217.30	227.73	225.68	229.35	0.023671	12.24	388.29	53.38	0.69
Canaan	1212	1.1 yr	515.40	217.40	221.81	220.46	222.14	0.014276	5.32	125.40	43.79	0.46
Canaan	1212	2 yr	947.90	217.40	223.07	221.54	223.58	0.016226	6.78	181.74	45.65	0.52
Canaan	1212	5 yr	1385.50	217.40	224.04	222.36	224.73	0.017967	7.97	226.68	46.72	0.56
Canaan	1212	10 yr	1696.90	217.40	224.65	222.85	225.47	0.018911	8.69	255.41	47.38	0.58
Canaan	1212	25 yr	2101.00	217.40	225.37	223.42	226.35	0.019928	9.53	289.95	48.24	0.61
Canaan	1212	50 yr	2409.50	217.40	225.88	223.81	226.98	0.020581	10.11	314.81	48.91	0.62
Canaan	1212	100 yr	2738.50	217.40	226.41	224.24	227.61	0.021122	10.68	340.54	49.62	0.64
Canaan	1212	500 yr	3524.30	217.40	227.47	225.17	228.97	0.022957	12.02	394.19	51.49	0.68
Canaan	1192	1.1 yr	515.40	217.80	221.26	220.46	221.74	0.028985	6.60	101.72	41.87	0.64
Canaan	1192	2 yr	947.90	217.80	222.46	221.51	223.15	0.028911	8.10	155.79	47.43	0.67
Canaan	1192	5 yr	1385.50	217.80	223.43	222.35	224.28	0.028118	9.09	202.58	48.97	0.69
Canaan	1192	10 yr	1696.90	217.80	224.05	222.82	225.01	0.027717	9.70	233.10	49.85	0.69
Canaan	1192	25 yr	2101.00	217.80	224.78	223.37	225.88	0.027314	10.39	270.27	50.80	0.70
Canaan	1192	50 yr	2409.50	217.80	225.32	223.76	226.51	0.027024	10.86	297.41	51.46	0.71
Canaan	1192	100 yr	2738.50	217.80	225.86	224.18	227.14	0.026742	11.33	325.39	52.12	0.71
Canaan	1192	500 yr	3524.30	217.80	226.92	225.04	228.48	0.027754	12.55	381.33	53.45	0.74
Canaan	1177	1.1 yr	515.40	217.30	220.74	220.08	221.24	0.033009	6.88	98.15	41.11	0.68
Canaan	1177	2 yr	947.90	217.30	221.92	221.07	222.65	0.032456	8.42	149.85	45.79	0.71
Canaan	1177	5 yr	1385.50	217.30	222.91	221.88	223.81	0.031195	9.44	196.02	48.15	0.72
Canaan	1177	10 yr	1696.90	217.30	223.54	222.37	224.55	0.030331	10.03	226.79	49.42	0.72
Canaan	1177	25 yr	2101.00	217.30	224.28	222.95	225.42	0.029575	10.71	264.32	50.92	0.73
Canaan	1177	50 yr	2409.50	217.30	224.83	223.35	226.05	0.028989	11.16	292.15	52.01	0.73
Canaan	1177	100 yr	2738.50	217.30	225.36	223.77	226.69	0.029210	11.74	320.62	54.09	0.74
Canaan	1177	500 yr	3524.30	217.30	226.44	224.68	228.01	0.029464	12.85	379.99	55.94	0.76
Canaan	1161	1.1 yr	515.40	216.60	220.42	219.38	220.78	0.018781	5.38	118.40	46.35	0.52
Canaan	1161	2 yr	947.90	216.60	221.62	220.38	222.15	0.019889	6.78	175.35	49.10	0.56
Canaan	1161	5 yr	1385.50	216.60	222.61	221.12	223.31	0.020246	7.79	224.98	51.01	0.58
Canaan	1161	10 yr	1696.90	216.60	223.25	221.59	224.04	0.020257	8.38	257.95	52.30	0.59
Canaan	1161	25 yr	2101.00	216.60	224.00	222.14	224.92	0.020296	9.05	298.05	53.86	0.61
Canaan	1161	50 yr	2409.50	216.60	224.55	222.54	225.55	0.020190	9.50	327.87	55.00	0.61
Canaan	1161	100 yr	2738.50	216.60	225.09	222.94	226.18	0.020207	9.95	357.84	56.12	0.62
Canaan	1161	500 yr	3524.30	216.60	226.16	223.84	227.49	0.021180	11.07	419.00	58.33	0.65
Canaan	1124		Bridge									
Canaan	1100	1.1 yr	515.40	212.10	216.52	215.29	216.98	0.019412	5.98	102.70	31.90	0.54
Canaan	1100	2 yr	947.90	212.10	217.74	216.43	218.55	0.024616	8.08	143.36	34.89	0.63
Canaan	1100	5 yr	1385.50	212.10	218.76	217.41	219.87	0.027212	9.60	180.33	37.69	0.69
Canaan	1100	10 yr	1696.90	212.10	219.44	218.03	220.73	0.027867	10.42	206.58	39.91	0.71
Canaan	1100	25 yr	2101.00	212.10	220.34	218.79	221.79	0.026973	11.14	243.89	42.87	0.71
Canaan	1100	50 yr	2409.50	212.10	221.05	219.32	222.56	0.025517	11.49	274.92	45.03	0.70
Canaan	1100	100 yr	2738.50	212.10	221.81	219.87	223.36	0.023709	11.74	310.00	47.18	0.68
Canaan	1100	500 yr	3524.30	212.10	223.65	221.06	225.21	0.019277	11.96	401.43	51.15	0.64
Canaan	1093	1.1 yr	515.40	211.00	216.40	215.00	216.84	0.016158	5.87	106.30	31.06	0.49
Canaan	1093	2 yr	947.90	211.00	217.50	216.21	218.35	0.023815	8.26	141.72	33.20	0.62

HEC-RAS Plan: Prop - NB River: Carrabasset Reach: Canaan (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
Canaan	1093	5 yr	1385.50	211.00	218.32	217.21	219.60	0.030384	10.23	169.66	34.79	0.71
Canaan	1093	10 yr	1696.90	211.00	218.80	217.85	220.40	0.034707	11.48	186.68	35.73	0.77
Canaan	1093	25 yr	2101.00	211.00	219.37	218.61	221.37	0.039599	12.93	207.18	36.84	0.84
Canaan	1093	50 yr	2409.50	211.00	219.75	219.15	222.07	0.043193	13.96	221.39	37.61	0.88
Canaan	1093	100 yr	2738.50	211.00	220.10	219.71	222.78	0.047393	15.06	234.62	38.31	0.93
Canaan	1093	500 yr	3524.30	211.00	220.89	220.89	224.40	0.055484	17.34	265.73	40.05	1.02
Canaan	1085	1.1 yr	515.40	211.50	216.29	214.87	216.70	0.015362	5.61	110.62	34.05	0.48
Canaan	1085	2 yr	947.90	211.50	217.35	216.07	218.13	0.022322	7.87	148.36	36.74	0.60
Canaan	1085	5 yr	1385.50	211.50	218.16	217.02	219.32	0.028019	9.69	178.78	38.78	0.69
Canaan	1085	10 yr	1696.90	211.50	218.64	217.63	220.07	0.031644	10.83	197.61	39.99	0.75
Canaan	1085	25 yr	2101.00	211.50	219.21	218.33	220.99	0.035344	12.11	221.10	41.44	0.80
Canaan	1085	50 yr	2409.50	211.50	219.62	218.87	221.64	0.037807	12.99	237.95	42.43	0.84
Canaan	1085	100 yr	2738.50	211.50	219.99	219.39	222.30	0.040650	13.92	254.01	43.31	0.87
Canaan	1085	500 yr	3524.30	211.50	220.76	220.51	223.75	0.047260	15.97	288.02	44.95	0.96
Canaan	1072	1.1 yr	515.40	211.60	216.19	214.63	216.49	0.012751	4.95	126.64	40.00	0.44
Canaan	1072	2 yr	947.90	211.60	217.26	215.73	217.83	0.017802	6.85	170.80	42.48	0.54
Canaan	1072	5 yr	1385.50	211.60	218.09	216.55	218.93	0.021707	8.37	206.91	44.51	0.61
Canaan	1072	10 yr	1696.90	211.60	218.60	217.09	219.62	0.024042	9.30	229.71	45.75	0.65
Canaan	1072	25 yr	2101.00	211.60	219.22	217.73	220.46	0.026101	10.32	258.82	47.27	0.69
Canaan	1072	50 yr	2409.50	211.60	219.67	218.17	221.07	0.027406	11.01	280.01	48.63	0.71
Canaan	1072	100 yr	2738.50	211.60	220.10	218.64	221.67	0.028729	11.70	301.30	49.95	0.73
Canaan	1072	500 yr	3524.30	211.60	221.02	219.67	222.99	0.031465	13.18	348.80	52.85	0.78
Canaan	1057	1.1 yr	515.40	212.40	215.55	215.18	216.13	0.044074	6.99	92.08	46.95	0.76
Canaan	1057	2 yr	947.90	212.40	216.66	216.08	217.42	0.036860	8.08	146.96	50.46	0.73
Canaan	1057	5 yr	1385.50	212.40	217.58	216.80	218.50	0.033952	8.96	193.80	52.06	0.73
Canaan	1057	10 yr	1696.90	212.40	218.14	217.22	219.18	0.033055	9.54	223.58	53.17	0.73
Canaan	1057	25 yr	2101.00	212.40	218.81	217.76	219.99	0.032378	10.22	259.56	54.60	0.74
Canaan	1057	50 yr	2409.50	212.40	219.29	218.13	220.57	0.032057	10.71	285.65	55.80	0.75
Canaan	1057	100 yr	2738.50	212.40	219.75	218.50	221.14	0.032011	11.21	311.67	56.98	0.75
Canaan	1057	500 yr	3524.30	212.40	220.74	219.38	222.40	0.032325	12.32	369.42	59.76	0.77
Canaan	1048		Inl Struct									
Canaan	1037	1.1 yr	515.40	203.10	207.93	206.30	208.19	0.010960	4.75	138.39	45.00	0.40
Canaan	1037	2 yr	947.90	203.10	209.36	207.35	209.76	0.011893	5.99	206.10	49.76	0.44
Canaan	1037	5 yr	1385.50	203.10	210.51	208.14	211.03	0.012361	6.90	265.98	54.01	0.46
Canaan	1037	10 yr	1696.90	203.10	211.23	208.66	211.82	0.012539	7.42	305.58	56.38	0.47
Canaan	1037	25 yr	2101.00	203.10	212.08	209.25	212.75	0.012646	8.00	354.84	59.17	0.49
Canaan	1037	50 yr	2409.50	203.10	212.68	209.62	213.40	0.012650	8.38	390.74	60.51	0.49
Canaan	1037	100 yr	2738.50	203.10	213.27	210.13	214.05	0.012722	8.76	426.77	61.81	0.50
Canaan	1037	500 yr	3524.30	203.10	214.56	211.03	215.47	0.012887	9.59	508.38	64.89	0.51
Canaan	1030	1.1 yr	515.40	203.10	207.93	205.79	208.11	0.006527	3.76	168.34	51.67	0.32
Canaan	1030	2 yr	947.90	203.10	209.38	206.79	209.65	0.007324	4.82	249.06	59.19	0.35
Canaan	1030	5 yr	1385.50	203.10	210.55	207.58	210.91	0.007534	5.53	321.30	63.58	0.37
Canaan	1030	10 yr	1696.90	203.10	211.29	208.07	211.69	0.007599	5.94	368.71	65.68	0.38
Canaan	1030	25 yr	2101.00	203.10	212.15	208.68	212.62	0.007641	6.39	426.73	67.91	0.38
Canaan	1030	50 yr	2409.50	203.10	212.76	209.15	213.27	0.007673	6.70	468.55	69.33	0.39
Canaan	1030	100 yr	2738.50	203.10	213.36	209.51	213.91	0.007740	7.02	510.47	70.65	0.40
Canaan	1030	500 yr	3524.30	203.10	214.67	210.38	215.32	0.007863	7.69	604.94	73.52	0.41
Canaan	1020	1.1 yr	515.40	203.20	207.68	206.41	207.99	0.014416	5.08	130.36	51.60	0.45
Canaan	1020	2 yr	947.90	203.20	209.15	207.47	209.54	0.012959	5.95	212.87	60.71	0.45
Canaan	1020	5 yr	1385.50	203.20	210.36	208.26	210.80	0.011580	6.43	289.62	65.41	0.44
Canaan	1020	10 yr	1696.90	203.20	211.11	208.74	211.59	0.010931	6.71	339.65	67.40	0.44
Canaan	1020	25 yr	2101.00	203.20	212.00	209.28	212.52	0.010351	7.04	400.29	69.33	0.43
Canaan	1020	50 yr	2409.50	203.20	212.62	209.68	213.17	0.010069	7.29	443.69	70.68	0.43
Canaan	1020	100 yr	2738.50	203.20	213.22	210.06	213.81	0.009909	7.56	486.91	72.00	0.43
Canaan	1020	500 yr	3524.30	203.20	214.55	210.84	215.22	0.009671	8.14	584.34	75.24	0.44
Canaan	1000	1.1 yr	515.40	203.50	207.24	206.21	207.65	0.020015	5.66	109.29	39.47	0.53
Canaan	1000	2 yr	947.90	203.50	208.60	207.22	209.20	0.020025	7.05	165.41	43.61	0.57
Canaan	1000	5 yr	1385.50	203.50	209.69	208.05	210.47	0.020000	8.07	215.26	47.13	0.58
Canaan	1000	10 yr	1696.90	203.50	210.37	208.57	211.26	0.020020	8.68	248.03	49.31	0.60
Canaan	1000	25 yr	2101.00	203.50	211.18	209.22	212.18	0.020013	9.37	288.64	52.07	0.61
Canaan	1000	50 yr	2409.50	203.50	211.74	209.68	212.84	0.020009	9.84	318.42	54.08	0.61
Canaan	1000	100 yr	2738.50	203.50	212.29	210.11	213.48	0.020002	10.28	348.65	55.56	0.62
Canaan	1000	500 yr	3524.30	203.50	213.49	211.13	214.88	0.020021	11.23	417.56	59.26	0.63

HEC-RAS Plan: Prop - NB River: Carrabasset Reach: Canaan

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)
Canaan	1262	1.1 yr	222.95	222.76	0.19	0.24	0.01	68.98	182.02	264.39	53.48
Canaan	1262	2 yr	224.50	224.22	0.27	0.25	0.02	142.15	305.41	500.34	58.68
Canaan	1262	5 yr	225.73	225.38	0.35	0.26	0.03	221.53	424.29	739.68	62.67
Canaan	1262	10 yr	226.50	226.11	0.40	0.26	0.04	280.34	506.16	910.40	65.21
Canaan	1262	25 yr	227.42	226.96	0.46	0.26	0.04	356.42	609.77	1134.80	68.40
Canaan	1262	50 yr	228.06	227.56	0.50	0.25	0.04	416.51	687.36	1305.63	70.85
Canaan	1262	100 yr	228.71	228.18	0.54	0.25	0.05	483.44	768.04	1487.02	73.33
Canaan	1262	500 yr	230.11	229.49	0.62	0.25	0.05	652.77	954.47	1917.06	78.58
Canaan	1245	1.1 yr	222.70	222.39	0.31	0.32	0.01	84.43	262.98	167.99	40.17
Canaan	1245	2 yr	224.23	223.72	0.51	0.36	0.01	176.14	471.61	300.15	45.43
Canaan	1245	5 yr	225.44	224.76	0.68	0.39	0.01	278.01	675.37	432.12	50.65
Canaan	1245	10 yr	226.21	225.43	0.78	0.40	0.02	355.03	812.42	529.46	54.03
Canaan	1245	25 yr	227.12	226.24	0.88	0.41	0.02	456.51	977.10	667.39	57.10
Canaan	1245	50 yr	227.76	226.82	0.94	0.41	0.03	535.92	1098.42	775.16	59.23
Canaan	1245	100 yr	228.41	227.41	1.00	0.41	0.03	621.96	1224.46	892.09	61.43
Canaan	1245	500 yr	229.81	228.68	1.14	0.41	0.05	829.70	1514.86	1179.74	66.02
Canaan	1226	1.1 yr	222.37	221.99	0.38	0.22	0.02	69.71	372.46	73.24	39.82
Canaan	1226	2 yr	223.86	223.25	0.60	0.25	0.03	169.73	627.69	150.48	44.64
Canaan	1226	5 yr	225.04	224.24	0.80	0.28	0.03	274.28	865.90	245.33	45.77
Canaan	1226	10 yr	225.79	224.86	0.93	0.29	0.03	351.37	1033.50	312.03	46.88
Canaan	1226	25 yr	226.69	225.59	1.10	0.30	0.04	453.33	1247.92	399.75	48.54
Canaan	1226	50 yr	227.33	226.11	1.22	0.31	0.04	531.82	1408.37	469.32	49.73
Canaan	1226	100 yr	227.97	226.63	1.34	0.32	0.04	616.09	1576.46	545.96	50.95
Canaan	1226	500 yr	229.35	227.73	1.62	0.34	0.04	817.74	1970.95	735.61	53.38
Canaan	1212	1.1 yr	222.14	221.81	0.33	0.39	0.02	52.69	315.61	147.10	43.79
Canaan	1212	2 yr	223.58	223.07	0.51	0.41	0.02	127.53	524.59	295.78	45.65
Canaan	1212	5 yr	224.73	224.04	0.70	0.43	0.02	208.49	728.95	448.06	46.72
Canaan	1212	10 yr	225.47	224.65	0.82	0.44	0.01	268.53	871.84	556.53	47.38
Canaan	1212	25 yr	226.35	225.37	0.98	0.45	0.01	348.84	1055.56	696.60	48.24
Canaan	1212	50 yr	226.98	225.88	1.09	0.46	0.01	411.61	1194.68	803.21	48.91
Canaan	1212	100 yr	227.61	226.41	1.21	0.46	0.01	479.89	1341.83	916.78	49.62
Canaan	1212	500 yr	228.97	227.47	1.51	0.49	0.01	646.23	1695.04	1183.03	51.49
Canaan	1192	1.1 yr	221.74	221.26	0.48	0.49	0.00	63.25	270.02	182.13	41.87
Canaan	1192	2 yr	223.15	222.46	0.69	0.49	0.00	136.44	451.20	360.26	47.43
Canaan	1192	5 yr	224.28	223.43	0.86	0.47	0.00	218.32	615.90	551.28	48.97
Canaan	1192	10 yr	225.01	224.05	0.97	0.47	0.00	280.50	730.72	685.69	49.85
Canaan	1192	25 yr	225.88	224.78	1.10	0.46	0.00	365.22	877.78	858.00	50.80
Canaan	1192	50 yr	226.51	225.32	1.19	0.45	0.00	432.19	989.09	988.22	51.46
Canaan	1192	100 yr	227.14	225.86	1.29	0.45	0.00	505.53	1107.16	1125.81	52.12
Canaan	1192	500 yr	228.48	226.92	1.56	0.46	0.00	683.46	1391.18	1449.66	53.45
Canaan	1177	1.1 yr	221.24	220.74	0.50	0.39	0.08	90.69	247.87	176.84	41.11
Canaan	1177	2 yr	222.65	221.92	0.73	0.40	0.09	180.17	415.24	352.49	45.79
Canaan	1177	5 yr	223.81	222.91	0.90	0.40	0.10	274.84	569.96	540.71	48.15
Canaan	1177	10 yr	224.55	223.54	1.01	0.40	0.11	345.49	676.28	675.12	49.42
Canaan	1177	25 yr	225.42	224.28	1.14	0.39	0.11	440.72	812.21	848.07	50.92
Canaan	1177	50 yr	226.05	224.83	1.23	0.39	0.11	516.13	914.36	979.01	52.01
Canaan	1177	100 yr	226.69	225.36	1.33	0.39	0.12	604.39	1032.51	1101.60	54.09
Canaan	1177	500 yr	228.01	226.44	1.57	0.40	0.12	805.01	1286.22	1433.08	55.94
Canaan	1161	1.1 yr	220.78	220.42	0.35	0.33	0.17	98.92	340.71	75.77	46.35
Canaan	1161	2 yr	222.15	221.62	0.54	0.34	0.22	181.97	580.16	185.76	49.10
Canaan	1161	5 yr	223.31	222.61	0.70	0.34	0.28	270.59	811.87	303.04	51.01
Canaan	1161	10 yr	224.04	223.25	0.80	0.34	0.32	336.35	973.30	387.25	52.30
Canaan	1161	25 yr	224.92	224.00	0.92	0.34	0.36	425.08	1179.97	495.95	53.86
Canaan	1161	50 yr	225.55	224.55	1.01	0.34	0.39	495.76	1335.33	578.41	55.00
Canaan	1161	100 yr	226.18	225.09	1.09	0.33	0.41	573.44	1499.72	665.34	56.12
Canaan	1161	500 yr	227.49	226.16	1.33	0.30	0.29	765.37	1890.24	868.69	58.33
Canaan	1124		Bridge								
Canaan	1100	1.1 yr	216.98	216.52	0.45	0.13	0.01	24.85	353.88	136.67	31.90
Canaan	1100	2 yr	218.55	217.74	0.80	0.18	0.01	55.98	629.73	262.19	34.89
Canaan	1100	5 yr	219.87	218.76	1.11	0.22	0.05	94.92	897.96	392.62	37.69

HEC-RAS Plan: Prop - NB River: Carrabasset Reach: Canaan (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)
Canaan	1100	10 yr	220.73	219.44	1.29	0.24	0.09	126.26	1083.02	487.61	39.91
Canaan	1100	25 yr	221.79	220.34	1.45	0.25	0.17	176.71	1311.82	612.47	42.87
Canaan	1100	50 yr	222.56	221.05	1.52	0.25	0.24	223.34	1477.52	708.64	45.03
Canaan	1100	100 yr	223.36	221.81	1.56	0.25	0.34	280.23	1645.91	812.36	47.18
Canaan	1100	500 yr	225.21	223.65	1.56	0.23	0.58	443.50	2015.26	1065.54	51.15
Canaan	1093	1.1 yr	216.84	216.40	0.44	0.13	0.01	65.24	387.28	62.88	31.06
Canaan	1093	2 yr	218.35	217.50	0.85	0.19	0.02	133.05	680.55	134.30	33.20
Canaan	1093	5 yr	219.60	218.32	1.28	0.25	0.04	205.13	967.93	212.44	34.79
Canaan	1093	10 yr	220.40	218.80	1.60	0.28	0.05	257.82	1168.59	270.49	35.73
Canaan	1093	25 yr	221.37	219.37	2.00	0.32	0.07	327.89	1424.62	348.50	36.84
Canaan	1093	50 yr	222.07	219.75	2.32	0.34	0.09	382.25	1617.76	409.49	37.61
Canaan	1093	100 yr	222.78	220.10	2.68	0.37	0.11	440.53	1822.73	475.23	38.31
Canaan	1093	500 yr	224.40	220.89	3.51	0.43	0.15	583.86	2303.36	637.08	40.05
Canaan	1085	1.1 yr	216.70	216.29	0.41	0.17	0.03	55.91	396.71	62.78	34.05
Canaan	1085	2 yr	218.13	217.35	0.78	0.24	0.06	112.96	697.47	137.46	36.74
Canaan	1085	5 yr	219.32	218.16	1.16	0.30	0.10	172.96	990.82	221.73	38.78
Canaan	1085	10 yr	220.07	218.64	1.44	0.33	0.12	216.51	1194.89	285.50	39.99
Canaan	1085	25 yr	220.99	219.21	1.77	0.36	0.16	274.16	1453.67	373.17	41.44
Canaan	1085	50 yr	221.64	219.62	2.03	0.38	0.19	318.70	1647.47	443.33	42.43
Canaan	1085	100 yr	222.30	219.99	2.31	0.40	0.22	366.38	1852.36	519.75	43.31
Canaan	1085	500 yr	223.75	220.76	2.99	0.45	0.31	480.91	2332.49	710.91	44.95
Canaan	1072	1.1 yr	216.49	216.19	0.30	0.33	0.03	35.09	352.62	127.69	40.00
Canaan	1072	2 yr	217.83	217.26	0.57	0.39	0.02	71.64	619.16	257.10	42.48
Canaan	1072	5 yr	218.93	218.09	0.83	0.42	0.01	110.51	880.71	394.28	44.51
Canaan	1072	10 yr	219.62	218.60	1.02	0.44	0.00	138.94	1063.02	494.93	45.75
Canaan	1072	25 yr	220.46	219.22	1.24	0.46	0.02	176.65	1293.99	630.37	47.27
Canaan	1072	50 yr	221.07	219.67	1.40	0.47	0.04	203.10	1467.89	738.51	48.63
Canaan	1072	100 yr	221.67	220.10	1.58	0.48	0.05	232.98	1650.60	854.93	49.95
Canaan	1072	500 yr	222.99	221.02	1.97	0.50	0.09	310.57	2077.31	1136.43	52.85
Canaan	1057	1.1 yr	216.13	215.55	0.59			37.21	336.99	141.20	46.95
Canaan	1057	2 yr	217.42	216.66	0.76			83.51	553.15	311.24	50.46
Canaan	1057	5 yr	218.50	217.58	0.92			136.26	761.48	487.75	52.06
Canaan	1057	10 yr	219.18	218.14	1.03			175.44	908.35	613.10	53.17
Canaan	1057	25 yr	219.99	218.81	1.18			227.57	1097.21	776.22	54.60
Canaan	1057	50 yr	220.57	219.29	1.28			268.22	1240.56	900.71	55.80
Canaan	1057	100 yr	221.14	219.75	1.39			312.82	1392.16	1033.53	56.98
Canaan	1057	500 yr	222.40	220.74	1.66			425.01	1751.52	1347.77	59.76
Canaan	1048		Inl Struct								
Canaan	1037	1.1 yr	208.19	207.93	0.26	0.06	0.03	197.93	291.53	25.94	45.00
Canaan	1037	2 yr	209.76	209.36	0.40	0.07	0.04	378.06	489.84	80.00	49.76
Canaan	1037	5 yr	211.03	210.51	0.51	0.07	0.05	561.37	677.93	146.20	54.01
Canaan	1037	10 yr	211.82	211.23	0.58	0.07	0.05	690.52	805.52	200.86	56.38
Canaan	1037	25 yr	212.75	212.08	0.67	0.07	0.06	856.63	965.71	278.67	59.17
Canaan	1037	50 yr	213.40	212.68	0.72	0.07	0.06	981.53	1082.86	345.11	60.51
Canaan	1037	100 yr	214.05	213.27	0.78	0.07	0.07	1114.71	1206.26	417.54	61.81
Canaan	1037	500 yr	215.47	214.56	0.91	0.07	0.08	1430.68	1496.40	597.22	64.89
Canaan	1030	1.1 yr	208.11	207.93	0.18	0.10	0.01	138.48	361.92	15.00	51.67
Canaan	1030	2 yr	209.65	209.38	0.28	0.10	0.01	290.05	618.07	39.78	59.19
Canaan	1030	5 yr	210.91	210.55	0.36	0.10	0.01	461.48	852.50	71.53	63.58
Canaan	1030	10 yr	211.69	211.29	0.40	0.10	0.01	586.45	1011.02	99.43	65.68
Canaan	1030	25 yr	212.62	212.15	0.46	0.10	0.01	750.29	1210.97	139.74	67.91
Canaan	1030	50 yr	213.27	212.76	0.50	0.09	0.00	876.23	1360.39	172.88	69.33
Canaan	1030	100 yr	213.91	213.36	0.55	0.09	0.00	1011.06	1517.82	209.62	70.65
Canaan	1030	500 yr	215.32	214.67	0.65	0.09	0.00	1336.79	1886.00	301.51	73.52
Canaan	1020	1.1 yr	207.99	207.68	0.31	0.34	0.01	142.65	349.57	23.18	51.60
Canaan	1020	2 yr	209.54	209.15	0.39	0.32	0.02	305.67	560.13	82.10	60.71
Canaan	1020	5 yr	210.80	210.36	0.44	0.30	0.03	497.43	740.99	147.09	65.41
Canaan	1020	10 yr	211.59	211.11	0.48	0.29	0.04	640.85	861.26	194.79	67.40
Canaan	1020	25 yr	212.52	212.00	0.52	0.28	0.05	829.53	1012.48	258.98	69.33
Canaan	1020	50 yr	213.17	212.62	0.55	0.28	0.05	973.30	1126.41	309.78	70.68

HEC-RAS Plan: Prop - NB River: Carrabasset Reach: Canaan (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)
Canaan	1020	100 yr	213.81	213.22	0.59	0.28	0.06	1126.00	1247.22	365.28	72.00
Canaan	1020	500 yr	215.22	214.55	0.68	0.27	0.07	1491.63	1531.62	501.05	75.24
Canaan	1000	1.1 yr	207.65	207.24	0.40			111.86	360.05	43.49	39.47
Canaan	1000	2 yr	209.20	208.60	0.60			226.01	622.52	99.37	43.61
Canaan	1000	5 yr	210.47	209.69	0.77			346.12	875.37	164.01	47.13
Canaan	1000	10 yr	211.26	210.37	0.88			433.46	1049.33	214.11	49.31
Canaan	1000	25 yr	212.18	211.18	1.01			549.06	1269.56	282.37	52.07
Canaan	1000	50 yr	212.84	211.74	1.10			638.55	1433.62	337.34	54.08
Canaan	1000	100 yr	213.48	212.29	1.19			733.36	1602.27	402.87	55.56
Canaan	1000	500 yr	214.88	213.49	1.39			968.49	1997.40	558.40	59.26

Plan: Prop - NB Carrabasset Canaan RS: 1161 Profile: 50 yr

E.G. Elev (ft)	225.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.	0.100	0.085	0.100
W.S. Elev (ft)	224.55	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	222.54	Flow Area (sq ft)	88.07	140.57	99.23
E.G. Slope (ft/ft)	0.020190	Area (sq ft)	88.07	140.57	99.23
Q Total (cfs)	2409.50	Flow (cfs)	495.76	1335.33	578.41
Top Width (ft)	55.00	Top Width (ft)	18.22	18.73	18.05
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)	5.63	9.50	5.83
Max Chl Dpth (ft)	7.95	Hydr. Depth (ft)	4.83	7.51	5.50
Conv. Total (cfs)	16957.4	Conv. (cfs)	3489.0	9397.7	4070.7
Length Wtd. (ft)	10.00	Wetted Per. (ft)	20.23	18.80	21.63
Min Ch El (ft)	216.60	Shear (lb/sq ft)	5.49	9.43	5.78
Alpha	1.20	Stream Power (lb/ft s)	30.89	89.54	33.70
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	0.27	0.63	0.27
C & E Loss (ft)	0.39	Cum SA (acres)	0.06	0.07	0.06

Plan: Prop - NB Carrabasset Canaan RS: 1161 Profile: 100 yr

E.G. Elev (ft)	226.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.100	0.085	0.100
W.S. Elev (ft)	225.09	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	222.94	Flow Area (sq ft)	98.16	150.68	109.00
E.G. Slope (ft/ft)	0.020207	Area (sq ft)	98.16	150.68	109.00
Q Total (cfs)	2738.50	Flow (cfs)	573.44	1499.72	665.34
Top Width (ft)	56.12	Top Width (ft)	19.19	18.73	18.20
Vel Total (ft/s)	7.65	Avg. Vel. (ft/s)	5.84	9.95	6.10
Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)	5.12	8.04	5.99
Conv. Total (cfs)	19264.8	Conv. (cfs)	4034.0	10550.2	4680.5
Length Wtd. (ft)	10.00	Wetted Per. (ft)	21.34	18.80	22.19
Min Ch El (ft)	216.60	Shear (lb/sq ft)	5.80	10.11	6.20
Alpha	1.20	Stream Power (lb/ft s)	33.90	100.65	37.82
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	0.30	0.68	0.30
C & E Loss (ft)	0.41	Cum SA (acres)	0.07	0.07	0.07