SUMMARY OF EXISTING UPSTREAM AND DOWNSTREAM BRIDGES

Upstream -	3.3 miles	**Town -**	Roque Bluffs	
		Name -	Meadow Brook Bridge	**Br. No. -** 3701
		Hydraulic Opening -	12 ' Span x 10 ' Rise=	120 SF
		Known Ice, Flooding, Scour, and Debris Concerns: None. By ratings Waterway – 8 'desirable waterway adequacy', and Channel – 5 'some bank erosion and undermining'.		

There are no other bridges on this waterway carrying roads. The old town way map indicates that there may be a railroad crossing over a tributary stream in Jonesboro. However, both the Gazeteer and Google Earth indicate that no tributaries extend into Jonesboro and are crossed by any other bridges other than the subject bridge and the above "Meadow Brook Bridge".

Since it is uncommon to have a "river" with only two roadway bridges, the tributary mapping done through Google Earth was documented by a labeled image file that is included in this report's back-up data.

HYDROLOGY

The hydrology calculations for storm event discharge levels are based on the typical USGS Regression equations and drainage basin characteristics. Please see the attached spreadsheet on Sheet #? for more detailed information. Englishman River Bridge is tidal; its downstream side is the Atlantic Ocean. So, tidal data must be considered to calculate the appropriate discharge rates for design, and in fact governs the extremes of the hydraulic behavior for each bridge location and bridge opening configuration investigated in the preliminary design.

Based on a weighted average of the U.S.G.S. regression method for Maine, Alex Mann has prepared the following hydrology data:

SUMMARY OF HYDROLOGY DATA

Drainage Area = 8.53 square miles
Design Discharge (Q50) = 725 c.f.s.
Check Discharge (Q100) = 840 c.f.s
Ordinary High Water (Q1.1) = 120 c.f.s.

The following tidal data was determined from the NOAA web pages:

SUMMARY OF TIDAL CHARACTERISTICS

Mean Lower Low Water (MLLW) -7.91 feet
Mean Low Water (MLW) -7.49 feet
Mean Tide Level (MTL) -0.58 feet
Mean High Water (MHW) 6.34 feet
Mean Higher High Water (MHHW) 6.80 feet
2014 Predicted High Tide (02/01/12) 7.04 feet

The following tidal data was used to consider a 2.0 foot increase in sea level:

SUMMARY OF TIDAL CHARACTERISTICS

Mean Lower Low Water (MLLW) -5.91 feet
Mean Low Water (MLW) -5.49 feet
Mean Tide Level (MTL) 1.42 feet
Mean High Water (MHW) 8.34 feet
Mean Higher High Water (MHHW) 8.80 feet

For the existing tidal characteristics, to calculate the tidal contribution at mid-tide, a fifteen minute time interval was used and the drop of the tide elevation was calculated as (sin(180)-sin(195))/sin(90) x Tide_Range/2, or 1.79 feet. Assuming an effective stream-slope of 6 ft/mi, the drawdown would extend nearly 1600 feet upstream. Assuming an average storage width upstream of the bridge of 600 feet, the drawdown volume at mid-tide is estimated as 1600 feet x 600 feet x 0.5 x 1.79 feet, or 17.17×10^5 cubic feet in fifteen minutes, equivalent to a discharge rate of the upstream storage of 1900 c.f.s. at midtide. Similarly, the discharge rate of the upstream storage at high tide was calculated as 225 c.f.s. These assumptions are intended to provide slightly conservative (high) discharge rates at mid-tide. The same process was used for calculating flows and stage elevations for a 2.0 foot increase in the Mean Sea Level.

HYDROLOGY AND HYDRAULICS REPORT

Summary

Drainage Area	8.53 mi^2
$Q_{1.1}$	2020 ft^3 / s
Q_{10}	2380 ft^3 / s
Q_{50}	2620 ft^3 / s
Q_{100}	2740 ft^3 / s

Reported By: Robert S. Bulger
Date: April 3, 2013

HYDRAULICS

HEC-RAS version 4.10 runs were made to simulate the hydraulic characteristics of the existing bridge and several replacement alternates. The Manning's n-values used were: 0.027 in the channel; and 0.037 for both banks. At the Preliminary Public Meeting the first statement made by local residents was "One of my concerns was the height of the bridge, because at times here in storm waters the bridge gets covered." Later in the public meeting it was noted that "there was a lot of discussion . . about erosion along the banks" when the bridge was moved from its previous location upstream towards the ocean. The next point from the local resident that dealt with hydraulics was, ". . the clear span would be an ideal thing, I think, because this thing gets pounded in the storms as far as any piers and stuff underneath." Meeting participant also stated that a local expert on "erosion issues on lengths of both sides of the bridge" has said "it has nothing to do with the bridge. It has everything to do with the fact that the hard-baked clay covering of the glacial till when it went away; and, basically, the hurricane in the early '70s was what really accelerated all of that." In summary, local resident testimony, the history of frequent maintenance work, the large tide range, photographs and team visit observations all support the conclusions that: 1) storm waves and normal tidal action aggressively erode any unprotected banks in the area; and 2) a relatively small storm surge at high tide could top the existing bridge.

The original alignment options included an alignment shifted towards the ocean. However, the ocean-side alignment required excessive capital costs and wetland impacts. Two basic alignments were used for the hydraulic analyses: 1) an alignment with the bridge replaced at the same location with a slight change of bearing, and 2) a shift of the alignment approximately twenty-five feet upstream or northerly, at the bridge. The "Hydraulics Summary" uses one 100-foot span alternate to represent all viable 100-foot span alternates, and similarly reports one 87 foot alternate. Please see the table footnote.

To adequately address design lifespan hydraulic loads, a two foot sea level increase was considered. The assumption was that every datum level of the future tide range, from MLLW to MHHW, would be increased by 2.0 feet. Various HEC-RAS runs proved that in every scenario: for the two bridge locations; each opening size; all storm events; and both the current and future tide ranges, the maximum velocities were at outgoing mid-tide and the maximum required headwater elevations were during high tide.

HYDRAULICS SUMMARY

	Existing Bridge	87-ft NEXT-Beam	100-ft Hillman Beam
Total Waterway Opening	1100 sq.ft.	940 sq.ft.	1130 sq.ft.
2012 Tide Range			
Max. Q50 Headwater Elev.	6.81 ft.	6.85 ft.	6.80 ft.
Max. Q100 Headwater Elev.	6.82 ft.	6.87 ft.	6.80 ft.
Max. Q50 Discharge Vel.	6.79 f.p.s	7.52 f.p.s.	7.60 f.p.s.
Max. Q100 Discharge Vel.	7.13 f.p.s	7.79 f.p.s.	7.86 f.p.s.
Max. Ord. High Water Q1.1	2.66 ft.	6.81 ft.	6.80 ft.
Max. Q1.1 Discharge Vel.	5.17 f.p.s.	6.45 f.p.s.	6.28 f.p.s.
Clearance at Q50	5.0 ft.	6.3 ft.	5.1 ft.
Projected 2-foot sea rise			
Max. Q50 Headwater Elev.	8.81 ft.	8.83 ft.	8.80 ft.
Max. Q100 Headwater Elev.	8.81 ft.	8.83 ft.	8.80 ft.
Max. Q50 Discharge Vel.	6.79 f.p.s.	6.79 f.p.s.	6.87 f.p.s.
Max. Q100 Discharge Vel.	7.13 f.p.s.	7.13 f.p.s.	7.22 f.p.s.
Max. Ord. High Water Q1.1	8.80 ft.	8.80 ft.	8.80 ft.
Max. Q1.1 Discharge Vel.	5.17 f.p.s.	5.30 f.p.s.	5.22 f.p.s.
Clearance at Q50	3.0 ft.	4.3 ft.	3.1 ft.

For proposed bridges use beam depth + 16 inches for distance from P.G. to bottom of beam

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

Please note, the location for determining the Q50 clearance varies for these structures. For the existing bridge, the bottom chord's lowest elevation is at Pier #1 (westerly pier). For each proposed alternate, the lowest bottom chord elevation is at the northwesterly bearings, Abutment #1.

As presumed and indicated above, the maximum headwater elevations occurred when storm discharge levels were combined with the High Tide level. The maximum velocities occurred when storm discharge levels were combined with the outgoing tide at mid-tide. Tidal flow discharges were calculated as steady state flows. Volume changes for the water stored upstream of the bridge were estimated for the fifteen minutes after high tide and at mid tide. The tidal component of the discharge rate was estimated from the immediate upstream volume change in the corresponding 15 minutes. These "steady state" tide exchange discharge rates of Englishman River were then added to the storm event discharges. Conservatively, for maximum velocities, the mid-tide exchange was checked against the Mean Low Tide as the tailwater elevation. For maximum headwater elevations, the high tide exchange was checked with the high tide as the tailwater.

In order to evaluate the Q50 clearance for other 100-foot spans, compare the depth of the carrying beams. For example a beam three inches shallower than the Hillman Beam will have three inches more clearance. If the Hillman Beam span/depth ratio is like the Union Street design, they will have four inches less clearance.

Note that the table indicates that the clearances for the 87-foot NExT-Beam alternate run slightly less than for the existing bridge. The differences are: for the existing tide range ½ inch at Q50 and 5/8 inch at Q100; for the tide range after a 2-foot increase in sea level ¼ inch at Q50 and ¼ inch at Q100. The differences in these table values imply a greater precision than the hydraulics analysis can provide. Though there is likely an increase in headwater, the differences are statistically insignificant.

SCOUR

The engineering that would be required to quantify storm scour protection at this site was determined to be excessive. Mike Wight was consulted after reviewing H.E.C. #25, the FHWA's "Highways in the Coastal Environment". Unfortunately, in order to correctly size riprap or armor stone by this federal document, it is necessary to know the wave characteristics of the site in question, such as H_{10}, the highest 10% of wave heights, the length of the design wave and the frequency, which would require a detailed study.

Another document that quantifies armor stone sizing is "Revetment Design Considerations in Sheltered Water Wave Conditions" by CE News. This document uses the same equations (Hudson) that were used in HEC #25, Chapter 6 "Coastal Revetments for Wave Attack". It seems ill advised to undertake a state-of-the-art coastal protection design process for this small bridge. Still, the CE News publication noted above provides some other thoughts worth considering for some future coastal designs: 1) a design wave height and period can be "hindcast" with methods from "the U.S. Army Corps of Engineers Shore Protection Manual and Coastal Engineering Manual"; 2) riprap in general is more evenly ('widely') graded than armor stone and is less stable; and 3) the threshold between deep and shallow water is where the water depth becomes greater than half the wave length.

Respectfully Submitted,

Robert S. Bulger

April 3, 2013

APPENDIX A

Preliminary Plan

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS

Design: Load and Resistance Factor Design per AASHTO LRFD Bridge Design Specifications, Fourth Edition 2007 and Interim Specifications through 2012.

DESIGN LOADING

Live Load ..... HL - 93 Modified

TRAFFIC DATA

Current (2011) AADT	210
Future (2031) AADT	250
DHV - % of AADT	11
Design Hour Volume	28
Heavy Trucks (% of AADT)	5
Heavy Trucks (% of DHV)	4
Directional Distribution (% of DHV)	55
18 kip Equivalent P 2.0	5
18 kip Equivalent P 2.5	5
Design Speed (mph)	30

HYDROLOGIC DATA

Drainage Area	8.53 sq mi
Design Discharge (Q50)	725 cfs
Check Discharge (Q100)	840 cfs
Headwater Elevation (Q50)	6.85 ft
Headwater Elevation (Q100)	6.87 ft
Discharge Velocity (Q50)	7.52 fps
Discharge Velocity (Q100)	7.79 fps
Headwater Elevation (Q1.1)	6.81 ft
Discharge Velocity (Q1.1)	6.45 fps
Headwater Elevation (Q25)	6.84 ft
Mean Lower Low Water (MLLW)	-7.91 ft
Mean Low Water (MLW)	-7.49 ft
Mean Tide Level (MTL)	-0.58 ft
Mean High Water (MHW)	6.34 ft
Mean Higher High Water (MHHW)	6.80 ft
2014 Predicted High Tide	7.04 ft

MATERIALS

Concrete:	
Curbs and Transition Barriers	Class "LP"
Precast	Class "P"
All Other	Class "A"
Reinforcing Steel	ASTM A 615/A 615M, Grade 60
Prestressing Strands	AASHTO 203 (ASTM A 416), Grade 270, Low Relaxation

BASIC DESIGN STRESSES

Concrete	f 'c = 4,350 psi
Precast Concrete	f 'c = 8,000 psi
	f 'ci = 6,000 psi
Reinforcing Steel	f y = 60,000 psi
Prestressing Strand	F μ = 270,000 psi

ROQUE BLUFFS
WASHINGTON COUNTY
ENGLISHMAN RIVER BRIDGE
OVER
ENGLISHMAN RIVER
JOHNSON COVE ROAD
FEDERAL AID PROJECT NO. BR-1788(100)X
PROJECT LENGTH 0.000 mi.
BRIDGE NO. 3964

LIST OF DRAWINGS

Title Sheet	1
General Plan	2
Profile and Typicals	3

UTILITIES

Central Maine Power Company
Fairpoint Communications
Time Warner Cable
Greater Augusta Utility District

MAINTENANCE OF TRAFFIC

Maintain one 11'-0" wide lane of alternating two - way traffic using traffic signals.

APPROXIMATE COST

Including Engineering $1,400,000

PROJECT LOCATION:	0.3 miles South of the intersection of Roque Bluffs Road and Johnson Cove Road. Latitude 44°36'36.13, Longitude 67°28'36.53
PROGRAM AREA:	Bridge
OUTLINE OF WORK:	Bridge replacement

WIN 17881.00

BR-1788(100)X

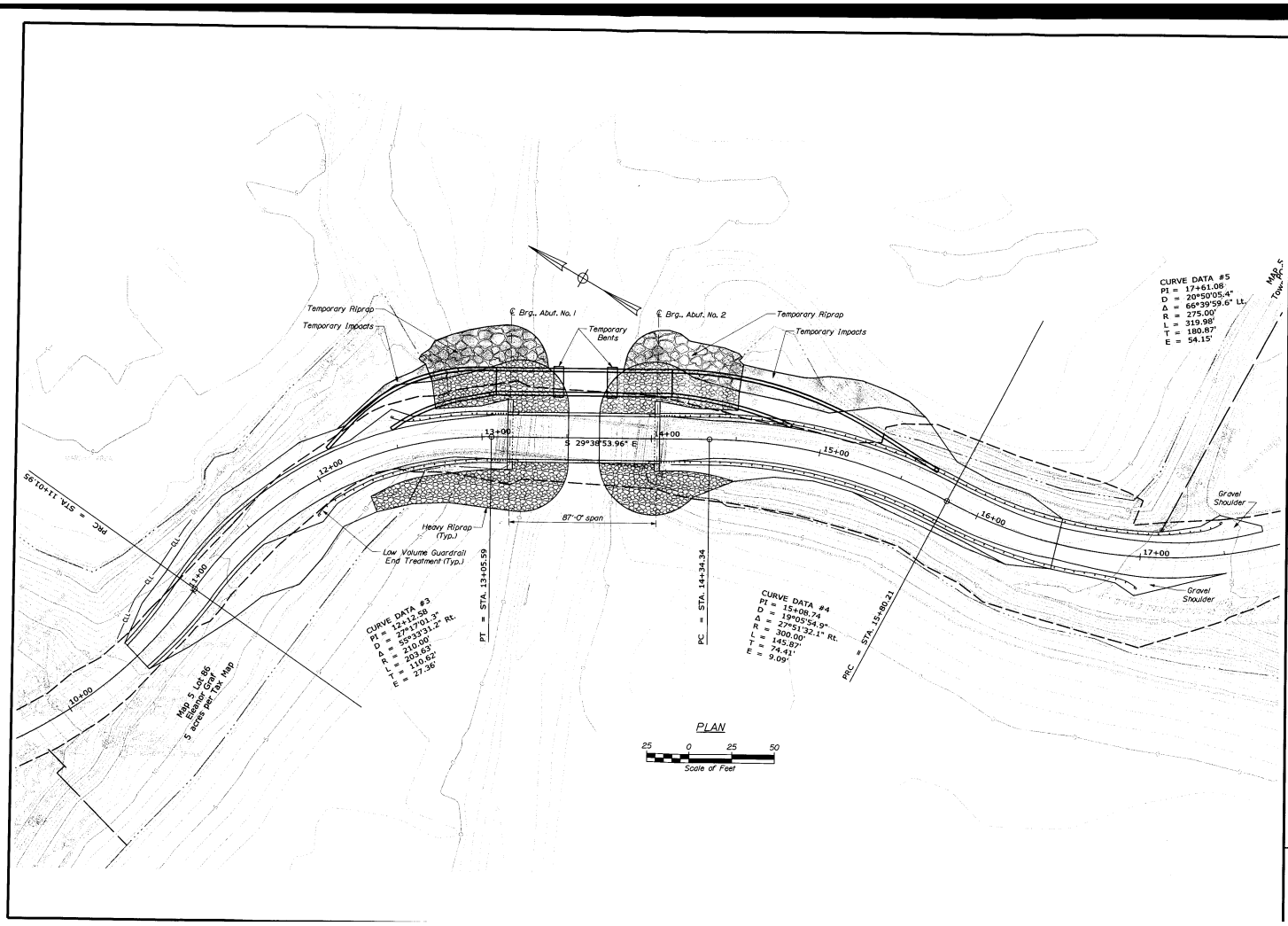
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
APPROVED
DATE

PROJECT INFORMATION
PROGRAM
PROJECT MANAGER
PROJECT ENGINEER
PROJECT PART
SIGNATURE
P. E. NUMBER

ROQUE BLUFFS
ENGLISHMAN RIVER BRIDGE

SHEET NO
1
OF

Filename:\00\BRIDGE\MSTA\001_Title.dgn Division: BRIDGE Username: David.Shaw Date:2/28/2013



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
BR-1788/1001X

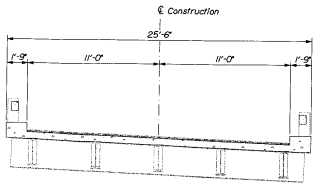
PROJ. MANAGER	S. BOOGE	BY	DATE
DESIGN STANDARD	MUTCD/AASHTO	I. WHITE	APR. 2013
CHECKED - PLANS			
VC SPOT - DESIGN			
VC SPOT - R.O.W.			
RE-CHECKED			

SIGNATURES
P.E. NUMBER

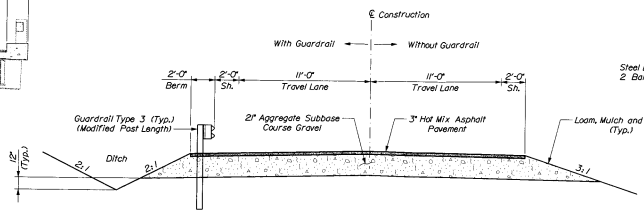
ENGLISHMAN RIVER BRIDGE
ENGLISHMAN RIVER
ROQUE BLUFFS WASHINGTON COUNTY

SHEET NUM
2
OF 3

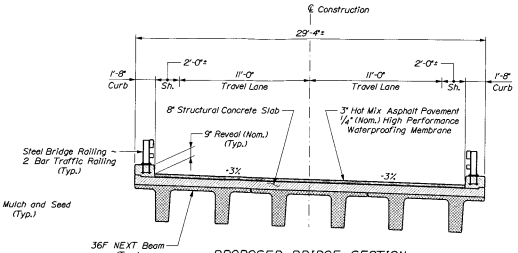
Filename: ...\MSTA\002_General_Plan.dgn Division: BRIDGE Username: david.show Date: 4/3/2013



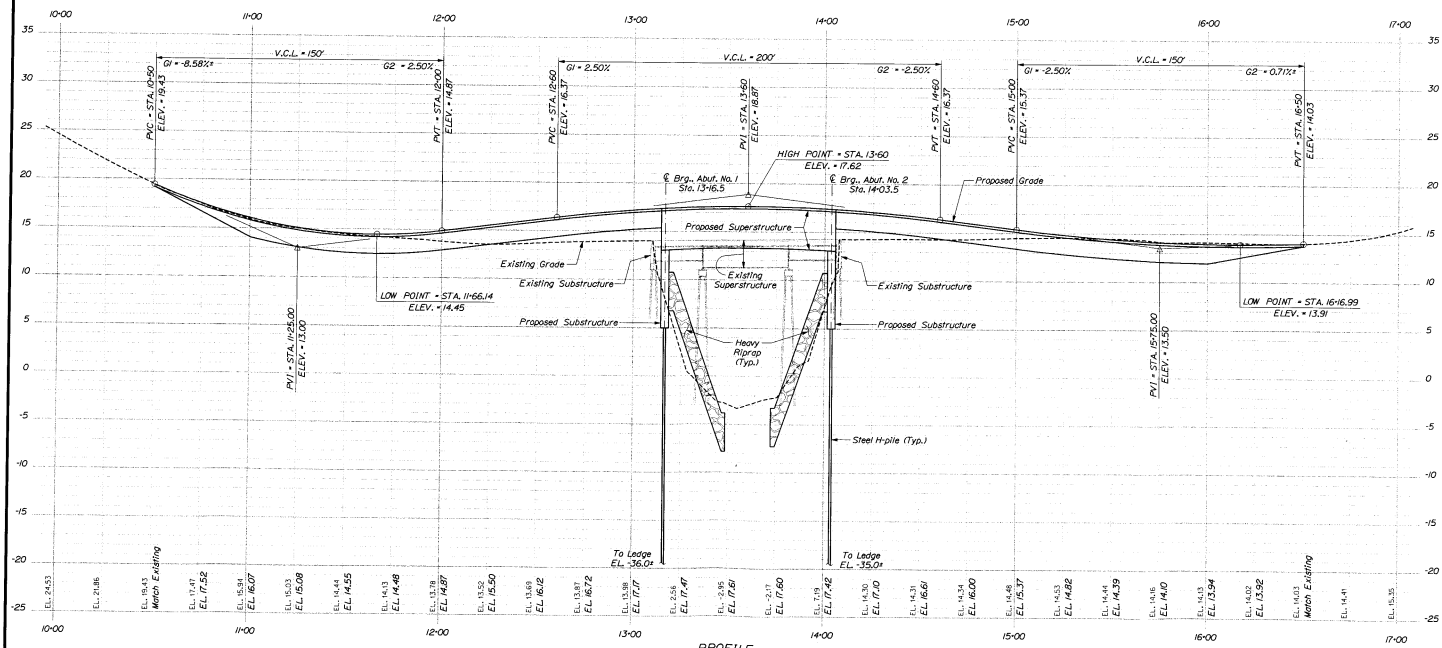
EXISTING BRIDGE SECTION
(Midspan)



TYPICAL APPROACH SECTION



PROPOSED BRIDGE SECTION



PROFILE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
BR-1788(100)X

PROJ. MANAGER	S. BOGGS	BY	DATE
CHECKED - PE REG.	M.MERCIER	J. WHITE	AUG. 2011
DESIGN - PE REG.			
DRAWN - PE REG.			
REVIEWED - PE REG.			
REVISED - PE REG.			

SIGNATURE
P.E. NUMBER

ENGLISHMAN RIVER BRIDGE
ENGLISHMAN RIVER
ROQUE BLUFFS WASHINGTON COUNTY

SHEET NUMBER
3
OF 3

Filename: ...\00\BRIDGE\MS1A\003_Profile.dgn Division: BRIDGE Username: david.shaw Date 4/3/2013

APPENDIX D

Hydrology & Hydraulic Data

Project Name:	Bridge Scour	**PIN:**	
Stream Name:	Englishman River	**Town:**	Roque Bluffs
Bridge Name:		**Bridge No.**	3964T
Route No.	Johnson Cove Road	**USGS Quad:**	
Analysis by:	AWMann	**Date:**	12/1/2009

Peak Flow Calculations by USGS Regression Equations (Hodgkins, 1999)

Enter data in blue cells only!

	km²	mi²	ac	
A	22.09	8.531	5459.7	*Enter data in [mi²]* Watershed Area
W	2.78	1.074	687.7	Wetlands area (by NWI)
P_c	620940	4944786		watershed centroid (E, N; UTM 19N; meters)
County	Washington			*choose county from drop-down menu*
pptA	44.2			mean annual precipitation (inches; by look-up)
SG	0.00			sand & gravel aquifer as decimal fraction of watershed A

A (km²)	22.09	Conf Lvl	0.67
W (%)	12.60		

Worksheet prepared by:
Charles S. Hebson, PE
Chief Hydrologist
Maine Dept. Transportation
Augusta, ME 04333-0016
207-287-1105
Charles.Hebson@maine.gov

Ret Pd T (yr)	Peak Flow Estimate Lower	Q_T (m³/s)	Upper	Q_T (ft³/s)
1.1		3.36		118.8
2	4.90	6.86	9.60	242.2
5	7.63	10.72	15.06	378.4
10	9.56	13.58	19.28	479.4
25	12.11	17.45	25.15	616.3
50	14.05	20.50	29.90	723.8
100	16.10	23.78	35.12	839.8
500	20.89	31.88	48.65	1125.7

Reference:

Hodgkins, G., 1999.
Estimating the magnitude of peak flows for streams in Maine for selected recurrence intervals
Water-Resources Investigations Report 99-4008
US Geological Survey, Augusta, Maine

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

Whitneyville trib conjunction
Approx. Machias Headwater
Approx. NW Conjunction
Approx N headwater E. trib.
River at Machias/RB border
North RB headwater
RB/Whitneyville Border
Joint of E trib halves
West RB headwater
E trib. conjunction
River at Whitneyville/RB border
3701 Meadow Brook Bridge
Collins Branch
Little Kennebec Bay
Roque Bluffs
Roque Bluffs, ME
Roque Bluffs
© 2012 Google
Image © 2012 GeoEye
Google earth
Imagery Date: 3/11/2010
1996
44°38'28.01" N 67°28'46.68" W elev 36 ft
Eye alt 31316 ft

PRELIM. BY R.S. Bulger DATE 3/16/2011 PROJ. NO. 17881.00 FILE NO. _____ OF _____
FINAL CHK. BY _____ DATE _____ LOCATION Roque Bluffs SH. NO. _____ OF _____
ITEM NO. _____ SUBJECT Tide

Description

The best tidal information appears to be on the Internet and the N.O.A.A. website is changing rapidly. A search for Roque Bluffs, Maine shows the nearest Tidal Stations as:

8401040 Eastport 33.2 mi. NE 44°54.2'N 66°58.9'W M.Range 18.35' Di.Range 19.27'

8413320 Bar Harbor 41.3 mi. W 44°23.5'N 68°12.3'W M.Range 10.56' Div.R. 11.37'

A check of Eastport shows Cutler Farris Wharf 8411060 21 mi. to S.W. referenced to Eastport

As of 2/6/2012, the N.O.A.A. website gave:

for Cutler Farris Wharf: MSL = 12.45' MHW = 19.43' & MLW = 5.59'

for Bar Harbor, Frenchman Bay, it gave NGVD29 = 5.17 feet

for Cutler Farris Wharf, the site gives NAVD88 = 7.91 ft., NGVD29 = 7.48 ft

Rick Wickett
Database
ASM_2404@homedepot.com
2404

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

The below data is excerpted from the N.O.A.A. Tide internet site on 2/6/2012

Station ID: 8411060 **PUBLICATION**
DATE: 09/20/2011
Name: CUTLER FARRIS WHARF, LITTLE RIVER MAINE
NOAA Chart: 13392 **Latitude:**
44° 39.4' N
USGS Quad: CUTLER **Longitude:**
67° 12.6' W

Say River Basin Area imparted by tidal flushing ≈ 1600' (long) x 600' (wide) rectangle, i.e 960,000 ft²

T I D A L D A T U M S

1.8' foot drop at 6ft./mi ⇒ 1584' long effective reach

Tidal datums at CUTLER FARRIS WHARF, LITTLE RIVER based on:

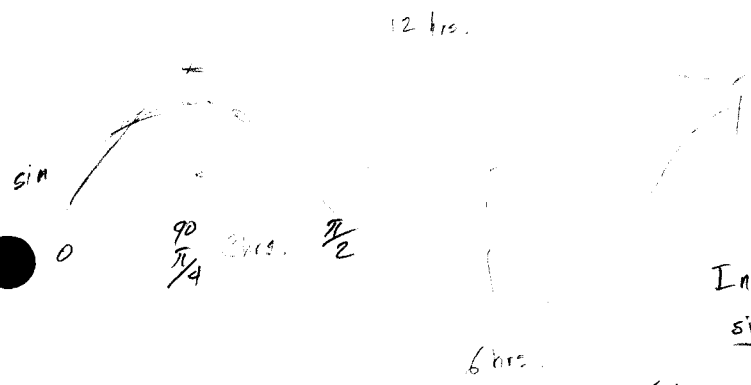
LENGTH OF SERIES:	6 MONTHS
TIME PERIOD:	February 2011 - July 2011
TIDAL EPOCH:	1983-2001
CONTROL TIDE STATION:	8410140 EASTPORT, PASSAMAQUODDY BAY

Elevations of tidal datums referred to Mean Lower Low Water (MLLW), in METERS:

				Adjusted to NAD88
MEAN HIGHER HIGH WATER	MHHW	=	4.484	6.80'
MEAN HIGH WATER	MHW	=	4.344	6.34
MEAN TIDE LEVEL	MTL	=	2.235	-0.58
MEAN SEA LEVEL	MSL	=	2.218	-0.63
MEAN LOW WATER	MLW	=	0.126	-7.49
MEAN LOWER LOW WATER	MLLW	=	0.000	-7.91

North American Vertical Datum (NAVD88)

This link indicated the NAVD88 datum is 7.91 feet above MLLW. So, MLLW by the datum is at 0.000 - 7.91 feet = -7.91 feet. To arrive at the adjusted column, divide the meter values by 0.3048 m/ft, and subtract 7.91 feet.



From high tide $\sin(\pi/4) = 1.0$, to 15 mins. beyond high tide, the tide drops $\frac{(\sin 90° - \sin 105°)}{\sin 90°} \frac{\text{Range}}{2} =$

(15 min = 1/6 x 1.5 hrs; 1 1/6 (90°) = 105°) $= 0.034\left(\frac{6.34 + 7.49}{2}\right)$

$= 0.034\left(\frac{13.83'}{2}\right) = 0.235'$

In the 15 mins. beyond mid-tide it drops

$\frac{\sin(180) - \sin 195°}{\sin 90°}\left(\frac{\text{Range}}{2}\right) = 0.259\left(\frac{13.83'}{2}\right) = 1.789'$

For River basin emptying $9.6 \times 10^5 \text{ ft}^2 \times 1.789' = 17.17 \times 10^5$ cu.ft. in 15 min ⇒ **1900** c.f.s.

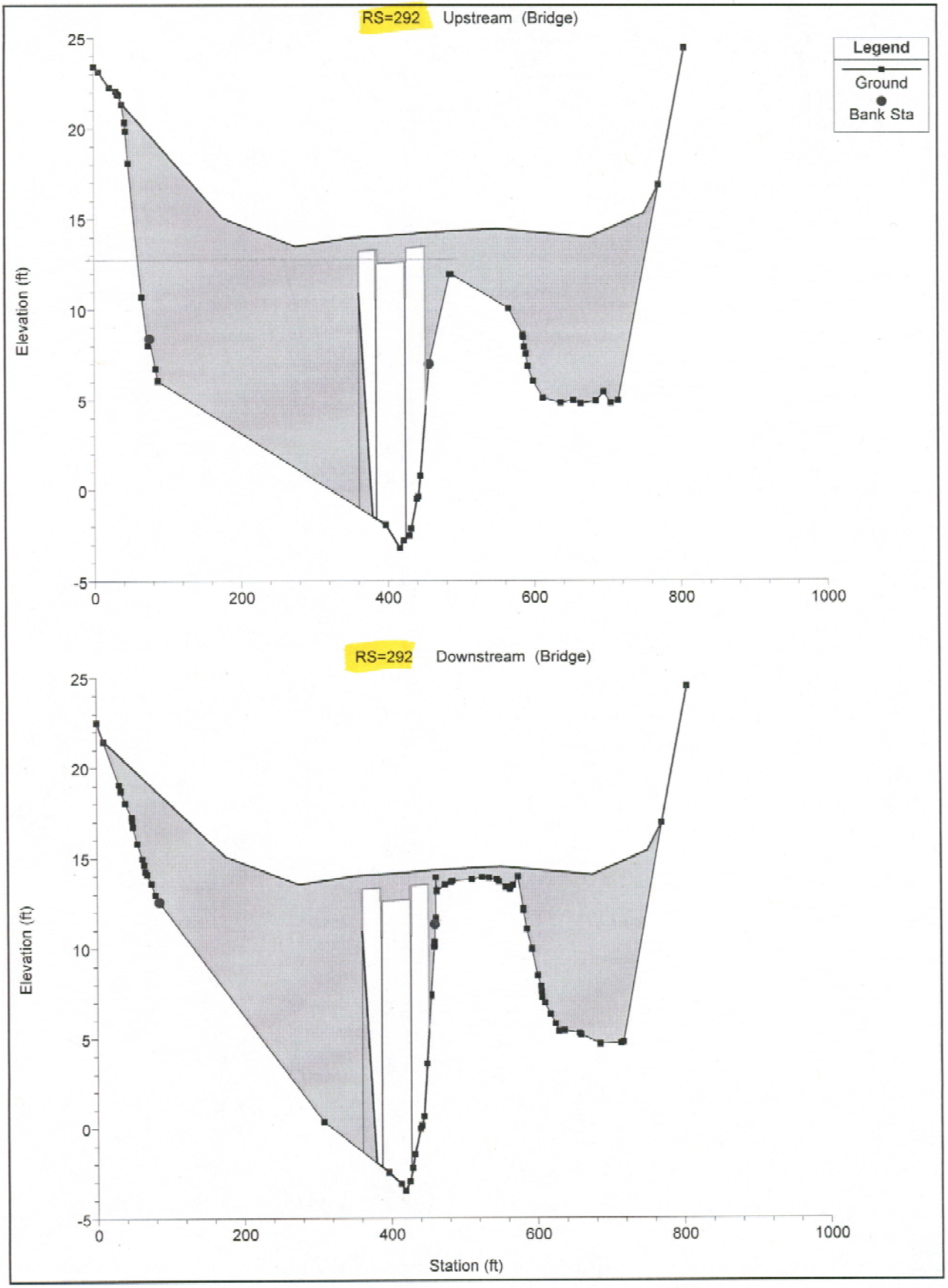
For Flows near high tide add $9.6 \times 10^5 \times 0.235' = 225$ c.f.s.

No bridge

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. E;ev/ (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
OpnMidTid	400	1.1wTideExch	2020	3.33	1.76		1.93	0.001901	607.5	372.09	0.46
OpnMidTid	400	Q10wTideExch	2380	3.37	2.02		2.2	0.001655	705.2	380.66	0.44
OpnMidTid	400	Q25wTideExch	2520	3.38	2.12		2.3	0.001566	744.7	384.17	0.43
OpnMidTid	400	Q50wTideExch	2620	3.39	2.2		2.38	0.001508	772.7	386.23	0.42
OpnMidTid	400	Q100wTideExch	2740	3.41	2.28		2.46	0.001456	804.2	388.68	0.42
OpnMidTid	350	1.1wTideExch	2020	3.55	1.64		1.83	0.002101	569.3	340.96	0.48
OpnMidTid	350	Q10wTideExch	2380	3.59	1.91		2.11	0.001785	663.7	346.11	0.46
OpnMidTid	350	Q25wTideExch	2520	3.59	2.02		2.22	0.001678	701.2	348.14	0.45
OpnMidTid	350	Q50wTideExch	2620	3.6	2.09		2.3	0.001613	727.6	349.56	0.44
OpnMidTid	350	Q100wTideExch	2740	3.62	2.18		2.38	0.001555	756.9	350.93	0.43
OpnMidTid	305	1.1wTideExch	2020	6.45	0.99		1.64	0.005678	313.1	160.79	0.81
OpnMidTid	305	Q10wTideExch	2380	7.02	1.15	0.93	1.92	0.006381	338.9	167.2	0.87
OpnMidTid	305	Q25wTideExch	2520	7.05	1.26	1.01	2.03	0.006212	357.3	171.62	0.86
OpnMidTid	305	Q50wTideExch	2620	7.07	1.33	1.06	2.11	0.006093	370.5	174.74	0.86
OpnMidTid	305	Q100wTideExch	2740	7.21	1.39		2.2	0.006227	380	176.95	0.87
OpnMidTid	279	1.1wTideExch	2020	6.23	0.9		1.5	0.004484	324.2	146.97	0.74
OpnMidTid	279	Q10wTideExch	2380	7.07	0.98		1.76	0.005565	336.9	148.66	0.83
OpnMidTid	279	Q25wTideExch	2520	7.33	1.03		1.86	0.00588	343.8	149.57	0.85
OpnMidTid	279	Q50wTideExch	2620	7.52	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
OpnMidTid	279	Q100wTideExch	2740	7.79	1.08		2.02	0.006497	351.8	150.62	0.9
OpnMidTid	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1
OpnMidTid	250	Q10wTideExch	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
OpnMidTid	250	Q25wTideExch	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1
OpnMidTid	250	Q50wTideExch	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1
OpnMidTid	250	Q100wTideExch	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
OpnMidTid	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1
OpnMidTid	200	Q10wTideExch	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
OpnMidTid	200	Q25wTideExch	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1
OpnMidTid	200	Q50wTideExch	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1
OpnMidTid	200	Q100wTideExch	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1
OpnMidTid	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.6
OpnMidTid	150	Q10wTideExch	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
OpnMidTid	150	Q25wTideExch	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
OpnMidTid	150	Q50wTideExch	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
OpnMidTid	150	Q100wTideExch	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
OpnMidTid	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
OpnMidTid	100	Q10wTideExch	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1
OpnMidTid	100	Q25wTideExch	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
OpnMidTid	100	Q50wTideExch	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
OpnMidTid	100	Q100wTideExch	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1
OpnMidTid	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
OpnMidTid	50	Q10wTideExch	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
OpnMidTid	50	Q25wTideExcl	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
OpnMidTid	50	Q50wTideExcl	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
OpnMidTid	50	Q100wTideExc	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43

Area of Bridge

Existing Bridge (Existing Alignment)



Existing Bridge at Current MidTide (-0.63' NAVD88)

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
ExBrCrntMidT	400	1.1wTideExch	2020	1.99	2.81		2.87	0.000384	1014	403.19	0.22
ExBrCrntMidT	400	Q10wTideExch	2380	1.93	3.34		3.4	0.000291	1232	416.77	0.2
ExBrCrntMidT	400	Q25wTideExch	2520	1.92	3.54		3.59	0.000267	1315	421.91	0.19
ExBrCrntMidT	400	Q50wTideExch	2620	1.91	3.68		3.73	0.000252	1374	425.52	0.19
ExBrCrntMidT	400	Q100wTideExch	2740	1.9	3.84		3.9	0.000236	1444	429.37	0.18
ExBrCrntMidT	350	1.1wTideExch	2020	2.08	2.78		2.85	0.000381	972	360.78	0.22
ExBrCrntMidT	350	Q10wTideExch	2380	2.04	3.32		3.38	0.000297	1167	369.32	0.2
ExBrCrntMidT	350	Q25wTideExch	2520	2.03	3.52		3.58	0.000274	1241	372.42	0.2
ExBrCrntMidT	350	Q50wTideExch	2620	2.03	3.66		3.72	0.000261	1293	375.59	0.19
ExBrCrntMidT	350	Q100wTideExch	2740	2.02	3.82		3.88	0.000248	1355	379.33	0.19
ExBrCrntMidT	305	1.1wTideExch	2020	3.17	2.66	0.69	2.82	0.000849	637.9	228.8	0.33
ExBrCrntMidT	305	Q10wTideExch	2380	3.1	3.2	0.93	3.35	0.000717	768.4	250.98	0.31
ExBrCrntMidT	305	Q25wTideExch	2520	3.07	3.41	1.01	3.55	0.000676	820	259.24	0.3
ExBrCrntMidT	305	Q50wTideExch	2620	3.06	3.55	1.06	3.69	0.000649	857.3	265.04	0.3
ExBrCrntMidT	305	Q100wTideExch	2740	3.04	3.72	1.15	3.86	0.000619	902	271.83	0.29
ExBrCrntMidT	292		Bridge								
ExBrCrntMidT	279	1.1wTideExch	2020	5.17	0.9		1.5	0.004484	324.2	146.97	0.74
ExBrCrntMidT	279	Q10wTideExch	2380	6.13	0.98		1.76	0.005565	336.9	148.66	0.83
ExBrCrntMidT	279	Q25wTideExch	2520	6.52	1.03		1.86	0.00588	343.8	149.57	0.85
ExBrCrntMidT	279	Q50wTideExch	2620	6.79	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
ExBrCrntMidT	279	Q100wTideExch	2740	7.13	1.08		2.02	0.006497	351.8	150.62	0.9
ExBrCrntMidT	250	1.1wTideExch	2020	4.05	0.62	0.61	1.31	0.009538	303.7	219.5	1
ExBrCrntMidT	250	Q10wTideExch	2380	4.77	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
ExBrCrntMidT	250	Q25wTideExch	2520	5.05	0.88	0.88	1.62	0.009495	364.3	247.51	1
ExBrCrntMidT	250	Q50wTideExch	2620	5.25	0.93	0.93	1.68	0.009445	376.7	252.86	1
ExBrCrntMidT	250	Q100wTideExch	2740	5.48	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
ExBrCrntMidT	200	1.1wTideExch	2020	3.23	0.15	0.15	0.8	0.009841	312.5	241.13	1
ExBrCrntMidT	200	Q10wTideExch	2380	3.83	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
ExBrCrntMidT	200	Q25wTideExch	2520	4.07	0.37	0.37	1.11	0.009427	365.6	248.1	1
ExBrCrntMidT	200	Q50wTideExch	2620	4.24	0.41	0.41	1.17	0.009352	375.9	249.43	1
ExBrCrntMidT	200	Q100wTideExch	2740	4.45	0.46	0.46	1.23	0.009236	388.6	251.06	1
ExBrCrntMidT	150	1.1wTideExch	2020	1.76	-0.05		0.19	0.003546	519.4	401.09	0.6
ExBrCrntMidT	150	Q10wTideExch	2380	2.06	0.08		0.35	0.003608	572	404.42	0.62
ExBrCrntMidT	150	Q25wTideExch	2520	2.18	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
ExBrCrntMidT	150	Q50wTideExch	2620	2.26	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
ExBrCrntMidT	150	Q100wTideExch	2740	2.36	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
ExBrCrntMidT	100	1.1wTideExch	2020	1.54	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
ExBrCrntMidT	100	Q10wTideExch	2380	1.8	-0.43	-0.44	0.04	0.01087	432.4	459.72	1
ExBrCrntMidT	100	Q25wTideExch	2520	1.91	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
ExBrCrntMidT	100	Q50wTideExch	2620	1.98	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
ExBrCrntMidT	100	Q100wTideExch	2740	2.07	-0.34	-0.35	0.18	0.010512	476.1	461.77	1
ExBrCrntMidT	50	1.1wTideExch	2020	1.17	-0.44		-0.33	0.001312	768.8	507.38	0.38
ExBrCrntMidT	50	Q10wTideExch	2380	1.37	-0.36		-0.23	0.00154	809.2	508.61	0.41
ExBrCrntMidT	50	Q25wTideExch	2520	1.45	-0.32		-0.18	0.001608	827	509.14	0.42
ExBrCrntMidT	50	Q50wTideExch	2620	1.51	-0.3		-0.15	0.001649	840.4	509.55	0.43
ExBrCrntMidT	50	Q100wTideExch	2740	1.57	-0.26		-0.11	0.00169	857.4	510.06	0.43

Existing Bridge at Future (2-ft. increase) MidTide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
ExBrFutMidT	400	1.1wTideExch	2020	1.99	2.81		2.87	0.000384	1014	403.19	0.22
ExBrFutMidT	400	Q10wTideExch	2380	1.93	3.34		3.4	0.000291	1232	416.77	0.2
ExBrFutMidT	400	Q25wTideExch	2520	1.92	3.54		3.59	0.000267	1315	421.91	0.19
ExBrFutMidT	400	Q50wTideExch	2620	1.91	3.68		3.73	0.000252	1374	425.52	0.19
ExBrFutMidT	400	Q100wTideExch	2740	1.9	3.84		3.9	0.000236	1444	429.37	0.18
ExBrFutMidT	350	1.1wTideExch	2020	2.08	2.78		2.85	0.000381	972	360.78	0.22
ExBrFutMidT	350	Q10wTideExch	2380	2.04	3.32		3.38	0.000297	1167	369.32	0.2
ExBrFutMidT	350	Q25wTideExch	2520	2.03	3.52		3.58	0.000274	1241	372.42	0.2
ExBrFutMidT	350	Q50wTideExch	2620	2.03	3.66		3.72	0.000261	1293	375.59	0.19
ExBrFutMidT	350	Q100wTideExch	2740	2.02	3.82		3.88	0.000248	1355	379.33	0.19
ExBrFutMidT	305	1.1wTideExch	2020	3.17	2.66	0.68	2.82	0.000849	637.9	228.8	0.33
ExBrFutMidT	305	Q10wTideExch	2380	3.1	3.2	0.92	3.35	0.000717	768.4	250.98	0.31
ExBrFutMidT	305	Q25wTideExch	2520	3.07	3.41	1	3.55	0.000676	820	259.24	0.3
ExBrFutMidT	305	Q50wTideExch	2620	3.06	3.55	1.06	3.69	0.000649	857.3	265.04	0.3
ExBrFutMidT	305	Q100wTideExch	2740	3.04	3.72	1.13	3.86	0.000619	902	271.83	0.29
ExBrFutMidT	292		Bridge								
ExBrFutMidT	279	1.1wTideExch	2020	5.17	1.33		1.75	0.002603	390.6	155.62	0.58
ExBrFutMidT	279	Q10wTideExch	2380	6.13	1.32		1.9	0.003686	388	155.28	0.68
ExBrFutMidT	279	Q25wTideExch	2520	6.52	1.31		1.97	0.004172	386.7	155.12	0.73
ExBrFutMidT	279	Q50wTideExch	2620	6.79	1.3		2.02	0.004545	385.7	154.99	0.76
ExBrFutMidT	279	Q100wTideExch	2740	7.13	1.29		2.08	0.005023	384.3	154.81	0.8
ExBrFutMidT	250	1.1wTideExch	2020	4.05	1.37		1.62	0.002772	498.6	300.43	0.55
ExBrFutMidT	250	Q10wTideExch	2380	4.77	1.37		1.72	0.003842	498.9	300.54	0.65
ExBrFutMidT	250	Q25wTideExch	2520	5.05	1.37		1.77	0.004303	499.1	300.62	0.69
ExBrFutMidT	250	Q50wTideExch	2620	5.25	1.37		1.8	0.004646	499.3	300.69	0.72
ExBrFutMidT	250	Q100wTideExch	2740	5.48	1.37		1.84	0.005074	499.6	300.8	0.75
ExBrFutMidT	200	1.1wTideExch	2020	3.23	1.34		1.5	0.001291	624.7	297.3	0.39
ExBrFutMidT	200	Q10wTideExch	2380	3.83	1.33		1.56	0.001826	620.7	296.65	0.47
ExBrFutMidT	200	Q25wTideExch	2520	4.07	1.32		1.58	0.002065	618.9	296.35	0.5
ExBrFutMidT	200	Q50wTideExch	2620	4.24	1.32		1.6	0.002247	617.4	296.11	0.52
ExBrFutMidT	200	Q100wTideExch	2740	4.45	1.31		1.62	0.00248	615.5	295.8	0.54
ExBrFutMidT	150	1.1wTideExch	2020	1.76	1.39		1.44	0.000307	1152	476.45	0.2
ExBrFutMidT	150	Q10wTideExch	2380	2.06	1.4		1.47	0.000421	1156	476.67	0.23
ExBrFutMidT	150	Q25wTideExch	2520	2.18	1.41		1.48	0.000469	1158	476.77	0.24
ExBrFutMidT	150	Q50wTideExch	2620	2.26	1.41		1.49	0.000505	1160	476.85	0.25
ExBrFutMidT	150	Q100wTideExch	2740	2.36	1.41		1.5	0.00055	1162	476.94	0.26
ExBrFutMidT	100	1.1wTideExch	2020	1.54	1.39		1.43	0.000217	1320	532.15	0.17
ExBrFutMidT	100	Q10wTideExch	2380	1.8	1.4		1.45	0.000298	1324	533.04	0.2
ExBrFutMidT	100	Q25wTideExch	2520	1.91	1.4		1.46	0.000332	1326	533.43	0.21
ExBrFutMidT	100	Q50wTideExch	2620	1.98	1.4		1.46	0.000358	1327	533.72	0.22
ExBrFutMidT	100	Q100wTideExch	2740	2.07	1.41		1.47	0.00039	1329	534.09	0.22
ExBrFutMidT	50	1.1wTideExch	2020	1.17	1.39		1.41	0.000095	1758	623.67	0.11
ExBrFutMidT	50	Q10wTideExch	2380	1.37	1.4		1.43	0.000131	1764	624.07	0.13
ExBrFutMidT	50	Q25wTideExch	2520	1.45	1.41		1.44	0.000146	1766	624.24	0.14
ExBrFutMidT	50	Q50wTideExch	2620	1.51	1.41		1.44	0.000158	1768	624.37	0.15
ExBrFutMidT	50	Q100wTideExch	2740	1.57	1.41		1.45	0.000172	1770	624.53	0.15

Checked & re-checked. Two foot increase in sea level makes no difference for MidTide hydraulics upstream. It does raise W.S. downstream.

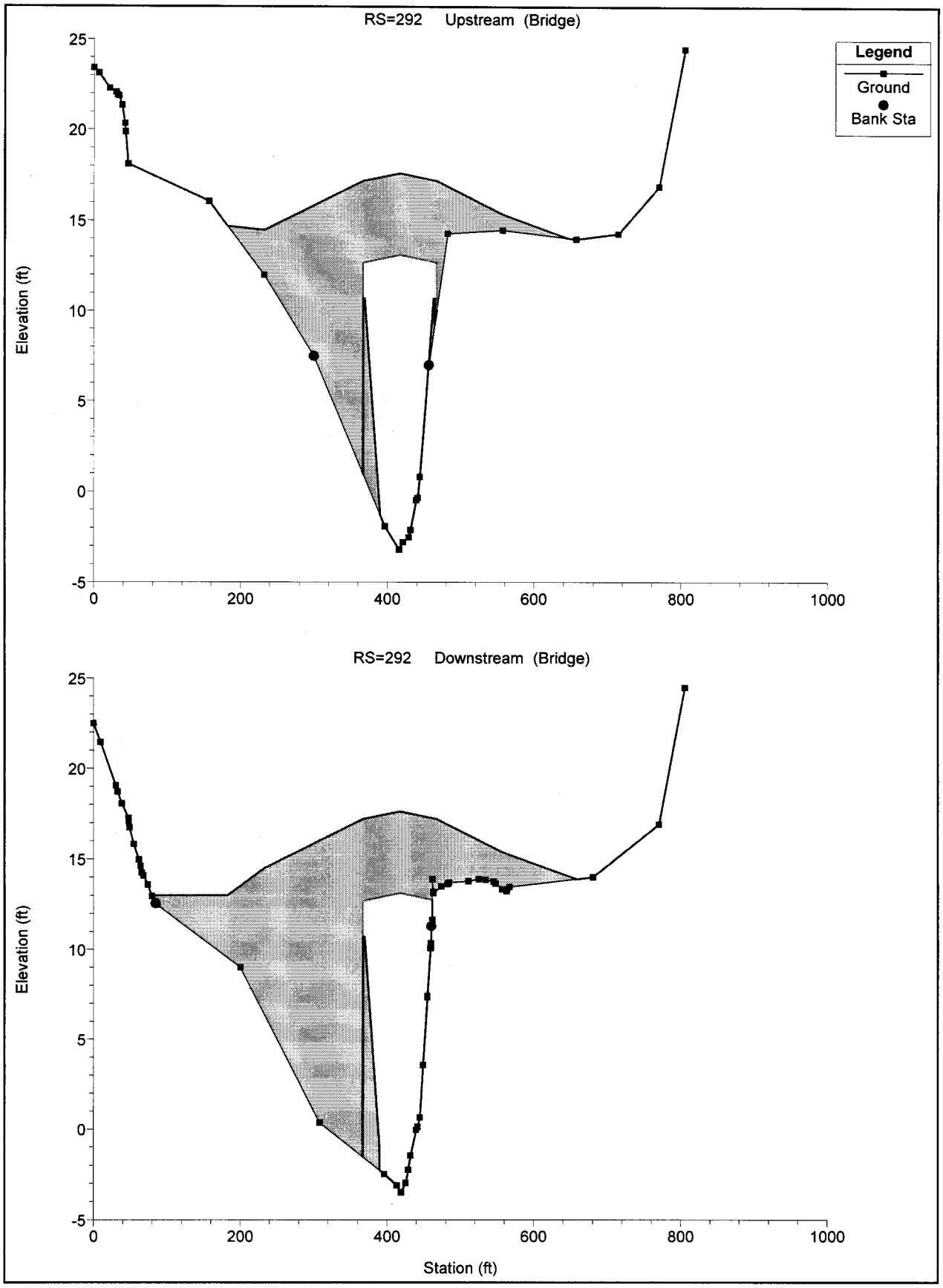
Existing Bridge at Current High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
ExBrCrntHiT	400	1.1wTideExch	345	0.10	6.80		6.8	0.000001	3316	770.45	0.01
ExBrCrntHiT	400	Q10wTideExch	705	0.21	6.81		6.81	0.000002	3321	770.61	0.02
ExBrCrntHiT	400	Q25wTideExch	845	0.25	6.81		6.81	0.000003	3324	770.71	0.02
ExBrCrntHiT	400	Q50wTideExch	950	0.29	6.82		6.82	0.000004	3327	770.79	0.02
ExBrCrntHiT	400	Q100wTideExch	1065	0.32	6.82		6.82	0.000005	3330	770.9	0.03
ExBrCrntHiT	350	1.1wTideExch	345	0.13	6.80		6.8	0.000001	2897	689.31	0.01
ExBrCrntHiT	350	Q10wTideExch	705	0.26	6.81		6.81	0.000002	2901	689.77	0.02
ExBrCrntHiT	350	Q25wTideExch	845	0.32	6.81		6.81	0.000003	2904	690.03	0.02
ExBrCrntHiT	350	Q50wTideExch	950	0.36	6.82		6.82	0.000004	2906	690.26	0.03
ExBrCrntHiT	350	Q100wTideExch	1065	0.40	6.82		6.82	0.000005	2909	690.55	0.03
ExBrCrntHiT	305	1.1wTideExch	345	0.17	6.80	-1.18	6.8	0.000001	2139	503.46	0.01
ExBrCrntHiT	305	Q10wTideExch	705	0.35	6.81	-0.56	6.81	0.000005	2142	503.57	0.03
ExBrCrntHiT	305	Q25wTideExch	845	0.42	6.81	-0.38	6.81	0.000007	2143	503.64	0.03
ExBrCrntHiT	305	Q50wTideExch	950	0.47	6.81	-0.26	6.82	0.000008	2145	503.7	0.04
ExBrCrntHiT	305	Q100wTideExch	1065	0.53	6.82	-0.14	6.82	0.00001	2147	503.77	0.04
ExBrCrntHiT	292		Bridge								
ExBrCrntHiT	279	1.1wTideExch	345	0.22	6.80		6.8	0.000001	1718	377.51	0.02
ExBrCrntHiT	279	Q10wTideExch	705	0.44	6.80		6.8	0.000006	1717	377.48	0.03
ExBrCrntHiT	279	Q25wTideExch	845	0.53	6.80		6.8	0.000009	1717	377.46	0.04
ExBrCrntHiT	279	Q50wTideExch	950	0.60	6.80		6.8	0.000011	1717	377.44	0.04
ExBrCrntHiT	279	Q100wTideExch	1065	0.67	6.80		6.8	0.000014	1717	377.42	0.05
ExBrCrntHiT	250	1.1wTideExch	345	0.14	6.80		6.8	0.000001	2510	484.74	0.01
ExBrCrntHiT	250	Q10wTideExch	705	0.29	6.80		6.8	0.000003	2510	484.73	0.02
ExBrCrntHiT	250	Q25wTideExch	845	0.35	6.80		6.8	0.000004	2510	484.73	0.03
ExBrCrntHiT	250	Q50wTideExch	950	0.40	6.80		6.8	0.000005	2510	484.73	0.03
ExBrCrntHiT	250	Q100wTideExch	1065	0.44	6.80		6.8	0.000006	2509	484.73	0.03
ExBrCrntHiT	200	1.1wTideExch	345	0.12	6.80		6.8	0	3063	567.63	0.01
ExBrCrntHiT	200	Q10wTideExch	705	0.25	6.80		6.8	0.000002	3063	567.63	0.02
ExBrCrntHiT	200	Q25wTideExch	845	0.30	6.80		6.8	0.000002	3063	567.63	0.02
ExBrCrntHiT	200	Q50wTideExch	950	0.33	6.80		6.8	0.000003	3063	567.63	0.02
ExBrCrntHiT	200	Q100wTideExch	1065	0.37	6.80		6.8	0.000004	3063	567.63	0.03
ExBrCrntHiT	150	1.1wTideExch	345	0.09	6.80		6.8	0	4037	582.9	0.01
ExBrCrntHiT	150	Q10wTideExch	705	0.18	6.80		6.8	0.000001	4037	582.91	0.01
ExBrCrntHiT	150	Q25wTideExch	845	0.22	6.80		6.8	0.000001	4037	582.91	0.01
ExBrCrntHiT	150	Q50wTideExch	950	0.25	6.80		6.8	0.000001	4037	582.91	0.02
ExBrCrntHiT	150	Q100wTideExch	1065	0.28	6.80		6.8	0.000002	4037	582.91	0.02
ExBrCrntHiT	100	1.1wTideExch	345	0.08	6.80		6.8	0	4639	661.52	0
ExBrCrntHiT	100	Q10wTideExch	705	0.16	6.80		6.8	0.000001	4639	661.52	0.01
ExBrCrntHiT	100	Q25wTideExch	845	0.20	6.80		6.8	0.000001	4639	661.52	0.01
ExBrCrntHiT	100	Q50wTideExch	950	0.22	6.80		6.8	0.000001	4639	661.53	0.01
ExBrCrntHiT	100	Q100wTideExch	1065	0.25	6.80		6.8	0.000001	4639	661.53	0.02
ExBrCrntHiT	50	1.1wTideExch	345	0.07	6.80		6.8	0	5487	738.92	0
ExBrCrntHiT	50	Q10wTideExch	705	0.14	6.80		6.8	0	5487	738.92	0.01
ExBrCrntHiT	50	Q25wTideExch	845	0.17	6.80		6.8	0.000001	5487	738.92	0.01
ExBrCrntHiT	50	Q50wTideExch	950	0.19	6.80		6.8	0.000001	5487	738.93	0.01
ExBrCrntHiT	50	Q100wTideExch	1065	0.21	6.80		6.8	0.000001	5487	738.93	0.01

Existing Bridge at Future (2-ft. increase) High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
ExBrFutHiT	400	1.1wTideExch	345	0.07	8.8		8.8	0	4903	806.94	0.01
ExBrFutHiT	400	Q10wTideExch	705	0.14	8.81		8.81	0.000001	4906	806.97	0.01
ExBrFutHiT	400	Q25wTideExch	845	0.17	8.81		8.81	0.000001	4908	806.99	0.01
ExBrFutHiT	400	Q50wTideExch	950	0.19	8.81		8.81	0.000001	4910	807	0.01
ExBrFutHiT	400	Q100wTideExch	1065	0.22	8.81		8.81	0.000001	4912	807.02	0.02
ExBrFutHiT	350	1.1wTideExch	345	0.09	8.8		8.8	0	4323	725.53	0.01
ExBrFutHiT	350	Q10wTideExch	705	0.19	8.81		8.81	0.000001	4326	725.55	0.01
ExBrFutHiT	350	Q25wTideExch	845	0.22	8.81		8.81	0.000001	4328	725.57	0.01
ExBrFutHiT	350	Q50wTideExch	950	0.25	8.81		8.81	0.000001	4330	725.58	0.02
ExBrFutHiT	350	Q100wTideExch	1065	0.28	8.81		8.81	0.000002	4331	725.6	0.02
ExBrFutHiT	305	1.1wTideExch	345	0.12	8.8	-1.18	8.8	0	3185	545.8	0.01
ExBrFutHiT	305	Q10wTideExch	705	0.24	8.8	-0.56	8.81	0.000001	3187	545.89	0.02
ExBrFutHiT	305	Q25wTideExch	845	0.29	8.81	-0.38	8.81	0.000002	3188	545.95	0.02
ExBrFutHiT	305	Q50wTideExch	950	0.33	8.81	-0.26	8.81	0.000003	3189	546	0.02
ExBrFutHiT	305	Q100wTideExch	1065	0.37	8.81	-0.14	8.81	0.000003	3191	546.06	0.02
ExBrFutHiT	292		Bridge								
ExBrFutHiT	279	1.1wTideExch	345	0.15	8.8		8.8	0.000001	2536	439.24	0.01
ExBrFutHiT	279	Q10wTideExch	705	0.31	8.8		8.8	0.000002	2536	439.23	0.02
ExBrFutHiT	279	Q25wTideExch	845	0.37	8.8		8.8	0.000003	2536	439.22	0.02
ExBrFutHiT	279	Q50wTideExch	950	0.41	8.8		8.8	0.000004	2536	439.22	0.03
ExBrFutHiT	279	Q100wTideExch	1065	0.46	8.8		8.8	0.000005	2536	439.21	0.03
ExBrFutHiT	250	1.1wTideExch	345	0.11	8.8		8.8	0	3527	529.41	0.01
ExBrFutHiT	250	Q10wTideExch	705	0.21	8.8		8.8	0.000001	3527	529.41	0.01
ExBrFutHiT	250	Q25wTideExch	845	0.26	8.8		8.8	0.000001	3527	529.4	0.02
ExBrFutHiT	250	Q50wTideExch	950	0.29	8.8		8.8	0.000002	3527	529.4	0.02
ExBrFutHiT	250	Q100wTideExch	1065	0.32	8.8		8.8	0.000002	3527	529.4	0.02
ExBrFutHiT	200	1.1wTideExch	345	0.09	8.8		8.8	0	4238	603.88	0.01
ExBrFutHiT	200	Q10wTideExch	705	0.19	8.8		8.8	0.000001	4238	603.88	0.01
ExBrFutHiT	200	Q25wTideExch	845	0.22	8.8		8.8	0.000001	4238	603.88	0.01
ExBrFutHiT	200	Q50wTideExch	950	0.25	8.8		8.8	0.000001	4238	603.88	0.01
ExBrFutHiT	200	Q100wTideExch	1065	0.28	8.8		8.8	0.000001	4238	603.88	0.02
ExBrFutHiT	150	1.1wTideExch	345	0.07	8.8		8.8	0	5234	616.18	0
ExBrFutHiT	150	Q10wTideExch	705	0.14	8.8		8.8	0	5234	616.18	0.01
ExBrFutHiT	150	Q25wTideExch	845	0.17	8.8		8.8	0	5234	616.18	0.01
ExBrFutHiT	150	Q50wTideExch	950	0.2	8.8		8.8	0.000001	5234	616.18	0.01
ExBrFutHiT	150	Q100wTideExch	1065	0.22	8.8		8.8	0.000001	5234	616.18	0.01
ExBrFutHiT	100	1.1wTideExch	345	0.06	8.8		8.8	0	5991	688.31	0
ExBrFutHiT	100	Q10wTideExch	705	0.13	8.8		8.8	0	5992	688.31	0.01
ExBrFutHiT	100	Q25wTideExch	845	0.15	8.8		8.8	0	5992	688.31	0.01
ExBrFutHiT	100	Q50wTideExch	950	0.17	8.8		8.8	0	5992	688.31	0.01
ExBrFutHiT	100	Q100wTideExch	1065	0.19	8.8		8.8	0.000001	5992	688.31	0.01
ExBrFutHiT	50	1.1wTideExch	345	0.05	8.8		8.8	0	6993	765.59	0
ExBrFutHiT	50	Q10wTideExch	705	0.11	8.8		8.8	0	6993	765.59	0.01
ExBrFutHiT	50	Q25wTideExch	845	0.13	8.8		8.8	0	6994	765.59	0.01
ExBrFutHiT	50	Q50wTideExch	950	0.15	8.8		8.8	0	6994	765.59	0.01
ExBrFutHiT	50	Q100wTideExch	1065	0.17	8.8		8.8	0	6994	765.59	0.01

New 100-ft Span On Existing Alignment



100-ft. Span, Existing Alignment, Current MidTide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
On100CrntMid	400	1.1wTideExch	2020	1.7	3.23		3.27	0.000236	1186	413.94	0.18
On100CrntMid	400	Q10wTideExch	2380	1.67	3.79		3.84	0.000187	1423	428.3	0.16
On100CrntMid	400	Q25wTideExch	2520	1.67	4		4.04	0.000174	1513	434.55	0.16
On100CrntMid	400	Q50wTideExch	2620	1.66	4.15		4.19	0.000167	1578	441.41	0.15
On100CrntMid	400	Q100wTideExch	2740	1.66	4.32		4.36	0.000159	1654	449.12	0.15
On100CrntMid	350	1.1wTideExch	2020	1.79	3.21		3.26	0.000238	1128	367.68	0.18
On100CrntMid	350	Q10wTideExch	2380	1.78	3.78		3.83	0.000194	1339	378.33	0.17
On100CrntMid	350	Q25wTideExch	2520	1.78	3.99		4.03	0.000182	1418	383.25	0.16
On100CrntMid	350	Q50wTideExch	2620	1.78	4.13		4.18	0.000175	1475	386.9	0.16
On100CrntMid	350	Q100wTideExch	2740	1.78	4.31		4.35	0.000168	1542	391.16	0.16
On100CrntMid	305	1.1wTideExch	2020	6.03	2.62	1.32	3.18	0.002363	334.8	97.67	0.57
On100CrntMid	305	Q10wTideExch	2380	6.08	3.18	1.66	3.75	0.002139	391.1	104.52	0.55
On100CrntMid	305	Q25wTideExch	2520	6.1	3.38	1.77	3.96	0.002066	413	107.06	0.55
On100CrntMid	305	Q50wTideExch	2620	6.11	3.53	1.86	4.11	0.002015	428.9	108.85	0.54
On100CrntMid	305	Q100wTideExch	2740	6.12	3.7	2	4.28	0.001961	447.6	110.95	0.54
On100CrntMid	292		Bridge								
On100CrntMid	279	1.1wTideExch	2020	6.28	0.89		1.5	0.004457	321.9	143.68	0.74
On100CrntMid	279	Q10wTideExch	2380	7.11	0.97		1.76	0.005504	334.6	144.9	0.83
On100CrntMid	279	Q25wTideExch	2520	7.37	1.02		1.87	0.005785	341.8	145.59	0.85
On100CrntMid	279	Q50wTideExch	2620	7.6	1.04		1.94	0.006091	344.8	145.88	0.87
On100CrntMid	279	Q100wTideExch	2740	7.86	1.07		2.03	0.006447	348.5	146.23	0.9
On100CrntMid	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1
On100CrntMid	250	Q10wTideExch	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
On100CrntMid	250	Q25wTideExch	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1
On100CrntMid	250	Q50wTideExch	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1
On100CrntMid	250	Q100wTideExch	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
On100CrntMid	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1
On100CrntMid	200	Q10wTideExch	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
On100CrntMid	200	Q25wTideExch	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1
On100CrntMid	200	Q50wTideExch	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1
On100CrntMid	200	Q100wTideExch	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1
On100CrntMid	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.6
On100CrntMid	150	Q10wTideExch	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
On100CrntMid	150	Q25wTideExch	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
On100CrntMid	150	Q50wTideExch	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
On100CrntMid	150	Q100wTideExch	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
On100CrntMid	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
On100CrntMid	100	Q10wTideExch	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1
On100CrntMid	100	Q25wTideExch	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
On100CrntMid	100	Q50wTideExch	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
On100CrntMid	100	Q100wTideExch	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1
On100CrntMid	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
On100CrntMid	50	Q10wTideExch	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
On100CrntMid	50	Q25wTideExch	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
On100CrntMid	50	Q50wTideExch	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
On100CrntMid	50	Q100wTideExch	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43

100-ft. Span, Existing Alignment, Future Mid Tide

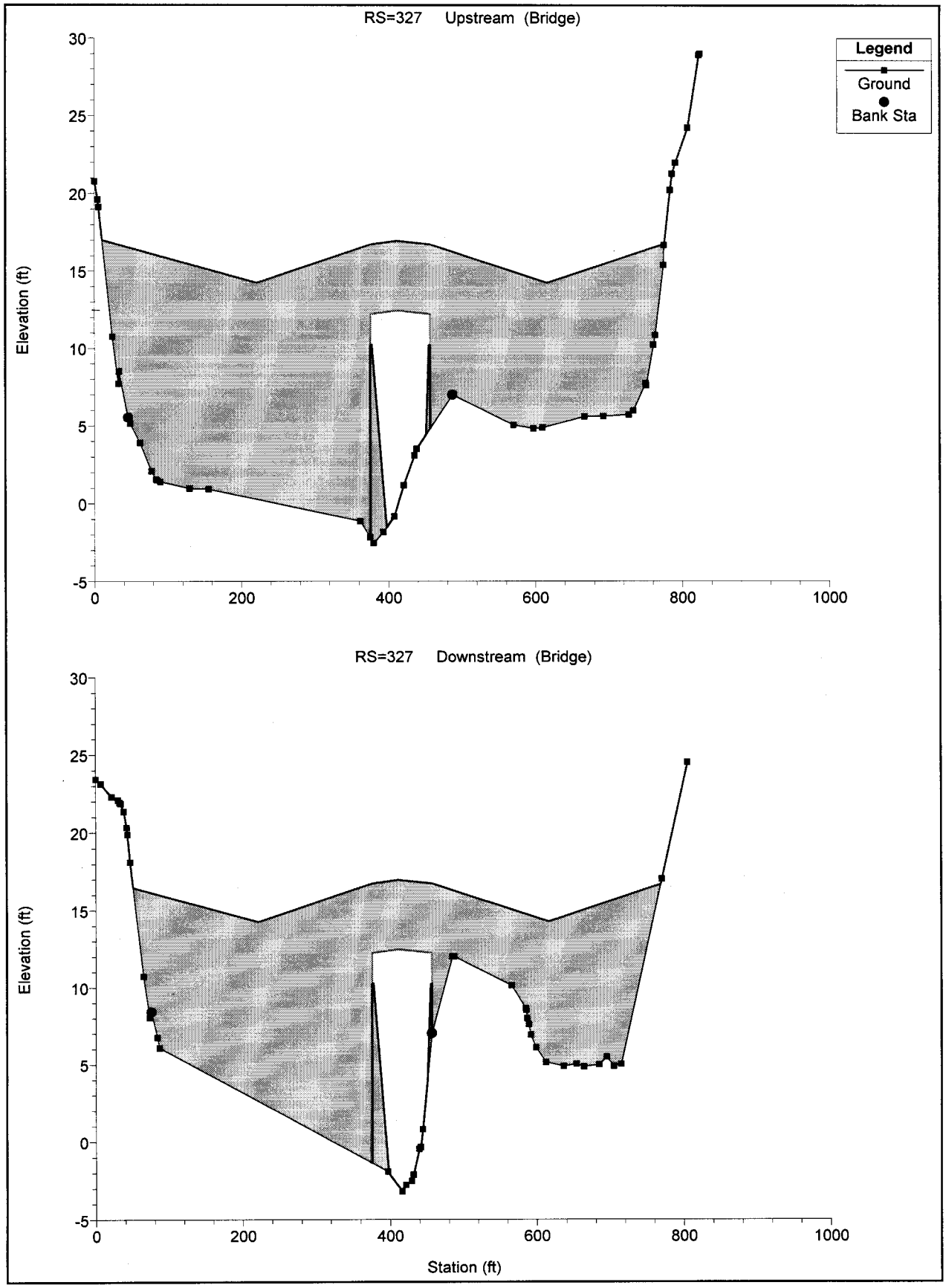
Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
On100FutMidT	400	1.1wTideExch	2020	1.7	3.23		3.27	0.000236	1186	413.94	0.18
On100FutMidT	400	Q10wTideExch	2380	1.67	3.79		3.84	0.000187	1423	428.3	0.16
On100FutMidT	400	Q25wTideExch	2520	1.67	4		4.04	0.000174	1513	434.55	0.16
On100FutMidT	400	Q50wTideExch	2620	1.66	4.15		4.19	0.000167	1578	441.4	0.15
On100FutMidT	400	Q100wTideExch	2740	1.66	4.32		4.36	0.000159	1654	449.12	0.15
On100FutMidT	350	1.1wTideExch	2020	1.79	3.21		3.26	0.000238	1128	367.68	0.18
On100FutMidT	350	Q10wTideExch	2380	1.78	3.78		3.83	0.000194	1339	378.33	0.17
On100FutMidT	350	Q25wTideExch	2520	1.78	3.99		4.03	0.000182	1418	383.25	0.16
On100FutMidT	350	Q50wTideExch	2620	1.78	4.13		4.18	0.000175	1475	386.9	0.16
On100FutMidT	350	Q100wTideExch	2740	1.78	4.31		4.35	0.000168	1542	391.16	0.16
On100FutMidT	305	1.1wTideExch	2020	6.03	2.62	1.31	3.18	0.002363	334.8	97.67	0.57
On100FutMidT	305	Q10wTideExch	2380	6.08	3.18	1.67	3.75	0.002139	391.1	104.52	0.55
On100FutMidT	305	Q25wTideExch	2520	6.1	3.38	1.8	3.96	0.002066	413	107.06	0.55
On100FutMidT	305	Q50wTideExch	2620	6.11	3.53	1.88	4.11	0.002015	428.9	108.85	0.54
On100FutMidT	305	Q100wTideExch	2740	6.12	3.7	1.99	4.28	0.00196	447.6	110.95	0.54
On100FutMidT	292		Bridge								
On100FutMidT	279	1.1wTideExch	2020	5.22	1.33		1.75	0.002557	386.9	149.84	0.57
On100FutMidT	279	Q10wTideExch	2380	6.2	1.31		1.91	0.003635	383.8	149.56	0.68
On100FutMidT	279	Q25wTideExch	2520	6.59	1.3		1.97	0.004122	382.4	149.42	0.73
On100FutMidT	279	Q50wTideExch	2620	6.87	1.29		2.02	0.004498	381.2	149.31	0.76
On100FutMidT	279	Q100wTideExch	2740	7.22	1.28		2.09	0.004981	379.6	149.17	0.8
On100FutMidT	250	1.1wTideExch	2020	4.05	1.37		1.62	0.002772	498.6	300.43	0.55
On100FutMidT	250	Q10wTideExch	2380	4.77	1.37		1.72	0.003842	498.9	300.54	0.65
On100FutMidT	250	Q25wTideExch	2520	5.05	1.37		1.77	0.004303	499.1	300.62	0.69
On100FutMidT	250	Q50wTideExch	2620	5.25	1.37		1.8	0.004646	499.3	300.69	0.72
On100FutMidT	250	Q100wTideExch	2740	5.48	1.37		1.84	0.005074	499.6	300.8	0.75
On100FutMidT	200	1.1wTideExch	2020	3.23	1.34		1.5	0.001291	624.7	297.3	0.39
On100FutMidT	200	Q10wTideExch	2380	3.83	1.33		1.56	0.001826	620.7	296.65	0.47
On100FutMidT	200	Q25wTideExch	2520	4.07	1.32		1.58	0.002065	618.9	296.35	0.5
On100FutMidT	200	Q50wTideExch	2620	4.24	1.32		1.6	0.002247	617.4	296.11	0.52
On100FutMidT	200	Q100wTideExch	2740	4.45	1.31		1.62	0.00248	615.5	295.8	0.54
On100FutMidT	150	1.1wTideExch	2020	1.76	1.39		1.44	0.000307	1152	476.45	0.2
On100FutMidT	150	Q10wTideExch	2380	2.06	1.4		1.47	0.000421	1156	476.67	0.23
On100FutMidT	150	Q25wTideExch	2520	2.18	1.41		1.48	0.000469	1158	476.77	0.24
On100FutMidT	150	Q50wTideExch	2620	2.26	1.41		1.49	0.000505	1160	476.85	0.25
On100FutMidT	150	Q100wTideExch	2740	2.36	1.41		1.5	0.00055	1162	476.94	0.26
On100FutMidT	100	1.1wTideExch	2020	1.54	1.39		1.43	0.000217	1320	532.15	0.17
On100FutMidT	100	Q10wTideExch	2380	1.8	1.4		1.45	0.000298	1324	533.04	0.2
On100FutMidT	100	Q25wTideExch	2520	1.91	1.4		1.46	0.000332	1326	533.43	0.21
On100FutMidT	100	Q50wTideExch	2620	1.98	1.4		1.46	0.000358	1327	533.72	0.22
On100FutMidT	100	Q100wTideExch	2740	2.07	1.41		1.47	0.00039	1329	534.09	0.22
On100FutMidT	50	1.1wTideExch	2020	1.17	1.39		1.41	0.000095	1758	623.67	0.11
On100FutMidT	50	Q10wTideExch	2380	1.37	1.4		1.43	0.000131	1764	624.07	0.13
On100FutMidT	50	Q25wTideExch	2520	1.45	1.41		1.44	0.000146	1766	624.24	0.14
On100FutMidT	50	Q50wTideExch	2620	1.51	1.41		1.44	0.000158	1768	624.37	0.15
On100FutMidT	50	Q100wTideExch	2740	1.57	1.41		1.45	0.000172	1770	624.53	0.15

100-ft. Span, On Alignment, Current High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
On100CrnHTid	400	1.1wTideExch	345	0.1	6.8		6.8	0.000001	3316	770.46	0.01
On100CrnHTid	400	Q10wTideExch	705	0.21	6.81		6.81	0.000002	3323	770.66	0.02
On100CrnHTid	400	Q25wTideExch	845	0.25	6.82		6.82	0.000003	3326	770.78	0.02
On100CrnHTid	400	Q50wTideExch	950	0.29	6.82		6.82	0.000004	3330	770.89	0.02
On100CrnHTid	400	Q100wTideExch	1065	0.32	6.83		6.83	0.000005	3334	771.02	0.03
On100CrnHTid	350	1.1wTideExch	345	0.13	6.8		6.8	0.000001	2897	689.34	0.01
On100CrnHTid	350	Q10wTideExch	705	0.26	6.81		6.81	0.000002	2903	689.92	0.02
On100CrnHTid	350	Q25wTideExch	845	0.32	6.82		6.82	0.000003	2906	690.25	0.02
On100CrnHTid	350	Q50wTideExch	950	0.36	6.82		6.82	0.000004	2909	690.54	0.03
On100CrnHTid	350	Q100wTideExch	1065	0.4	6.82		6.83	0.000005	2912	690.9	0.03
On100CrnHTid	305	1.1wTideExch	345	0.41	6.8	-1.17	6.8	0.000005	850.3	148.97	0.03
On100CrnHTid	305	Q10wTideExch	705	0.83	6.8	-0.39	6.81	0.000023	850.3	148.97	0.06
On100CrnHTid	305	Q25wTideExch	845	0.99	6.8	-0.16	6.82	0.000033	850.3	148.97	0.07
On100CrnHTid	305	Q50wTideExch	950	1.12	6.8	0.02	6.82	0.000041	850.3	148.97	0.08
On100CrnHTid	305	Q100wTideExch	1065	1.25	6.8	0.19	6.82	0.000052	850.3	148.97	0.09
On100CrnHTid	292		Bridge								
On100CrnHTid	279	1.1wTideExch	345	0.24	6.8		6.8	0.000002	1416	226.37	0.02
On100CrnHTid	279	Q10wTideExch	705	0.5	6.8		6.8	0.000007	1415	226.35	0.04
On100CrnHTid	279	Q25wTideExch	845	0.6	6.8		6.8	0.00001	1415	226.34	0.04
On100CrnHTid	279	Q50wTideExch	950	0.67	6.8		6.8	0.000013	1415	226.33	0.05
On100CrnHTid	279	Q100wTideExch	1065	0.75	6.8		6.8	0.000016	1415	226.31	0.05
On100CrnHTid	250	1.1wTideExch	345	0.14	6.8		6.8	0.000001	2510	484.74	0.01
On100CrnHTid	250	Q10wTideExch	705	0.29	6.8		6.8	0.000003	2510	484.73	0.02
On100CrnHTid	250	Q25wTideExch	845	0.35	6.8		6.8	0.000004	2510	484.73	0.03
On100CrnHTid	250	Q50wTideExch	950	0.4	6.8		6.8	0.000005	2510	484.73	0.03
On100CrnHTid	250	Q100wTideExch	1065	0.44	6.8		6.8	0.000006	2509	484.73	0.03
On100CrnHTid	200	1.1wTideExch	345	0.12	6.8		6.8	0	3063	567.63	0.01
On100CrnHTid	200	Q10wTideExch	705	0.25	6.8		6.8	0.000002	3063	567.63	0.02
On100CrnHTid	200	Q25wTideExch	845	0.3	6.8		6.8	0.000002	3063	567.63	0.02
On100CrnHTid	200	Q50wTideExch	950	0.33	6.8		6.8	0.000003	3063	567.63	0.02
On100CrnHTid	200	Q100wTideExch	1065	0.37	6.8		6.8	0.000004	3063	567.63	0.03
On100CrnHTid	150	1.1wTideExch	345	0.09	6.8		6.8	0	4037	582.9	0.01
On100CrnHTid	150	Q10wTideExch	705	0.18	6.8		6.8	0.000001	4037	582.91	0.01
On100CrnHTid	150	Q25wTideExch	845	0.22	6.8		6.8	0.000001	4037	582.91	0.01
On100CrnHTid	150	Q50wTideExch	950	0.25	6.8		6.8	0.000001	4037	582.91	0.02
On100CrnHTid	150	Q100wTideExch	1065	0.28	6.8		6.8	0.000002	4037	582.91	0.02
On100CrnHTid	100	1.1wTideExch	345	0.08	6.8		6.8	0	4639	661.52	0
On100CrnHTid	100	Q10wTideExch	705	0.16	6.8		6.8	0.000001	4639	661.52	0.01
On100CrnHTid	100	Q25wTideExch	845	0.2	6.8		6.8	0.000001	4639	661.52	0.01
On100CrnHTid	100	Q50wTideExch	950	0.22	6.8		6.8	0.000001	4639	661.53	0.01
On100CrnHTid	100	Q100wTideExch	1065	0.25	6.8		6.8	0.000001	4639	661.53	0.02
On100CrnHTid	50	1.1wTideExch	345	0.07	6.8		6.8	0	5487	738.92	0
On100CrnHTid	50	Q10wTideExch	705	0.14	6.8		6.8	0	5487	738.92	0.01
On100CrnHTid	50	Q25wTideExch	845	0.17	6.8		6.8	0.000001	5487	738.92	0.01
On100CrnHTid	50	Q50wTideExch	950	0.19	6.8		6.8	0.000001	5487	738.93	0.01
On100CrnHTid	50	Q100wTideExch	1065	0.21	6.8		6.8	0.000001	5487	738.93	0.01

100-ft. Span, On Alignment, Future High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg. Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
On100FutHTid	400	1.1wTideExch	345	0.07	8.8		8.8	0	4903	806.94	0.01
On100FutHTid	400	Q10wTideExch	705	0.14	8.81		8.81	0.000001	4907	806.98	0.01
On100FutHTid	400	Q25wTideExch	845	0.17	8.81		8.81	0.000001	4909	807	0.01
On100FutHTid	400	Q50wTideExch	950	0.19	8.81		8.81	0.000001	4911	807.02	0.01
On100FutHTid	400	Q100wTideExch	1065	0.22	8.81		8.82	0.000001	4914	807.04	0.02
On100FutHTid	350	1.1wTideExch	345	0.09	8.8		8.8	0	4324	725.53	0.01
On100FutHTid	350	Q10wTideExch	705	0.19	8.81		8.81	0.000001	4327	725.56	0.01
On100FutHTid	350	Q25wTideExch	845	0.22	8.81		8.81	0.000001	4329	725.58	0.01
On100FutHTid	350	Q50wTideExch	950	0.25	8.81		8.81	0.000001	4331	725.59	0.02
On100FutHTid	350	Q100wTideExch	1065	0.28	8.81		8.82	0.000002	4333	725.61	0.02
On100FutHTid	305	1.1wTideExch	345	0.3	8.8	-1.17	8.8	0.000002	1179	182.48	0.02
On100FutHTid	305	Q10wTideExch	705	0.61	8.8	-0.39	8.81	0.000009	1179	182.49	0.04
On100FutHTid	305	Q25wTideExch	845	0.73	8.8	-0.16	8.81	0.000012	1179	182.49	0.05
On100FutHTid	305	Q50wTideExch	950	0.82	8.8	0.02	8.81	0.000016	1180	182.5	0.05
On100FutHTid	305	Q100wTideExch	1065	0.91	8.8	0.19	8.81	0.00002	1180	182.5	0.06
On100FutHTid	292		Bridge								
On100FutHTid	279	1.1wTideExch	345	0.18	8.8		8.8	0.000001	1896	254.39	0.01
On100FutHTid	279	Q10wTideExch	705	0.37	8.8		8.8	0.000003	1896	254.38	0.02
On100FutHTid	279	Q25wTideExch	845	0.45	8.8		8.8	0.000005	1896	254.37	0.03
On100FutHTid	279	Q50wTideExch	950	0.5	8.8		8.8	0.000006	1896	254.36	0.03
On100FutHTid	279	Q100wTideExch	1065	0.56	8.8		8.8	0.000007	1896	254.36	0.04
On100FutHTid	250	1.1wTideExch	345	0.11	8.8		8.8	0	3527	529.41	0.01
On100FutHTid	250	Q10wTideExch	705	0.21	8.8		8.8	0.000001	3527	529.41	0.01
On100FutHTid	250	Q25wTideExch	845	0.26	8.8		8.8	0.000001	3527	529.4	0.02
On100FutHTid	250	Q50wTideExch	950	0.29	8.8		8.8	0.000002	3527	529.4	0.02
On100FutHTid	250	Q100wTideExch	1065	0.32	8.8		8.8	0.000002	3527	529.4	0.02
On100FutHTid	200	1.1wTideExch	345	0.09	8.8		8.8	0	4238	603.88	0.01
On100FutHTid	200	Q10wTideExch	705	0.19	8.8		8.8	0.000001	4238	603.88	0.01
On100FutHTid	200	Q25wTideExch	845	0.22	8.8		8.8	0.000001	4238	603.88	0.01
On100FutHTid	200	Q50wTideExch	950	0.25	8.8		8.8	0.000001	4238	603.88	0.01
On100FutHTid	200	Q100wTideExch	1065	0.28	8.8		8.8	0.000001	4238	603.88	0.02
On100FutHTid	150	1.1wTideExch	345	0.07	8.8		8.8	0	5234	616.18	0
On100FutHTid	150	Q10wTideExch	705	0.14	8.8		8.8	0	5234	616.18	0.01
On100FutHTid	150	Q25wTideExch	845	0.17	8.8		8.8	0	5234	616.18	0.01
On100FutHTid	150	Q50wTideExch	950	0.2	8.8		8.8	0.000001	5234	616.18	0.01
On100FutHTid	150	Q100wTideExch	1065	0.22	8.8		8.8	0.000001	5234	616.18	0.01
On100FutHTid	100	1.1wTideExch	345	0.06	8.8		8.8	0	5991	688.31	0
On100FutHTid	100	Q10wTideExch	705	0.13	8.8		8.8	0	5992	688.31	0.01
On100FutHTid	100	Q25wTideExch	845	0.15	8.8		8.8	0	5992	688.31	0.01
On100FutHTid	100	Q50wTideExch	950	0.17	8.8		8.8	0	5992	688.31	0.01
On100FutHTid	100	Q100wTideExch	1065	0.19	8.8		8.8	0.000001	5992	688.31	0.01
On100FutHTid	50	1.1wTideExch	345	0.05	8.8		8.8	0	6993	765.59	0
On100FutHTid	50	Q10wTideExch	705	0.11	8.8		8.8	0	6993	765.59	0.01
On100FutHTid	50	Q25wTideExch	845	0.13	8.8		8.8	0	6994	765.59	0.01
On100FutHTid	50	Q50wTideExch	950	0.15	8.8		8.8	0	6994	765.59	0.01
On100FutHTid	50	Q100wTideExch	1065	0.17	8.8		8.8	0	6994	765.59	0.01


RS=327 Upstream (Bridge)
Legend
Ground
Bank Sta
Elevation (ft)
30
25
20
15
10
5
0
-5
0
200
400
600
800
1000
RS=327 Downstream (Bridge)
Elevation (ft)
Station (ft)

New 84-ft. Span on U.S. Aligment, Current Mid Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
84ft_US	400	1.1wTideExch	2020	0.7	6.23		6.24	0.000027	2882	755.84	0.06
84ft_US	400	Q10wTideExch	2380	0.72	6.78		6.79	0.000025	3302	770.03	0.06
84ft_US	400	Q25wTideExch	2520	0.73	6.99		7	0.000024	3459	774.94	0.06
84ft_US	400	Q50wTideExch	2620	0.73	7.13		7.14	0.000023	3571	777.74	0.06
84ft_US	400	Q100wTideExc	2740	0.74	7.3		7.31	0.000023	3702	783.63	0.06
84ft_US	350	1.1wTideExch	2020	0.85	6.23	0.8	6.24	0.000025	2513	648.92	0.06
84ft_US	350	Q10wTideExch	2380	0.9	6.78	1.02	6.79	0.000025	2881	687.69	0.07
84ft_US	350	Q25wTideExch	2520	0.91	6.98	1.09	6.99	0.000025	3022	702	0.07
84ft_US	350	Q50wTideExch	2620	0.92	7.13	1.13	7.14	0.000025	3123	704.96	0.07
84ft_US	350	Q100wTideExc	2740	0.93	7.29	1.17	7.31	0.000025	3242	707.26	0.07
84ft_US	327		Bridge								
84ft_US	305	1.1wTideExch	2020	6.45	0.99		1.64	0.005678	313.1	160.79	0.81
84ft_US	305	Q10wTideExch	2380	7.02	1.15	0.93	1.92	0.006381	338.9	167.2	0.87
84ft_US	305	Q25wTideExch	2520	7.05	1.26	1.01	2.03	0.006212	357.3	171.62	0.86
84ft_US	305	Q50wTideExch	2620	7.07	1.33	1.06	2.11	0.006093	370.5	174.74	0.86
84ft_US	305	Q100wTideExc	2740	7.21	1.39		2.2	0.006227	380	176.95	0.87
84ft_US	279	1.1wTideExch	2020	6.23	0.9		1.5	0.004484	324.2	146.97	0.74
84ft_US	279	Q10wTideExch	2380	7.07	0.98		1.76	0.005565	336.9	148.66	0.83
84ft_US	279	Q25wTideExch	2520	7.33	1.03		1.86	0.00588	343.8	149.57	0.85
84ft_US	279	Q50wTideExch	2620	7.52	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
84ft_US	279	Q100wTideExc	2740	7.79	1.08		2.02	0.006497	351.8	150.62	0.90
84ft_US	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1.00
84ft_US	250	Q10wTideExch	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
84ft_US	250	Q25wTideExch	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1.00
84ft_US	250	Q50wTideExch	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1.00
84ft_US	250	Q100wTideExc	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
84ft_US	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1.00
84ft_US	200	Q10wTideExch	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
84ft_US	200	Q25wTideExch	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1.00
84ft_US	200	Q50wTideExch	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1.00
	200	Q100wTideExc	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1.00
84ft_US											
84ft_US	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.60
84ft_US	150	Q10wTideExch	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
84ft_US	150	Q25wTideExch	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
84ft_US	150	Q50wTideExch	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
84ft_US	150	Q100wTideExc	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
84ft_US	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
84ft_US	100	Q10wTideExch	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1.00
84ft_US	100	Q25wTideExch	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
84ft_US	100	Q50wTideExch	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
84ft_US	100	Q100wTideExc	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1.00
84ft_US	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
84ft_US	50	Q10wTideExch	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
84ft_US	50	Q25wTideExch	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
84ft_US	50	Q50wTideExch	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
84ft_US	50	Q100wTideExc	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43

7.13'
- 6.83
0.3'
0.3' x 84' = 25 ft

7.07
- 6.83
.24
.24(84') = 20
370 - 20 = 350 ft

(84-ft. clear, 87' c-c brgs.)

New 84-ft. Span on U.S., Future Mid Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
84USwFtrMidT	400	1.1wTideExch	2020	0.7	6.23		6.24	0.000027	2882	755.84	0.06
84USwFtrMidT	400	Q10wTideExch	2380	0.72	6.78		6.79	0.000025	3302	770.03	0.06
84USwFtrMidT	400	Q25wTideExch	2520	0.73	6.99		7	0.000024	3459	774.94	0.06
84USwFtrMidT	400	Q50wTideExch	2620	0.73	7.13		7.14	0.000023	3571	777.74	0.06
84USwFtrMidT	400	Q100wTideExch	2740	0.74	7.3		7.31	0.000023	3702	783.63	0.06
84USwFtrMidT	350	1.1wTideExch	2020	0.85	6.23	0.81	6.24	0.000025	2513	648.92	0.06
84USwFtrMidT	350	Q10wTideExch	2380	0.9	6.78	1.01	6.79	0.000025	2881	687.69	0.07
84USwFtrMidT	350	Q25wTideExch	2520	0.91	6.98	1.06	6.99	0.000025	3022	702	0.07
84USwFtrMidT	350	Q50wTideExch	2620	0.92	7.13	1.12	7.14	0.000025	3123	704.96	0.07
84USwFtrMidT	350	Q100wTideExch	2740	0.93	7.29	1.16	7.31	0.000025	3242	707.26	0.07
84USwFtrMidT	327		Bridge								
84USwFtrMidT	305	1.1wTideExch	2020	5.3	1.4		1.83	0.003354	381.3	177.25	0.64
84USwFtrMidT	305	Q10wTideExch	2380	6.17	1.42		2.01	0.004523	385.5	178.2	0.74
84USwFtrMidT	305	Q25wTideExch	2520	6.48	1.44		2.09	0.004952	388.9	178.98	0.77
84USwFtrMidT	305	Q50wTideExch	2620	6.67	1.46		2.15	0.005218	392.6	179.83	0.8
84USwFtrMidT	305	Q100wTideExch	2740	6.87	1.49		2.23	0.005475	398.8	181.22	0.82
84USwFtrMidT	279	1.1wTideExch	2020	5.17	1.33		1.75	0.002603	390.6	155.62	0.58
84USwFtrMidT	279	Q10wTideExch	2380	6.13	1.32		1.9	0.003686	388	155.28	0.68
84USwFtrMidT	279	Q25wTideExch	2520	6.52	1.31		1.97	0.004172	386.7	155.12	0.73
84USwFtrMidT	279	Q50wTideExch	2620	6.79	1.3		2.02	0.004545	385.7	154.99	0.76
84USwFtrMidT	279	Q100wTideExch	2740	7.13	1.29		2.08	0.005023	384.3	154.81	0.8
84USwFtrMidT	250	1.1wTideExch	2020	4.05	1.37		1.62	0.002772	498.6	300.43	0.55
84USwFtrMidT	250	Q10wTideExch	2380	4.77	1.37		1.72	0.003842	498.9	300.54	0.65
84USwFtrMidT	250	Q25wTideExch	2520	5.05	1.37		1.77	0.004303	499.1	300.62	0.69
84USwFtrMidT	250	Q50wTideExch	2620	5.25	1.37		1.8	0.004646	499.3	300.69	0.72
84USwFtrMidT	250	Q100wTideExch	2740	5.48	1.37		1.84	0.005074	499.6	300.8	0.75
84USwFtrMidT	200	1.1wTideExch	2020	3.23	1.34		1.5	0.001291	624.7	297.3	0.39
84USwFtrMidT	200	Q10wTideExch	2380	3.83	1.33		1.56	0.001826	620.7	296.65	0.47
84USwFtrMidT	200	Q25wTideExch	2520	4.07	1.32		1.58	0.002065	618.9	296.35	0.5
84USwFtrMidT	200	Q50wTideExch	2620	4.24	1.32		1.6	0.002247	617.4	296.11	0.52
84USwFtrMidT	200	Q100wTideExch	2740	4.45	1.31		1.62	0.00248	615.5	295.8	0.54
84USwFtrMidT	150	1.1wTideExch	2020	1.76	1.39		1.44	0.000307	1152	476.45	0.2
84USwFtrMidT	150	Q10wTideExch	2380	2.06	1.4		1.47	0.000421	1156	476.67	0.23
84USwFtrMidT	150	Q25wTideExch	2520	2.18	1.41		1.48	0.000469	1158	476.77	0.24
84USwFtrMidT	150	Q50wTideExch	2620	2.26	1.41		1.49	0.000505	1160	476.85	0.25
84USwFtrMidT	150	Q100wTideExch	2740	2.36	1.41		1.5	0.00055	1162	476.94	0.26
84USwFtrMidT	100	1.1wTideExch	2020	1.54	1.39		1.43	0.000217	1320	532.15	0.17
84USwFtrMidT	100	Q10wTideExch	2380	1.8	1.4		1.45	0.000298	1324	533.04	0.2
84USwFtrMidT	100	Q25wTideExch	2520	1.91	1.4		1.46	0.000332	1326	533.43	0.21
84USwFtrMidT	100	Q50wTideExch	2620	1.98	1.4		1.46	0.000358	1327	533.72	0.22
84USwFtrMidT	100	Q100wTideExch	2740	2.07	1.41		1.47	0.00039	1329	534.09	0.22
84USwFtrMidT	50	1.1wTideExch	2020	1.17	1.39		1.41	0.000095	1758	623.67	0.11
84USwFtrMidT	50	Q10wTideExch	2380	1.37	1.4		1.43	0.000131	1764	624.07	0.13
84USwFtrMidT	50	Q25wTideExch	2520	1.45	1.41		1.44	0.000146	1766	624.24	0.14
84USwFtrMidT	50	Q50wTideExch	2620	1.51	1.41		1.44	0.000158	1768	624.37	0.15
84USwFtrMidT	50	Q100wTideExch	2740	1.57	1.41		1.45	0.000172	1770	624.53	0.15

(84-ft. clear, 87' c-c brgs.)

New 84-ft. Span on U.S., Current High Tide

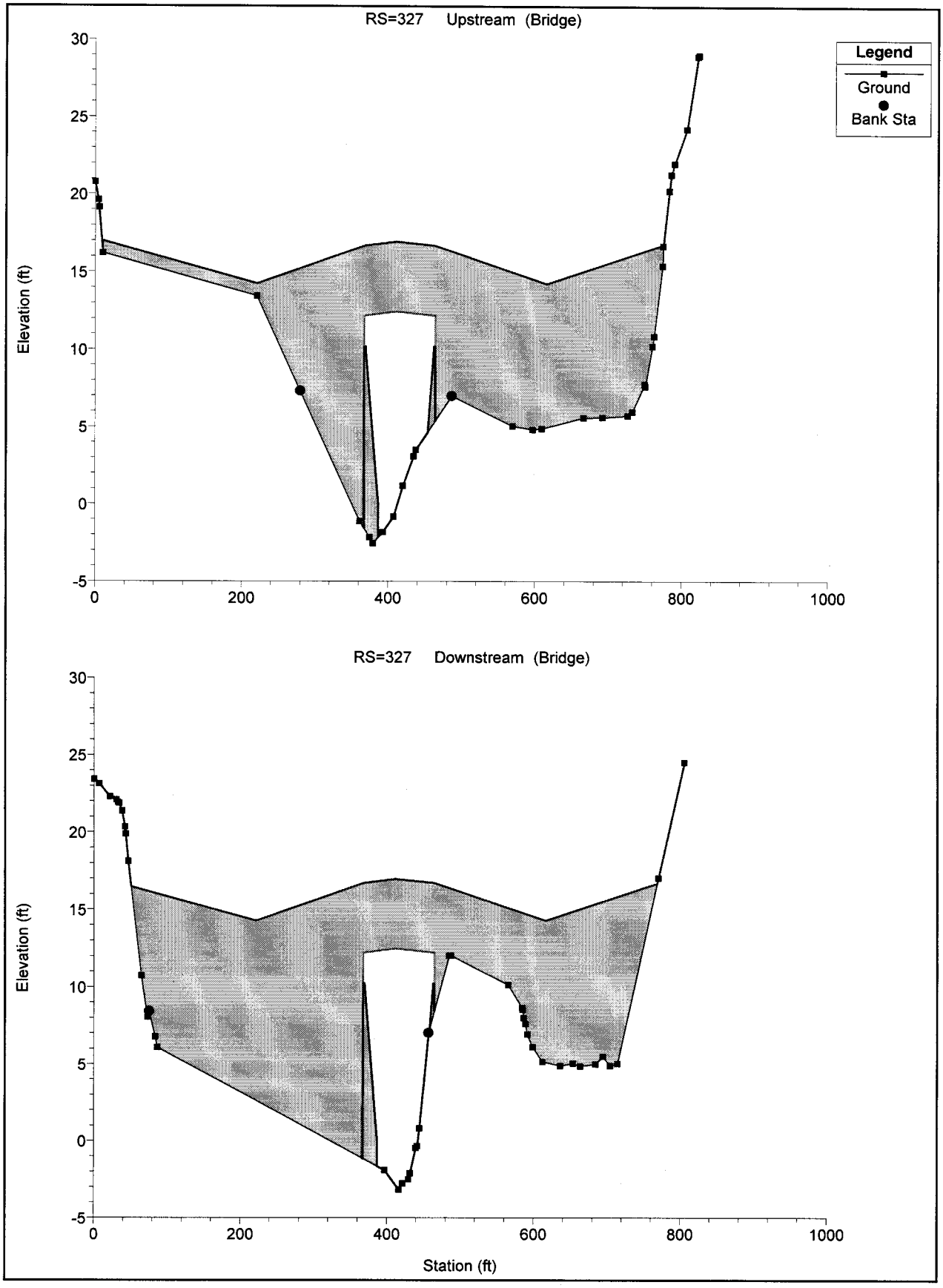
Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
84ftCrntHi	400	1.1wTideExch	345	0.1	6.81		6.81	0.000001	3319	770.56	0.01
84ftCrntHi	400	Q10wTideExch	705	0.21	6.83		6.83	0.000002	3336	771.09	0.02
84ftCrntHi	400	Q25wTideExch	845	0.25	6.84		6.84	0.000003	3346	771.4	0.02
84ftCrntHi	400	Q50wTideExch	950	0.28	6.85		6.85	0.000004	3355	771.67	0.02
84ftCrntHi	400	Q100wTideExc	1065	0.32	6.87		6.87	0.000005	3365	772.01	0.03
84ftCrntHi	350	1.1wTideExch	345	0.13	6.81	-0.55	6.81	0.000001	2900	689.63	0.01
84ftCrntHi	350	Q10wTideExch	705	0.26	6.83	-0.07	6.83	0.000002	2915	691.15	0.02
84ftCrntHi	350	Q25wTideExch	845	0.31	6.84	0.04	6.84	0.000003	2923	692.04	0.02
84ftCrntHi	350	Q50wTideExch	950	0.35	6.85	0.13	6.85	0.000004	2931	692.81	0.03
84ftCrntHi	350	Q100wTideExc	1065	0.39	6.87	0.23	6.87	0.000005	2941	693.79	0.03
84ftCrntHi	327		Bridge								
84ftCrntHi	305	1.1wTideExch	345	0.17	6.8		6.8	0.000001	2138	503.35	0.01
84ftCrntHi	305	Q10wTideExch	705	0.35	6.8		6.8	0.000005	2138	503.35	0.03
84ftCrntHi	305	Q25wTideExch	845	0.42	6.8		6.8	0.000007	2138	503.35	0.03
84ftCrntHi	305	Q50wTideExch	950	0.48	6.8		6.8	0.000008	2138	503.35	0.04
84ftCrntHi	305	Q100wTideExc	1065	0.53	6.8		6.8	0.000011	2138	503.36	0.04
84ftCrntHi	279	1.1wTideExch	345	0.22	6.8		6.8	0.000001	1718	377.51	0.02
84ftCrntHi	279	Q10wTideExch	705	0.44	6.8		6.8	0.000006	1717	377.48	0.03
84ftCrntHi	279	Q25wTideExch	845	0.53	6.8		6.8	0.000009	1717	377.46	0.04
84ftCrntHi	279	Q50wTideExch	950	0.6	6.8		6.8	0.000011	1717	377.44	0.04
84ftCrntHi	279	Q100wTideExc	1065	0.67	6.8		6.8	0.000014	1717	377.42	0.05
84ftCrntHi	250	1.1wTideExch	345	0.14	6.8		6.8	0.000001	2510	484.74	0.01
84ftCrntHi	250	Q10wTideExch	705	0.29	6.8		6.8	0.000003	2510	484.73	0.02
84ftCrntHi	250	Q25wTideExch	845	0.35	6.8		6.8	0.000004	2510	484.73	0.03
84ftCrntHi	250	Q50wTideExch	950	0.4	6.8		6.8	0.000005	2510	484.73	0.03
84ftCrntHi	250	Q100wTideExc	1065	0.44	6.8		6.8	0.000006	2509	484.73	0.03
84ftCrntHi	200	1.1wTideExch	345	0.12	6.8		6.8	0	3063	567.63	0.01
84ftCrntHi	200	Q10wTideExch	705	0.25	6.8		6.8	0.000002	3063	567.63	0.02
84ftCrntHi	200	Q25wTideExch	845	0.3	6.8		6.8	0.000002	3063	567.63	0.02
84ftCrntHi	200	Q50wTideExch	950	0.33	6.8		6.8	0.000003	3063	567.63	0.02
	200	Q100wTideExc	1065	0.37	6.8		6.8	0.000004	3063	567.63	0.03
84ftCrntHi											
84ftCrntHi	150	1.1wTideExch	345	0.09	6.8		6.8	0	4037	582.9	0.01
84ftCrntHi	150	Q10wTideExch	705	0.18	6.8		6.8	0.000001	4037	582.91	0.01
84ftCrntHi	150	Q25wTideExch	845	0.22	6.8		6.8	0.000001	4037	582.91	0.01
84ftCrntHi	150	Q50wTideExch	950	0.25	6.8		6.8	0.000001	4037	582.91	0.02
84ftCrntHi	150	Q100wTideExc	1065	0.28	6.8		6.8	0.000002	4037	582.91	0.02
84ftCrntHi	100	1.1wTideExch	345	0.08	6.8		6.8	0	4639	661.52	0
84ftCrntHi	100	Q10wTideExch	705	0.16	6.8		6.8	0.000001	4639	661.52	0.01
84ftCrntHi	100	Q25wTideExch	845	0.2	6.8		6.8	0.000001	4639	661.52	0.01
84ftCrntHi	100	Q50wTideExch	950	0.22	6.8		6.8	0.000001	4639	661.53	0.01
84ftCrntHi	100	Q100wTideExc	1065	0.25	6.8		6.8	0.000001	4639	661.53	0.02
84ftCrntHi	50	1.1wTideExch	345	0.07	6.8		6.8	0	5487	738.92	0
84ftCrntHi	50	Q10wTideExch	705	0.14	6.8		6.8	0	5487	738.92	0.01
84ftCrntHi	50	Q25wTideExch	845	0.17	6.8		6.8	0.000001	5487	738.92	0.01
84ftCrntHi	50	Q50wTideExch	950	0.19	6.8		6.8	0.000001	5487	738.93	0.01
84ftCrntHi	50	Q100wTideExc	1065	0.21	6.8		6.8	0.000001	5487	738.93	0.01

.63 × 84 = 25.4 ft
call 2MUCD

New 84-ft. Span on U.S., Future High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
84USFutrHiT	400	1.1wTideExch	345	0.07	8.8		8.8	0	4904	806.95	0.01
84USFutrHiT	400	Q10wTideExch	705	0.14	8.81		8.81	0.000001	4913	807.03	0.01
84USFutrHiT	400	Q25wTideExch	845	0.17	8.82		8.82	0.000001	4918	807.08	0.01
84USFutrHiT	400	Q50wTideExch	950	0.19	8.83		8.83	0.000001	4923	807.12	0.01
84USFutrHiT	400	Q100wTideExch	1065	0.22	8.83		8.83	0.000001	4928	807.16	0.02
84USFutrHiT	350	1.1wTideExch	345	0.09	8.8	-0.55	8.8	0	4325	725.54	0.01
84USFutrHiT	350	Q10wTideExch	705	0.19	8.81	-0.07	8.81	0.000001	4333	725.61	0.01
84USFutrHiT	350	Q25wTideExch	845	0.22	8.82	0.04	8.82	0.000001	4337	725.65	0.01
84USFutrHiT	350	Q50wTideExch	950	0.25	8.83	0.13	8.83	0.000001	4341	725.68	0.02
84USFutrHiT	350	Q100wTideExch	1065	0.28	8.83	0.23	8.83	0.000002	4346	725.72	0.02
84USFutrHiT	327		Bridge								
84USFutrHiT	305	1.1wTideExch	345	0.12	8.8		8.8	0	3184	545.62	0.01
84USFutrHiT	305	Q10wTideExch	705	0.24	8.8		8.8	0.000001	3184	545.62	0.02
84USFutrHiT	305	Q25wTideExch	845	0.29	8.8		8.8	0.000002	3184	545.62	0.02
84USFutrHiT	305	Q50wTideExch	950	0.33	8.8		8.8	0.000003	3184	545.62	0.02
84USFutrHiT	305	Q100wTideExch	1065	0.37	8.8		8.8	0.000003	3184	545.62	0.02
84USFutrHiT	279	1.1wTideExch	345	0.15	8.8		8.8	0.000001	2536	439.24	0.01
84USFutrHiT	279	Q10wTideExch	705	0.31	8.8		8.8	0.000002	2536	439.23	0.02
84USFutrHiT	279	Q25wTideExch	845	0.37	8.8		8.8	0.000003	2536	439.22	0.02
84USFutrHiT	279	Q50wTideExch	950	0.41	8.8		8.8	0.000004	2536	439.22	0.03
84USFutrHiT	279	Q100wTideExch	1065	0.46	8.8		8.8	0.000005	2536	439.21	0.03
84USFutrHiT	250	1.1wTideExch	345	0.11	8.8		8.8	0	3527	529.41	0.01
84USFutrHiT	250	Q10wTideExch	705	0.21	8.8		8.8	0.000001	3527	529.41	0.01
84USFutrHiT	250	Q25wTideExch	845	0.26	8.8		8.8	0.000001	3527	529.4	0.02
84USFutrHiT	250	Q50wTideExch	950	0.29	8.8		8.8	0.000002	3527	529.4	0.02
84USFutrHiT	250	Q100wTideExch	1065	0.32	8.8		8.8	0.000002	3527	529.4	0.02
84USFutrHiT	200	1.1wTideExch	345	0.09	8.8		8.8	0	4238	603.88	0.01
84USFutrHiT	200	Q10wTideExch	705	0.19	8.8		8.8	0.000001	4238	603.88	0.01
84USFutrHiT	200	Q25wTideExch	845	0.22	8.8		8.8	0.000001	4238	603.88	0.01
84USFutrHiT	200	Q50wTideExch	950	0.25	8.8		8.8	0.000001	4238	603.88	0.01
84USFutrHiT	200	Q100wTideExch	1065	0.28	8.8		8.8	0.000001	4238	603.88	0.02
84USFutrHiT	150	1.1wTideExch	345	0.07	8.8		8.8	0	5234	616.18	0
84USFutrHiT	150	Q10wTideExch	705	0.14	8.8		8.8	0	5234	616.18	0.01
84USFutrHiT	150	Q25wTideExch	845	0.17	8.8		8.8	0	5234	616.18	0.01
84USFutrHiT	150	Q50wTideExch	950	0.2	8.8		8.8	0.000001	5234	616.18	0.01
84USFutrHiT	150	Q100wTideExch	1065	0.22	8.8		8.8	0.000001	5234	616.18	0.01
84USFutrHiT	100	1.1wTideExch	345	0.06	8.8		8.8	0	5991	688.31	0
84USFutrHiT	100	Q10wTideExch	705	0.13	8.8		8.8	0	5992	688.31	0.01
84USFutrHiT	100	Q25wTideExch	845	0.15	8.8		8.8	0	5992	688.31	0.01
84USFutrHiT	100	Q50wTideExch	950	0.17	8.8		8.8	0	5992	688.31	0.01
84USFutrHiT	100	Q100wTideExch	1065	0.19	8.8		8.8	0.000001	5992	688.31	0.01
84USFutrHiT	50	1.1wTideExch	345	0.05	8.8		8.8	0	6993	765.59	0
84USFutrHiT	50	Q10wTideExch	705	0.11	8.8		8.8	0	6993	765.59	0.01
84USFutrHiT	50	Q25wTideExch	845	0.13	8.8		8.8	0	6994	765.59	0.01
84USFutrHiT	50	Q50wTideExch	950	0.15	8.8		8.8	0	6994	765.59	0.01
84USFutrHiT	50	Q100wTideExch	1065	0.17	8.8		8.8	0	6994	765.59	0.01

New 100-ft. Span on U.S. Alignment



100-ft. Span, U.S. Alignment, Current High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
100'USCrMTid	400	1.1wTideExch	2020	0.87	5.48		5.49	0.000053	2318	717.24	0.09
100'USCrMTid	400	Q10wTideExch	2380	0.87	6.02		6.03	0.000045	2721	750.03	0.08
100'USCrMTid	400	Q25wTideExch	2520	0.88	6.21		6.23	0.000043	2867	755.29	0.08
100'USCrMTid	400	Q50wTideExch	2620	0.88	6.35		6.36	0.000042	2967	758.9	0.08
100'USCrMTid	400	Q100wTideExch	2740	0.89	6.5		6.51	0.000041	3085	763.11	0.08
100'USCrMTid	350	1.1wTideExch	2020	1	5.47	0.8	5.49	0.000041	2054	522.53	0.08
100'USCrMTid	350	Q10wTideExch	2380	1.05	6.01	1.02	6.03	0.00004	2374	633.67	0.08
100'USCrMTid	350	Q25wTideExch	2520	1.07	6.21	1.09	6.22	0.00004	2498	647.29	0.08
100'USCrMTid	350	Q50wTideExch	2620	1.08	6.34	1.13	6.36	0.00004	2585	656.65	0.08
100'USCrMTid	350	Q100wTideExch	2740	1.09	6.49	1.17	6.51	0.000039	2687	667.57	0.08
100'USCrMTid	327		Bridge								
100'USCrMTid	305	1.1wTideExch	2020	6.45	0.99		1.64	0.005678	313.1	160.79	0.81
100'USCrMTid	305	Q10wTideExch	2380	7.02	1.15	0.93	1.92	0.006381	338.9	167.2	0.87
100'USCrMTid	305	Q25wTideExch	2520	7.05	1.26	1.01	2.03	0.006212	357.3	171.62	0.86
100'USCrMTid	305	Q50wTideExch	2620	7.07	1.33	1.06	2.11	0.006093	370.5	174.74	0.86
100'USCrMTid	305	Q100wTideExch	2740	7.21	1.39		2.2	0.006227	380	176.95	0.87
100'USCrMTid	279	1.1wTideExch	2020	6.23	0.9		1.5	0.004484	324.2	146.97	0.74
100'USCrMTid	279	Q10wTideExch	2380	7.07	0.98		1.76	0.005565	336.9	148.66	0.83
100'USCrMTid	279	Q25wTideExch	2520	7.33	1.03		1.86	0.00588	343.8	149.57	0.85
100'USCrMTid	279	Q50wTideExch	2620	7.52	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
100'USCrMTid	279	Q100wTideExch	2740	7.79	1.08		2.02	0.006497	351.8	150.62	0.9
100'USCrMTid	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1
100'USCrMTid	250	Q10wTideExch	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
100'USCrMTid	250	Q25wTideExch	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1
100'USCrMTid	250	Q50wTideExch	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1
100'USCrMTid	250	Q100wTideExch	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
100'USCrMTid	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1
100'USCrMTid	200	Q10wTideExch	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
100'USCrMTid	200	Q25wTideExch	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1
100'USCrMTid	200	Q50wTideExch	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1
100'USCrMTid	200	Q100wTideExch	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1
100'USCrMTid	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.6
100'USCrMTid	150	Q10wTideExch	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
100'USCrMTid	150	Q25wTideExch	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
100'USCrMTid	150	Q50wTideExch	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
100'USCrMTid	150	Q100wTideExch	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
100'USCrMTid	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
100'USCrMTid	100	Q10wTideExch	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1
100'USCrMTid	100	Q25wTideExch	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
100'USCrMTid	100	Q50wTideExch	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
100'USCrMTid	100	Q100wTideExch	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1
100'USCrMTid	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
100'USCrMTid	50	Q10wTideExch	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
100'USCrMTid	50	Q25wTideExch	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
100'USCrMTid	50	Q50wTideExch	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
100'USCrMTid	50	Q100wTideExch	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43

100-ft. Span, U.S. Alignment, Future High Tide

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
100'USFutMdT	400	1.1wTideExch	2020	0.87	5.48		5.49	0.000053	2318	717.24	0.09
100'USFutMdT	400	Q10wTideExch	2380	0.87	6.02		6.03	0.000045	2721	750.03	0.08
100'USFutMdT	400	Q25wTideExch	2520	0.88	6.21		6.23	0.000043	2867	755.29	0.08
100'USFutMdT	400	Q50wTideExch	2620	0.88	6.35		6.36	0.000042	2967	758.9	0.08
100'USFutMdT	400	Q100wTideExch	2740	0.89	6.5		6.51	0.000041	3085	763.11	0.08
100'USFutMdT	350	1.1wTideExch	2020	1	5.47	0.81	5.49	0.000041	2054	522.53	0.08
100'USFutMdT	350	Q10wTideExch	2380	1.05	6.01	1.01	6.03	0.00004	2374	633.67	0.08
100'USFutMdT	350	Q25wTideExch	2520	1.07	6.21	1.06	6.22	0.00004	2498	647.29	0.08
100'USFutMdT	350	Q50wTideExch	2620	1.08	6.34	1.12	6.36	0.00004	2585	656.65	0.08
100'USFutMdT	350	Q100wTideExch	2740	1.09	6.49	1.16	6.51	0.000039	2687	667.57	0.08
100'USFutMdT	327		Bridge								
100'USFutMdT	305	1.1wTideExch	2020	5.3	1.4		1.83	0.003354	381.3	177.25	0.64
100'USFutMdT	305	Q10wTideExch	2380	6.17	1.42		2.01	0.004523	385.5	178.2	0.74
100'USFutMdT	305	Q25wTideExch	2520	6.48	1.44		2.09	0.004952	388.9	178.98	0.77
100'USFutMdT	305	Q50wTideExch	2620	6.67	1.46		2.15	0.005218	392.6	179.83	0.8
100'USFutMdT	305	Q100wTideExch	2740	6.87	1.49		2.23	0.005475	398.8	181.22	0.82
100'USFutMdT	279	1.1wTideExch	2020	5.17	1.33		1.75	0.002603	390.6	155.62	0.58
100'USFutMdT	279	Q10wTideExch	2380	6.13	1.32		1.9	0.003686	388	155.28	0.68
100'USFutMdT	279	Q25wTideExch	2520	6.52	1.31		1.97	0.004172	386.7	155.12	0.73
100'USFutMdT	279	Q50wTideExch	2620	6.79	1.3		2.02	0.004545	385.7	154.99	0.76
100'USFutMdT	279	Q100wTideExch	2740	7.13	1.29		2.08	0.005023	384.3	154.81	0.8
100'USFutMdT	250	1.1wTideExch	2020	4.05	1.37		1.62	0.002772	498.6	300.43	0.55
100'USFutMdT	250	Q10wTideExch	2380	4.77	1.37		1.72	0.003842	498.9	300.54	0.65
100'USFutMdT	250	Q25wTideExch	2520	5.05	1.37		1.77	0.004303	499.1	300.62	0.69
100'USFutMdT	250	Q50wTideExch	2620	5.25	1.37		1.8	0.004646	499.3	300.69	0.72
100'USFutMdT	250	Q100wTideExch	2740	5.48	1.37		1.84	0.005074	499.6	300.8	0.75
100'USFutMdT	200	1.1wTideExch	2020	3.23	1.34		1.5	0.001291	624.7	297.3	0.39
100'USFutMdT	200	Q10wTideExch	2380	3.83	1.33		1.56	0.001826	620.7	296.65	0.47
100'USFutMdT	200	Q25wTideExch	2520	4.07	1.32		1.58	0.002065	618.9	296.35	0.5
100'USFutMdT	200	Q50wTideExch	2620	4.24	1.32		1.6	0.002247	617.4	296.11	0.52
100'USFutMdT	200	Q100wTideExch	2740	4.45	1.31		1.62	0.00248	615.5	295.8	0.54
100'USFutMdT	150	1.1wTideExch	2020	1.76	1.39		1.44	0.000307	1152	476.45	0.2
100'USFutMdT	150	Q10wTideExch	2380	2.06	1.4		1.47	0.000421	1156	476.67	0.23
100'USFutMdT	150	Q25wTideExch	2520	2.18	1.41		1.48	0.000469	1158	476.77	0.24
100'USFutMdT	150	Q50wTideExch	2620	2.26	1.41		1.49	0.000505	1160	476.85	0.25
100'USFutMdT	150	Q100wTideExch	2740	2.36	1.41		1.5	0.00055	1162	476.94	0.26
100'USFutMdT	100	1.1wTideExch	2020	1.54	1.39		1.43	0.000217	1320	532.15	0.17
100'USFutMdT	100	Q10wTideExch	2380	1.8	1.4		1.45	0.000298	1324	533.04	0.2
100'USFutMdT	100	Q25wTideExch	2520	1.91	1.4		1.46	0.000332	1326	533.43	0.21
100'USFutMdT	100	Q50wTideExch	2620	1.98	1.4		1.46	0.000358	1327	533.72	0.22
100'USFutMdT	100	Q100wTideExch	2740	2.07	1.41		1.47	0.00039	1329	534.09	0.22
100'USFutMdT	50	1.1wTideExch	2020	1.17	1.39		1.41	0.000095	1758	623.67	0.11
100'USFutMdT	50	Q10wTideExch	2380	1.37	1.4		1.43	0.000131	1764	624.07	0.13
100'USFutMdT	50	Q25wTideExch	2520	1.45	1.41		1.44	0.000146	1766	624.24	0.14
100'USFutMdT	50	Q50wTideExch	2620	1.51	1.41		1.44	0.000158	1768	624.37	0.15
100'USFutMdT	50	Q100wTideExch	2740	1.57	1.41		1.45	0.000172	1770	624.53	0.15

100' U.S. Steel

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
100 Ft US	400	1.1wTideExch	2020	0.87	5.48		5.49	0.000053	2318	717.24	0.09
100 Ft US	400	Q10wTideExcl	2380	0.87	6.02		6.03	0.000045	2721	750.03	0.08
100 Ft US	400	Q25wTideExcl	2520	0.88	6.21		6.23	0.000043	2867	755.29	0.08
100 Ft US	400	Q50wTideExcl	2620	0.88	6.35		6.36	0.000042	2967	758.9	0.08
100 Ft US	400	Q100wTideExc	2740	0.89	6.5		6.51	0.000041	3085	763.11	0.08
100 Ft US	350	1.1wTideExch	2020	1	5.47	0.8	5.49	0.000041	2054	522.53	0.08
100 Ft US	350	Q10wTideExcl	2380	1.05	6.01	1.02	6.03	0.00004	2374	633.67	0.08
100 Ft US	350	Q25wTideExcl	2520	1.07	6.21	1.09	6.22	0.00004	2498	647.29	0.08
100 Ft US	350	Q50wTideExcl	2620	1.08	6.34	1.13	6.36	0.00004	2585	656.65	0.08
100 Ft US	350	Q100wTideExc	2740	1.09	6.49	1.17	6.51	0.000039	2687	667.57	0.08
100 Ft US	327		Bridge								
100 Ft US	305	1.1wTideExch	2020	6.45	0.99		1.64	0.005678	313.1	160.79	0.81
100 Ft US	305	Q10wTideExcl	2380	7.02	1.15	0.93	1.92	0.006381	338.9	167.2	0.87
100 Ft US	305	Q25wTideExcl	2520	7.05	1.26	1.01	2.03	0.006212	357.3	171.62	0.86
100 Ft US	305	Q50wTideExcl	2620	7.07	1.33	1.06	2.11	0.006093	370.5	174.74	0.86
100 Ft US	305	Q100wTideExc	2740	7.21	1.39		2.2	0.006227	380	176.95	0.87
100 Ft US	279	1.1wTideExch	2020	6.23	0.9		1.5	0.004484	324.2	146.97	0.74
100 Ft US	279	Q10wTideExcl	2380	7.07	0.98		1.76	0.005565	336.9	148.66	0.83
100 Ft US	279	Q25wTideExcl	2520	7.33	1.03		1.86	0.00588	343.8	149.57	0.85
100 Ft US	279	Q50wTideExcl	2620	7.52	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
100 Ft US	279	Q100wTideExc	2740	7.79	1.08		2.02	0.006497	351.8	150.62	0.9
100 Ft US	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1
100 Ft US	250	Q10wTideExcl	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
100 Ft US	250	Q25wTideExcl	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1
100 Ft US	250	Q50wTideExcl	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1
100 Ft US	250	Q100wTideExc	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
100 Ft US	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1
100 Ft US	200	Q10wTideExcl	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
100 Ft US	200	Q25wTideExcl	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1
100 Ft US	200	Q50wTideExcl	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1
100 Ft US	200	Q100wTideExc	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1
100 Ft US	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.6
100 Ft US	150	Q10wTideExcl	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
100 Ft US	150	Q25wTideExcl	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
100 Ft US	150	Q50wTideExcl	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
100 Ft US	150	Q100wTideExc	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
100 Ft US	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
100 Ft US	100	Q10wTideExcl	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1
100 Ft US	100	Q25wTideExcl	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
100 Ft US	100	Q50wTideExcl	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
100 Ft US	100	Q100wTideExc	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1
100 Ft US	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
100 Ft US	50	Q10wTideExcl	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
100 Ft US	50	Q25wTideExcl	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
100 Ft US	50	Q50wTideExcl	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
100 Ft US	50	Q100wTideExc	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43

110' U.S. Steel

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Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. E;ev/ (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
US_Steel	400	1.1wTideExch	2020	1.01	5.01		5.03	0.000071	2009	630.47	0.1
US_Steel	400	Q10wTideExcl	2380	1	5.57		5.59	0.000069	2387	737.3	0.1
US_Steel	400	Q25wTideExcl	2520	0.99	5.77		5.79	0.000064	2534	743.25	0.09
US_Steel	400	Q50wTideExcl	2620	0.99	5.91		5.92	0.000061	2636	746.95	0.09
US_Steel	400	Q100wTideExc	2740	0.99	6.07		6.08	0.000058	2755	751.26	0.09
US_Steel	350	1.1wTideExch	2020	1.11	5.01	0.8	5.03	0.000055	1827	452.04	0.09
US_Steel	350	Q10wTideExcl	2380	1.16	5.56	1.02	5.58	0.000053	2103	535.72	0.09
US_Steel	350	Q25wTideExcl	2520	1.17	5.76	1.09	5.78	0.000053	2217	612.62	0.09
US_Steel	350	Q50wTideExcl	2620	1.18	5.9	1.13	5.92	0.000052	2302	624.19	0.09
US_Steel	350	Q100wTideExc	2740	1.2	6.06	1.17	6.08	0.000052	2401	636.7	0.09
US_Steel	327		Bridge								
US_Steel	305	1.1wTideExch	2020	6.45	0.99		1.64	0.005678	313.1	160.79	0.81
US_Steel	305	Q10wTideExcl	2380	7.02	1.15	0.93	1.92	0.006381	338.9	167.2	0.87
US_Steel	305	Q25wTideExcl	2520	7.05	1.26	1.01	2.03	0.006212	357.3	171.62	0.86
US_Steel	305	Q50wTideExcl	2620	7.07	1.33	1.06	2.11	0.006093	370.5	174.74	0.86
US_Steel	305	Q100wTideExc	2740	7.21	1.39		2.2	0.006227	380	176.95	0.87
US_Steel	279	1.1wTideExch	2020	6.23	0.9		1.5	0.004484	324.2	146.97	0.74
US_Steel	279	Q10wTideExcl	2380	7.07	0.98		1.76	0.005565	336.9	148.66	0.83
US_Steel	279	Q25wTideExcl	2520	7.33	1.03		1.86	0.00588	343.8	149.57	0.85
US_Steel	279	Q50wTideExcl	2620	7.52	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
US_Steel	279	Q100wTideExc	2740	7.79	1.08		2.02	0.006497	351.8	150.62	0.9
US_Steel	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1
US_Steel	250	Q10wTideExcl	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
US_Steel	250	Q25wTideExcl	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1
US_Steel	250	Q50wTideExcl	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1
US_Steel	250	Q100wTideExc	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
US_Steel	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1
US_Steel	200	Q10wTideExcl	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
US_Steel	200	Q25wTideExcl	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1
US_Steel	200	Q50wTideExcl	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1
US_Steel	200	Q100wTideExc	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1
US_Steel	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.6
US_Steel	150	Q10wTideExcl	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
US_Steel	150	Q25wTideExcl	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
US_Steel	150	Q50wTideExcl	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
US_Steel	150	Q100wTideExc	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
US_Steel	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
US_Steel	100	Q10wTideExcl	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1
US_Steel	100	Q25wTideExcl	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
US_Steel	100	Q50wTideExcl	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
US_Steel	100	Q100wTideExc	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1
US_Steel	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
US_Steel	50	Q10wTideExcl	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
US_Steel	50	Q25wTideExcl	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
US_Steel	50	Q50wTideExcl	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
US_Steel	50	Q100wTideExc	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43

120-ft Span U.S. Bridge

Model	River Sta	Profile	Total Q (cfs)	Avg Vel. (ft/s)	W.S. E;ev/ (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Flow Area (sq ft)	Top Width (ft)	Froude Numbr
120 Ft US	400	1.1wTideExch	2020	1.14	4.59		4.61	0.000073	1778	473.47	0.10
120 Ft US	400	Q10wTideExch	2380	1.13	5.15		5.17	0.00009	2097	651.59	0.11
120 Ft US	400	Q25wTideExch	2520	1.13	5.36		5.38	0.000086	2234	681.35	0.11
120 Ft US	400	Q50wTideExch	2620	1.12	5.5		5.52	0.000088	2334	724.09	0.11
120 Ft US	400	Q100wTideExc	2740	1.12	5.66		5.68	0.000083	2455	740.35	0.11
120 Ft US	350	1.1wTideExch	2020	1.22	4.58	0.8	4.61	0.000074	1652	398.07	0.11
120 Ft US	350	Q10wTideExch	2380	1.27	5.14	1.02	5.17	0.00007	1890	475.23	0.10
120 Ft US	350	Q25wTideExch	2520	1.28	5.35	1.09	5.37	0.000069	1990	504.61	0.10
120 Ft US	350	Q50wTideExch	2620	1.29	5.49	1.13	5.51	0.000068	2063	525.06	0.10
120 Ft US	350	Q100wTideExc	2740	1.31	5.65	1.17	5.68	0.000067	2152	580.52	0.10
120 Ft US	327		Bridge								
120 Ft US	305	1.1wTideExch	2020	6.45	0.99		1.64	0.005678	313.1	160.79	0.81
120 Ft US	305	Q10wTideExch	2380	7.02	1.15	0.93	1.92	0.006381	338.9	167.2	0.87
120 Ft US	305	Q25wTideExch	2520	7.05	1.26	1.01	2.03	0.006212	357.3	171.62	0.86
120 Ft US	305	Q50wTideExch	2620	7.07	1.33	1.06	2.11	0.006093	370.5	174.74	0.86
120 Ft US	305	Q100wTideExc	2740	7.21	1.39		2.2	0.006227	380	176.95	0.87
120 Ft US	279	1.1wTideExch	2020	6.23	0.9		1.5	0.004484	324.2	146.97	0.74
120 Ft US	279	Q10wTideExch	2380	7.07	0.98		1.76	0.005565	336.9	148.66	0.83
120 Ft US	279	Q25wTideExch	2520	7.33	1.03		1.86	0.00588	343.8	149.57	0.85
120 Ft US	279	Q50wTideExch	2620	7.52	1.06	0.83	1.94	0.006102	348.6	150.2	0.87
120 Ft US	279	Q100wTideExc	2740	7.79	1.08		2.02	0.006497	351.8	150.62	0.90
120 Ft US	250	1.1wTideExch	2020	6.65	0.62	0.61	1.31	0.009538	303.7	219.5	1.00
120 Ft US	250	Q10wTideExch	2380	6.87	0.81	0.81	1.54	0.009579	346.6	239.68	1.01
120 Ft US	250	Q25wTideExch	2520	6.92	0.88	0.88	1.62	0.009495	364.3	247.51	1.00
120 Ft US	250	Q50wTideExch	2620	6.96	0.93	0.93	1.68	0.009445	376.7	252.86	1.00
120 Ft US	250	Q100wTideExc	2740	7.03	0.98	0.98	1.75	0.009496	389.6	258.32	1.01
120 Ft US	200	1.1wTideExch	2020	6.46	0.15	0.15	0.8	0.009841	312.5	241.13	1.00
120 Ft US	200	Q10wTideExch	2380	6.92	0.28	0.28	1.03	0.010153	343.9	245.28	1.03
120 Ft US	200	Q25wTideExch	2520	6.89	0.37	0.37	1.11	0.009427	365.6	248.1	1.00
120 Ft US	200	Q50wTideExch	2620	6.97	0.41	0.41	1.17	0.009352	375.9	249.43	1.00
120 Ft US	200	Q100wTideExc	2740	7.05	0.46	0.46	1.23	0.009236	388.6	251.06	1.00
120 Ft US	150	1.1wTideExch	2020	3.89	-0.05		0.19	0.003546	519.4	401.09	0.60
120 Ft US	150	Q10wTideExch	2380	4.16	0.08		0.35	0.003608	572	404.42	0.62
120 Ft US	150	Q25wTideExch	2520	4.27	0.13	-0.3	0.41	0.003656	590.2	405.57	0.62
120 Ft US	150	Q50wTideExch	2620	4.35	0.16	-0.27	0.45	0.003699	602.6	406.35	0.63
120 Ft US	150	Q100wTideExc	2740	4.46	0.19	-0.23	0.49	0.003796	614.6	407.1	0.64
120 Ft US	100	1.1wTideExch	2020	4.98	-0.49	-0.56	-0.1	0.009644	405.7	458.29	0.93
120 Ft US	100	Q10wTideExch	2380	5.5	-0.43	-0.44	0.04	0.01087	432.4	459.72	1.00
120 Ft US	100	Q25wTideExch	2520	5.64	-0.4	-0.41	0.09	0.010973	446.5	460.41	1.01
120 Ft US	100	Q50wTideExch	2620	5.73	-0.38	-0.38	0.13	0.010953	457.5	460.92	1.01
120 Ft US	100	Q100wTideExc	2740	5.76	-0.34	-0.35	0.18	0.010512	476.1	461.77	1.00
120 Ft US	50	1.1wTideExch	2020	2.63	-0.44		-0.33	0.001312	768.8	507.38	0.38
120 Ft US	50	Q10wTideExch	2380	2.94	-0.36		-0.23	0.00154	809.2	508.61	0.41
120 Ft US	50	Q25wTideExch	2520	3.05	-0.32		-0.18	0.001608	827	509.14	0.42
120 Ft US	50	Q50wTideExch	2620	3.12	-0.3		-0.15	0.001649	840.4	509.55	0.43
120 Ft US	50	Q100wTideExc	2740	3.2	-0.26		-0.11	0.00169	857.4	510.06	0.43