HYDROLOGY REPORT

Durrells Mill Bridge carries Norton Road over Newton Brook. Newton Brook watershed at Durrells Mill Bridge extends to the north and southeast from the bridge location. The watershed extends approximately 2 miles north of the bridge and 1.8 miles southeast of the bridge for a total area of 4.4 square miles. The confluence of Newton Brook and an Unknown Stream is located 50 ft upstream of the bridge. A negligible portion of the watershed area comes from the Unknown Stream.

Newton Brook originates between Gould Hill and Holman Mountain upstream of the crossing and it runs down the slope into the crossing location. Newton Brook appears to have several beaver dams. The floodplains upstream of the crossing consist of dense forest. Downstream of the crossing, Newton Brook runs 4 miles before its confluence with the Androscoggin River. The floodplains downstream of the crossing consist of mainly forest with little development. Downstream of Durrells Mill Bridge, the stream bed is very steeply sloped with boulders, cobbles, and what appear to be bedrock outcrops. Downstream of the crossing, the stream bed loses approximately 80 ft of elevation within 0.25 mile and the floodplains turn into a marshy area with a flatter slope. Newton Brook then joins with small streams before its confluence with the Androscoggin River. Downstream of the crossing and all the way to the Androscoggin River, stream banks are reportedly jagged with forest on top of banks with limited development.

A FEMA Flood Insurance Study (FIS) was published in July 2009 for Oxford County and it discussed floods and estimated headwater profiles and discharges for the Newton Brook along with other stream and rivers in the county. There is a general lack of flood records for Newton Brook; however, it is a part of the Androscoggin River watershed, which was discussed in the FIS referenced above. The FIS states that up to the year of publication, the largest flood occurring near Dixfield was in March 1936. It was recorded on the USGS gage No. 01054500, Androscoggin River at Rumford and was considered a Q100 flood event. Lesser floods on the Androscoggin River has also occurred in March 1953 and October 1959. The most recent major flood on the Androscoggin River occurred in April 1987. These recorded flood events all exceeded Q100 flow at the Rumford gage, USGS gage No. 01054500.

The FIS states that in Oxford County, flooding generally occurs in the winter and early spring because of heavy rainfall on snow-covered or frozen ground. The most severe flooding occurs in the early spring because of snowmelt and heavy rain in conjunction with ice jams. Ice is a major threat to bridge crossings and other structures in its path. Additional flooding, generally lower in magnitude, occurs in late summer because of hurricanes or tropical storms.

The table below shows the headwater elevations and the corresponding discharges at Norton Road as estimated by the FIS.

	Discharge (ft^3/s)	HW Elev. (ft) (NAVD) 88 Upstream	HW Elev. (ft) (NAVD) 88 Downstream
Q10	815	577.6	570.0
Q50	1,465	-	-
Q100	1,740	579.3	571.5
Q500	2,430	580.2	572.2

The drainage basin characteristics for the Newton Brook at Norton Road were provided by the Maine Department of Transportation Environmental Office, Hydrology Section. Peak flows were calculated with techniques described in the United States Geological Survey Regression Equations (Hodgkins, 1999 & Lombard/Hodgkins, 2015). The resulting peak flow values from the USGS Regression Equations were compared with the peak flows from the FIS. The values from the USGS were considerably lower than the values from the FIS. Because of the difference in the values of the peak flows, another attempt to calculate peak flows using the USGS Regression Equations was carried out. The second attempt was calculated using the upper bound for the assumptions. The resulting peak flows were higher than the first attempt but still were lower than the FIS peak flows. There is uncertainty associated with watershed because of its topography. The values of peak flows from each of the sources discussed are shown in the table below.

SUMMARY

	FEMA FIS	Regression Equation 1st Iteration	Regression Equation 2nd Iteration	
Drainage Area	4.4	4.4	4.4	mi^2
Q1.1	145	89.4	125	ft^3/s
Q10	815	389.3	550	ft^3/s
Q25	1,150	510.8	770	ft^3/s
Q50	1,465	604.7	1000	ft^3/s
Q100	1,740	708.2	1150	ft^3/s
Q500	2,430	968.5	1625	ft^3/s

Reported by: Shkara, Ahmed R
Date: March 5, 2019

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

HYDRAULIC REPORT

The existing and proposed structures were analyzed using HEC-RAS version 4.1.0, river analysis software developed by the U.S. Army Corps of Engineers. The HEC- RAS models for this project represents a 606-foot section of Newton Brook including the crossing. Six cross sections downstream and three cross sections upstream of the crossing were utilized in the models.

The first step was calibrating the model of the existing conditions. The FIS headwater elevations and highwater marks visible on the existing pipe culverts were used. The appropriate peak flows were used in conjunction with the headwater elevations. The second step was comparing the models of existing and proposed conditions. Another set of peak flows was used.

Calibration:

The existing crossing model was calibrated using the flows Q10, Q100, and Q500 from the FIS. In addition, Q1.1 flow from the USGS Regression Equation (from the first iteration) was used. The headwater elevations resulting from the model were compared to the corresponding headwater elevations from the FIS profile. In the case of headwater elevation resulting from Q1.1, it was compared to the observed existing highwater marks from photographs. The following assumptions were made in the calibration hydraulic model:

- Mixed Flow Analysis
- Manning's number
  - Channel: 0.045
  - Overbanks: 0.06
- Expansion and contraction coefficients were left as defaults: 0.3 For expansion and 0.1 for contraction
- Boundary Conditions: normal depth boundary conditions were used both upstream and downstream of the crossing. The existing crossing was modeled using the existing downstream slope (0.026) and upstream slope (0.004) as the boundary condition

Just like the FIS profile, the existing crossing model shows a great drop in water surface elevation for all flows greater than Q10. On the upstream, the Q1.1 water elevation on the existing bridge model is a few inches higher than the observed approximate highwater marks on the existing bridge. In addition, the water surface elevations for Q100 and Q500 shown on the FIS profile and the corresponding water surface elevations on the existing bridge model agree within a few inches. The only discrepancy in water surface elevations between the HEC-RAS model and the FIS is the Q10 water surface elevation. It is 2.9 ft lower in the model than it is on the FIS profile. The existing crossing model doesn't overtop at Q10; however, according to the FIS profile, it should overtop. Downstream, the Q1.1 water elevation on the existing bridge model matches the observed approximate highwater marks on the existing bridge. Also, the calibration model approximately matches the FIS profile for Q10, Q100, and Q500 water elevations immediately downstream.

The upstream and downstream slope were varied but the large drops in the headwater elevations still occur and the headwater elevations upstream of the crossing remained unchanged. The results above indicate that the model is inlet controlled. The existing crossing model used the recommended Manning's "n" value and inlet and outlet loss factors for the type of pipe and configuration as follows:

- Entrance loss coefficient: 0.5
- Manning's "n" for the pipe culvert: 0.027

In order to check the inlet control culvert analysis assumptions, the stream with the existing crossing was modeled with HY8. The HY8 model agrees with HEC-RAS model within 1 inch on Q10, but has 2 ft of discrepancy at Q500 and 1 ft of discrepancy at Q100. The Manning's "n" values for the inside of the culvert were varied, but it only affected the Q10 headwater elevation (at which the crossing doesn't overtop), while the headwater elevations for Q100 and Q500 remains unchanged. The results for Q100 and Q500 are not exact since HY8 uses a simple model for overtopping, which explains the unchanged headwater elevations while changing the Manning's "n". The results from the HY8 model for Q10 inspire more faith in the HEC-RAS model.

The few inches water surface elevation difference on the inlet for the Q1.1 between the HEC-RAS model and the highwater marks is not a concern since the highwater marks were not surveyed and these elevations were assumed based on photographs of the crossing. The discrepancy in the Q10 between HEC-RAS and the FIS profile could be because Durrells Mill Bridge is the limit of the study where the accuracy of the profile from the FIS may suffer especially when the upstream conditions are not influential. Both the HEC-RAS model, HY8, and the FIS profiles agree that the bridge is inlet controlled since there is a great drop in the water surface elevation and the downstream water surface elevations match. To verify that the crossing's hydraulics is inlet controlled, the Manning's "n" for the corrugated metal pipes values were increased greatly (0.095) to reproduce the headwater elevations from the FIS profile. Because of the increase in Manning's "n", the crossing is overtopped at Q10 and the headwater elevation upstream matches the headwater elevation shown on the stream profile included in the FIS, while the headwater elevations downstream of the crossing remained unchanged. It is safe to assume that the model is calibrated with the FIS and the existing conditions.

Looking at Newton Brook downstream of Durrells Mill Bridge, it becomes no surprise that the hydraulics of the crossing is inlet controlled or at least not tailwater controlled. The marshy areas located 1.2 miles downstream and the confluence with the Androscoggin River do not control the hydraulics at Durrells Mill Bridge, since the slope of the stream is steep.

It should be noted that HEC-RAS issued several warnings about the flow characteristics at several sections along the stream for Q10. These warnings indicated that there are large energy and velocity differences between several cross sections. This is not a surprise when looking at the stream and existing bridge geometry. The stream banks are jagged and the streambed has varying width with numerous boulders and stones. These conditions result in varying cross sections, which resulted in the warnings mentioned. The difference in energy and velocity is an interruption to turbulence in the stream during highwater events (Q1.1 and higher), which is expected in a stream with similar grade and geometry. The warnings were not considered to be a problem with the model rather a reflection of the site conditions.

Comparison:

Both the proposed box culvert and existing crossing were modeled with HEC-RAS using the peak flows from the second iteration of the USGS Regression Equations. Both the existing and the proposed box culvert were modeled using the same assumptions used in the calibration model. The proposed box culvert has a streambed slope of 0.009 with Manning's "n" equivalent to the rest of the stream.

The proposed box culvert did not run full at any storm, so the cross section and the opening are considered sufficient. The proposed culvert provides a 10.7 ft roadway clearance above the stream bed. The proposed box culvert has a 10 ft rise with 2 ft minimum overburden on top of the assumed 1 ft deep concrete box culvert members.

Headwater elevations and stream velocities are reported in the table below for the corresponding peak flows for both the existing and proposed structures. The overall hydraulic opening has increased in the proposed structure versus the existing structure, so the hydraulic performance is improved.

SUMMARY

		Existing Structure	Recommended Structure
		7'- 7'- 6' Corrugated Metal Culverts	20' Span by 10' Rise Concrete Box Culvert
Total Area of Waterway Opening	ft^2	105	145
Headwater elevation @ $Q_{1.1}$	ft	569.58	567.84
Headwater elevation @ Q_{10}	ft	573.04	570.70
Headwater elevation @ Q_{25}	ft	574.42	571.95
Headwater elevation @ Q_{50}	ft	575.89	573.10
Headwater elevation @ Q_{100}	ft	576.96	573.80
Headwater elevation @ Q_{500}	ft	578.62	575.84
Low Chord Elevation	ft	575.50	574.00
Q_{50} Clearance	ft	-0.4	0.9
Q_{100} Clearance	ft	Overtopped	0.2
Headwater/Depth @Q_{50}			0.89
Outlet Velocity @ $Q_{1.1}$	ft/s	6.15	6.26
Outlet Velocity @ Q_{10}	ft/s	8.40	8.44
Outlet Velocity @ Q_{25}	ft/s	9.20	9.42
Outlet Velocity @ Q_{50}	ft/s	10.07	10.33
Outlet Velocity @ Q_{100}	ft/s	10.46	10.79
Outlet Velocity @ Q_{500}	ft/s	11.79	12.31

Reported by: Shkara, Ahmed R
Date: March 7, 2019

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

Appendix C

Hydraulics Data

WIN:	22234.00		**Project Name:**	Dixfield Durrells Mills
Town:	Dixfield		**Stream Name:**	
Route No.	Norton Rd		**Bridge Name:**	Durrells Mills
Asset ID:	0658		**Analysis by:**	CSH
Lat:	44.5549	**Long:** -70.38059	**Date:**	3/14/2017

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

Enter data in blue cells only!

	km^2	mi^2	ac	*Enter data in [mi^2]*
A	11.40	4.40	2816.0	Watershed Area *DRNAREA*
W	0.34	0.1	84.2	Wetlands area (by NWI)
P_c	391183	4935074		watershed centroid (E, N; UTM 19N; meters)
County	Oxford W			*choose county from drop-down menu*
pptA	43.8			mean annual precipitation (inches; by look-up)
SG	0.00			sand & gravel aquifer as decimal fraction of watershed A

Worksheet prepared by:
Charles S. Hebson, PE
Environmental Office
Maine Dept. Transportation
Augusta, ME 04333-0016
207-557-1052
Charles.Hebson@maine.gov

ver. 2016 Feb 05

A (km^2)	11.40	**Conf Lvl**	0.67
W (%)	2.99		NWI Wetlands % *STORNWI*

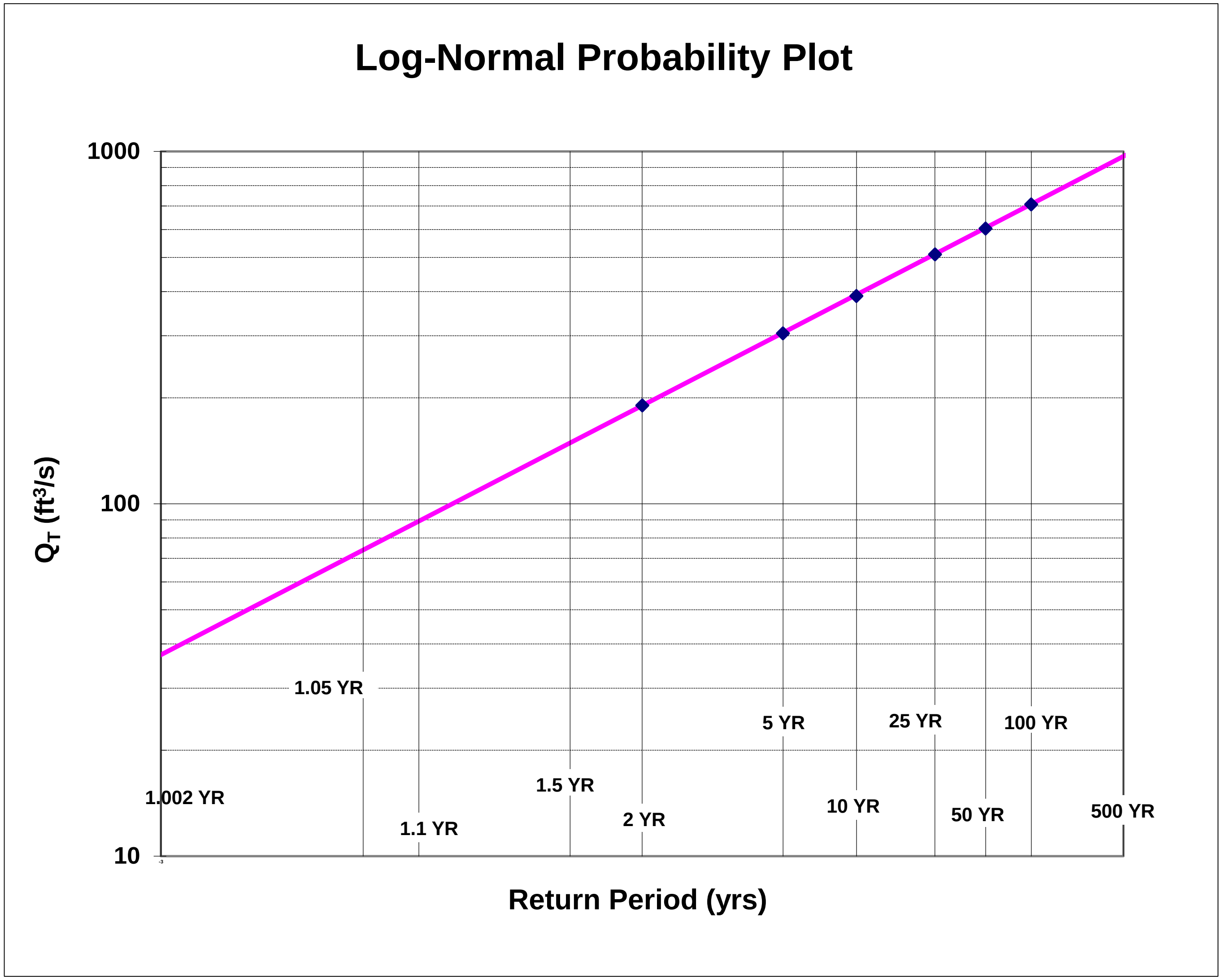
Ret Pd T (yr)	**Peak Flow Estimate Lower**	**Q_T (m^3/s)**	**Upper**	**Q_T (ft^3/s)**
1.1		2.53		89.4
2		5.39		190.2
5		8.63		304.8
10		11.03		389.3
25		14.47		510.8
50		17.12		604.7
100		20.06		708.2
500		27.43		968.5

References:

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

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

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


Log-Normal Probability Plot
1000
100
10
Q_T (ft³/s)
1.05 YR
5 YR
25 YR
100 YR
1.5 YR
1.002 YR
10 YR
500 YR
2 YR
50 YR
1.1 YR
Return Period (yrs)

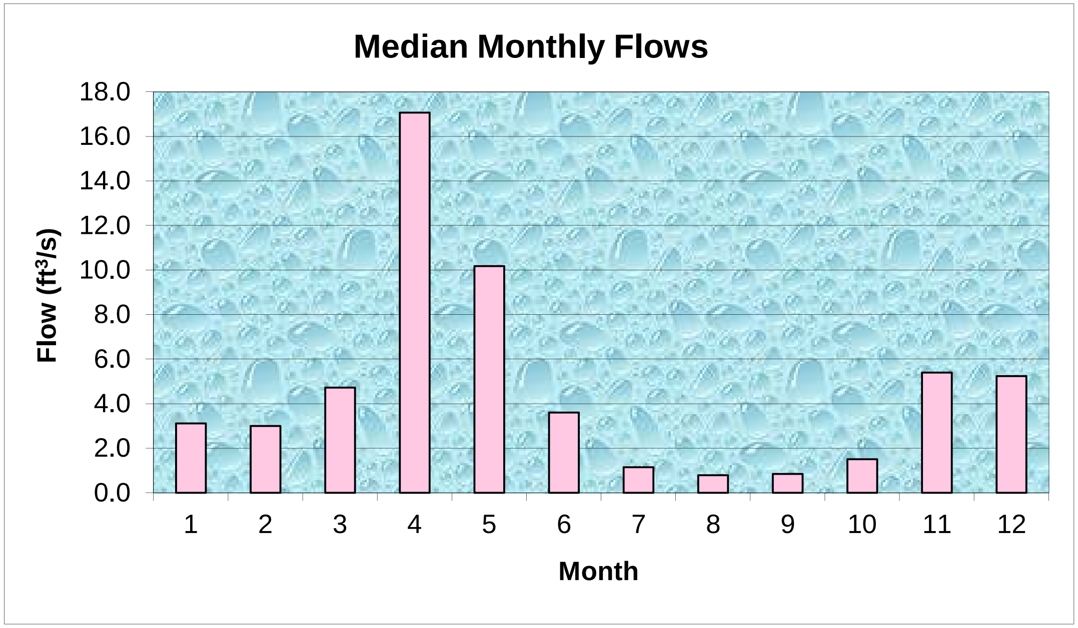
WIN:	22234.00	**Project Name:**	Dixfield Durrells Mills
Town:	Dixfield	**Stream Name:**	0
Route No.	Norton Rd	**Bridge Name:**	Durrells Mills
Asset ID:	0658	**Analysis by:**	CSH
Lat:	44.55488 **Long:** -70.38059	**Date:**	3/14/2017

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
	4.40	*A*	Area (mi^2)
391183	4935074	P_c	Watershed centroid (E,N; UTM; Zone 19; meters)
	90.00	*DIST*	Distance from Coastal reference line (mi)
	43.8	*pptA*	Mean Annual Precipitation (inches)
	0.00	*SG*	Sand & Gravel Aquifer (decimal fraction of watershed area)

Month	Q_{median} (ft3/s)	(m^3/s)
Jan	**3.12**	0.0883
Feb	**3.01**	0.0852
Mar	**4.73**	0.1341
Apr	**17.07**	0.4838
May	**10.18**	0.2885
Jun	**3.61**	0.1024
Jul	**1.15**	0.0327
Aug	**0.80**	0.0226
Sep	**0.85**	0.0242
Oct	**1.51**	0.0427
Nov	**5.41**	0.1533
Dec	**5.25**	0.1488



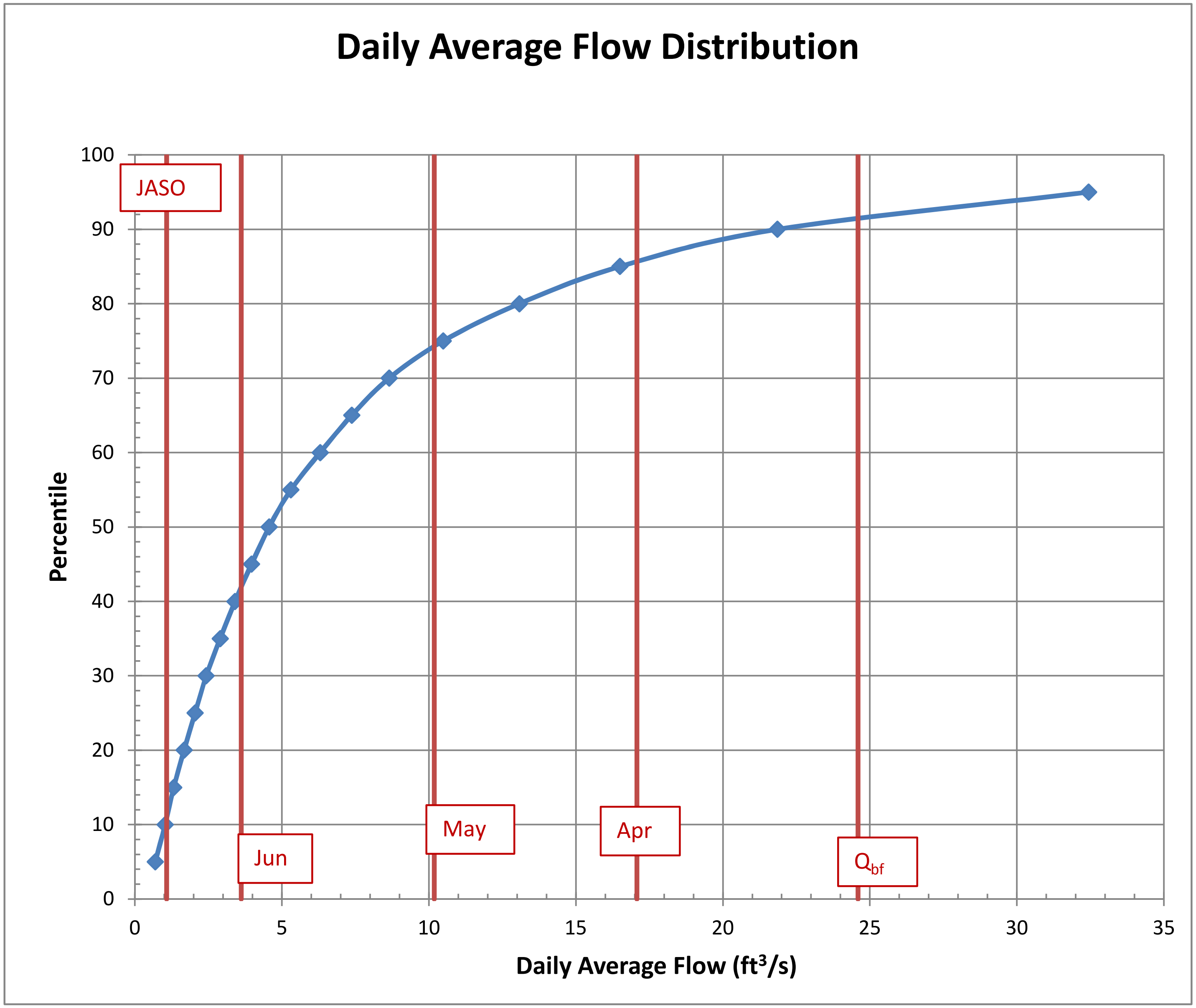
Q_{bf}	**24.6**	
ann avg	**8.9**	
ann med	**4.5**	
$Q_{1.002}$	**37.3**	
$Q_{1.01}$	**50.9**	
$Q_{1.05}$	**74.0**	
Q_{bf}	**65.2**	assume v = 4ft/s

W_{bf}	**16.6**	estimated bankfull width (ft)
d_{bf}	**1.0**	estimated bankfull depth (ft)
A_{bf}	**16.3**	estimated bankfull flow area (ft^2)

References

Dudley, R.W., 2004. Hydraulic Geometry Relations ..., SIR 2004-5042

Dudley, R.W., 2004. Estimating Monthly Streamflows … , SIR 2004-5026



Daily Avg Flow Dist

A_{ws} = (mi^2) 4.4

Q (ft^3/s)

Pctl	Median	84th pctl
5	0.69	1.11
10	1.03	1.55
15	1.32	1.93
20	1.67	2.34
25	2.05	2.75
30	2.42	3.13
35	2.90	3.57
40	3.41	4.11
45	3.97	4.65
50	4.57	5.49
55	5.31	6.39
60	6.30	7.50
65	7.37	8.73
70	8.65	10.19
75	10.49	12.25
80	13.08	14.63
85	16.50	18.75
90	21.86	25.17
95	32.44	39.15

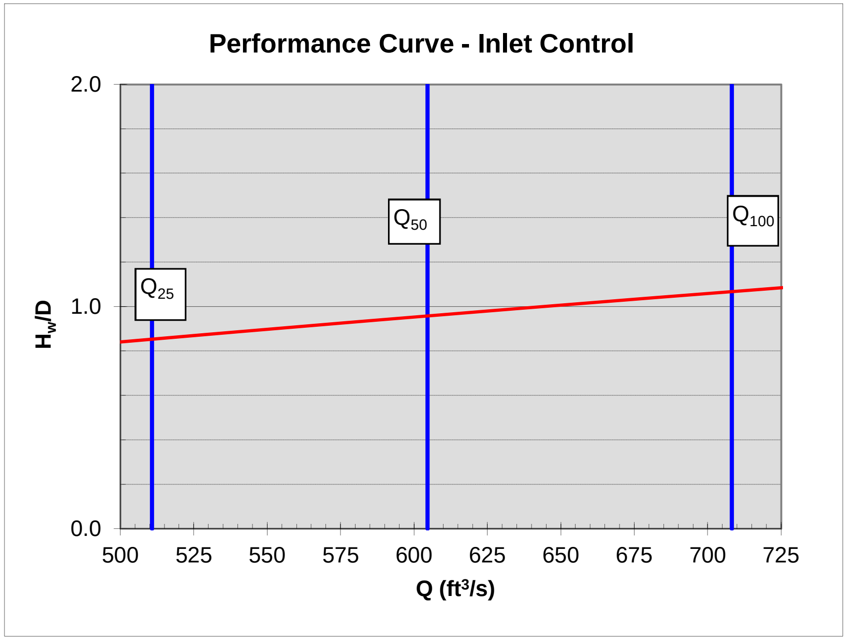
Q_{bf}	24.6
$Q_{1.002}$	37.3
$Q_{1.1}$	89.4
Q_2	190.2

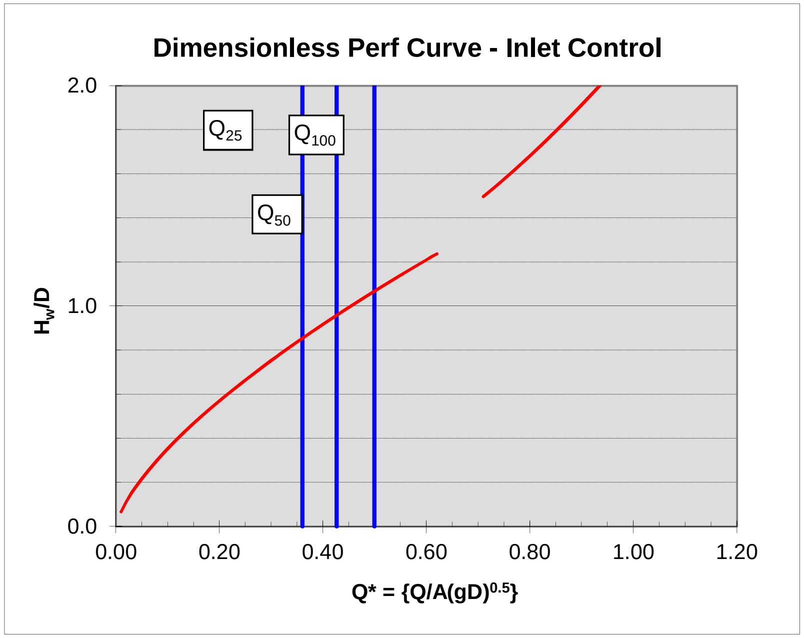
NOTE: ***This page is for preliminary sizing only.***
Final design should be done with HY8 or HDS-5

Preliminary Culvert Sizing - Round & Box Culverts

Shape:	Box					
Type:	Box 0 ww		Q_{25}	510.8		
D or R (ft)	6		Q_{50}	604.7	trial D / R =	10.7
w (ft)	*17*	*box width*	Q_{100}	708.2	trial w: BFW =	16.6
Slope (ft/ft)	0.02					
A (ft^2)	102.00					
g (ft/s^2)	32.2					

Note:
culvert dimensions are for open flow area; adjust for lost capacity due to embedding / backfilling (min {2' / 25% rise} embedment)





FRANKLIN CO
OXFORD CO
Gould Hill
Holman Mountain
Newton Brook
Childs Hill
Science Hill
Gordon Brook
Colonel Holman Mountain
Dixfield Center
Brown Mountain
Little Mountain
Newton Hill

Dixfield 22234 Durrell's Mills Bridge

Region ID:

ME

Workspace ID:

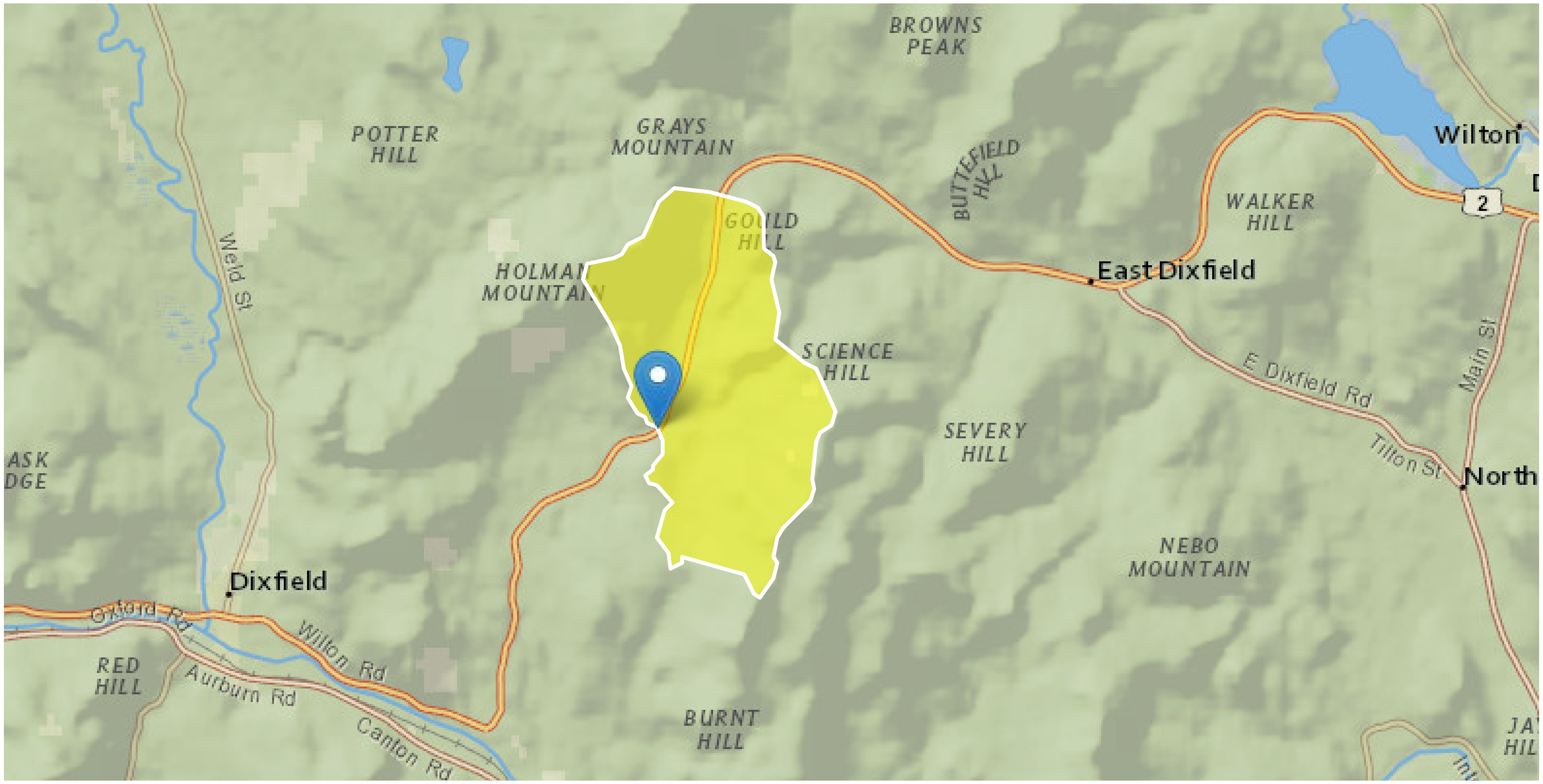
ME20170314074435105000

Clicked Point (Latitude, Longitude):

44.55484, -70.38052

Time:

2017-03-14 09:45:04 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.4	square miles
STORNWI	Percentage of storage (combined water bodies and wetlands) from the National Wetlands Inventory	2.99	percent
ELEV	Mean Basin Elevation	942.4	feet
PRECIP	Mean Annual Precipitation	45.5	inches
SANDGRAVAP	Percentage of land surface underlain by sand and gravel aquifers	0	percent
COASTDIST	Shortest distance from the coastline to the basin centroid	91.2	miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	391182.98	State plane coordinates
CENTROIDY	Basin centroid vertical (y) location in state plane units	4935074.37	State plane coordinates
SANDGRAVAF	Fraction of land surface underlain by sand and gravel aquifers	0	dimensionless
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.84	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	4.21	percent
LC06WATER	Percent of open water, class 11, from NLCD 2006	0	percent
ELEVMAX	Maximum basin elevation	1840	feet
BSLDEM10M	Mean basin slope computed from 10 m DEM	18.5	percent
STATSGOA	Percentage of area of Hydrologic Soil Type A from STATSGO	13	percent

Bankfull Statistics Parameters [100 Percent (NaN square miles) Central and Coastal Bankfull 2004 5042]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit

DRNAREA	Drainage Area	4.4	square miles	2.92	298

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

Statistic	Value	Unit	Average standard error of estimate
Bankfull Streamflow	24.6	ft^3/s	54.1
Bankfull Width	16.6	ft	33
Bankfull Depth	0.983	ft	26.2
Bankfull Area	16.3	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 (NaN square miles) Statewide Peak Flow DA LT 12sqmi 2015 5049]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.4	square miles	0.31	12
STORNWI	Percentage of Storage from NWI	2.99	percent	0	22.2

Peak-Flow Statistics Flow Report [100 Percent (NaN square miles) Statewide Peak Flow DA LT 12sqmi 2015 5049]

Statistic	Value	Unit	Average standard error of prediction
1.01 Year Peak Flood	54	ft^3/s	38
2 Year Peak Flood	190	ft^3/s	34
5 Year Peak Flood	305	ft^3/s	35
10 Year Peak Flood	389	ft^3/s	37
25 Year Peak Flood	510	ft^3/s	39

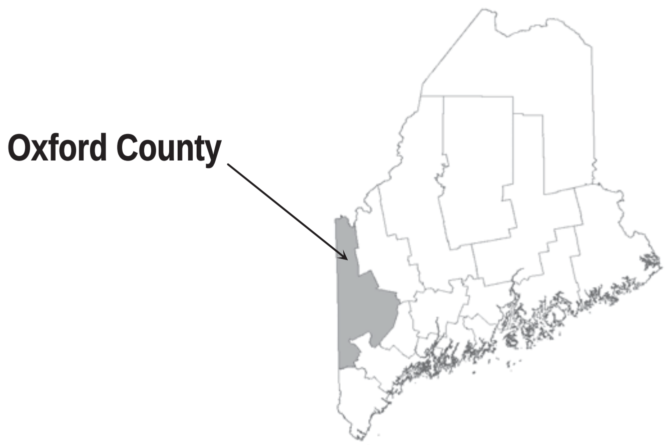
Statistic	Value	Unit	Average standard error of prediction
50 Year Peak Flood	604	ft^3/s	41
100 Year Peak Flood	708	ft^3/s	42
250 Year Peak Flood	812	ft^3/s	44
500 Year Peak Flood	968	ft^3/s	47

Peak-Flow Statistics Citations

Lombard, P.J., and Hodgkins, G.A.,2015, Peak flow regression equations for small, ungaged streams in Maine— Comparing map-based to field-based variables: U.S. Geological Survey Scientific Investigations Report 2015–5049, 12 p. (http://dx.doi.org/10.3133/sir20155049)

FLOOD INSURANCE STUDY

OXFORD COUNTY, MAINE
(ALL JURISDICTIONS)



VOLUME 1 OF 3

COMMUNITY NAME	COMMUNITY NUMBER
ADAMSTOWN T04 R02 WBKP, TOWNSHIP OF*	230688
ALBANY, TOWNSHIP OF*	230606
ANDOVER NORTH SURPLUS, TOWNSHIP OF*	230689
ANDOVER WEST SURPLUS, TOWNSHIP OF*	230690
ANDOVER, TOWN OF	230160
BATCHELDERS GRANT, TOWNSHIP OF*	230459
BETHEL, TOWN OF	230088
BOWMANTOWN T04 R06 WBKP, TOWNSHIP OF*	230691
BROWNFIELD, TOWN OF	230089
BUCKFIELD, TOWN OF	230090
BYRON, TOWN OF	230330
C SURPLUS, TOWNSHIP OF*	230692
CANTON, TOWN OF	230091
DENMARK, TOWN OF	230476
DIXFIELD, TOWN OF	230092
FRYEBURG, TOWN OF	230093
GILEAD, TOWN OF	230166
GRAFTON TA2, TOWNSHIP OF*	230607
GREENWOOD, TOWN OF	230332
HANOVER, TOWN OF	230333
HARTFORD, TOWN OF	230334
HEBRON, TOWN OF	230335
HIRAM, TOWN OF	230094
LINCOLN PLANTATION T5R2WBKP, TOWNSHIP OF*	230604
LOVELL, TOWN OF	230336
LOWER CUPSUPTIC T04 RO3 WBKP, TOWNSHIP OF*	230693
LYNCHTOWN T05 R04 WBKP, TOWNSHIP OF*	230694
MAGALLOWAY PLANTATION*	230605
MASON, TOWNSHIP OF*	230695
MEXICO, TOWN OF	230095
MILTON, TOWNSHIP OF	230460
NEWRY, TOWN OF	230337
NORWAY, TOWN OF	230096
OTISFIELD, TOWN OF	230203

COMMUNITY NAME	COMMUNITY NUMBER
OXBOW T04 R05 WBKP, TOWNSHIP OF*	230696
OXFORD, TOWN OF	230869
PARIS, TOWN OF	230097
PARKERTOWN T05 R03 WBKP, TOWNSHIP OF*	230697
PARMACHENEE T05 R05 WBKP, TOWNSHIP OF*	230698
PERU, TOWN OF	230098
PORTER, TOWN OF	230338
RICHARDSONTOWN T04 R01 WBKP, TOWNSHIP OF*	230699
RILEY TA1, TOWNSHIP OF*	230700
ROXBURY, TOWN OF	230181
RUMFORD, TOWN OF	230099
STONEHAM, TOWN OF	230340
STOW, TOWN OF	230186
SUMNER, TOWN OF	230187
SWEDEN, TOWN OF	230341
TOWNSHIP C, TOWNSHIP OF*	230701
UPPER CUPSUPTIC T04 R04 WBKP TOWNSHIP OF*	230702
UPTON, TOWN OF	230342
WATERFORD, TOWN OF	230343
WEST PARIS, TOWN OF	230100
WOODSTOCK, TOWN OF	230344

*NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED

July 7, 2009

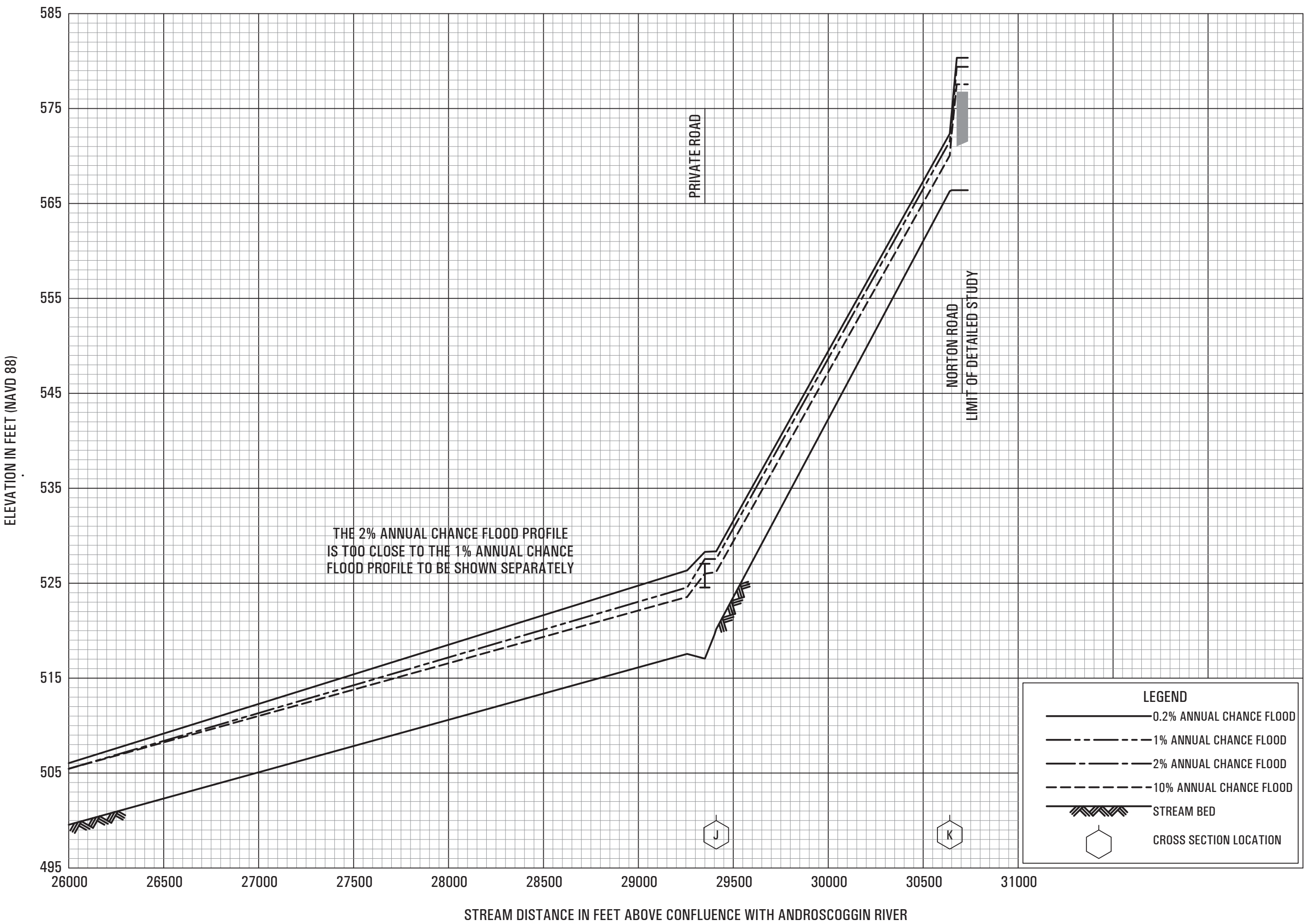
Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
23017CV001A

TABLE 7 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQUARE MILES)	PEAK DISCHARGES (CUBIC FEET PER SECOND) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
Newton Brook					
At Canton Point Road	10.6	830	1,610	1,955	2,860
At Porter Road	9.6	830	1,590	1,930	2,805
At U.S. Rt. 2/State Rt. 17	9.4	830	1,585	1,920	2,795
At Private Road No. 1	7.3	825	1,545	1,860	2,670
At Private Road No. 2	5.1	815	1,485	1,770	2,495
At Private Road No. 3	4.7	815	1,475	1,750	2,455
At Norton Road	4.4	815	1,465	1,740	2,430
Nezinscot River					
At Buckfield-Turner corporate limits	115.0	*	*	10,000	*
Upstream from Bog Brook	104.0	*	*	9,220	*
Old Course Saco River					
At confluence with Saco River	137.0	2,700	4,000	4,800	6,450
Ossipee River					
Cornish Gage (No. 01065500)	453.0	7,840	11,760	13,690	18,890
At Corporate Limits	412.0	7,265	10,900	12,960	17,510
Upstream of Mill Brook	387.5	6,920	10,380	12,080	16,670
Upstream of South River	354.0	6,435	9,655	11,240	15,510
Paddy Meadow Brook					
At Weld Road	0.9	175	305	355	490
Pennesseewassee Stream					
At confluence with Little Androscoggin River	30.6	900	1,370	1,620	2,300
Upstream from Bird Brook	22.5	630	970	1,140	1,620
Pleasant River					
At U.S. Route 2	24.4	2,000	4,100	5,100	7,400

*Data not computed



FLOOD PROFILES

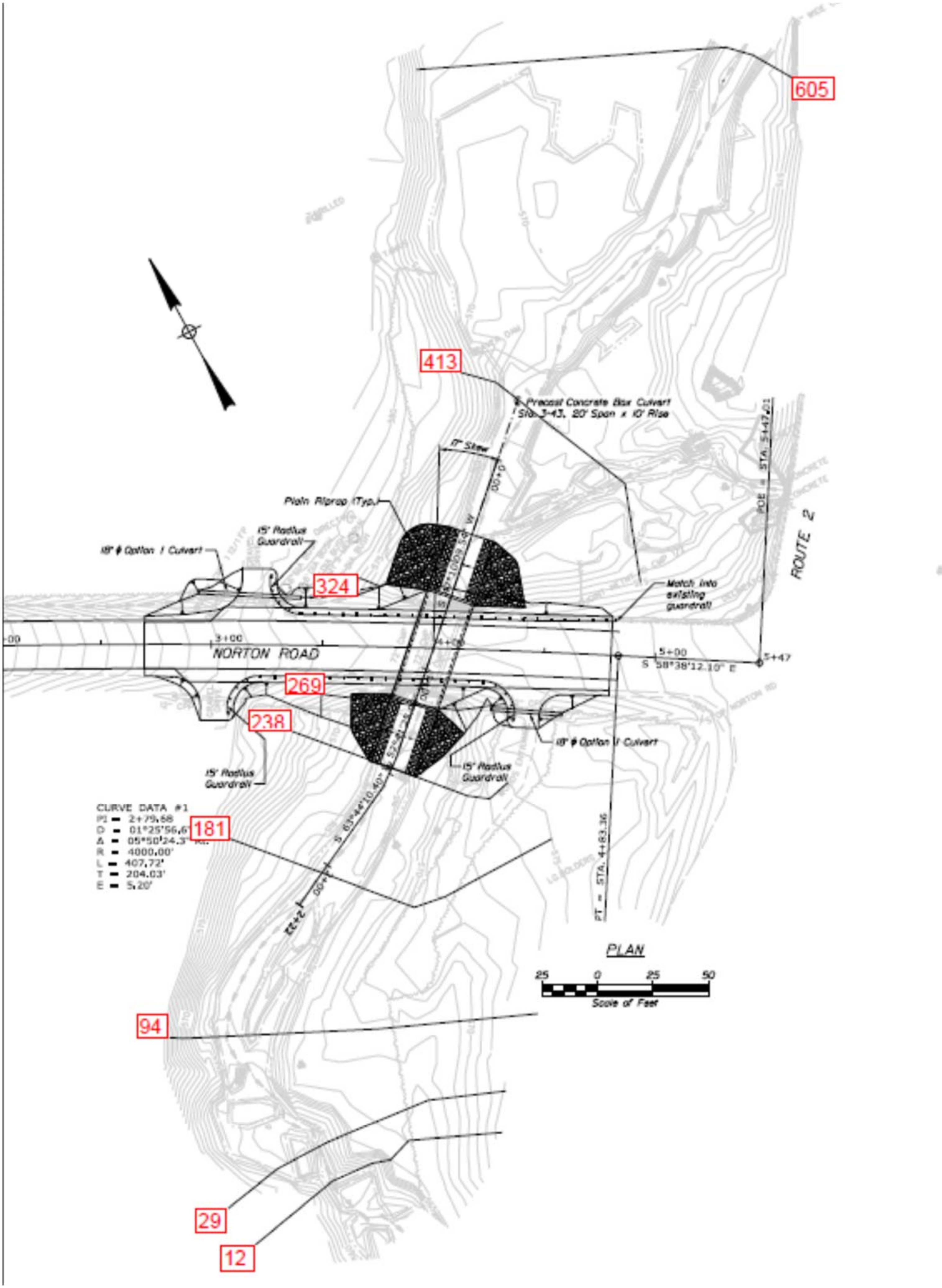
NEWTON BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

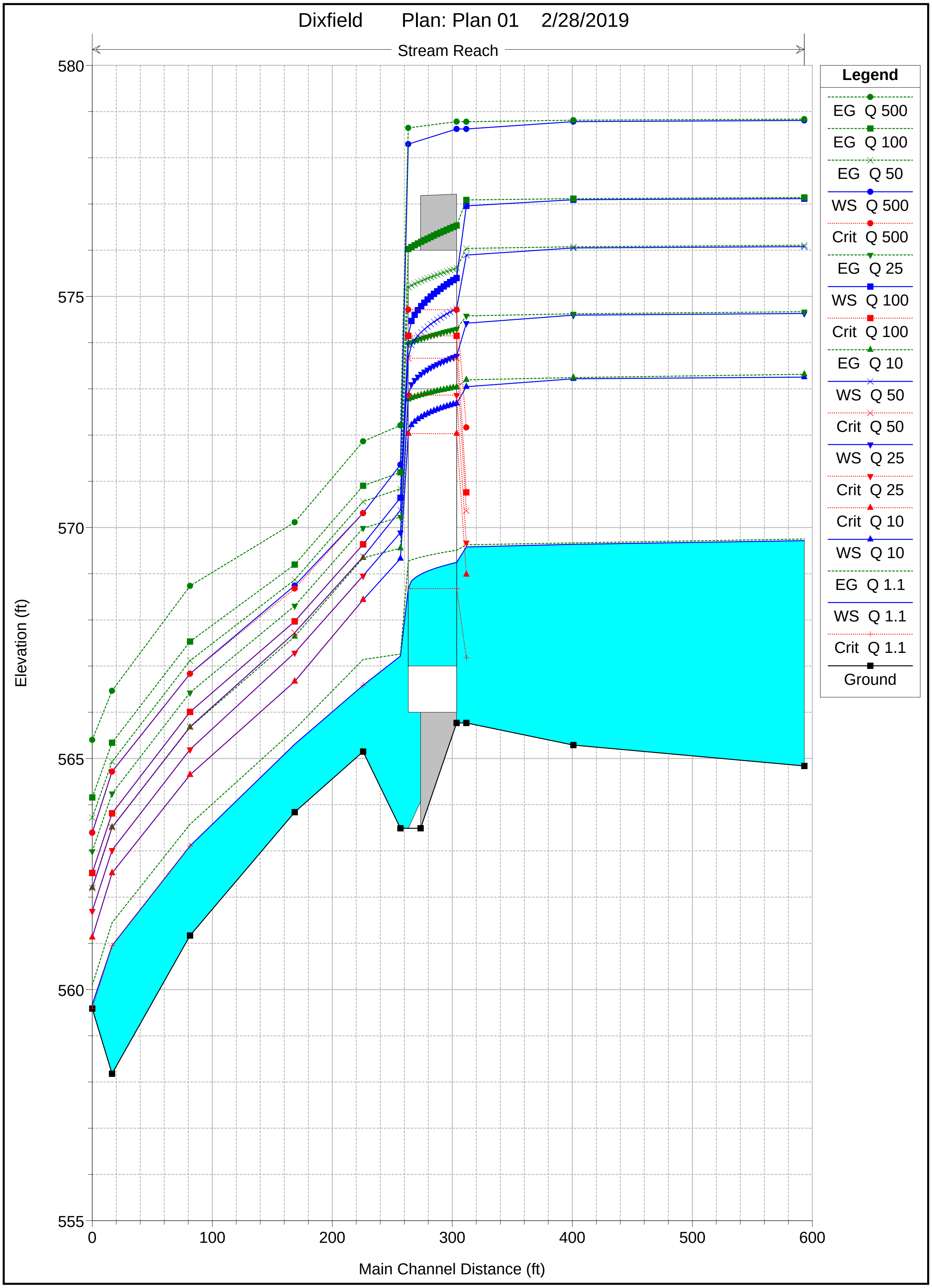
OXFORD COUNTY, ME

(ALL JURISDICTIONS)

HEC-RAS


605
413
Precast Concrete Box Culvert
Sta. 3+43, 20' Span x 10' Rise
17° Skew
Plain Riprap (Typ.)
15' Radius Guardrail
18" ϕ Option I Culvert
324
Match into existing guardrail
ROUTE 2
POE = STA. 5+47.01
3+00
NORTON ROAD
4+00
5+00
5+47
S 58°38'12.10" E
269
238
18" ϕ Option I Culvert
15' Radius Guardrail
15' Radius Guardrail
CURVE DATA #1
PI = 2+79.68
D = 01°25'56.6"
Δ = 05°50'24.3"
R = 4000.00'
L = 407.72'
T = 204.03'
E = 5.20'
181
S 63°44'10.40"
PT = STA. 4+83.36
PLAN
25 0 25 50
Scale of Feet
94
29
12

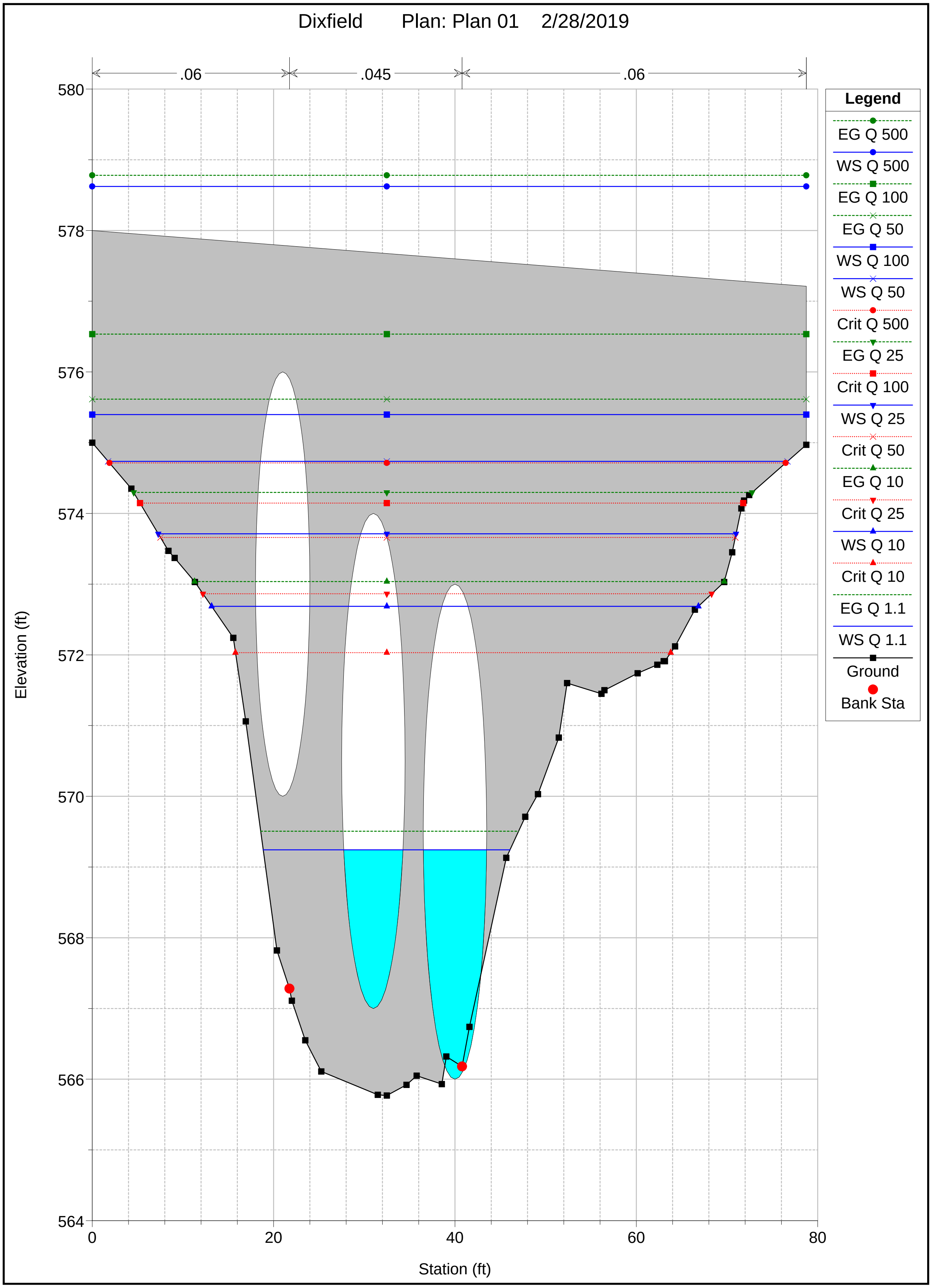
Existing Bridge, Profile


Dixfield Plan: Plan 01 2/28/2019
Stream Reach
Elevation (ft)
Main Channel Distance (ft)
580
575
570
565
560
555
0
100
200
300
400
500
600
Legend
EG Q 500
EG Q 100
EG Q 50
WS Q 500
Crit Q 500
EG Q 25
WS Q 100
Crit Q 100
EG Q 10
WS Q 50
Crit Q 50
WS Q 25
Crit Q 25
Crit Q 10
WS Q 10
EG Q 1.1
WS Q 1.1
Crit Q 1.1
Ground

Existing Bridge, Summary Table

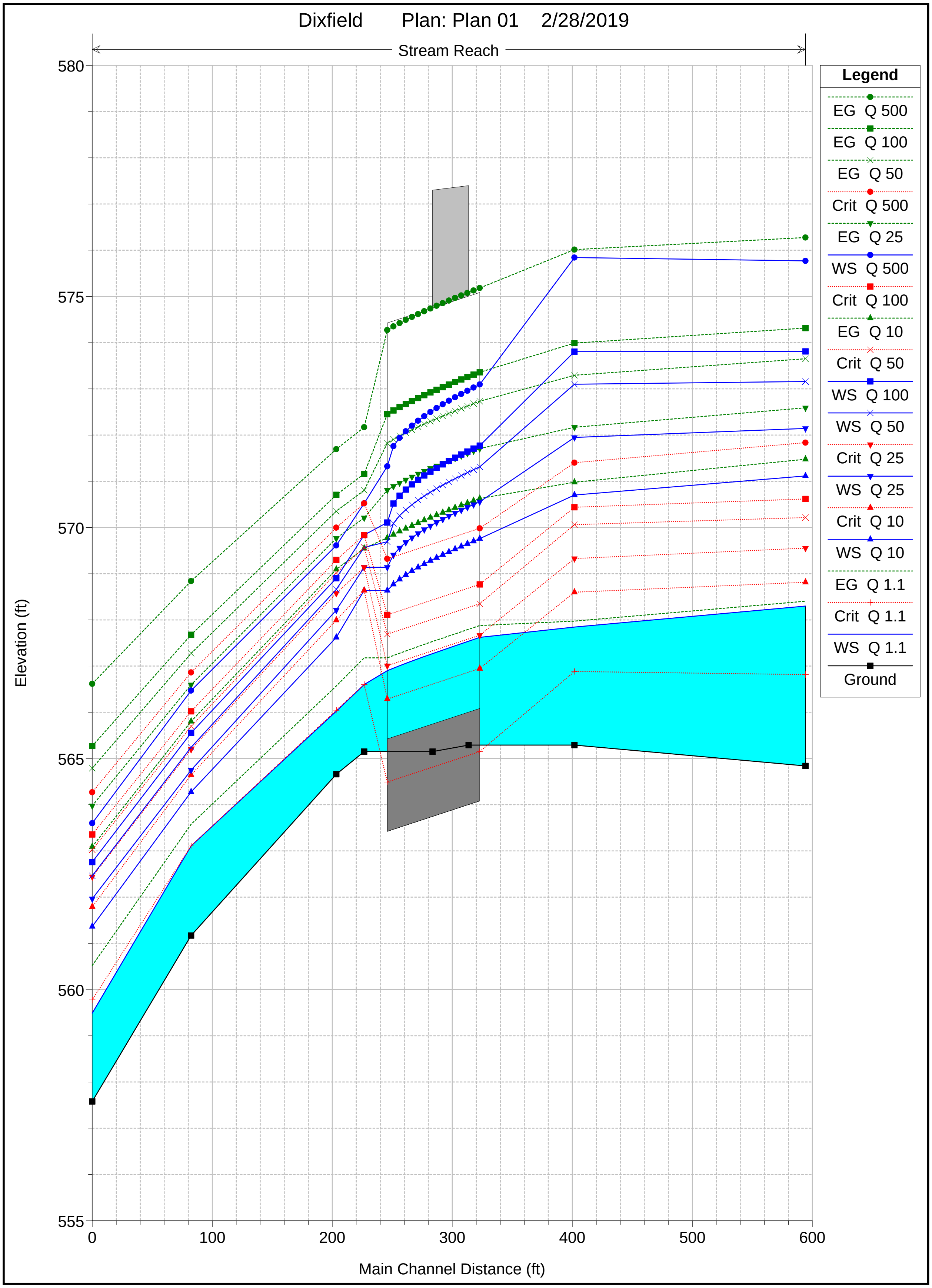
HEC-RAS Plan: Plan 01 River: Stream Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	605.8522	Q 1.1	125.00	564.84	569.71		569.75	0.000508	1.54	81.10	24.42	0.15
Reach	605.8522	Q 10	550.00	564.84	573.25		573.31	0.000482	2.26	384.45	165.53	0.16
Reach	605.8522	Q 25	770.00	564.84	574.63		574.67	0.000292	2.01	616.51	171.77	0.13
Reach	605.8522	Q 50	1000.00	564.84	576.08		576.11	0.000189	1.81	866.86	173.35	0.11
Reach	605.8522	Q 100	1150.00	564.84	577.12		577.14	0.000143	1.69	1047.00	173.35	0.09
Reach	605.8522	Q 500	1625.00	564.84	578.81		578.84	0.000134	1.82	1340.30	173.35	0.09
Reach	413.3774	Q 1.1	125.00	565.29	569.64		569.66	0.000376	1.39	100.51	60.22	0.13
Reach	413.3774	Q 10	550.00	565.29	573.22		573.24	0.000237	1.41	469.89	119.53	0.11
Reach	413.3774	Q 25	770.00	565.29	574.60		574.62	0.000199	1.46	644.91	132.87	0.10
Reach	413.3774	Q 50	1000.00	565.29	576.05		576.07	0.000155	1.44	841.25	135.45	0.09
Reach	413.3774	Q 100	1150.00	565.29	577.09		577.12	0.000129	1.41	982.56	135.45	0.08
Reach	413.3774	Q 500	1625.00	565.29	578.78		578.81	0.000136	1.61	1211.32	135.45	0.09
Reach	324.2210	Q 1.1	125.00	565.77	569.58	567.18	569.62	0.000539	1.74	80.50	28.78	0.16
Reach	324.2210	Q 10	550.00	565.77	573.04	568.98	573.19	0.000816	3.39	220.33	58.49	0.23
Reach	324.2210	Q 25	770.00	565.77	574.42	569.67	574.58	0.000726	3.61	308.15	70.01	0.22
Reach	324.2210	Q 50	1000.00	565.77	575.89	570.36	576.04	0.000576	3.58	421.77	78.74	0.20
Reach	324.2210	Q 100	1150.00	565.77	576.96	570.76	577.09	0.000468	3.46	505.49	78.74	0.19
Reach	324.2210	Q 500	1625.00	565.77	578.62	572.16	578.78	0.000491	3.90	636.64	78.74	0.19
Reach	324.22		Culvert									
Reach	269.3205	Q 1.1	125.00	563.49	567.22		567.26	0.000677	1.69	79.96	33.55	0.17
Reach	269.3205	Q 10	550.00	563.49	569.33		569.55	0.001880	4.01	160.36	41.32	0.31
Reach	269.3205	Q 25	770.00	563.49	569.89		570.23	0.002500	4.96	184.02	42.82	0.37
Reach	269.3205	Q 50	1000.00	563.49	570.37		570.84	0.003108	5.84	205.10	44.13	0.42
Reach	269.3205	Q 100	1150.00	563.49	570.64		571.20	0.003503	6.38	217.12	45.19	0.44
Reach	269.3205	Q 500	1625.00	563.49	571.36		572.21	0.004761	7.98	251.17	49.10	0.53
Reach	238.2085	Q 1.1	125.00	565.15	566.58	566.58	567.14	0.031184	6.15	21.23	19.77	1.00
Reach	238.2085	Q 10	550.00	565.15	568.44	568.44	569.34	0.017073	8.40	80.21	49.38	0.86
Reach	238.2085	Q 25	770.00	565.15	568.96	568.96	569.99	0.016518	9.20	106.95	53.16	0.87
Reach	238.2085	Q 50	1000.00	565.15	569.37	569.37	570.56	0.017055	10.07	129.26	55.46	0.90
Reach	238.2085	Q 100	1150.00	565.15	569.64	569.64	570.90	0.016829	10.46	144.39	56.96	0.90
Reach	238.2085	Q 500	1625.00	565.15	570.31	570.31	571.86	0.017493	11.79	184.12	60.74	0.94
Reach	181.2694	Q 1.1	125.00	563.84	565.31		565.64	0.017716	4.64	27.81	28.22	0.78
Reach	181.2694	Q 10	550.00	563.84	566.67	566.67	567.64	0.018996	8.25	73.79	40.52	0.93
Reach	181.2694	Q 25	770.00	563.84	567.29	567.29	568.30	0.015308	8.61	104.58	55.27	0.87
Reach	181.2694	Q 50	1000.00	563.84	567.72	567.72	568.87	0.014924	9.28	129.58	59.50	0.87
Reach	181.2694	Q 100	1150.00	563.84	567.97	567.97	569.20	0.014908	9.71	144.45	61.89	0.88
Reach	181.2694	Q 500	1625.00	563.84	568.74	568.68	570.11	0.013568	10.50	195.38	69.08	0.87
Reach	94.0263	Q 1.1	125.00	561.17	563.11	563.11	563.58	0.032695	5.49	22.87	25.89	1.02
Reach	94.0263	Q 10	550.00	561.17	564.65	564.65	565.67	0.021902	8.27	71.22	37.59	0.96
Reach	94.0263	Q 25	770.00	561.17	565.20	565.20	566.43	0.020119	9.13	92.43	39.81	0.95
Reach	94.0263	Q 50	1000.00	561.17	565.69	565.69	567.12	0.019228	9.93	112.46	41.81	0.96
Reach	94.0263	Q 100	1150.00	561.17	566.01	566.01	567.53	0.018277	10.29	126.11	43.07	0.95
Reach	94.0263	Q 500	1625.00	561.17	566.84	566.84	568.74	0.017732	11.61	163.66	49.30	0.97
Reach	29.0793	Q 1.1	125.00	558.18	560.95	560.95	561.45	0.024386	5.98	24.43	23.80	0.87
Reach	29.0793	Q 10	550.00	558.18	562.52	562.52	563.51	0.036834	8.40	69.62	35.81	1.06
Reach	29.0793	Q 25	770.00	558.18	563.02	563.02	564.24	0.035703	9.39	87.89	38.01	1.08
Reach	29.0793	Q 50	1000.00	558.18	563.51	563.51	564.93	0.033050	10.26	107.30	41.17	1.07
Reach	29.0793	Q 100	1150.00	558.18	563.81	563.81	565.34	0.031468	10.71	120.20	43.28	1.06
Reach	29.0793	Q 500	1625.00	558.18	564.72	564.72	566.47	0.026529	11.63	161.60	47.85	1.02
Reach	12.5366	Q 1.1	125.00	559.59	559.68	559.59	560.09	0.026022	0.65	24.21	24.98	0.55
Reach	12.5366	Q 10	550.00	559.59	561.13	561.13	562.20	0.023540	5.94	67.08	31.71	0.91
Reach	12.5366	Q 25	770.00	559.59	561.70	561.70	562.99	0.022110	7.30	85.51	33.20	0.93
Reach	12.5366	Q 50	1000.00	559.59	562.20	562.20	563.72	0.021656	8.44	102.48	34.52	0.96
Reach	12.5366	Q 100	1150.00	559.59	562.52	562.52	564.16	0.020915	9.03	113.87	35.38	0.96
Reach	12.5366	Q 500	1625.00	559.59	563.39	563.39	565.40	0.019579	10.51	145.69	37.59	0.98



Dixfield Plan: Plan 01 2/28/2019
.06
.045
.06
Legend
EG Q 500
WS Q 500
EG Q 100
EG Q 50
WS Q 100
WS Q 50
Crit Q 500
EG Q 25
Crit Q 100
WS Q 25
Crit Q 50
EG Q 10
Crit Q 25
WS Q 10
Crit Q 10
EG Q 1.1
WS Q 1.1
Ground
Bank Sta
Elevation (ft)
580
578
576
574
572
570
568
566
564
0
20
40
60
80
Station (ft)

Proposed Bridge, Profile

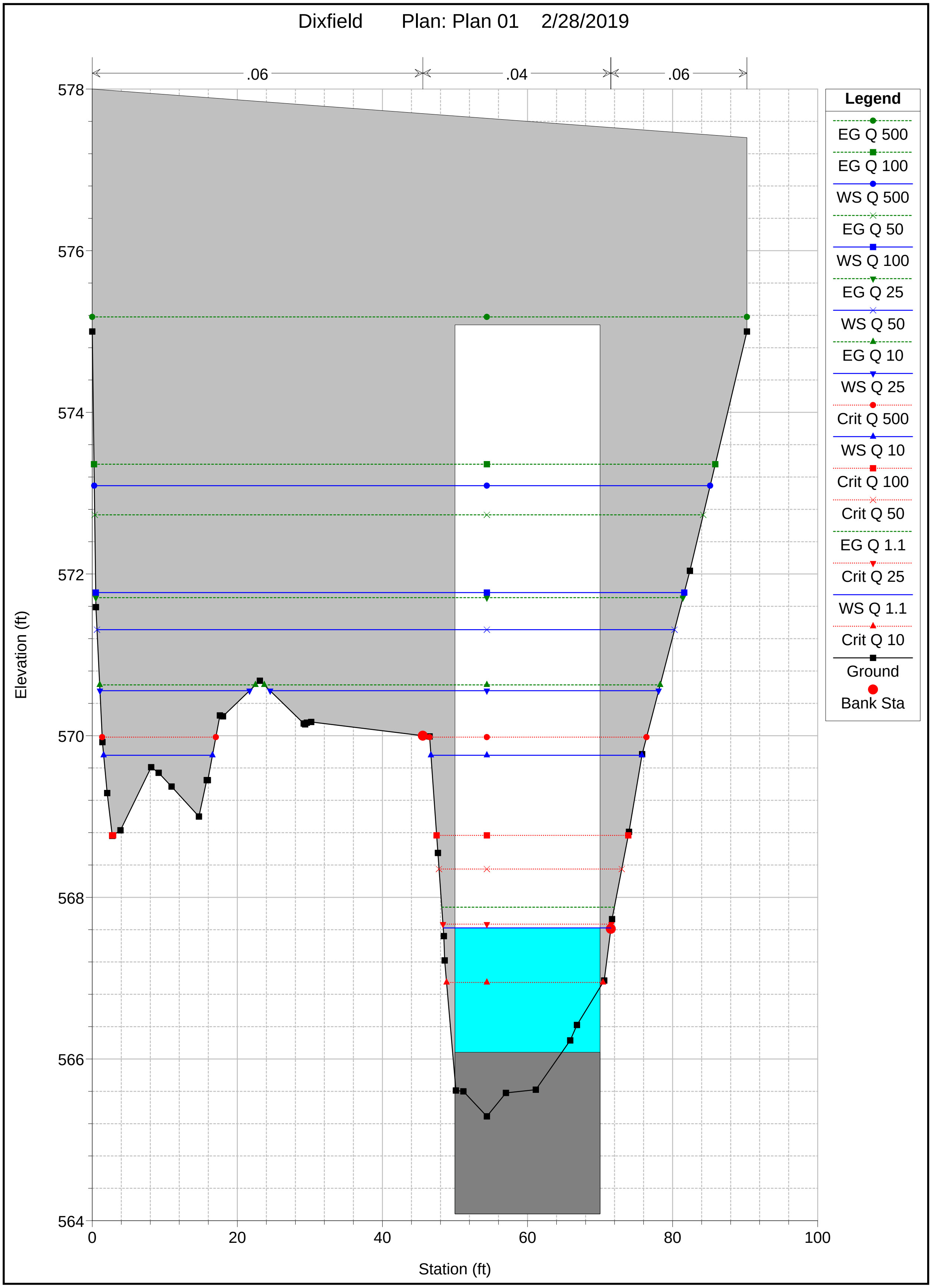


Dixfield Plan: Plan 01 2/28/2019
Stream Reach
Legend
EG Q 500
EG Q 100
EG Q 50
Crit Q 500
EG Q 25
WS Q 500
Crit Q 100
EG Q 10
Crit Q 50
WS Q 100
WS Q 50
Crit Q 25
WS Q 25
Crit Q 10
WS Q 10
EG Q 1.1
Crit Q 1.1
WS Q 1.1
Ground
Elevation (ft)
580
575
570
565
560
555
0
100
200
300
400
500
600
Main Channel Distance (ft)

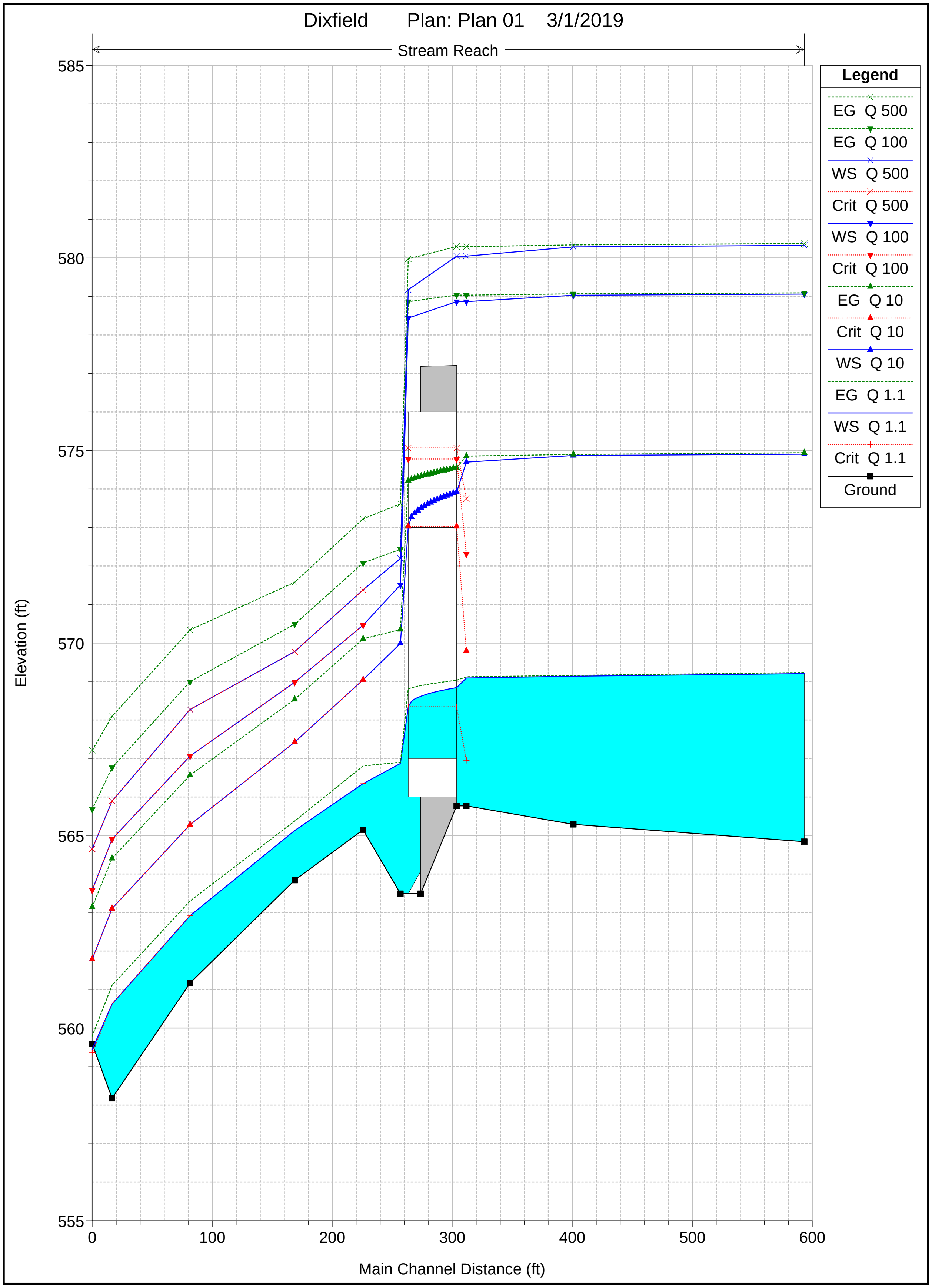
Proposed Bridge, Summary Table

HEC-RAS Plan: Plan 01   River: Stream   Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	605.8522	Q 1.1	125.00	564.84	568.30	566.82	568.40	0.001774	2.61	47.87	20.40	0.30
Reach	605.8522	Q 10	550.00	564.84	571.11	568.81	571.47	0.002917	4.82	114.13	26.68	0.41
Reach	605.8522	Q 25	770.00	564.84	572.14	569.55	572.59	0.003005	5.36	145.98	37.32	0.43
Reach	605.8522	Q 50	1000.00	564.84	573.16	570.22	573.65	0.002619	5.68	188.09	44.55	0.41
Reach	605.8522	Q 100	1150.00	564.84	573.81	570.62	574.32	0.002374	5.79	218.39	48.47	0.40
Reach	605.8522	Q 500	1625.00	564.84	575.77	571.84	576.27	0.001769	5.95	322.39	55.19	0.36
Reach	413.3774	Q 1.1	125.00	565.29	567.84	566.88	567.97	0.002850	2.89	43.34	23.70	0.37
Reach	413.3774	Q 10	550.00	565.29	570.70	568.60	570.98	0.002213	4.41	159.48	77.52	0.37
Reach	413.3774	Q 25	770.00	565.29	571.95	569.33	572.17	0.001414	4.16	258.79	81.66	0.31
Reach	413.3774	Q 50	1000.00	565.29	573.10	570.06	573.29	0.001044	4.05	354.69	84.91	0.27
Reach	413.3774	Q 100	1150.00	565.29	573.80	570.44	573.99	0.000899	4.02	415.19	86.89	0.26
Reach	413.3774	Q 500	1625.00	565.29	575.84	571.40	576.01	0.000647	4.00	597.06	90.24	0.23
Reach	300		Culvert									
Reach	238.2085	Q 1.1	125.00	565.15	566.60	566.60	567.18	0.025072	6.26	21.58	19.87	1.01
Reach	238.2085	Q 10	550.00	565.15	568.64	568.64	569.55	0.012490	8.44	90.30	51.10	0.84
Reach	238.2085	Q 25	770.00	565.15	569.14	569.14	570.21	0.012767	9.42	116.79	54.19	0.87
Reach	238.2085	Q 50	1000.00	565.15	569.57	569.57	570.81	0.013252	10.33	140.57	56.59	0.90
Reach	238.2085	Q 100	1150.00	565.15	569.84	569.84	571.16	0.013286	10.79	156.03	58.10	0.91
Reach	238.2085	Q 500	1625.00	565.15	570.52	570.52	572.17	0.014240	12.31	197.19	62.44	0.97
Reach	214.9868	Q 1.1	125.00	564.66	566.02	566.04	566.57	0.024851	5.95	21.50	21.79	1.03
Reach	214.9868	Q 10	550.00	564.66	567.62	567.99	569.09	0.019919	9.93	64.73	46.59	1.08
Reach	214.9868	Q 25	770.00	564.66	568.21	568.58	569.76	0.017154	10.55	94.83	55.45	1.04
Reach	214.9868	Q 50	1000.00	564.66	568.66	569.02	570.35	0.016577	11.30	120.31	57.90	1.04
Reach	214.9868	Q 100	1150.00	564.66	568.90	569.30	570.71	0.016625	11.81	134.49	58.76	1.05
Reach	214.9868	Q 500	1625.00	564.66	569.61	570.00	571.69	0.016307	13.07	177.09	61.55	1.07
Reach	94.0263	Q 1.1	125.00	561.17	563.11	563.11	563.58	0.025840	5.49	22.87	25.89	1.02
Reach	94.0263	Q 10	550.00	561.17	564.28	564.65	565.80	0.032015	10.01	57.64	35.26	1.27
Reach	94.0263	Q 25	770.00	561.17	564.75	565.20	566.60	0.029378	11.09	75.07	38.00	1.26
Reach	94.0263	Q 50	1000.00	561.17	565.24	565.70	567.28	0.025635	11.73	94.32	40.01	1.21
Reach	94.0263	Q 100	1150.00	561.17	565.56	566.02	567.68	0.023575	12.04	107.01	41.27	1.18
Reach	94.0263	Q 500	1625.00	561.17	566.47	566.86	568.84	0.019286	12.87	146.40	45.20	1.12
Reach	11.6298	Q 1.1	125.00	557.58	559.49	559.78	560.52	0.054891	8.15	15.35	15.45	1.44
Reach	11.6298	Q 10	550.00	557.58	561.36	561.79	563.09	0.032488	10.55	52.14	24.03	1.26
Reach	11.6298	Q 25	770.00	557.58	561.96	562.44	563.98	0.031832	11.39	67.62	27.43	1.28
Reach	11.6298	Q 50	1000.00	557.58	562.46	563.03	564.79	0.031046	12.24	81.67	29.04	1.29
Reach	11.6298	Q 100	1150.00	557.58	562.76	563.36	565.27	0.030560	12.71	90.47	29.98	1.29
Reach	11.6298	Q 500	1625.00	557.58	563.60	564.27	566.62	0.028487	13.93	116.75	32.14	1.28


Dixfield Plan: Plan 01 2/28/2019
.06
.04
.06
Legend
EG Q 500
EG Q 100
WS Q 500
EG Q 50
WS Q 100
EG Q 25
WS Q 50
EG Q 10
WS Q 25
Crit Q 500
WS Q 10
Crit Q 100
Crit Q 50
EG Q 1.1
Crit Q 25
WS Q 1.1
Crit Q 10
Ground
Bank Sta
Elevation (ft)
578
576
574
572
570
568
566
564
0
20
40
60
80
100
Station (ft)

Existing Bridge Calibration Profile

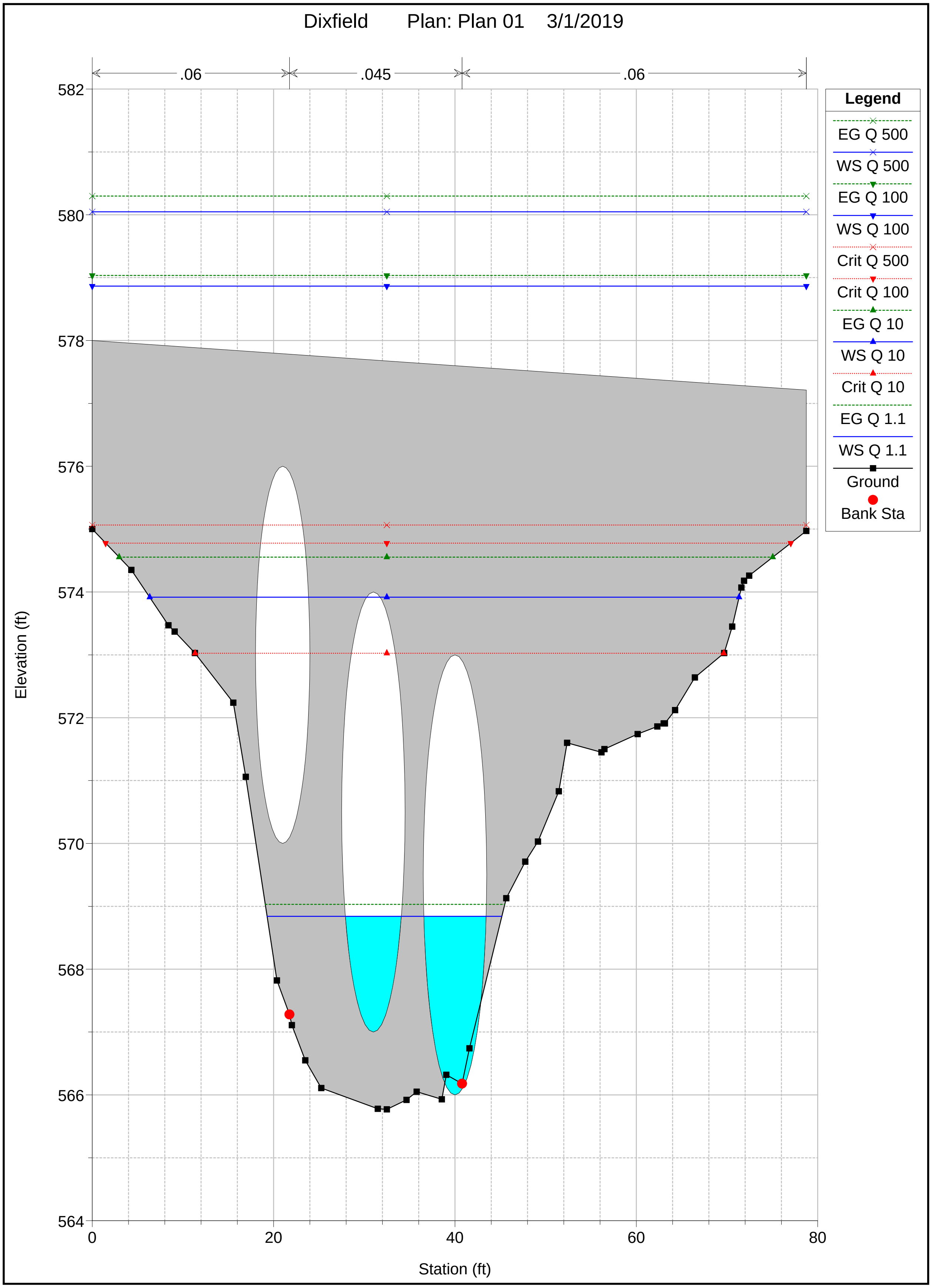

Dixfield Plan: Plan 01 3/1/2019
Stream Reach
Legend
EG Q 500
EG Q 100
WS Q 500
Crit Q 500
WS Q 100
Crit Q 100
EG Q 10
Crit Q 10
WS Q 10
EG Q 1.1
WS Q 1.1
Crit Q 1.1
Ground
Elevation (ft)
585
580
575
570
565
560
555
0
100
200
300
400
500
600
Main Channel Distance (ft)

Existing Bridge Calibration
Summary Table

HEC-RAS Plan: Plan 01   River: Stream   Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	605.8522	Q 1.1	89.40	564.84	569.21		569.23	0.000411	1.30	68.99	23.21	0.13
Reach	605.8522	Q 10	815.00	564.84	574.90		574.94	0.000268	1.97	663.77	172.76	0.12
Reach	605.8522	Q 100	1740.00	564.84	579.06		579.09	0.000140	1.88	1384.04	173.35	0.10
Reach	605.8522	Q 500	2430.00	564.84	580.33		580.37	0.000173	2.24	1603.77	173.35	0.11
Reach	413.3774	Q 1.1	89.40	565.29	569.14		569.16	0.000335	1.19	77.42	33.13	0.12
Reach	413.3774	Q 10	815.00	565.29	574.87		574.90	0.000185	1.51	681.66	134.62	0.10
Reach	413.3774	Q 100	1740.00	565.29	579.03		579.07	0.000131	1.77	1244.99	135.45	0.10
Reach	413.3774	Q 500	2430.00	565.29	580.28		580.34	0.000172	2.18	1414.94	135.45	0.11
Reach	324.2210	Q 1.1	89.40	565.77	569.09	566.95	569.12	0.000466	1.46	67.01	26.58	0.15
Reach	324.2210	Q 10	815.00	565.77	574.70	569.80	574.86	0.000711	3.65	328.09	74.30	0.22
Reach	324.2210	Q 100	1740.00	565.77	578.86	572.31	579.03	0.000518	4.06	655.66	78.74	0.20
Reach	324.2210	Q 500	2430.00	565.77	580.05	573.74	580.29	0.000693	4.97	748.71	78.74	0.23
Reach	324.22		Culvert									
Reach	269.3205	Q 1.1	89.40	563.49	566.87		566.90	0.000517	1.38	69.06	29.99	0.15
Reach	269.3205	Q 10	815.00	563.49	569.99		570.35	0.002623	5.14	188.35	43.09	0.38
Reach	269.3205	Q 100	1740.00	563.49	571.51		572.43	0.005044	8.33	258.65	49.67	0.54
Reach	269.3205	Q 500	2430.00	563.49	572.19		573.62	0.006998	10.42	293.56	52.24	0.65
Reach	238.2085	Q 1.1	89.40	565.15	566.35	566.35	566.81	0.031795	5.55	16.75	18.50	0.98
Reach	238.2085	Q 10	815.00	565.15	569.05	569.05	570.11	0.016525	9.36	111.79	53.67	0.87
Reach	238.2085	Q 100	1740.00	565.15	570.46	570.46	572.08	0.017592	12.07	193.45	61.94	0.95
Reach	238.2085	Q 500	2430.00	565.15	571.38	571.38	573.22	0.016788	13.19	253.69	69.42	0.96
Reach	181.2694	Q 1.1	89.40	563.84	565.13		565.38	0.016864	4.01	22.89	26.89	0.74
Reach	181.2694	Q 10	815.00	563.84	567.43	567.43	568.54	0.015832	9.02	112.41	56.62	0.89
Reach	181.2694	Q 100	1740.00	563.84	568.98	568.98	570.49	0.014254	11.13	211.74	70.23	0.90
Reach	181.2694	Q 500	2430.00	563.84	569.78	569.78	571.58	0.014431	12.42	269.28	74.13	0.93
Reach	94.0263	Q 1.1	89.40	561.17	562.92	562.92	563.30	0.035414	4.97	18.01	24.85	1.02
Reach	94.0263	Q 10	815.00	561.17	565.28	565.28	566.57	0.020272	9.35	95.87	40.16	0.96
Reach	94.0263	Q 100	1740.00	561.17	567.06	567.06	569.00	0.016969	11.74	175.25	51.71	0.95
Reach	94.0263	Q 500	2430.00	561.17	568.27	568.27	570.34	0.013979	12.40	245.61	70.01	0.90
Reach	29.0793	Q 1.1	89.40	558.18	560.62	560.62	561.11	0.024947	5.77	17.47	19.31	0.88
Reach	29.0793	Q 10	815.00	558.18	563.11	563.11	564.41	0.032208	9.80	91.29	38.40	1.10
Reach	29.0793	Q 100	1740.00	558.18	564.91	564.91	566.77	0.023450	12.08	170.67	48.50	1.03
Reach	29.0793	Q 500	2430.00	558.18	565.89	565.89	568.09	0.021316	13.24	220.03	50.94	1.02
Reach	12.5366	Q 1.1	89.40	559.59	559.45	559.36	559.79	0.026028		19.02	21.63	0.00
Reach	12.5366	Q 10	815.00	559.59	561.79	561.79	563.14	0.022321	7.56	88.52	33.44	0.95
Reach	12.5366	Q 100	1740.00	559.59	563.58	563.58	565.68	0.019329	10.81	152.83	37.90	0.98
Reach	12.5366	Q 500	2430.00	559.59	564.65	564.65	567.21	0.017911	12.29	194.24	39.45	0.98

Existing Bridge Calibration
Cross Sections



Dixfield Plan: Plan 01 3/1/2019
.06
.045
.06
Legend
EG Q 500
WS Q 500
EG Q 100
WS Q 100
Crit Q 500
Crit Q 100
EG Q 10
WS Q 10
Crit Q 10
EG Q 1.1
WS Q 1.1
Ground
Bank Sta
Elevation (ft)
582
580
578
576
574
572
570
568
566
564
0
20
40
60
80
Station (ft)