



**ADDITIONAL INFORMATION AND COMPUTATIONS**

USGS RURAL REGRESSION EQUATIONS FROM SCIENTIFIC INVESTIGATIONS REPORT 2009-5158

DA = 2.74 SQ. MI.

IMPERVIOUS AREA % = <10% (FUTURE IMPERVIOUS FROM GUILFORD COUNTY ZONING DATA)

REGION 1 - PIEDMONT

RURAL RIDGE and VALLEY-PIEDMONT (SIR 2009-5158) SAY

$Q_{10} = 398 (2.74)^{0.617} = 741$  cfs      740 cfs

$Q_{25} = 537 (2.74)^{0.606} = 989$  cfs      990 cfs

$Q_{50} = 661 (2.74)^{0.600} = 1,210$  cfs      1,200 cfs

$Q_{100} = 776 (2.74)^{0.594} = 1,412$  cfs      1,400 cfs

$Q_{500} = 1,072 (2.74)^{0.583} = 1,929$  cfs      1,900 cfs

**NOTES:**

- NO UPSTREAM OR DOWNSTREAM STRUCTURES THAT WERE IN PLACE AT THE TIME THIS PROJECT WAS DESIGNED WILL BE ADVERSELY AFFECTED BY THE PROPOSED CULVERT.
- STREAM BED MATERIAL IS SANDY CLAY.
- JEFFREY BROWN, THE NCDOT DIVISION 7 TRANSPORTATION SUPERVISOR, STATED THAT HE HAS NOT SEEN THE WATER OVERTOP THE ROADWAY AT THE PROJECT LOCATION.
- NATIVE MATERIAL BETWEEN SILLS/Baffles IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

**SITE DATA**

Drainage Area ..... 2.74 SQ. MI.      Source ..... USGS STREAM STATS/USGS QUAD MAP

River Basin ..... CAPE FEAR      Character ..... REGION 1-PIEDMONT; RURAL

Stream Classification (Such as Trout, High Quality Water, etc.) ..... WS-IV; NSW

Data on Existing Structure ..... 1 SPAN, 1 @ 33'-4" TIMBER DECK ON I-BEAMS, 14' BED TO CROWN

Total Waterway Opening ..... 306.5 s.f.      Waterway Opening Below 100yr. WS EL. .... 204.8 s.f.

Debris Potential: Low  Moderate  High

Data on Structures Up and Down Stream ..... 0.7 MILES UPSTREAM: NON-NBIS STR. NO. E131 ON SR 2719

..... 2 @ 7' DIAMETER CMP WITH CONCRETE HEADWALL. DOWNSTREAM: CONFLUENCE WITH HAW RIVER.

Gage Station No. .... N/A      Period of Records ..... N/A      yrs.

Max. Discharge ..... N/A      c.f.s      Date ..... N/A      Frequency ..... N/A

**Historical Flood Information:** SEE NOTE 3 IN ADDITIONAL INFORMATION

Date ..... Elev. NO. OT ft. Est. Freq. .... yr. Source ..... JEFFREY BROWN (NCDOT DIV. 7 PERIOD OF KNOWLEDGE NA yrs. TRANSPORTATION SUPERVISOR)

Date 12/2018 ..... Elev. 628.2 ft. Est. Freq. <10 yr. Source ..... RECENT HIGH WATER (SURVEYED ON 1/8/2019)      Period of Knowledge NA yrs.

Allowable HW Elev. 630.5 (25-YR EXISTING @ RS 634) ft. Normal Water Surface Elev. 623.4 ft.

Manning's n : Left O.B. 0.14      Channel 0.05      Right O.B. 0.14      Obtained From FIELD SURVEY.

Flood Study/Status BACKWATER OF HAW RIVER, ZONE AE, PANEL #8930 Floodway Established? NO

Flood Study 100 yr. Discharge NA c.f.s.; WS Elev.: Floodway NA ft. Without Floodway NA ft.

**DESIGN DATA**

Hydrological Method USGS RURAL REGRESSION EQUATIONS - SCIENTIFIC INVESTIGATIONS REPORT 2009-5158

Hydraulic Design Method HEC-RAS 5.0.6 FILENAME: 400183\_UTtoHawRiver\_SR2710.prj

Design Tailwater :  $Q_{10}$  6.4 ft.;  $Q_{25}$  7.3 ft.;  $Q_{50}$  7.9 ft.;  $Q_{100}$  8.5 ft.;  $Q_{500}$  9.7 ft.

Size & Type	Q (c.f.s.)	Ke	Inlet Control		Outlet Control				Remarks
			HWD	H.W. (ft.)	dc	dc+D/2	h <sub>o</sub>	H	
<b>SEE HEC-RAS MODEL</b>									

Is a Floodway Revision Required? NO      Total Proposed Waterway Opening ..... 204 s.f.

Outlet Velocity ( $V_{10}$ ) 5.1 f.p.s. Natural Channel Velocity ( $V_{10}$ ) 4.3 f.p.s.

Required Outlet Protection CLASS II RIP RAP

**INFORMATION TO BE SHOWN ON PLANS**

Design: Discharge 990 c.f.s. Frequency 25 yr. Elev. 630.3 ft.

Base Flood: Discharge 1,400 c.f.s. Frequency 100 yr. Elev. 631.8 ft.

Overtopping: Discharge 2,900 c.f.s. Frequency 500+ yr. Elev. 639.1 ft.

\*OT OCCURS AT SAG -L- STA. 14+91.6 RT

**CULVERT SURVEY & HYDRAULIC DESIGN REPORT**

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HYDRAULICS UNIT  
RALEIGH, N. C.

I.D. No. SF-400183      Project No. 17BP.7.R.134      Proj. Station 14+77.0 -L-

County GUILFORD      Stream UT TO HAW RIVER      Stru. No. 0183

On Highway SR 2710 (RUNNING CREEK RD) Between SR 2719 (HIGH ROCK RD) and SR 2711 (TROXLER MILL RD)

Recommended Structure 2 @ 12' X 10' RCBC w/TOP EDGE BEVEL AND WINGWALLS.

SILLS AT INLET & OUTLET (1' HIGH IN WEST BARREL, 2' HIGH IN EAST BARREL)

Recommended Width of Roadway 40'-0" SHOULDER PT. TO SHOULDER PT.      Skew 64'

Recommended Location is (Up, At, Down) Stream from Existing Crossing 11.6' DOWNSTREAM

Latitude 36.23330      Longitude -79.56108

Statewide Tier       Regional Tier       Sub-Regional Tier

Bench Mark is BM1, -L- STA. 14+35.64, 112.00' RT, 60D. NAIL IN 12" POPLAR

Northing: 904232      Easting: 1834425      Elev. 634.30 ft. Datum: NAVD 88

Temporary Crossing NOT REQUIRED. OFFSITE DETOUR PROVIDED



Stream UT to HAW RIVER. Struc. Inv. No. 0183. I.D. No. SF-400183. Project No. 17BP.7.R.134. PDF File 40\_0183\_2019\_SF-400183\_UT to HAW RIVER\_SR\_2710.PDF

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