



FEMA PERFORMANCE TABLE

29.5 FT. FROM US FACE OF BRIDGE	SECTION 109787
REVISOR	425.9
CORRECTED EFFECTIVE	426.0
DUPICATE EFFECTIVE	425.9
100yr.	425.9

NC DOT PERFORMANCE TABLE

29.5 FT. FROM US FACE OF BRIDGE	SECTION 109787
PROPOSED	423.8
EXISTING	424.0
NATURAL	423.7
10yr.	425.2
50yr.	426.2
100yr.	427.3
500yr.	429.3

INFORMATION TO BE SHOWN ON PLANS

WS EL. Taken @ River Station 109787

Design:	Discharge	8,700	c.f.s.	Frequency	25	yr.	Elev.	425.3	ft.
Base Flood:	Discharge	12,000	c.f.s.	Frequency	100	yr.	Elev.	427.4	ft.
Overtopping:	Discharge	6,100	c.f.s.	Frequency	500+	yr.	Elev.	423.0	ft.

*OT OCCURS AT -L- STA. 18+55 CL (EXISTING ROADWAY)

ADDITIONAL INFORMATION AND COMPUTATIONS

USGS RURAL REGRESSION EQUATIONS FROM SCIENTIFIC INVESTIGATIONS REPORT 2009-5158

DA = 100 SQ. MI.

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

REGION 1 - PIEDMONT

RURAL RIDGE and VALLEY-PIEDMONT (SIR 2009-5158)	SAY	PRELIMINARY HEC-RAS DISCHARGE
Q ₁₀ = 398 (100) = 6,822 cfs	6,800 cfs	5,600 cfs
Q ₂₅ = 537 (100) = 8,749 cfs	8,700 cfs	6,980 cfs
Q ₅₀ = 661 (100) = 10,476 cfs	10,000 cfs	8,200 cfs
Q ₁₀₀ = 776 (100) = 11,964 cfs	12,000 cfs	9,280 cfs
Q ₅₀₀ = 1,072 (100) = 15,711 cfs	16,000 cfs	12,000 cfs

AFTER COMPARISON, THE 100-YR DISCHARGE FROM THE PRELIMINARY HEC-RAS MODEL SHOULD BE USED FOR FEMA COMPLIANCE AND USGS DISCHARGES SHOULD BE USED FOR DESIGN.

- NOTES:
- NO UPSTREAM OR DOWNSTREAM STRUCTURES THAT WERE IN PLACE AT THE TIME THIS PROJECT WAS DESIGNED WILL BE ADVERSELY AFFECTED BY THE PROPOSED BRIDGE.
 - STREAM BED MATERIAL IS SAND.

SITE DATA

Drainage Area	100 SQ. MI.	Source	USGS STREAM STATS/USGS QUAD MAP
River Basin	ROANOKE	Character	REGION 1-PIEDMONT; RURAL
Stream Classification (Such as Trout, High Quality Water, etc.)	Class C		
Data on Existing Structure	6 SPANS, 1@36'-9", 4@37'-6", 1@36'-9" REINFORCED CONCRETE DECK GIRDERS		
CONC. ABUTS. & BENTS, 23' OUT TO OUT WIDTH, 25' CROWN TO BED	Total Waterway Opening	2,215 s.f.	
Debris Potential: Low Moderate High	Waterway Opening Below 100yr. WS EL	2,010 s.f.	
Data on Structures Up and Down Stream	UPSTREAM STR. NO. 160062 ON NC 62, 3.0 MILES UPSTREAM;	TRIPLE BARREL, 3 @ 10' X 10' RCBC; 14' BED TO CROWN. DOWNSTREAM STR. NO. 160001 ON NC 86US 158, 600 FT. DOWNSTREAM; 4 SPANS, 4@55'-0" COMPOSITE; RC DECK ON I-BEAMS; 33' BED TO CROWN	
Design Control Elev.	426.0	ft.	(CORRECTED EFFECTIVE @ RS 109787 - FEMA 100-YR)
Gage Station No.	NA	Period of Records	NA yrs.
Max. Discharge	NA	c.f.s.	Date NA Frequency NA
Historical Flood Information:	NO		
Date	Elev.	OT	ft. Est. Freq. yr. Source
Date 03/2019	Elev. 418.1	ft.	Est. Freq. <10 yr. Source RECENT HIGH WATER (SURVEYED ON 4/4/2019)
Date	Elev.	ft.	Est. Freq. yr. Source
Historical Scour Info.:	General	NA	ft. Contraction NA ft. Local NA
Channel Slope	0.0003	ft/ft	Source FIELD SURVEY Normal Water Surface Elev. 412.8 ft.
Manning's n:	Left O.B. 0.08-0.14	Channel 0.05	Right O.B. 0.09-0.14 Source FIELD SURVEY
Flood Study / Status	FEMA PRELIMINARY DETAILED STUDY - ZONE AE, PANEL #9906		
Flood Study 100yr. Discharge	9,280	c.f.s.	WS Elev.: Floodway 426.7 ft. Without Floodway 425.9 ft. @ River Station 109787

DESIGN DATA

Hydrological Method	USGS RURAL REGRESSION EQUATIONS COMPARED WITH FEMA PRELIMINARY DISCHARGES				
Hydraulic Design Method	HEC-RAS 5.0.6 FILENAME: Country_Line_Creek.prj				
Floods Evaluated:	Freq. (yr.)	Q (c.f.s.)	Elev. (ft.)	Backwater (ft.)	Bridge Opening Velocity (f.p.s.)
@ River Station 109787	10-YR	6,800	423.8	0.1	N/A
	25-YR	8,700	425.3	0.1	N/A
	50-YR	10,000	426.3	0.1	N/A
	100-YR	12,000	427.4	0.1	N/A
	500-YR	16,000	429.3	0.0	N/A
Waterway Opening Provided Below Design W.S. Elev.	NA	s.f.	100yr W.S. Elev.	NA	s.f.
Average Channel Velocity (Design)	3.7	f.p.s.	Average Overbank Velocity (Design)	0.8	f.p.s.
Computed Scour:	General	NA	ft.	Contraction	NA
Is a Floodway Revision Required?	MOA TYPE 1 (MAXIMUM DECREASE = 0.1')				

BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

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

I.D. No. SF-160117 Project No. 17BP.7.R.130 Proj. Station 15+16.7 -L-

County CASWELL Bridge Over COUNTRY LINE CREEK Bridge Inv. No. 0117

On Highway (GATEWOOD RD) SR 1780 Between NC 86 / US 158 and DEAD END

Recommended Structure NA - REMOVE EXISTING BRIDGE

Recommended Width of Roadway N/A Skew N/A

Recommended Location is (-Up, At, Down) Stream from Existing Crossing N/A

Latitude 36.403294 Longitude -79.299106

Statewide Tier Regional Tier Sub-Regional Tier

Bench Mark is BM1, -L- STA. 20+83.67, 36.72' LT, RAILROAD SPIKE SET IN 16" OAK TREE

Northing 968676 Easting 1912614 Elev. 418.80 ft. Datum: NAVD 88

Temporary Crossing NA - REMOVE EXISTING BRIDGE

Stream: COUNTRY LINE CREEK, Struct. Inv. No. 0117, I.D. No. SF-160117, Project No. 17BP.7.R.130, PDF File 16_0117_2019_SF-160117_COUNTRY_LINE_CREEK_SR_1780.PDF

Designed by: MOTT MACDONALD (Professional Engineer Seal)

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Date: 4/25/2019