



**ADDITIONAL INFORMATION AND COMPUTATIONS**

DRAINAGE AREA = .811 ACRES (1.27 SQ. MI.)  
 IMPERVIOUS AREA % = .34.8% (FROM FUTURE LAND USE MAPS)  
 24-HR, 50-YR MAX. PRECIPITATION = 7.64 IN  
 USGS SIR 2014-5030  
 REGION 4, 0.10 SQ. MI < DA < 53.5 SQ. MI.

Q	10	25	50	100	500
Q <sub>10</sub>	434 CFS	430 CFS	434 CFS	430 CFS	434 CFS
Q <sub>25</sub>	492 CFS	490 CFS	492 CFS	490 CFS	492 CFS
Q <sub>50</sub>	529 CFS	530 CFS	529 CFS	530 CFS	529 CFS
Q <sub>100</sub>	565 CFS	570 CFS	565 CFS	570 CFS	565 CFS
Q <sub>500</sub>	638 CFS	650 CFS	638 CFS	650 CFS	638 CFS

-BED MATERIALS: SAND, SILT, GRAVEL  
 -NO UPSTREAM OR DOWNSTREAM STRUCTURES  
 THAT WERE IN PLACE AT THE TIME THIS  
 PROJECT WAS DESIGNED WILL BE ADVERSELY  
 IMPACTED BY THIS CULVERT PROJECT

**SITE DATA**

Drainage Area 1.27 SQ. MI. Source QL2 LIDAR  
 River Basin NEUSE Character RESIDENTIAL; AGRICULTURAL  
 Stream Classification (Such as Trout, High Quality Water, etc.) C; NSW  
 Data on Existing Structure 2@6'X8' RCBC  
 Total Waterway Opening 96 s.f. Waterway Opening Below 100yr. WS EL. 77 s.f.  
 Debris Potential: Low  Moderate  High   
 Data on Structures Up and Down Stream US: BRIDGE #449 ON SR 1173;  
 DS: 2@6'X8' RCBC ON I-40

**Historical Flood Information:**

DID NOT OT IN HURRICANE MATTHEW(10/2016)FLORENCE(09/2018) RAYMOND HONBARRIER DIV. 4 MAINT. ENGINEER Period of .28 yr. Source Knowledge  
 DID NOT OT IN HURRICANE MATTHEW(10/2016)FLORENCE(09/2018) NEIL GODWIN - DIV. 4 BRIDGE MAINT. SUPERVISOR Knowledge .23 yr. Source Knowledge

Allowable HW Elev. 175.6 (1.5' BELOW SP\*) ft. Normal Water Surface Elev. 172.4 ft.  
 Manning's n : Left O.B. .012 Channel .045 Right O.B. 0.12 Obtained From FIELD RECON  
 Flood Study/Status N/A Floodway Established? N/A  
 Flood Study 100 yr. Discharge N/A c.f.s.; WS Elev.: Floodway N/A ft. Without Floodway N/A ft.

**DESIGN DATA**

Hydrological Method USGS SIR 2014-5030 (REGION 4, 34.8% IMPERVIOUS AREA)  
 Hydraulic Design Method HEC-RAS 5.0.6 (I-5986B DRIVING BRANCH I-95)  
 Design Tailwater : Q<sub>10</sub> 5.0 ft.; Q<sub>25</sub> 5.4 ft.; Q<sub>50</sub> N/A ft.; Q<sub>100</sub> 5.8 ft.; Q<sub>500</sub> 6.1 ft.

FREQUENCY	Q (cfs)	Inlet Control		Outlet Control		Remarks	
		H.W.	WSEL	H.W.	WSEL		
10 YR	430	0.64	5.1	169.7	5.9	170.5	OUTLET CONTROL
25 YR	490	0.70	5.6	170.2	6.4	171.0	OUTLET CONTROL
100 YR	570	0.78	6.2	170.8	7.0	171.6	OUTLET CONTROL
500 YR	650	0.85	6.8	171.4	7.6	172.2	OUTLET CONTROL

Is a Floodway Revision Required? N/A Total Proposed Waterway Opening 96 s.f.  
 Outlet Velocity (V<sub>o</sub>) 7.1 f.p.s. Natural Channel Velocity (V<sub>n</sub>) 5.0 f.p.s.  
 Required Outlet Protection CLASS I RIPRAP (BANKS ONLY)

**INFORMATION TO BE SHOWN ON PLANS**

Design: Discharge 490 c.f.s. Frequency 25 yr. Elev. 171.0 ft.  
 Base Flood: Discharge 530 c.f.s. Frequency 100 yr. Elev. 171.6 ft.  
 Overtopping: Discharge 1350 c.f.s. Frequency 500+ yr. Elev. 177.1\* ft.  
 \*SP @ 37+12 -Y33- LT (SAG)

**CULVERT SURVEY & HYDRAULIC DESIGN REPORT**

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

I.D. No. I-5986B Project No. 47532.1.3 Proj. Station 35+91 -Y33-  
 County JOHNSTON Stream DRIVING BRANCH Stru. No. C01  
 On Highway SR1219 (N. WALTON AVE.) Between SR1211 and DEAD END  
 Recommended Structure 2@6'X9' RCBC W/6" BEVELED HW (BURIED 1' BELOW STREAM BED)  
 Recommended Width of Roadway 30' SP-SP (NORMAL) Skew 68 DEGREES  
 Recommended Location is (Up, At, Down) Stream from Existing Crossing DOWN  
 Latitude 35.38440 Longitude -078.52650  
 Statewide Tier  Regional Tier  Sub-Regional Tier   
 Bench Mark is BM#7: BENCH TIE IN 17" POPULAR TREE, STA 1391+89 -L-, 187' RT  
 N 595120 E 2141144 Elev. 175.42 ft. Datum: NAVD 88  
 Temporary Crossing N/A (PROPOSED BOX CULVERT IS DOWNSTREAM OF EXISTING CROSSING)



Designed by: WILL HINES, P.E. Date 1/23/2020  
 Assisted by: D. TALBERT, J. HARVEY, M. EDWARDS, F. REESE  
 Project Engineer: JOSHUA G. DALTON, P.E.  
 Reviewed by: Matthew J. York, P.E.  
 SUNGATE DESIGN GROUP, P.A.  
 802 JONES FRANKLIN ROAD  
 FLEETWOOD, NORTH CAROLINA 27641  
 NC COA No. C-0880