

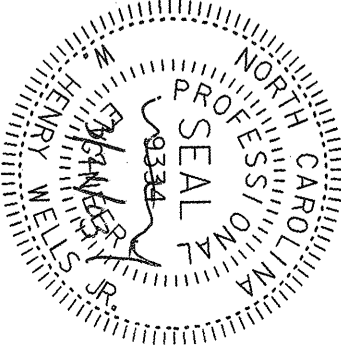
N. C. DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 HYDRAULIC DESIGN UNIT
 RALEIGH, N. C.

LD. No. R-3403A Project No. 8.1171601 Proj. Station STA 109+35.67
 County CRAVEN Stream TRIB MILLS BRANCH Stru. No. SR 1616
 On Highway US 17 Between BRIDGETON and SR 1616
 Recommended Structure RETAIN & EXTEND 2 @ 6'x5' RCBC INLET & OUTLET
 Recommended Width of Roadway 86' Skew 89°24'35"
 Location is (Up, At, Down Stream from Existing Crossing) At
 Bench Mark is BM NO. 6 - CHISELED SQUARE IN NE CORNER OF SOUTH RR BRIDGE HEADWALL
BL - STA. 105+98.40 126.8' RT Elev. 11.42' Datum: 1470 AC
 Temporary Crossing NOT REQUIRED



Stream TRIB MILLS BRANCH Stru. No. SR 1616 LD. No. R-3403 Project No. 8.1171601

Designed by: SUNGATE DESIGN GROUP
 Assisted by: WHW, RHK, TSG
 Project Engineer: W. H. WELLS JR. PE
 Reviewed & Approved by: W. H. Wells Jr. Date 3/24/03



SITE DATA

Drainage Area 1.0 Mi² Source USGS & FIELD RECONN Character URBANIZING
 Stream Classification (Such as Trout, High Quality Water, etc.) NONE
 Data on Existing Structure 2 @ 6'x5' RCBC
 Data on Structures Up and Down Stream UPSTREAM - RR 1 @ 10' ON STEEL I-BEAMS 8' VERT CLEARING.
DOWNSTREAM - SR 1433 5.5x3.6 CSPA
 Gage Station No. NONE Period of Records MARK PHILLIPS Frequency MARK PHILLIPS
 Max. Discharge NONE c.f.s. Date MARK PHILLIPS
 Historical Flood Information:
 Date 1954 Elev. 10.5 Est. Freq. 50 YR Source MARK PHILLIPS Period of Knowledge 53 YRS
 Date 1954 Elev. 10.5 Est. Freq. 50 YR Source MARK PHILLIPS Period of Knowledge 53 YRS
 Allowable HW Elev. MATCH EXISTING 100 YR Normal Water Surface Elev. 2.3
 Manning's n: left O.B. .06 Channel .05 Right O.B. .12 Obtained From FIELD RECONN
 Flood Study / Status DETAILED STUDY Floodway Established YES
 Flood Study 100 yr. Discharge 745 c.f.s.; W.S. Elev. with Floodway 11.6 Without Floodway 10.7
 FROM SECTION "B" 2086

DESIGN DATA

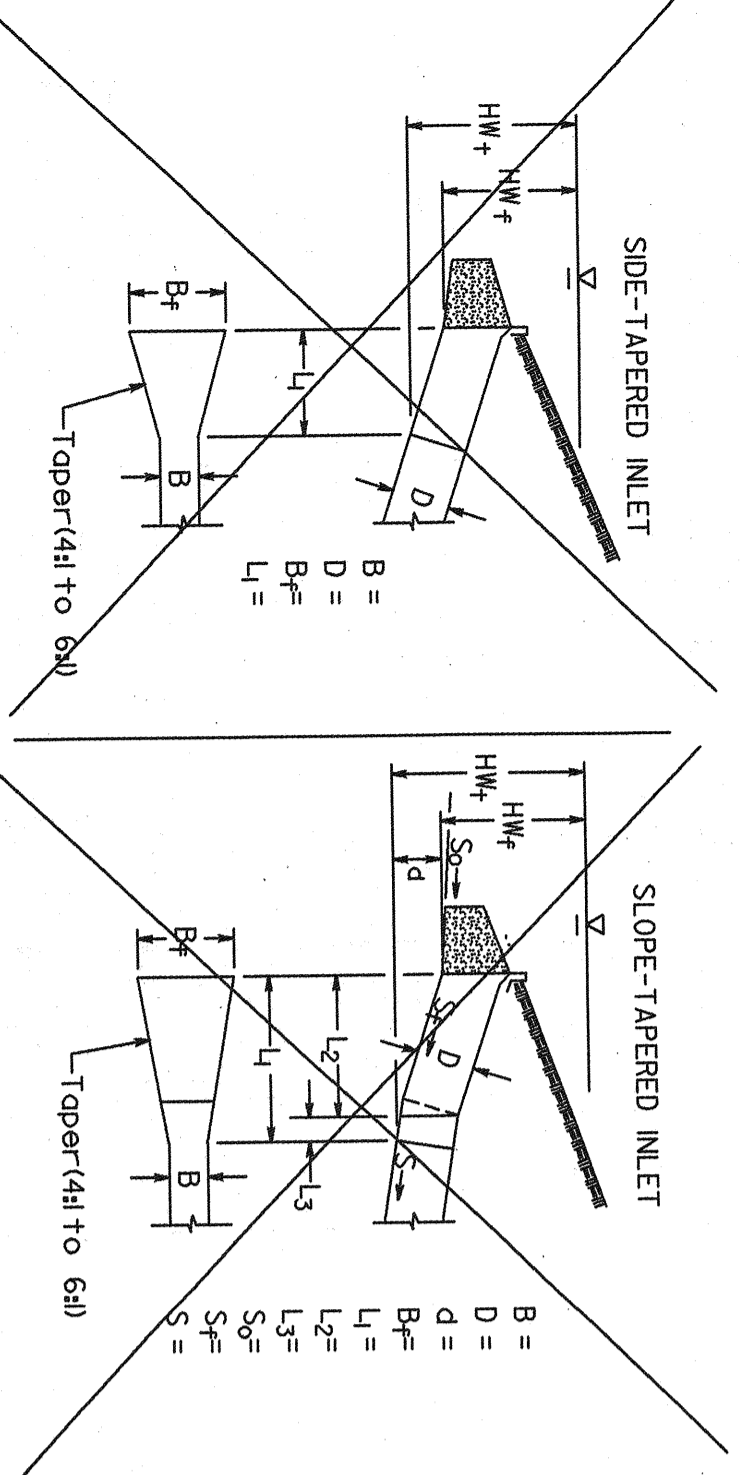
Hydrological Method RURAL REGRESSION W/10% IA
 Hydraulic Design Method HEC-RAS
 Design Tailwater : 0.0 5.0 ; 0.25 5.9 ; 0.50 6.4 ; 0.100 6.8 ; 0.500 8.3

Size & Type	Q	Inlet Control			Outlet Control			Remarks			
		Ke	H _W /D	H.W.	dc	h _o	H		LS _o	H.W.	
2 @ 6x5 RCBC	10YR 355	2	0.97	4.9	3.1	4.1	5.0	0.9	0.32	6.2	OC
	25YR 565	1	1.48	7.3	4.1	4.6	5.9	2.1		8.3	OC
	50YR 695		1.80	9.0	4.7	4.9	6.4	2.6		9.3	OC
	100YR 825		1.86	9.3	5.0	5.0	6.8	2.4		9.5	OC
	500YR 1230		1.96	9.8	5.0	5.0	8.3	1.4		10.0	OC

Is a Floodway Revision Required? NO
 Outlet Velocity, (V₀) 5.9 Natural Channel Velocity, (V₀) 2.3
 Required Outlet Protection NO

INFORMATION TO BE SHOWN ON PLANS

Design: Discharge 695 c.f.s. Frequency 50 YR Elev. 10.5
 Base Flood: Discharge 825 c.f.s. Frequency 100 YR Elev. 10.7
 Overtopping: Discharge 695 c.f.s. Frequency 50 YR Elev. 10.05



ADDITIONAL INFORMATION AND COMPUTATIONS

DA = 633 Ac URBANIZING 10% IMPERVIOUS
 RQ₁₀ = 225(.99)^{1.592} = 223
 RQ₂₅ = 362(.99)^{1.592} = 360
 RQ₅₀ = 490(.99)^{1.514} = 487
 RQ₁₀₀ = 653(.99)^{1.497} = 650
 RQ₅₀₀ = 1771(.99)^{1.483} = 1768
 UQ₁₀ = 227(.99)^{1.483} = 223
 UQ₂₅ = 285(.99)^{1.483} = 281
 UQ₅₀ = 374(.99)^{1.397} = 369
 UQ₁₀₀ = 481(.99)^{1.397} = 476
 UQ₅₀₀ = 1230
 FROM FIS (2-16-95)
 Q₁₀ = 270
 Q₅₀ = 565
 Q₁₀₀ = 745
 Q₅₀₀ = 1330
 USE USGS