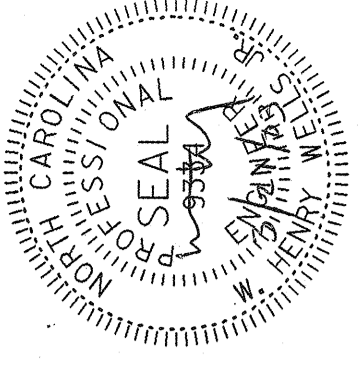


CULVERT SURVEY & HYDRAULIC DESIGN REPORT  
N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAY  
HYDRAULIC DESIGN UNIT  
RALEIGH, N. C.

I.D. No. R-3403A Project No. 8.1171601 Proj. Station STA 66+10.00  
County CRAVEN Stream TRIB TO NEUSE RIVER and SR 1616  
On Highway US 17 Between BRIDGETON and SR 1616  
Recommended Structure RETAIN & EXTEND 6x6 RCBC  
Recommended Width of Roadway 86' SP-SP Skew 89°28'53"  
Location is (Up, At, Down Stream from Existing Crossing) At  
Bench Mark is BM NO.4 - RR SPIKE SET IN BASE OF 28" GUM TREE  
BL- STA. 65+04.40 208.3' RT Elev. 9.44' Datum: NGVD  
Temporary Crossing NOT REQUIRED



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

SITE DATA

Drainage Area 280 Ac Source USGS QUAD & FIELD RECONN Character URBANIZING  
Stream Classification (Such as Trout, High Quality Water, etc.) NONE  
Data on Existing Structure 6x6 RCBC  
Data on Structures Up and Down Stream UPSTREAM - RAILROAD 1@10' STEEL I-BEAMS VERT CL = 7.0'  
DOWNSTREAM - SR 1602 60"x46" CSPA  
Gage Station No. NONE Period of Records Frequency  
Max. Discharge NONE c.f.s. Date Frequency  
Historical/Flood Information:  
Date 1958 Elev. 8.6 Est. Freq. 100YR Source DAVID STEWART Period of Knowledge 50YRS  
Date \_\_\_\_\_ Elev. \_\_\_\_\_ Est. Freq. \_\_\_\_\_ Source \_\_\_\_\_ Period of Knowledge \_\_\_\_\_  
Allowable HW Elev. MATCH EXISTING 100YR 8.5' Normal Water Surface Elev. 1.45  
Manning's n: Left O.B. .05 Channel .05 Right O.B. .11 Obtained From FIELD RECONN  
Flood Study / Status DETAILED - FLOODPLAIN OF NEUSE RIVER Floodway Established N/A  
Flood Study 100 yr. Discharge \_\_\_\_\_ c.f.s.; W.S. Elev.: With Floodway \_\_\_\_\_ Without Floodway \_\_\_\_\_

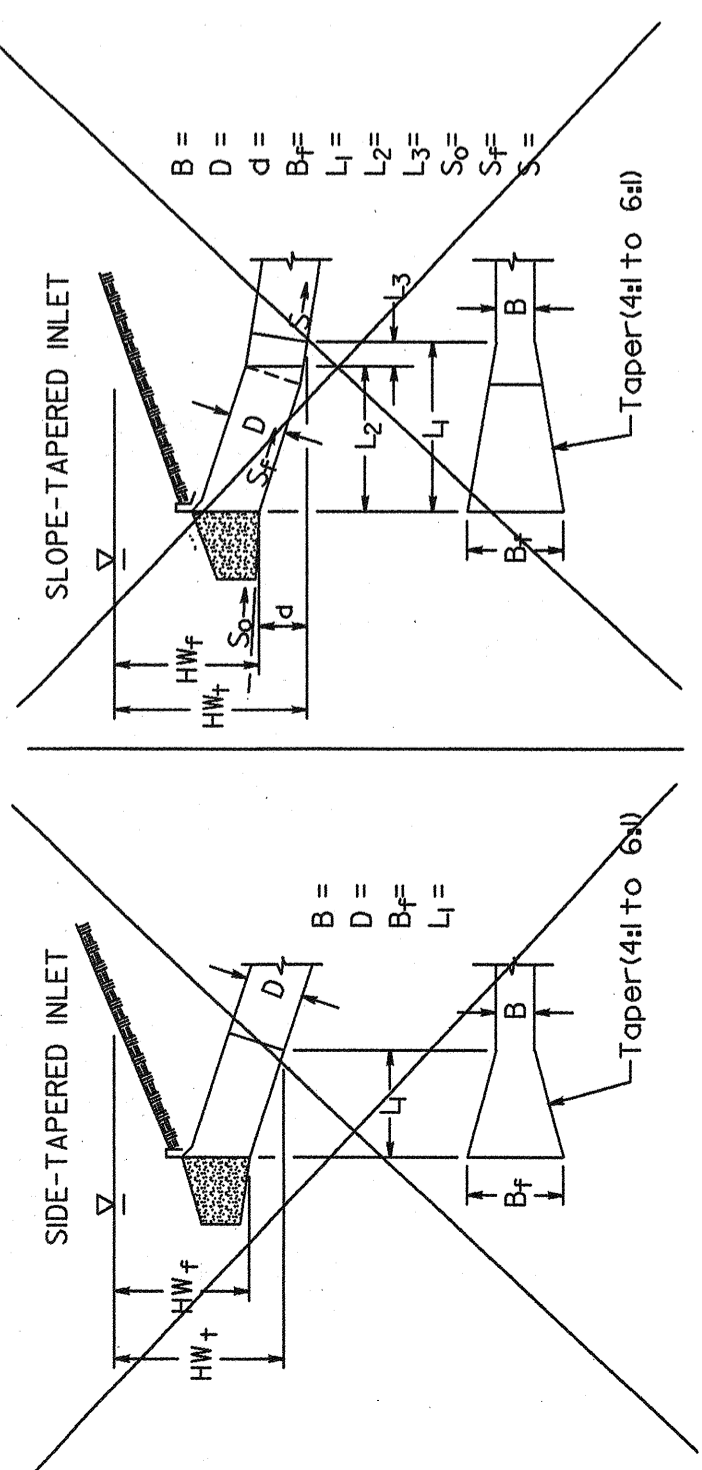
DESIGN DATA

Hydrological Method USGS REGRESSION W/10% IA  
Hydraulic Design Method HEC-RAS  
Design Tailwater:  $Q_{10} = 5.8'$ ;  $Q_{25} = 6.6'$ ;  $Q_{50} = 6.9'$ ;  $Q_{100} = 7.3'$ ;  $Q_{500} = 8.0'$

Size & Type	Q	Ke	Inlet Control		Outlet Control			Remarks			
			HW/D	H.W.	dc	h <sub>0</sub>	H		L <sub>S0</sub>	H.W.	
6x6 RCBC	10YR 215	.2	.92	5.5	3.5	4.8	5.8	0.8	.52	6.1	OC
	25YR 355		1.42	8.5	4.8	5.4	6.6	2.2		8.3	
	50YR 440		1.60	9.6	5.5	5.8	6.9	3.2		9.6	
	100YR 525		1.63	9.8	6.0	6.0	7.3	3.0		9.8	
	500YR 780		1.68	10.1	6.0	6.0	8.0	2.6		10.1	

Is a Floodway Revision Required? NO  
Outlet Velocity, (V<sub>0</sub>) 6.2 Natural Channel Velocity, (V<sub>nc</sub>) 2.6  
Required Outlet Protection NONE  
Design: Discharge 440 c.f.s. Frequency 50 YR Elev. 8.5  
Base Flood: Discharge 525 c.f.s. Frequency 100 YR Elev. 8.7  
Overtopping: Discharge 420 c.f.s. Frequency 50 Elev. 8.3

INFORMATION TO BE SHOWN ON PLANS



ADDITIONAL INFORMATION AND COMPUTATIONS

DA = 280 Ac USGS WRIR 96-4084 URBANIZING IA=10%  
 $RQ_{10} = 225(44)^{.559} = 143$   
 $RQ_{25} = 362(44)^{.522} = 234$   
 $RQ_{50} = 490(44)^{.514} = 321$   
 $RQ_{100} = 653(44)^{.497} = 435$   
 $UQ_{10} = 22.7(44)^{.463(10)^{.515(143)^{.289}}} = 215$   
 $UQ_{25} = 28.5(44)^{.390(10)^{.436(234)^{.338}}} = 355$   
 $UQ_{50} = 37.4(44)^{.391(10)^{.396(321)^{.325}}} = 440$   
 $UQ_{100} = 48.0(44)^{.392(10)^{.858(434)^{.312}}} = 525$   
 $UQ_{500} = 1.77 Q_{500} = 780$