

## RIPRAP @ BRIDGE ENDS CALCULATIONS      6-12-2007

This spreadsheet is setup to be used in conjunction with the example shown on pages 3-4 and 3-12 of the SCDOT Plan and Preparation Guide. The variables a, b, c, d, x, y, Z, A, & R shown in the example are calculated from the elevations that should be provided in the Hydraulic Design. The data necessary for the calculations is put into the boxes with blue text.

Elevation of High Water	536.00	a=	538.00
Elevation of Ground Line	532.55	b=	530.55
Elevation of Shoulder Line	547.70		
Slope of Fill	2.00	<----- ( x/y ) example 2:1 = 2	
Shoulder to Shoulder width "Y"	41.00		
Riprap Class	Class B		
D50 Riprap average diameter	0.75		FT
Riprap Minimum Placement Thickness (ft)	1.5		FT
**Z value			30.00

X=	42.18
A=	16.66
R=	26.85

**\*\*Z = 30' minimum**

Area of Riprap (SY)	343.1	SY
Riprap Placement Weight	3400.0	lbs/CY
Riprap Placement Weight	126.0	lbs/CF
Tons of Riprap (1' Thickness)	194.4	Tons
Tons of Riprap (Thickness Required)	291.6	Tons

Riprap Class	D50 size (FT)	Min Placement Thickness (FT)
Class A	0.50	1
Class B	0.75	1.5
Class C	1.30	2.6
Class D	1.80	3.6
Class E	2.25	4.5
Class F	2.85	5.7

**If approaches are symmetrical, then total for the bridge is:**

Area of Riprap (SY)	686.2	SY
Tons of Riprap	583.2	Tons

**If not compute the other approach accordingly**