

ROCK PROTECTION AT OUTFALLS						
Design Velocity at Design Flow (fps)		REQUIRED PROTECTION				
Greater Than	Less Than or Equal To	Minimum Dimensions				
		Type	Thickness	Width	Length	Height
0	5	Rock Lining (1)	1 Foot	Diameter + 6 Feet	8 Feet or 4 x Diameter, whichever is greater	Crown + 1 Foot
5	10	Riprap (2)	2 Feet	Diameter + 6 Feet or 3 x Diameter, whichever is greater	8 Feet or 4 x Diameter, whichever is greater	Crown + 1 Foot
10	20	Gabion Outfall	As required	As required	As required	Crown + 1 Foot
20	–	Engineered Energy Dissipater required				

(1) **Rock Lining** shall be quarry spalls with gradation as follows:
 Passing 8–inch square sieve: 100%
 Passing 3–inch square sieve: 40 to 60% maximum
 Passing 3/4–inch square sieve: 0 to 10% maximum

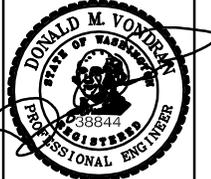
(2) **Riprap** shall be reasonably well graded with gradation as follows:
 Maximum stone size: 24–inches (nominal diameter)
 Median stone size: 16–inches
 Minimum stone size: 4–inches

Notes: Riprap sizing governed by side–slopes on outlet channel is assumed to be approximately 3:1.

Alternate methods of scour protection may be used upon acceptance of the City Engineer.



City of Covington
 Public Works
 Community Development



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 January 2010