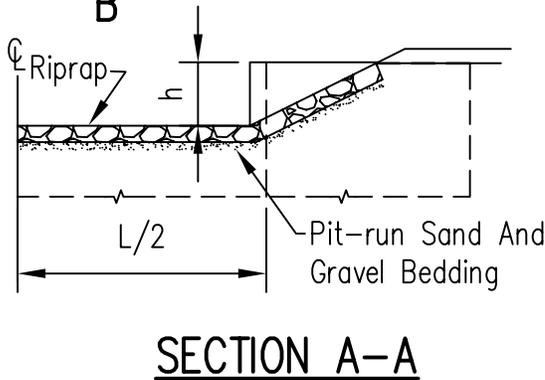
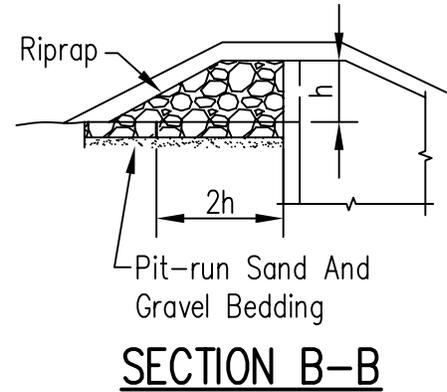
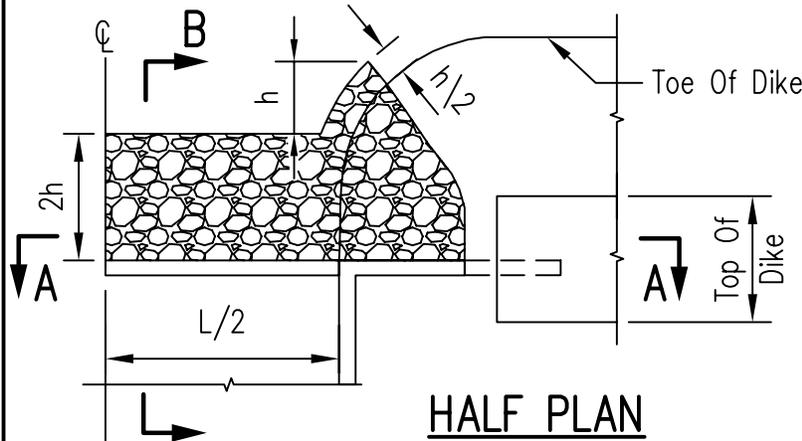


## DROP SPILLWAYS—RIPRAP OF APPROACH CHANNEL LAYOUT AND REQUIREMENTS



Depth Of Weir, h, In Feet	Average Diameter Of Rock, D., In Inches	Weight Of Rock In Pounds	Minimum Thickness Of Bedding In Inches
1.0	3.0	2.0	3.0
1.5	3.0	2.0	3.0
2.0	4.0	3.0	3.0
2.5	5.0	6.0	3.0
3.0	6.0	10.0	3.0
3.5	7.0	16.0	3.5
4.0	8.0	23.0	4.0
4.5	9.0	32.0	4.5
5.0	10.0	44.0	5.0
5.5	11.0	59.0	5.0
6.0	12.0	76.0	6.0

**NOTES:**

The riprap material should be of hard, durable stone or broken concrete with a unit weight equal to or greater than 150 pounds per cubic foot.

Angular, fragmented rock is preferable to rounded stone.

At least 75% of the riprap, by weight, should consist of pieces of rock or concrete, which equal or exceed the weight given in the table opposite the required depth of weir.

The thickness of the layer of riprap should be at least equal to the average diameter of rock, D, indicated in the table.

The riprap should be placed on a bed of coarse pit-run sand and gravel. The minimum thickness of the bedding is indicated in the table.

The spaces between the large rock of the riprap should be filled with spalls, smaller rock, and pit-run material.

The dimension of the area of riprap shown in the above sketches are minimum dimensions.

The surface of the riprap should be as smooth as possible.

**The average diameter, D., is defined as the diameter of a spherical rock of equal weight and density.**

U.S. DEPARTMENT OF AGRICULTURE  
**SOIL CONSERVATION SERVICE**  
ENGINEERING DIVISION – DESIGN SECTION

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