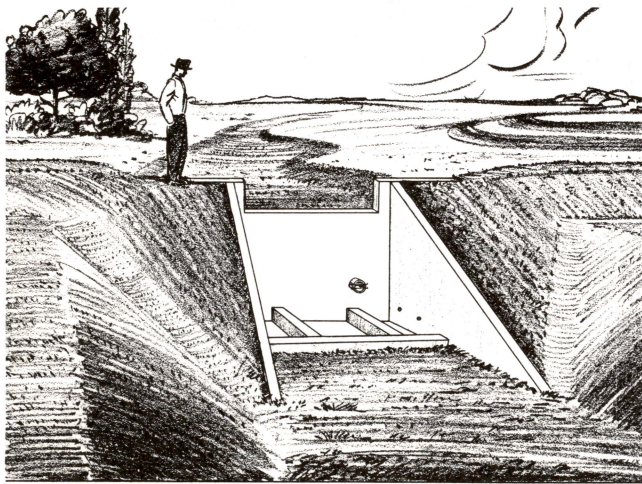


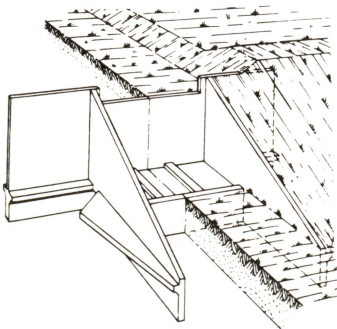
Design Criteria for Straight Drop Spillways

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The straight drop spillway is a weir structure. Water passes through the weir, drops to an approximately level apron or stilling basin and then passes to the downstream channel. It may be constructed of reinforced concrete, rock masonry, concrete blocks, steel or timber piling and prefabricated metal.



Drop Spillway



Type F



Type E

Figure 1. Straight drop spillway.

This Guide prepared jointly by state and field staffs of College of Agriculture, University of Missouri-Columbia and Soil Conservation Service. Original author was R. P. Beasley, UMC (deceased).

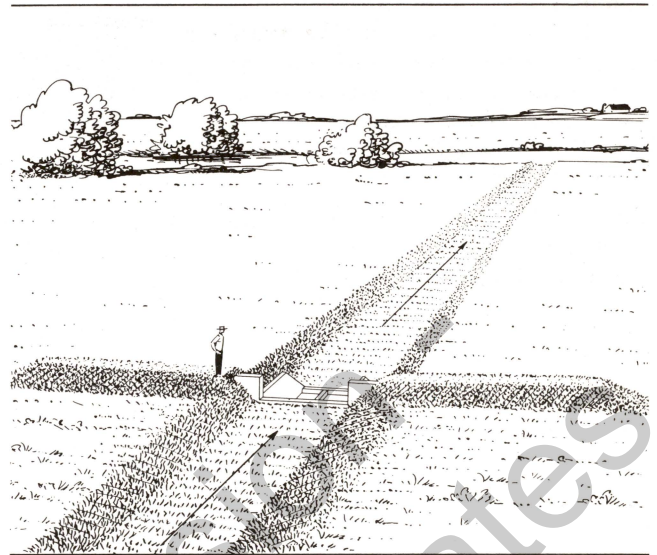


Figure 2. An island-type structure.

Adaptability: The straight drop spillway is adapted to overfalls up to 8 feet where large rates of flow must be handled and where detention storage is limited.

Uses:

1. For grade stabilization of grass waterways or other channels. See Fig. 1.
2. As outlets for tile and surface water into drainage ditches.
3. For protection of the outlet end of a sod chute.
4. As an island type structure, shown in Fig. 2, where low flows are carried by the drop spillway and high flows are diverted around the structure. This structure can be used only where there is sufficient area of nearly level land on either side of the structure to carry the overflow without damage to the land or the crop. If incoming water is loaded with sediment, the sediment may be deposited in the overflow area. This method has been used to build a layer of silt loam sediment over heavy gumbo to improve its productivity.

TABLE 1
CAPACITIES OF STRAIGHT DROP SPILLWAYS IN CFS

Depth of Weir in Feet	Length of Weir in Feet										
	4	6	8	10	12	14	16	18	20	22	24
1.0	11	17	22	28	33	39	44	50	55	61	66
1.5	20	30	40	50	60	70	81	91	101	111	121
2.0	31	46	62	77	92	108	123	138	154	169	185
2.5		64	85	107	128	149	170	192	213	234	256
3.0		83	111	139	167	194	222	250	278	306	333
3.5			130	174	208	243	278	312	347	382	416
4.0			168	210	252	294	336	378	420	462	504

Advantages:

1. It is stable if properly designed and installed.
2. It is not likely to be clogged by debris.

Limitations:

1. A stable grade below the structure is essential.
2. It is more costly than other types of structures if the discharge capacity is less than 100 cfs and the total head is over 8 feet.
3. It is not a suitable structure if detention storage is needed.

Design: Follow suggestions given in UMC Guide 1509 "Types of Stabilization Structures" in selecting the design storm which the spillway should carry.

After the desired capacity has been determined, the size of the weir can be obtained from Table 1. These structures should be designed by a competent technician. Standard drawings are available from Soil Conservation Service offices.

Construction: Follow accepted construction practices in mixing and placing the concrete, selecting and placing the reinforcing and curing the concrete.

Place backfill about the structure following procedures given in UMC Guide 1546 "Designing and Constructing Earth Embankments." Extend the backfill to a height of 1 foot over the wingwalls of the structure.

Fertilize, seed and mulch the earth fill in accordance with UMC Guide 4805 "Establishing and Maintaining Vegetative Cover on Critical Areas."