MN6-8 Canopy Inlet Spillway

A canopy inlet is formed by cutting the end of the conduit at an angle and welding an end-plate of suitable metal to the end of the conduit. In the case of PVC or Dual wall polyethylene (PE) pipe, an endcap may be glued or extrusion welded onto the pipe end to provide the plate width (W) shown in Figure 6-8.1. The canopy is then cut out using a reciprocating or cut-off saw. The dimensions for construction of canopy inlets and the minimum entrance heads required to cause the conduit to flow full are given in Figure 6-8.1 and Table 6-8.1.

The canopy inlet is an alternate to the hood inlet spillway. Both are typically used in conjunction with an auxiliary spillway. The canopy inlet is particularly well adapted to controlling overfalls over eight feet in height and to sites where a good auxiliary spillway or an appreciable amount of detention storage above the inlet can be provided.

Figure 6-8.1 Dimensions of Canopy Inlet

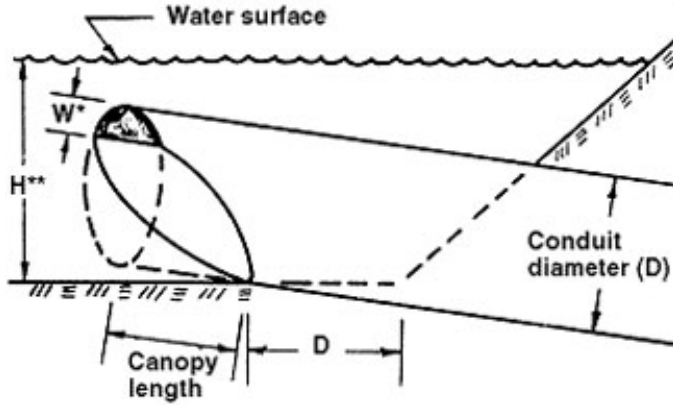

Table 6-8.1 Canopy Inlet Dimensions

Slope of Conduit (%)	W = Plate Width[1]	Canopy Length	H = Minimum Entrance Head[2]
0-5	0.2D	0.6D	1.3D
6-15	0.2D	0.8D	1.4D
16-25	0.3D	1.1D	1.5D
26-32	0.35D	1.3D	1.6D

[1]Plate width is measured from the valley of the corrugations on corrugated pipe and from the inside surface of smooth pipe.

[2]Minimum entrance head required to cause the conduit to flow full. Place the emergency spillway at least this distance above the invert of the inlet.

6-8.1 Advantages

In comparison to the drop inlet, the canopy inlet has the following advantages:

1. No riser is required.
2. Less excavation is required if the structure is used at the ends of waterways or diversions to discharge water into a main drainage way.
3. The fill is lower over the conduit in grade stabilization structures using an earth embankment.
4. It is simple to fabricate and install.
5. The initial cost is low.
6. It is less likely to be clogged with debris.
7. Livestock and children are not likely to fall into it and be injured.

When compared to the hood inlet, the canopy inlet has the following advantages:

1. The conduit will fill at a lower entrance head.
2. Because a baffle is not required, it is simpler to fabricate and install and is less expensive.

6-8.2 Limitations

Canopy inlets require a greater depth of water over the inlet to obtain full conduit flow than do drop inlets. For larger-diameter conduits, a large difference in elevation between the conduit inlet and the auxiliary spillway is required if full flow in the conduit occurs before the auxiliary spillway functions. This large difference in elevation can be avoided by using a box inlet on the canopy inlet. Refer to the section below titled *Metal or Concrete Box Inlet on a Canopy*

or Hood Inlet. It may however, be desirable at some locations to substitute a drop inlet for the canopy inlet.

If high rates of flow are to be carried and a suitable auxiliary spillway cannot be constructed and there is limited detention storage, a large-diameter tube will be required. In this case, a flume or drop spillway may be better suited.

6-8.3 Design

Operation at full pipe flow is critical. If the canopy inlet is constructed to the dimensions given in Figure 6-8.1, the conduit will flow full when the water surface over the inlet reaches the minimum entrance head stage. An additional 0.5 foot freeboard is strongly recommended between the entrance head and the auxiliary spillway.

6-8.4 Canopy Drop Inlets

For those installations where the depth of water that can be impounded over a canopy inlet is less than the required minimum entrance head, it may be advisable to lower the inlet by means of an entrance box so that the conduit will flow full. This entrance box is identical to the entrance box for a hooded inlet, whose minimum dimensions are shown in Figure 6-6.2 in the Minnesota Supplement to EFH Chapter 6.