

A3.5 Inlet Fundamentals

Inlets for collecting pavement drainage can be divided into three major categories:

- kerb-opening (can be grated or ungrated)
- Grated gutter
- Combination

kerb-opening inlets are openings in the kerb face which are generally placed in a depressed gutter section. *Gutter inlets* consist of a metal grate or grates placed over an opening in the gutter. A modification of the gutter inlet is a slotted pipe or slotted trench drain that allows pavement drainage to enter continuously along its longitudinal axis. *Combination inlets* are composed of both a kerb-opening and a gutter type. Perspective drawings of these four types of inlets are presented in Figures A3-5 and A3-6. The sketches define fundamental parameters discussed in this section. They are not intended to be used as standard details of the Department.

Pavement inlets can be placed either on a *continuous grade* or in a *sump* or *sag condition*. If pavement drainage can enter an inlet from only one longitudinal direction, a continuous grade condition exists. On the other hand, if the inlet is located at a point where flow enters it from two directions, a sump condition exists.

The *interception capacity* of an inlet is the gutter flow that enters an inlet under a given set of conditions. The capacity changes as those conditions change. Factors affecting the interception capacity of kerb-opening and gutter inlets are briefly discussed in Sections A3.5.1 and A3.5.2.

The *efficiency* of an inlet is the percent of total gutter flow that the inlet will intercept for a given set of operating conditions. In mathematical form, efficiency is defined as:

$$E = Q_i/Q \text{ (100)} \quad \text{(Eq. A3-7)}$$

where:

E = efficiency of an inlet, in percent

Q_i = intercepted flow, in m³/sec

Q = total gutter flow, in m³/sec

Flow that is not intercepted by an inlet is called *bypass* or *carryover*, and is expressed mathematically as:

$$Q_b = Q - Q_i \quad \text{(Eq. A3-8)}$$

where:

Q_b = bypass flow, in m³/sec

Q = total gutter flow, in m³/sec

Q_i = intercepted flow, in m³/sec

In most cases, an increase in total gutter flow causes an increase in the interception capacity of an inlet and a decrease in its efficiency.