empirical methods and further information can be found from specific storm drainage grate manufacturer's test data.

A3.5.3 Combination Inlets

Continuous Grade

On a continuous grade, the capacity of an unclogged combination inlet with the kerb opening located adjacent to the grate is approximately equal to the capacity of the grated gutter inlet alone due to the inefficiencies of the kerb inlet. The appropriate efficiency level is a function of the location and associated debris potential.

Sump Locations

All debris carried by stormwater runoff that is not intercepted by upstream inlets will be concentrated at the inlet located at the low point, or sump. Since this will increase the probability of clogging for grated inlets, it is appropriate to delete the grate from the kerb inlet and assume a combination inlet at a sump will be limited by the kerb-opening capacity.

A3.5.4 Slotted Trench Drains and Slotted Pipe Inlets

A slotted trench drain is a version of the grated gutter inlet but is more susceptible to clogging. This inlet should not be used for main highway drainage but as an interceptor of sheet surface flow or for isolated low areas that are on flat grades and need an exceptionally long intercept length. The capacity for slotted trench drains can be calculated the same as for grated gutter inlets.

Slotted pipe is a version of the gutter inlet that allows pavement drainage to enter the pipe continuously along its longitudinal axis. Slotted pipes can be used on kerbed or unkerbed pavement and present minimal interference to traffic and pedestrians; however, they are susceptible to clogging. The interception capacity of slotted pipe inlets on a continuous grade has been found to be hydraulically similar to that of a kerb-opening inlet. Both inlets function as falling head weirs, with the flow subjected to lateral acceleration caused by the pavement cross slope. The analysis of test data collected by the USDOT, FHWA for slot widths greater than 45 millimetres indicates that the length of inlet required for complete interception of gutter flow can be computed using an equation developed for kerb-opening inlets. This equation is expressed as:

$$\mathbf{L_T = 6.46\ Q^{0.42}\ s^{0.3}\ (1 / (n\ S_x))^{0.6}} \qquad \textbf{(Eq. A3-24)}$$

where:

L_T = length required to intercept 100 percent of gutter flow on a continuous grade, in m
Q = total gutter flow, in m^3/sec
S = longitudinal slope of gutter, in m/m
N = Manning's roughness coefficient for gutter pavement
S_x = cross slope of pavement, in m/m

The efficiency of a slotted inlet on a continuous grade with a length shorter than that required for total interception can be computed using another equation developed for kerb-opening inlets, expressed as:

$$\mathbf{E = 1 - (1 - L/L_T)^{1.8}} \qquad \textbf{(Eq. A3-25)}$$

where:

E = efficiency of the inlet on a continuous grade, as a decimal
L = slotted inlet, or kerb-opening length, in m
L_T = length required to intercept 100 percent of gutter flow on a continuous grade (see Equation A3-24), in metres