11.7 Design Frequency And Spread

The major considerations for selecting a design frequency and spread include highway classification, because it defines and reflects public expectations for finding water on the pavement surface. Ponding should be prevented on the traffic lanes of high-speed, high-volume highways, where it is not expected.

Highway speed is another major consideration, because at speeds greater than 70 km/h, (45 mi/h) even a shallow depth of water on the pavement can cause hydroplaning. Design speed is recommended for use in evaluating hydroplaning potential. When the design speed is selected, consideration should be given to the likelihood that legal posted speeds may be exceeded. It is clearly unreasonable and not cost effective to provide the same level of protection for low speed facilities as for high speed facilities.

Other considerations include inconvenience, hazards and nuisances to pedestrian traffic and buildings adjacent to roadways which are located within the splash zone. These considerations should not be minimized and, in some locations (such as commercial areas), may assume major importance.

The design criteria for various types of Connecticut roadways are outlined in Table 11-2.

Table 11-2 Pavement Drainage Design Criteria

ROADWAY	ADT	SPEED km/hr (mi/hr)	DESIGN FREQUENCY yr	ALLOWABLE DESIGN SPREAD
State Arterial Highways	≥ 3000	≥ 80 (≥ 50)	10	shoulder
and Expressways	≥ 3000	≤ 70 (≤ 45)	10	½ of lane
	< 3000	---	10	½ of lane
Sag Condition	any	any	50*	all except one lane width
State Collector Highways and	≥ 3000	≥ 80 (≥ 50)	10	shoulder
State-owned service Roads	≥ 3000	≤ 70 (≤ 45)	10	½ of lane
	< 3000	---	10	½ of lane
Sag Condition	any	any	25*	all except one lane width
Town Roads	≥ 3000	any	10	½ of lane
	< 3000		5	½ of lane
Sag Condition	≥ 3000	any	25	all except one lane width
	< 3000		10	
One Lane Ramps	any	any	10	0.3m (1 ft) of lane
Ramps > one lane	any	any	10	1m (3 ft) of lane

* Sag condition is defined as sag vertical curves where the water cannot escape over berms and down an embankment. The procedure is to design the drainage inlets and storm system for a 10 year frequency and then to impose the higher frequency storm on the inlets and storm system. If the higher frequency storm closes the facility to traffic then additional inlets or the storm system will have to be changed.