

Highway Classification	Drainage Appurtenance							
	Roadway Serviceability	Bridge Waterway Openings		Roadway Cross Culverts		Storm Drain Systems (2)		Open Channels (4)
		Allowable Backwater	Allowable Velocity	Allowable Backwater	Allowable Velocity	Design for Inlet Spacing And Trunk Line (Gravity)	Check for HGL on Trunk Line (Pressure Flow)	
Freeways	100	100	100	100	50	50	N/A	10
Multilane Non-Freeways	100	100	100	100	50	10	50	10
Two-Lane Facilities (3) AADT \geq 3000	100	100	100	100	50	10	50	10
3000 > AADT \geq 1000	25	100	100	100	25	10	50	10
AADT < 1000	10	100	100	100	10	10	50	10
Driveways (1)	10	N/A	N/A	100	10	N/A	N/A	N/A
Bridge Decks (Non-Freeways)	N/A	N/A	N/A	N/A	N/A	10	N/A	N/A
Ramps	100	100	100	100	50	10	50	10

- (1) An overtopping area should be provided at the driveway entrance to accommodate floods larger than the design flood. The designer should check the capacity of the driveway culvert for the design frequency indicated for the roadway cross culvert to ensure that there will be no overtopping of the roadway. The design storm for allowable backwater for driveway pipes will match the allowable backwater for the facility the driveway is connected to.
- (2) Inlet spacing for pavement drainage is based on both the recurrence interval and the allowable spread of water in the gutter. See [Figure 36-7A](#) for the criteria for allowable spread.
- (3) Traffic volumes are for a 20-year projection.
- (4) Side ditches only. Relocated streams parallel to the road will be designed for a 100-year event.

General Note: Where existing drainage appurtenances can accommodate less frequent recurrence intervals, no reduction in hydraulic capacity nor serviceability is allowable.

DESIGN FREQUENCY
(Return Period - Years)
Figure 29-5A