

Appendix A - Design Frequencies

Design frequencies for hydraulic facilities related to transportation projects shall be as follows:

<u>ITEM</u>	<u>DESIGN FREQUENCY</u>
• Curb inlet/storm drainage system	10 year (Note 1) also Chapter 11, Storm Drainage Systems
• Channels/ditches (Not conducting a watercourse)	10 year (Note 6) also Chapter 7, Channels
• Watercourse channels	50 year (minimum) also Chapter 7, Channels (Note 2)
• Culverts Watershed area < 2.59 km ² (1 mi ²) Watershed area > 2.59 km ² (1 mi ²)	50 year (Notes 3,4,5) also Chapter 8, Culverts 100 year (Notes 3,4) also Chapter 8, Culverts
• Bridges	100 year (Notes 3,4) Also see Chapter 9, Bridges
• Detention facilities	See Storage Chapter 10, Storage Facilities
• Pumping Stations	50 year - Expressways 25 year - Other roads

NOTES:

1. Depressed expressways will be analyzed for a fifty (50) year frequency and all other depressed roads for a twenty-five (25) year frequency. The floods from these storms will not be allowed to close the facility to traffic.

Depressed Expressways or Roadways are defined as sag vertical curves where water is removed only through a storm system. This does not apply to a sag vertical curve in a fill section where the water would escape over berms and curbs 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 and/or larger pipes will be required.

2. All watercourse channels shall be analyzed for the 2, 25, 50 and 100 year storms at a minimum. All perennial watercourse channels shall incorporate an inner channel to concentrate the 2 year design frequency and low flows. Certain activities, such as the construction of channel segments contiguous to flood improvement projects or channel construction adjacent to areas that must be protected from flooding could require a higher frequency for design. (See Chapter 7, Channels.)
3. All culvert/bridge designs generated using the designated frequencies shall be checked using a flood of greater magnitude to ensure that there are no unexpected flood hazards. For watershed > 2.59 km² (1 mi²) the 500 year flooding event will also be evaluated. For “critical activities” as defined in the Flood Management Regulations for State agencies (Section 25-68b-25-68h, CGS)

and for certain extremely large structures, the design storm frequency shall be the 500 year event. For watersheds $<2.59 \text{ km}^2$ (1 mi^2) which convey a watercourse the 100 year flooding event will be evaluated. (See Chapter 9, Bridges.)

4. Rating curves shall be developed to document the performance of the proposed facility over a full range of storm events including the highway overtopping discharge or frequency where practical.
5. If the cross culverts with watershed areas $<2.59 \text{ km}^2$ (1 mi^2) that do not convey a watercourse a 25 year frequency shall be used. (Also see Chapter 8, Culverts.)
6. The design frequency used for the design of bridges or culverts shall be used for any channel improvements associated with the design.