

CHAPTER 10 APPENDIX D

DESIGN STORM FOR PEDESTRIAN BRIDGES AND OTHER STRUCTURES

The Federal Highway Administration has no standards in regard to evaluating pedestrian structures for scour and hydraulic forces. Accordingly, the Office of Bridge Development recommends that a flood event with a recurrence interval of 10 years or greater be used when designing structures to serve only pedestrians such as bridges, piers or other such public facilities that are funded wholly or in part with Federal or State funds. The low chord of the structure should be above the water surface elevation of the design flood.

- For design floods of less than the 100-year flood, the structure should be evaluated to assure that it meets State regulations and will not create a flooding hazard due to any upstream backwater.
 - If the pedestrian bridge is designed alongside an existing highway structure, the waterway area of the pedestrian bridge should match the waterway area of the highway structure.
 - If the pedestrian structure is a significant and costly structure, such as a crossing of a large river, it reasonable to design the structure for the 100-year flood.
1. An evaluation of scour should be prepared in accordance with the OBD H&H Manual. As a minimum, the overtopping flood (if less than 10 years) and the 10-year floods should be used for the scour evaluation, except for the particular cases cited above where a larger flood would be appropriate.
 2. Consideration should be given to the potential for debris build-up in evaluating the stability of the structure.
 3. In most cases, public safety should not be an over-riding concern since pedestrians are not expected to be on such facilities during a flood or storm event. Selection of the design storm should be based on the value of the structure, considering such factors as costs of removal of the damaged structure and replacement of a new structure. Other considerations should include the amount of pedestrian traffic, inconvenience to pedestrians during the time the facility would be closed to repair flood damage, available detour routes to accommodate pedestrian traffic and so forth.
 4. Normally, the additional cost of designing a structure to resist damage from a major storm event will be small in comparison to the cost of a structure designed for a minimal storm event. SHA encourages designs which minimize the potential for flood damage. The selection of hydrologic and hydraulic factors for use in structure designs is based on the designer's best estimate of what may occur. The nationwide performance history of structures subjected to flood events is indicative of a tendency of designers to underestimate the forces of nature.
 5. Pedestrian structures are not as sturdy as those designed for vehicles and are therefore more likely to be damaged from a storm of a given frequency.