

6.7 Hydrologic Procedure Selection

6.7.1 Overview

Streamflow measurements for determining a flood frequency relationship at a site are usually unavailable; in such cases, it is accepted practice to estimate peak runoff rates and hydrographs using statistical or empirical methods. In general results from using several methods should be compared and evaluated, not averaged. The Department practice shall be to use the discharge that best reflects local project conditions with the reasons documented. The use for each procedure is outlined with each hydrologic procedure given below.

6.7.2 Peak Flow Rates Or Hydrographs

A consideration of peak runoff rates for design conditions is generally adequate for conveyance systems such as storm drains or open channels. However, if the design must include flood routing (e.g., storage basins or complex conveyance networks), a flood hydrograph is usually required. The development of runoff hydrographs (typically more complex than estimating peak runoff rates) is usually accomplished using computer programs.

6.7.3 Hydrologic Procedures

The methods or procedures in the ensuing text are recommended for hydrologic studies performed in conjunction with the design of transportation facilities. In addition to the procedures noted, numerous proprietary software packages are available for hydrologic design. The hydraulic engineer should obtain approval from the Hydraulics and Drainage Section for the use of programs not specifically listed prior to their application in Department designs. The designer is referred to the Federal Highway Administration document entitled Hydraulic Design Series No. 2, "Highway Hydrology," Second Edition (FHWA-NHI-02-001, October 2002) for more detailed information on hydrologic methods. Additionally, computer program documentation, detailed application instructions, and related manuals must be referenced for background information.

All hydrologic studies shall be documented in accordance with the "Hydrologic Design Report Format" and all design discharge values for all bridges and culverts conveying watercourses shall be approved by the Department's Hydraulics and Drainage Section prior to the start of hydraulic design activities. (See Appendix D for report format).