



Acceptable Peak Flow and Detention Design Software

Description

It is recommended that construction BMPs be designed based on the peak flow calculated for the design storm. The Rational Method may be used for small drainage areas. Any drainage from off-site must be considered as a component of Peak Flow if there is no diversion structure or no natural barrier to prevent flow from crossing the site.

The hydrology software listed in this section is acceptable for use on stormwater projects. Use of this software should generally aid the plans review and approval process. Special circumstances or increased watershed protection may require other software. The acceptable software is listed in the Table below. Under special circumstances, the designer will need to compute peak flow rates from predominantly impervious areas to generate runoff hydrographs for the design of detention facilities, or determine peak flow rates from upstream reservoirs.

When a runoff hydrograph is required, it is recommended the designer use the Corps of Engineers HEC-HMS, or the Natural Resources Conservation Service (NRCS) TR-20 hydrologic models. **The Corps of Engineers HEC-1 model may be used only if there is an existing HEC-1 model.** The National Flood Frequency program is published by the United States Geological Survey and is available on the internet. The results of this program should be consistent with the current USGS regression equations for both rural and urban areas. The user should verify that results obtained from this program are consistent with the regression equations presented in this manual.

See also 3.4 Peak Flow Calculations (Permanent Basins).

Table 1

Approved Software	Uses
GeoPak	Computes Peak Discharge Rational Method NRCS Curve Number Method
HYDRAIN (HYDRO Module)	Computes Peak Discharge Rational Method
National Flood Frequency Program	Computes Peak Discharge USGS Rural Regression Equation USGS Urban Regression Equation USGS Memphis Regression Equation
HEC-HMS, HEC-1 *	Develops Hydrographs using NRCS Curve Number and Unit Hydrograph Methods Channel Routings Reservoir Routings (existing and proposed) Diversions

Approved Software	Uses
Hydraflow Storm Sewers Extension for AutoCAD Civil 3D	AutoCAD® Civil 3D® software delivers the Hydraflow Storm Sewers Extension for AutoCAD Civil 3D. It enables storm and sewer design and analysis for land development and transportation projects. Used to design pipes, inverts, slopes, and inlets based on user-defined design parameters.
WinTR-20	The WinTR-20 model is a storm event surface water hydrologic model applied at a watershed scale. The model assists in the hydrologic evaluation of flood events for use in the analysis of water resource projects. It can be used to analyze current watershed conditions as well as assess the impact of proposed changes (alternates) made within the watershed.
WinTR-55	WinTR-55 is a single-event rainfall-runoff small watershed hydrologic model. The model generates hydrographs from both urban and agricultural areas and at selected points along the stream system. Hydrographs are routed downstream through channels and/or reservoirs. Multiple sub-areas can be modeled within the watershed.

References

Tennessee Department of Transportation (TDOT). 03-15-07(Updated). Design Division Drainage Manual. http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/DrainManChap%201-10.htm.