

Control Act is a goal of primary importance to the City of Manassas Park.

The State Water Control Board has developed manuals for Best Management Practices which set forth an economically feasible program to control non-point source pollution in state waters. Developers and engineers are encouraged to refer to these Manuals or to seek other better methods to achieve the same goal.

Structural measures that store stormwater and rely upon solid settling processes to remove pollutants should be implemented, since minor modifications could practically convert a stormwater detention facility to a multipurpose facility satisfying both water quality and quantity needs.

Volume control best management practices like porous pavement, modular pavement and infiltration pits or trenches (when the soil permeability allows it) are also encouraged to be used.

507.00 FLOOD PLAIN REQUIREMENTS

It is recognized that whenever the balance established by nature between a watershed and its naturally stabilized drainageways is disturbed that some corrective measures must be taken to restore the balance and to avoid downstream flooding and damage.

Therefore, it is recognized that some improvements must be made within flood plains, streams and/or drainageways in such manner that the increased run-off from changes or improvements within the watershed may be accommodated without unacceptably elevating flood plain or stream levels particularly within improved or developed areas. This may take the form of stream bed clearing, removal of obstructions, reduction of constrictions, stabilization of stream bottom and/or banks or areas to eliminate or reduce erosion, widening, deepening or realigning of streams to provide the necessary hydraulic characteristics to accommodate the anticipated stormwater flow without damaging adjacent properties. These improvements should include the removal of silt and debris which may clog or damage downstream drainage structures or property, the filling of drainage ponding areas and stagnant pools which are potential vermin shelters and mosquito breeding areas. Recognizing the right of a land owner to the full lawful use of his land and the City's responsibility for the protection of the health, safety and welfare of all of its citizens, backwater areas may be filled when they are not required as safety valves or temporary retention reservoirs to control downstream run-off intensity

so long as the necessary drainageway is preserved and filled or excavated areas are adequately stabilized against erosion. The method outlined herein will provide a general guide as to the criteria and procedures used by the Director in the processing and approval of flood plain studies and their related flood plain easements.

507.01 General Off-Site Information Required:

- A. Drainage divides of off-site contributing areas and their relation to the site in question at a maximum scale of 1" equals 2,000 ft. (U.S.G.S. Quadrangle Sheets).
- B. Present zoning and planned zoning of the off-site contributing areas, and coefficient of imperviousness .
- C. Time of concentration will be estimated by generally accepted engineering procedures.
- D. With the establishment of the total off-site drainage area, the required rainfall curve to be used is as follows:
 - 1. If the off-site drainage area is less than one square mile, the 100-year rainfall curve shall be used. The freeboard easement shall be two feet (2') above the approved computed water level.
 - 2. If the off-site drainage area is more than one square mile, the 100-year rainfall curve shall be used without any freeboard.
- E. Friction coefficient - "N" factor both on-site and off-site shall be approved by the Director.
- F. The discharge (Q) shall be determined by the rational formula $Q = CIA$ for drainage areas less than 200 acres. For (drainage areas greater than 200 acres, another proven method shall be used, e.g. Anderson method.

507.02 Flood Plain Study Requirements Through Site:

- A. Field run topography of the stream through the site and extending three hundred (300') feet up and downstream from the property lines or to major construction, if deemed necessary.

- B. Field run topography shall extend to cover the limits of the flood plain freeboard except in cases of abrupt change in the characteristics of the terrain additional topography may be required.
- C. Base line shall be located as closely as possible to the centerline of the flooded area and the field run cross-sections shall be perpendicular to the stream channel and flood plain and taken at all constrictions and other areas of change in the channel and flood plain.
- D. A mathematical tie between the base line, flood plain easement line, and the lot property lines shall be required on the contour plan view of the flood plain at a scale of one inch equals fifty feet (1" = 50') horizontally.
- E. Cross-sections shall be plotted at a scale of one inch equals ten feet (1" = 10') vertically and horizontally. In cases of extremely flat terrain, a scale of one inch equals five feet (1" = 5') vertically and one inch equals fifty feet (1" = 50') horizontally shall be used.
- F. A profile of the stream bed indicating the elevation of water surface and invert of the stream entry fifty feet (50') for the full length of the flood plain will be submitted with the cross-sections. The scale of the profile shall be one inch equals five feet (1" = 5') vertically and one inch equals fifty feet (1" = 50') horizontally.
- G. Flood Plain Studies must be certified by a Virginia registered professional engineer.

507.03 Basis for Determining Flood Limits:

The procedure described herein is the method that shall be used for establishing water level elevations and balance of energy of flowing streams and/or flood plains.

- A. The examination of the topography of the flood plain area for the location of major constrictions, sharp changes of slope, or where the cross-section becomes narrow relative to the width of the channel.

- B. Review of the plotted cross-sections of the stream.
- C. Flood plain limits shall be determined using the Corps of Engineers HEC-12 computer model. Other modeling must be approved by the City Engineer.

507.04 Minimum Lot Area Requirements: In all zones with minimum lot area requirements, lots may be platted within the 100-year flood plain as long as the minimum lot area required by the particular zone is located outside the limits of the 100-year flood plain.