

Memorandum

To: Programs, Projects and Operations Subcommittee
From: Paul Woodward, Water Resources Engineer
Date: October 10, 2006
Re: Papillion Creek Watershed Partnership Stormwater Management Policies

After consideration at the June 2006 Board meeting, the proposed Stormwater Management Policies were tabled for 3 months. These same policies along with revisions to Policy 17.16 of the District's Policy Manual were again considered and delayed last month.

Revisions to District Policy 17.16 Urban Stormwater Management are again enclosed for your considerations. These revisions incorporate the proposed Stormwater Management Policies as an appendix to the Policy Manual. These Policies guide District staff to incorporate stormwater management recommendations when reviewing new or significant redevelopment. In addition, Policy 17.16 clarifies that the District will continue to work on implementing Regional Detention and Water Quality Basins provided the Board determines they are appropriate and affordable. The District will also recommend that all cities and counties require developers to consider Low Impact Development BMPs, including local detention, to reduce runoff and improve water quality. Finally, it instructs District staff to recommend that local detention basins be evaluated on new development to reduce runoff and pollutants, especially if the development is not located upstream of an existing or proposed regional detention basin.

Management recommends that the subcommittee recommend to the Board that the amended District Policy 17.16 - Urban Stormwater Management be adopted to incorporate the proposed Papillion Creek Watershed Partnership Stormwater Management Policies.

17.16 District Programs - Urban Stormwater Management Program. The Urban Stormwater Management Program is an authorized program of the District. To promote the health, safety and well-being of the public, it is the present and long range intent of the District to:

A. Serve as a regional coordination and management agency for major urban drainage and flood control systems which are those systems that involve open channels where the drainage area is more than approximately 200 acres. Coordination of actions affecting these systems is necessary to achieve the best possible results in the District.

B. Develop Urban Drainage Master Plans which define policies and outline plans for the development, financing, implementation and continued maintenance of urban drainage and flood control systems in each basin. This will be done with the assistance of and in consultation with other local governmental agencies. The master plan will be presented for adoption to each local governmental agency identified as responsible for implementing all or portions of the plan.

In accordance with this policy, Stormwater Management Policies (hereinafter referred to as the "Policies") were developed through a community-based process known as Watershed By Design involving the development community, Papillion Creek Watershed Partnership members, public agencies, non-profit organizations, other stakeholder groups and the general public. The Policies developed through the WBD process consist of six (6) Policy Groups, headed as follows:

- #1 Stormwater Management Financing
- #2 Peak Flow Reduction
- #3 Pollution Control
- #4 Landscape Preservation, Restoration, and Conservation
- #5 Erosion and Sediment Control and Other BMPs
- #6 Floodplain Management

These Policies are attached hereto as Appendix "S" and incorporated herein by reference, and provide guidance for a comprehensive approach to stormwater quality and quantity, subject to the following:

- As outlined in Policy Groups 1 and 2, the District intends to implement construction of Regional Detention and Water Quality Basins proposed in the conceptual Watershed Drainage Plan, as deemed necessary by the District and subject to available funding as determined by the District.
- The District will recommend to local zoning jurisdictions that all new development or significant redevelopment be required to consider Low Impact/Conservation Development strategies or best management practices.
- The District will recommend to local zoning jurisdictions that all new development or significant redevelopment be encouraged to evaluate local basins to reduce runoff and pollutants, especially if not located above regional basins.

C. Expect and continue to rely on other local governmental subdivisions (cities, counties and SID's) to continue to develop, finance, implement, operate and maintain urban drainage and flood control systems that involve enclosed conduits (storm sewers), road crossing and other similar appurtenant systems.

D. Assume responsibility for major urban drainage and flood control systems in the District in accordance with the Urban Drainage Master Plan. For areas where no Urban Drainage Master Plan is currently available, the District will consider the planning, development, improvement, financing, implementation and continued maintenance of existing and proposed improvements to major urban drainage and flood control systems on an individual basis.

E. Expect, concurrent with or prior to assumption of responsibility for an urban drainage and flood control system, that the local subdivision with regulatory responsibility and authority enact for existing and proposed urban development Sediment and Erosion Control ordinances and Stormwater Management ordinances that provide for District review and concurrence of basin development proposals to ensure that they comply with Urban Drainage Master Plans if the District is expected to assume responsibility for any portion of the development plan.

F. Financing of the additional duties and responsibilities envisioned by this policy statement could be through:

1. District general tax levy revenue
2. Stormwater utility fees, and,
3. Federal, state and local funds that may be available to assist the District

(February 7, 1985 resolution, Revised September, 2006).

STORMWATER MANAGEMENT POLICIES

POLICY GROUP #1: STORMWATER MANAGEMENT FINANCING

ISSUE: Regulatory requirements for stormwater management and implementation of Stormwater Management Policies intended to accommodate new development and significant redevelopment will impose large financial demands for capital and operation and maintenance beyond existing funding resources.

“ROOT” POLICY: A dedicated, sustainable funding mechanism shall be developed and implemented to meet capital and operation and maintenance obligations as a result of new stormwater management regulations and to implement Stormwater Management Policies to accommodate new development and significant redevelopment.

SUB-POLICIES:

- 1) Adequate funds shall be earmarked by the jurisdictional authority or the Papio-Missouri River Natural Resources District (P-MRNRD) for preparing the Watershed Drainage Plan for siting regional stormwater detention and water quality basin facilities that will enable critical peak flow reduction for flood protection and improved water quality within the Papillion Creek Watershed.
- 2) A Regional Stormwater Detention Fee system shall be established to equitably distribute the capital cost of implementing regional stormwater detention facilities among new development or significant redevelopment within the Papillion Creek Watershed.
- 3) The Regional Stormwater Detention Fee initial framework shall consist of the following provisions:
 - a. Development of a Watershed Drainage Plan for Douglas and Sarpy Counties preliminarily consisting of seven (7) remaining multi-reservoir sites, ten (10) additional regional detention sites, and twelve (12) water quality basins.
 - b. Collection of fees shall be earmarked specifically for construction of regional detention structures and water quality basins.
 - c. Two (2) fee classifications shall be established:
 - 1) “Low-Density Residential Development” (generally consisting of single-family and duplex multi-family dwelling units, or as otherwise determined by the local zoning jurisdiction). Fees shall be assessed on a per dwelling unit or equivalent prorated average area of lot basis.
 - 2) “High-Density Development” (consisting of other multi-family residential dwelling units determined by the local zoning jurisdiction to represent high density development, plus Commercial and Industrial development). Fees shall be assessed on a per developed acre basis and shall be proportionately indexed to “Low-Density Residential Development” in terms of the potential to generate stormwater surface runoff. Unless otherwise determined by the local zoning jurisdiction, “High-Density Development” fees shall be 1.5 times that of “Low-Density Residential Development” when considered on an estimated dwelling unit per developed acre basis.
 - d. Regional Stormwater Detention Fees (private) are intended to account for approximately one-third (1/3) of required capital funds, except as further provided

STORMWATER MANAGEMENT POLICIES

below, and shall be paid to the applicable local zoning jurisdiction with building permit applications.

- e. Regional Stormwater Detention Fee revenues shall be transferred from the applicable local zoning jurisdiction to a special P-MRNRD construction account via inter-local agreements.
- f. The P-MRNRD (public) costs are intended to account for approximately two-thirds (2/3) of required capital funds, including the cost of obtaining necessary land rights, except as further provided below; and the P-MRNRD shall be responsible for constructing regional detention structures and water quality basins using pooled accumulated funds.
- g. The P-MRNRD will seek general obligation bonding authority from the Nebraska Legislature to provide necessary construction scheduling flexibility.
- h. Financing for detention structures and water quality basins may additionally require public-private partnership agreements between the P-MRNRD and developers/S&IDs at the detention structure sites on a case-by-case basis.
- i. On approximately three (3)-year intervals, the Watershed Drainage Plan and Regional Stormwater Detention Fee framework, rates, and construction priority schedule shall be reviewed with respect to availability of needed funds and rate of development within the Papillion Creek Watershed by the parties involved (local zoning jurisdictions, P-MRNRD, and the development community). Subsequent changes thereto shall be formally approved by the respective local zoning jurisdictions and the P-MRNRD.
- j. Additional funding strategies shall be developed and implemented to fund on-going O&M after construction of regional detention and water quality basin facilities.

REFERENCE INFORMATION

DEFINITIONS

- 1) Stormwater Management Policies. Stormwater management policies developed by the Technical Workgroup and Policy Workgroup that were commissioned by the Papillion Creek Watershed Partnership (PCWP) subsequent to the “Green, Clean, and Safe” initiatives developed through the “Watershed by Design” public forums conducted in 2004 and 2005. The following policy groups contain “root” policies and sub-policies for stormwater management that have been developed in addition to the Stormwater Management Financing Policy Group herein:
 - Policy Group #2 – Peak Flow Reduction
 - Policy Group #3 – Pollution Control
 - Policy Group #4 – Landscape Preservation, Restoration, and Conservation
 - Policy Group #5 – Erosion and Sediment
 - Policy Group #6 – Floodplain Management
- 2) Stormwater Management Plan (SWMP). A SWMP is a required part of the NPDES Phase II Stormwater Permits issued to many of the Omaha metropolitan area Papillion

STORMWATER MANAGEMENT POLICIES

Creek Watershed Partnership (PCWP) members. Development of Stormwater Management Policies is an integral part of the SWMP, and such policies are to be adopted by respective PCWP partners by the end of year 2 (August 2006) of the permit cycle.

- 3) Comprehensive Development Plans. Existing plans developed by local jurisdictions that serve as the basis for zoning and other land use regulations and ordinances. The Stormwater Management Policies are to be incorporated into the respective Comprehensive Development Plans.
- 4) Policy Implementation. The implementation of the policies will be through the development of ordinances and regulations, in years 3 through 5 of the NPDES permit cycle; that is, by the year 2009. Ordinances and regulations are intended to be consistent for, and adopted by, the respective PCWP members. Such ordinances and regulations shall need to be consistent with the Comprehensive Development Plans of the respective PCWP members.

BASIS FOR STORMWATER MANAGEMENT FINANCING ISSUE

- 1) Time is of the essence for policy development and implementation:
 - a) Under the existing Phase II Stormwater Permits issued by the Nebraska Department of Environmental Quality, permittees must develop strategies, which include a combination of structural and/or non-structural best management practices and incorporate them into existing Comprehensive Development Plans by the end of July 2006.
 - b) The S&ID platting process is typically several years ahead of full occupation of an S&ID. Therefore, careful pre-emptive planning and program implementation is necessary in order to construct regional stormwater detention and water quality basin improvements in a timely manner to meet the purposes intended and to avoid conflicts from land use encroachments from advancing development.
- 2) Financing to meet capital and O&M obligations for stormwater management projects requires a comprehensive, uniformly applied approach and not a project-by-project approach.

STORMWATER MANAGEMENT POLICIES

POLICY GROUP #2: PEAK FLOW REDUCTION

ISSUE

Urbanization within the Papillion Creek Watershed has and will continue to increase runoff leading to more flooding problems and diminished water quality.

ROOT POLICY

Maintain or reduce stormwater peak discharge during development and after full build-out land use conditions from that which existed under baseline land use conditions.

SUB-POLICY

- 1) Regional stormwater detention facilities shall be located in general conformance with a Watershed Drainage Plan to be prepared and adopted following appropriate hydrologic and hydraulic modeling and shall be coordinated with other related master planning efforts for parks, streets, water, sewer, etc.

REFERENCE INFORMATION

DEFINITIONS

- 1) Peak Discharge or Peak Flow. The maximum instantaneous surface water discharge rate resulting from a design storm frequency event for a particular hydrologic and hydraulic analysis, as defined in the Omaha Regional Stormwater Design Manual. The measurement of the peak discharge shall be at the outlet from a downstream regional stormwater detention facility (as defined); or where no downstream regional detention facility exists or is otherwise not proposed to be constructed under a watershed drainage plan, the peak discharge determination shall be relative to the lower-most drainage outlet(s) from a new development or significant redevelopment.
- 2) Regional Stormwater Detention Facilities. Those facilities generally serving a drainage catchment area of 500 acres or more in size.
- 3) Baseline Land Use Conditions. That which existed for Year 2001 for Big and Little Papillion Creeks and its tributaries (excluding West Papillion Creek) and for Year 2004 for West Papillion Creek and its tributaries.
- 4) Full Build-Out Land Use Conditions. Fully platted developable land use conditions for the combined portions of the Papillion Creek Watershed that lie in Douglas and Sarpy Counties that are assumed to occur by the Year 2040, plus the projected 2040 land uses within the Watershed in Washington County; or as may be redefined through periodic updates to the respective County comprehensive plans.

STORMWATER MANAGEMENT POLICIES

BASIS FOR INCREASED FLOODING ISSUE

- 1) The levees on the West Papillion Creek System were originally designed for 100-year flood protection under the development conditions that existed at that time. Recent FEMA floodplain remapping efforts indicate that the required 3-foot freeboard for the levees for many segments is being significantly encroached upon under existing development conditions and will be further compromised under full build-out conditions.
- 2) Similar threats most likely exist on the Papillion and Big Papillion Creek Systems; particularly since much of the levee system was originally designed for only 50-year flood protection and for development conditions that existed at that time.

STORMWATER MANAGEMENT POLICIES

POLICY GROUP #3: POLLUTION CONTROL

ISSUE: Waters of the Papillion Creek Watershed are impaired.

“ROOT” POLICY: Reduce pollution from contributing sources, including but not limited to, agricultural activities and combined sewer overflows, such that waters of the Papillion Creek Watershed and other local watersheds can meet applicable water quality standards and community-based goals, where feasible.

SUB-POLICIES:

- 1) Protect surface and groundwater resources from soil erosion (sheet and rill, wind erosion, gully and stream bank erosion), sedimentation, nutrient and chemical contamination.
- 2) Preserve, protect, and mitigate wetland areas to improve water quality by minimizing the downstream transport of sediment, nutrients, bacteria, etc. borne by surface water runoff.
- 3) Support NDEQ in an accelerated TMDL development process that addresses potential pollutant sources in a fair and reasonable manner based on sound technical data and scientific approach.
- 4) Implement Best Management Practices (BMPs) that reduce both urban and rural pollution sources, maintain designated beneficial uses of streams and surface water impoundments, minimize soil loss, and provide sustainable production levels.

REFERENCE INFORMATION

DEFINITIONS:

- 1) Best Management Practice (BMP). “A technique, measure or structural control that is used for a given set of conditions to manage the quantity and improve the quality of stormwater runoff in the most cost-effective manner.” [Source: U.S. Environmental Protection Agency (EPA)]
- 2) Total Maximum Daily Load (TMDL). A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Water quality standards are set by States, Territories, and Tribes. They identify the uses for each waterbody, for example, drinking water supply, contact recreation (swimming), and aquatic life support (fishing), and the scientific criteria to support that use. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs, and for Nebraska such standards and programs are administered by the Nebraska Department of Environmental Quality. [Source: EPA and Nebraska Surface Water Quality Standards, Title 117].

STORMWATER MANAGEMENT POLICIES

POLICY GROUP #4: LANDSCAPE PRESERVATION, RESTORATION, AND CONSERVATION

ISSUE: Natural areas are diminishing, and there is a need to be proactive and integrate efforts directed toward providing additional landscape and green space areas with enhanced stormwater management through restoration and conservation of stream corridors, wetlands, and other natural vegetation.

“ROOT” POLICY: Utilize landscape preservation, restoration, and conservation techniques to meet the multi-purpose objectives of enhanced aesthetics, quality of life, recreational and educational opportunities, pollutant reduction, and overall stormwater management.

SUB-POLICIES:

- 1) Incorporate stormwater management strategies as a part of landscape preservation, restoration, and conservation efforts where technically feasible.
- 2) Define natural resources for the purpose of preservation, restoration, mitigation, and/or enhancement.
- 3) Encourage the use of low-impact development (LID) strategies to preserve significant natural resources, benefit water quality, and maintain or reduce the volume of surface runoff from baseline land use conditions.
- 4) For new or significant redevelopment, provide a Creek Setback (3:1 plus 50 feet) along watercourses as defined within the Watershed Drainage Plan for the Papillion Creek Watershed.
- 5) Any watercourse associated with new or significant redevelopment shall be placed into an outlot or within public right of way or otherwise approved easement and shall require a minimum Creek Setback width of 3:1 plus 20 feet.

REFERENCE INFORMATION

DEFINITIONS

- 1) Low-Impact Development (LID). A land development and management approach whereby stormwater runoff is managed using local controls to achieve a site's predevelopment hydrology by using design techniques that promote infiltration, filtration, storage, evaporation, and temporary detention close to its source. Management of such stormwater runoff sources may include open space, rooftops, streetscapes, parking lots, sidewalks, medians, etc.
- 2) Baseline Land Use Conditions: That which existed for Year 2001 for Big and Little Papillion Creeks and its tributaries (excluding West Papillion Creek) and for Year 2004 for West Papillion Creek and its tributaries.
- 3) Creek Setback. See Figure 1 below and related definitions in Policy Group #6: Floodplain Management. A setback area equal to three (3) times the channel depth plus fifty (50) feet (3:1 plus 50 feet) from the edge of low water on both sides of channel shall be required for any above or below ground structure exclusive of bank stabilization structures, poles or sign structures adjacent to any watercourse defined within the watershed drainage plan. Grading, stockpiling, and other construction

STORMWATER MANAGEMENT POLICIES

activities are not allowed within the setback area and the setback area must be protected with adequate erosion controls or other Best Management Practices, (BMPs). The outer 30 feet adjacent to the creek setback limits may be credited toward meeting the landscaping buffer and pervious coverage requirements.

A property can be exempt from the creek setback requirement upon a showing by a licensed professional engineer or licensed landscape architect that adequate bank stabilization structures or slope protection will be installed in the construction of said structure, having an estimated useful life equal to that of the structure, which will provide adequate erosion control conditions coupled with adequate lateral support so that no portion of said structure adjacent to the stream will be endangered by erosion or lack of lateral support. In the event that the structure is adjacent to any stream which has been channelized or otherwise improved by any agency of government, then such certificate providing an exception to the creek setback requirement may take the form of a certification as to the adequacy and protection of the improvements installed by such governmental agency. If such exemption is granted, applicable rights-of-way must be provided and a minimum 20 foot corridor adjacent thereto.

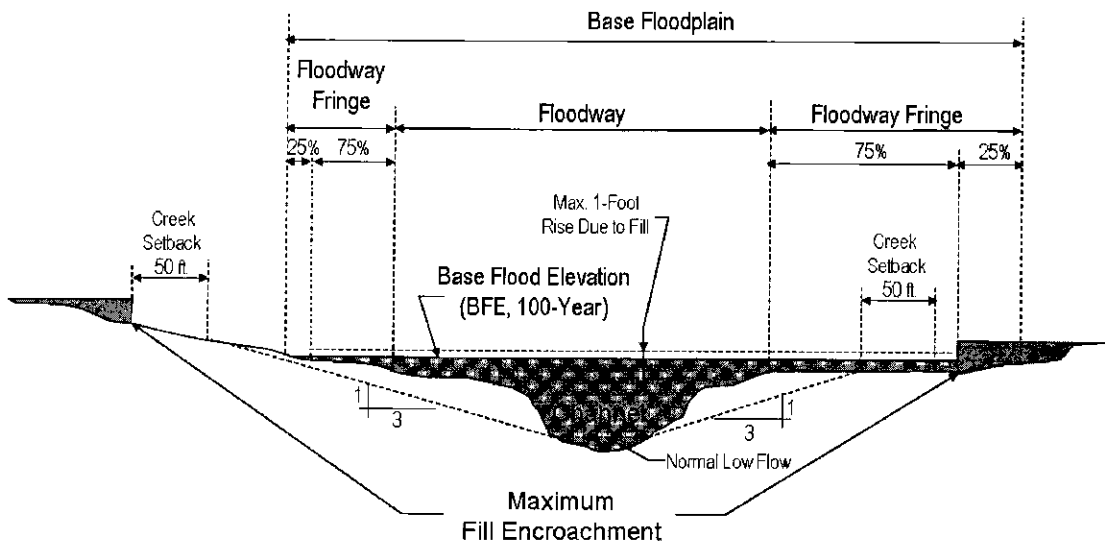


Figure 1 – Floodway Fringe Encroachment and Creek Setback Schematic

STORMWATER MANAGEMENT POLICIES

POLICY GROUP #5: EROSION AND SEDIMENT CONTROL AND OTHER BMPs

ISSUE: Sound erosion and sediment control design and enforcement practices are needed in order to protect valuable land resources, stream and other drainage corridors, and surface water impoundments and for the parallel purpose of meeting applicable Nebraska Department of Environmental Quality regulatory requirements for construction activities that disturb greater than one acre.

“ROOT” POLICY: Promote uniform erosion and sediment control measures, including the adoption of the Omaha Regional Stormwater Design Manual and by implementing consistent rules for regulatory compliance pursuant to State and Federal requirements.

SUB-POLICIES:

- 1) Construction site stormwater management controls shall include both erosion and sediment control measures.
- 2) The design and implementation of post-construction, permanent erosion and sediment controls shall be considered in conjunction with meeting the intent of other Stormwater Management Policies.
- 3) Sediment storage shall be incorporated with all regional detention facilities where technically feasible.

REFERENCE INFORMATION

DEFINITIONS

- 1) Erosion Control. Land and stormwater management practices that minimize soil loss caused by surface water movement.
- 2) Sediment Control. Land and stormwater management practices that minimize the transport and deposition of sediment onto adjacent properties and into receiving streams and surface water impoundments.

STORMWATER MANAGEMENT POLICIES

POLICY GROUP #6: FLOODPLAIN MANAGEMENT

ISSUE: Continued and anticipated development within the Papillion Creek Watershed mandates that holistic floodplain management be implemented and maintained in order to protect its citizens, property, and natural resources.

“ROOT” POLICY: Participate in the FEMA National Flood Insurance Program, update FEMA floodplain mapping throughout the Papillion Creek Watershed, and enforce floodplain regulations to full build-out, base flood elevations.

SUB-POLICIES:

- 1) Floodplain management coordination among all jurisdictions within the Papillion Creek Watershed and the Papio-Missouri River Natural Resources District (P-MRNRD) is required.
- 2) Flood Insurance studies and mapping throughout the Papillion Creek Watershed shall be updated using current and full-build out conditions hydrology.
- 3) Encroachments for new developments or significant redevelopments within floodway fringes shall not cause any increase greater than one (1) foot in the height of the full build-out base flood elevation using best available data.
- 4) Filling of the floodway fringe associated with new development within the Papillion Creek System shall be limited to 25% of the plan area directly adjacent to the full-build out base flood limits, unless approved mitigation measures are implemented to protect upstream, adjacent, and downstream properties. For redevelopment, these provisions may be modified or waived in whole or in part by the local jurisdiction.
- 5) The low chord elevation for bridges crossing all watercourses within FEMA designated floodplains shall be a minimum of one (1) foot above the base flood elevation for full-build out conditions hydrology using best available data.
- 6) The lowest first floor elevation of buildings associated with new development or significant redevelopment that are upstream of and contiguous to regional dams within the Papillion Creek Watershed shall be a minimum of one (1) foot above the 500-year flood pool elevation.

REFERENCE INFORMATION

DEFINITIONS (See Figure 1 below and related definitions in Policy Group #4: Landscape Preservation, Restoration, and Conservation).

- 1) Base Flood. The flood having a one percent chance of being equaled or exceeded in magnitude in any given year (commonly called a 100-year flood). *[Adapted from Chapter 31 of Nebraska Statutes]*
- 2) Floodway. The channel of a watercourse and the adjacent land areas that are necessary to be reserved in order to discharge the base flood without cumulatively

STORMWATER MANAGEMENT POLICIES

increasing the water surface elevation more than one foot. *[Adapted from Chapter 31 of Nebraska Statutes]*. The Federal Emergency Management Agency (FEMA) provides further clarification that a floodway is the central portion of a riverine floodplain needed to carry the deeper, faster moving water.

- 3) Floodway Fringe. That portion of the floodplain of the base flood, which is outside of the floodway. *[Adapted from Chapter 31 of Nebraska Statutes]*
- 4) Floodplain. The area adjoining a watercourse, which has been or may be covered by flood waters. *[Adapted from Chapter 31 of Nebraska Statutes]*
- 5) Watercourse. Any depression two feet or more below the surrounding land which serves to give direction to a current of water at least nine months of the year and which has a bed and well-defined banks. *[Adapted from Chapter 31 of Nebraska Statutes]*
- 6) Low Chord Elevation. The bottom-most face elevation of horizontal support girders or similar superstructure that supports a bridge deck.
- 7) Updated Flood Hazard Maps. The remapping of flooding sources within the Papillion Creek Watershed where Digital Flood Insurance Rate Maps (DFIRMs) are based on 2004 or more recent conditions hydrology and full-build out conditions hydrology. West Papillion Creek and its tributaries are currently under remapping and will become regulatory in 2006. Updating flood hazard maps for Big Papillion Creek and Little Papillion Creek are planned to be completed in the future.
- 8) New Development. New development shall be defined as that which is undertaken to any undeveloped parcel that existed at the time of implementation of this policy.

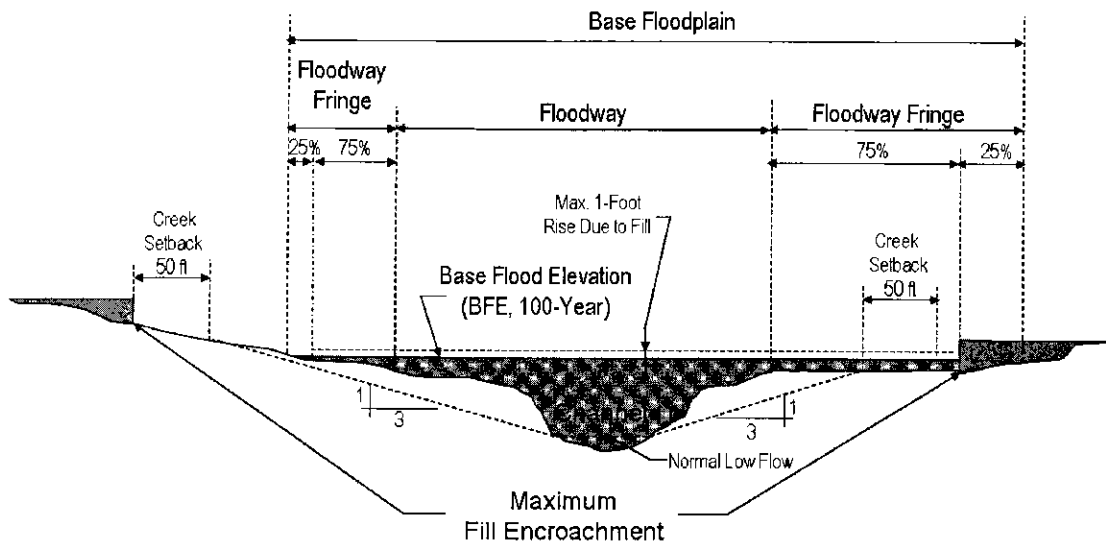


Figure 1 – Floodway Fringe Encroachment and Creek Setback Schematic

STORMWATER MANAGEMENT POLICIES

BASIC FEMA REQUIREMENTS

On March 1, 2003, FEMA became part of the U.S. Department of Homeland Security (DHS). In order for a community to participate in the FEMA National Flood Insurance Program, it must first define base flood elevations and adopt a floodway for all its major streams and tributaries. Once a community adopts its floodway, the requirements of *44 CFR 60.3(d)* must be fulfilled. The key concern is that each project in the floodway must receive an encroachment review; i.e., an analysis to determine if the project will increase flood heights or cause increased flooding downstream. Note that the FEMA regulations call for preventing any increase in flood heights. Projects, such as filling, grading or construction of a new building, must be reviewed to determine whether they will obstruct flood flows and cause an increase in flood heights upstream or adjacent to the project site. Further, projects, such as grading, large excavations, channel improvements, and bridge and culvert replacements should also be reviewed to determine whether they will remove an existing obstruction, resulting in increases in flood flows downstream. *[adapted from Federal Emergency Management Agency guidance]*