



Thomas Bruun  
Director

## COUNTY OF PRINCE WILLIAM

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Department of  
Public Works



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Public Works Agency

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**TO:** Planning Commission

**FROM:** Thomas Bruun  
Director of Public Works

**RE:** Amend the Design and Construction Standards Manual to Update the  
Floodplain Management Standards # DPA2015-20012 – **Countywide**

**I. Background** is as follows:

- A. Purpose of the Design and Construction Standards Manual – The Design and Construction Standards Manual (DCSM) contains County provisions that relate primarily to the requirements for the review and approval of site development plans, plats, and site construction. Section 101.01 establishes that the manual has been developed and designed to assist the public in knowing the policies and regulations which apply to land development in the County. Amendments to the DCSM are generally necessitated by changes in federal or state laws, Zoning Ordinance updates, Comprehensive Plan updates, and changes to the procedures and processes.
- B. Purpose for the Amendments – The Federal Emergency Management Agency (FEMA) and the Virginia Department of Conservation and Recreation (DCR) are requiring that local jurisdictions adopt ordinances that are consistent with current National Flood Insurance Program (NFIP) regulations. The County must update their floodplain management regulations and associated map changes by August 3, 2015 as a condition of continued eligibility in the NFIP. The County will be the recipient of a Physical Map Revision (PMR) to its floodplain zones and must ensure standards and regulations are compatible with that revision.
- C. Request – To amend the DCSM to incorporate updated federal flood management standards and regulations. The associated floodplain map changes are being adopted concurrently with the zoning text amendments to the flood hazard overlay district.

**II. Current Situation** is as follows:

- A. Application of Current Language – Sections 730, 731 and 732 of the DCSM address definitions, areas of applicability, the effects of the Flood Hazard Overlay District map, boundary disputes, use regulations, nonconforming uses, flood damage control, structures and lots within the overlay district, administrative review, variances and notification requirements. Most of these standards and requirements have been in effect since 1974 with subsequent amendments.
- B. FEMA Standards – The Virginia Department of Conservation and Recreation has been assigned the role of working with local jurisdictions to ensure that local floodplain ordinances and regulations are consistent with FEMA standards. FEMA has established a new coastal flood zone designation that will apply to some portions of Prince William County. This designation must be incorporated into the County's floodplain overlay district map with additional standards and restrictions in the DCSM.
- C. Coastal Flood Zone Designations – FEMA has updated the Prince William County Flood Insurance Study, including the Flood Insurance Rate Maps, with additional coastal flood hazard information. The map updates are proposed only for the coastal areas to account for the storm surges and wave actions that affect the regulatory flood zone designations and flood elevations. The coastal areas affected are east of U.S. Route 1, along the Occoquan River (Route 1 to the Potomac River), the Potomac River (from the Occoquan River to the United States Marine Corps Base), and Marumsco, Powells and Quantico Creeks near their confluence with the Potomac River.
- D. Staff Coordination – Staff has worked with the Virginia Department of Conservation and Recreation and FEMA to amend Part 501 of the Zoning Ordinance and the Floodplain Management requirements (Sections 730 through 732) of the DCSM to incorporate the most recent flood zone designation and ensure consistency with current FEMA standards.
- E. Major Changes to DCSM – The major changes that are proposed to be incorporated into the DCSM are: several definitions related to floodplain management; a new coastal zone designation (Zone VE); new construction requirements for activities within special flood hazard areas; the Director of Public Works as the designated Floodplain Administrator with defined duties.

- F. Board Initiation – By Res. No. 14-618, the Board of County Supervisors (BOCS) initiated amendments to the Zoning Ordinance and DCSM related to floodplain management standards.
- G. Public Works Department Recommendation – The Department of Public Works recommends approval of DCSM #DAP2015-20012, Floodplain Management Standards, to amend the Prince William County Design and Construction Standards Manual as proposed in Attachment A and B.
- H. Planning Commission Public Hearing – A public hearing before the Planning Commission has been duly advertised for May 6, 2015.

**III. Issues** in order of importance are:

- A. Policy Issues – Will the amendments comply with standards established by the Federal Emergency Management Agency?
- B. Community Input – Have members of the community raised any concerns?
- C. Legal – Are there any legal implications associated with adopting these amendments?
- D. Fiscal Impacts – Are there any fiscal impacts associated with these amendments?
- E. Timing – What are the timing considerations for the adoption of these amendments?

**IV. Alternatives** beginning with the staff recommendation are as follows:

- A. Amend the DCSM to update the floodplain management standards #DPA2015-20012.
  - 1. Policy – Proposed amendments to the Design and Construction Standards Manual will allow County floodplain management standards to conform to FEMA standards and will enhance the health, safety and welfare of County residents and businesses.
  - 2. Community Input – A public “open house” was held on May 15, 2014 and enabled representatives from FEMA and the Virginia Department of Conservation and Recreation to answer questions from property owners. Approximately 30 property owners attended the open house. FEMA received no appeals from property owners during the appeal timeframe. The Development

Ordinance Review Advisory Committee reviewed the proposed amendments on April 17, 2015 and no substantive issues were raised.

3. Legal – The Board of County Supervisors must approve amendments to the Zoning Ordinance and the DCSM. The County Attorney has reviewed the proposed amendments.
4. Fiscal Impacts –Fiscal impacts of the proposed DCSM amendment are related primarily to owners of properties who are subject to changes in flood zones, and may result in changes to flood insurance premiums. Property owners may incur additional costs for land development in certain flood zones. Concurrence with FEMA standards will help ensure the continuance of property owner flood insurance policies.
5. Timing – The Planning Commission has until May 6, 2015 to take action on this proposal because DCR and FEMA have established an August 3, 2015 deadline for the Board of County Supervisors to adopt and implement the proposed amendments to the floodplain management standards. Approval of the amendments will allow the County to continue participation in the National Flood Insurance Program.

B. Take No Action –

1. Policy – Not adopting flood hazard overlay and floodplain management amendments to the DCSM would result in floodplain management standards and regulations that are not compliant with FEMA standards.
2. Community Input – Not applicable.
3. Legal – Not adopting floodplain management amendments to the DCSM would result in suspension from participation in the National Flood Insurance Program.
4. Fiscal Impacts – Suspension from participation in the NFIP may impact flood insurance premiums for individual homeowners and businesses. Also, prospective property owners may be unable to obtain a mortgage, and existing mortgage holders may become non-compliant with lender requirements to maintain a flood insurance policy. Furthermore, County's ability to apply for flood mitigation assistance grants may be impacted.

5. Timing – The Planning Commission has until May 6, 2015 to take action on this proposal because DCR and FEMA have established an August 3, 2015 deadline for the Board of County Supervisors to adopt and implement the proposed amendments to the floodplain management standards or risk suspension from the NFIP.

V. **Recommendation** is that the Prince William County Planning Commission concur with Alternative A and recommends adoption of DCSM amendment #DPA2015-20012, Floodplain Management.

**Staff:** John Mark Colwell, 703-792-6984

**Attachments:**

- A. Proposed DCSM Text Amendment
- B. BOCS Initiation Resolution

## Attachment A – Proposed Text Amendment

### 730.00 FLOODPLAIN MANAGEMENT - POLICY

#### 730.01 General Policy:

A. Whenever the balance established by nature between a watershed and its naturally stabilized drainageways is disturbed by development, some corrective measures shall be taken to restore the balance and to avoid downstream flooding and damage. The need for corrective measures does not preempt any requirements established in Section 740.00 or elsewhere in this manual.

B. No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of this manual and any other applicable ordinances and regulations which apply to uses within the jurisdiction of this manual.

C. Persons wishing to construct or repair bridges, culverts, embankments, channelizations, dams, reservoirs, and small ponds must obtain any necessary permits or certificates from the federal or state agencies regulating these types of activities in the County's waterways.

ED. Permits or certificates obtained from federal or state agencies do not obviate the need to submit the required information and plans to the ~~Office of Planning~~Department of Development Services for distribution to other County agencies and for review and approval of this information and plans. The agencies that are often involved with or regulate construction on waterways are the U.S. Army Corps of Engineers, the Federal Emergency Management Agency (FEMA), the Virginia Marine Resources Commission, the Division of Soil and Water Conservation of the Virginia Department of Conservation and Recreation (DCR), and the Department of Environmental Quality (DEQ). It is the responsibility of the property owner to initiate and obtain the necessary ~~Federal Emergency Management Agency~~FEMA flood insurance map revisions or amendments if floodplain modifications occur in areas identified as special flood hazard areas (~~A and AE~~) in the Flood Insurance Rate Map (FIRM). Copies of correspondence with these agencies regarding the project shall be provided.

**730.02 Definitions:** The following words and terms used in this subsection of the manual have the following meanings, unless the context clearly indicates otherwise:

A. A Zone - An area for which no detailed flood profiles or elevations are provided, but the one percent annual chance floodplain boundary has been approximated.

B. AE Zone - An area inundated by the one percent annual chance flooding, for which base flood elevations have been determined.

AC. Base Flood ~~One Hundred Year Flood/Regulatory Flood~~—A flood that, on the average, is likely to occur once every one hundred (100) years (i.e., that has a one percent (1%) chance of occurring each year, although the flood may occur in any year). - The flood having a one percent chance of being equaled or exceeded in any given year.

BD. Base Flood Elevation (BFE) - ~~The Federal Emergency Management Agency designated one hundred (100) year water surface elevation.~~ The water surface elevations of the base flood, that is, the flood level that has a one percent or greater chance of occurrence in any given year. The water surface elevation of the base flood in relation to the datum specified on the County's FIRM.

CE. Basement - Any area of the building having its floor subgrade (below ground level) on all sides.

F. Board of Zoning Appeals - The board appointed to review appeals made by individuals with regard to decisions of the Zoning Administrator in the interpretation of the flood hazard overlay district ordinance.

G. Coastal A Zone - Flood hazard areas, as defined by the Uniform Statewide Building Code (USBC), that have been delineated as subject to wave heights between 1.5 feet and three (3) feet. The 1.5-foot wave height line is referred to as the Limit of Moderate Wave Action (LiMWA) line.

## Attachment A – Proposed Text Amendment

~~DH~~. Development - Any man-made change to improved or unimproved real estate including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

I. Elevated building - A non-basement building built to have the lowest floor elevated above the ground level by means of solid foundation perimeter walls, pilings, or columns (posts and piers).

J. Encroachment - The advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

K. Existing Manufactured Home Park – Any manufactured home park that was in existence on or prior to December 1, 1981.

L. Expansion to an Existing Manufactured Home Park – Any increase in the total number of manufactured home spaces or increase in the number of double-wide spaces within an existing manufactured home park or an expansion of the total area of the manufactured home park.

M. Flood or flooding -

1. A general or temporary condition of partial or complete inundation of normally dry land areas from
  - a. the overflow of inland or tidal waters; or
  - b. the unusual and rapid accumulation or runoff of surface waters from any source.
  - c. mudflows which are proximately caused by flooding as defined in paragraph (1)(b) of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.
2. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph 1(a) of this definition.

N. Flood Insurance Rate Map (FIRM) - An official map of Prince William County on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to Prince William County with an effective date of August 3, 2015. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

I—O. Flood Insurance Study (FIS) – A report by FEMA that examines, evaluates and determines flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudflow and/or flood-related erosion hazards, adopted by the Board of County Supervisors, with an effective date of August 3, 2015.

EP. Floodplain or flood-prone area - Any land area that would be inundated by floodwater as a result of the ~~regulatory~~ base flood.

Q. Flood proofing - Any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

~~FR~~. Floodway - The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base ~~or regulatory~~ flood without cumulatively increasing the water surface elevation more than one ~~half~~ (1/2) foot in height for FEMA-studied streams. The Floodway District includes all areas delineated as floodways in the Flood Insurance Study and shown on the accompanying ~~Flood Boundary and Floodway Map or~~ Flood Insurance Rate Map and all floodways delineated from studies. Refer to Section 731.01B of this manual for determination of floodways for unstudied or approximate floodplain areas.

S. Floodway Fringe – That portion of the 100-year floodplain outside the floodway.

T. Flood Profile – A graph or a longitudinal profile showing the relationship of water surface elevation of a flood event to locations along a stream or river.

## Attachment A – Proposed Text Amendment

**GU.** Freeboard - A factor of safety, usually expressed in feet, above a flood level for purposes of floodplain management. Freeboard tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed.

**V.** Highest adjacent grade - The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

**W.** Historic structure - Any structure that is

1. listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
2. certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
3. individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or,
4. individually listed on a local inventory of historic places in the County that has been certified either
  - a. by an approved state program as determined by the Secretary of the Interior; or,
  - a.b. directly by the Secretary of the Interior in states without approved programs.

**X.** Hydrologic and Hydraulic Engineering Analysis – Analyses performed by a licensed professional engineer, in accordance with standard engineering practices that are accepted by DCR and FEMA, used to determine the base flood, other frequency floods, flood elevations, floodway information and boundaries, and flood profiles.

**Y.** Letters of Map Change (LOMC) - An official FEMA determination, by letter, that amends or revises an effective FIRM or FIS. LOMC include:

Letter of Map Amendment (LOMA): An amendment based on technical data showing that a property was incorrectly included in a designated SFHA. A LOMA amends the current effective FIRM and establishes that a land as defined by meets and bounds or structure is not located in a SFHA.

Letter of Map Revision (LOMR): A revision based on technical data that may show changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. A Letter of Map Revision Based on Fill (LOMR-F), is a determination that a structure or parcel of land has been elevated by fill above the base flood elevation and is, therefore, no longer exposed to flooding associated with the base flood. In order to qualify for this determination, the fill must have been permitted and placed in accordance with the County's floodplain management regulations.

Conditional Letter of Map Revision (CLOMR): A formal review and comment as to whether a proposed flood protection project or other project complies with the minimum NFIP requirements for such projects with respect to delineation of SFHAs. A CLOMR does not revise the effective FIRM or FIS.

**Z.** Lowest adjacent grade - The lowest natural elevation of the ground surface next to the walls of a structure.

**HAA.** Lowest Floor - The lowest floor of the lowest enclosed area including basement. An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of 44CFR §60.3.

**BB.** Manufactured home - A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes manufactured home also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days.



## Attachment A – Proposed Text Amendment

CC. Manufactured home park or subdivision - A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

DD. Mean Sea Level - Is an elevation point that represents the average height of the ocean's surface (such as the halfway point between the mean high tide and the mean low tide) which is used as a standard in reckoning land elevation.

EE. National Flood Insurance Program (NFIP) – The program of flood insurance and floodplain management administered under the National Flood Insurance Act and applicable federal regulations promulgated in Title 44 of the Code of Federal Regulations Subchapter B.

FF. New construction - For the purposes of determining insurance rates, structures for which the start of construction commenced on or after December 1, 1981 and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a floodplain management regulation adopted by the County and includes any subsequent improvements to such structures.

GG. Recreational Vehicle - A vehicle which is (a) built on a single chassis; (b) four hundred (400) square feet or less when measured at the largest horizontal projection; (c) designed to be self-propelled or permanently towable by a light duty truck; and (d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel, or seasonal use.

HH. Special flood hazard area (SFHA) - The land in the floodplain subject to a one percent or greater chance of being flooded in any given year. The following districts are included in the SFHA: Floodway District, Floodway Fringe District, Approximate Floodplain District, Coastal High Hazard District, Tidal Flood Zone District and Non-Tidal Flood Zone District (Zone AE Without Floodway).

II. Start of construction - The date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

JJ. Structure – For floodplain management purposes, a walled and roofed building, including gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

KK. Substantial Damage - Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed fifty percent (50%) of the market value of the structure before the damage occurred.

LLL. Substantial Improvement - Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either (1) any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or (2) any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure, or (3) historic structures undergoing repair or rehabilitation that would constitute a substantial improvement as defined above, must comply with all ordinance requirements that do not preclude the structure's continued designation as a historic structure. Documentation that a specific ordinance requirement will cause removal of the structure from the National Register of Historic Places or the State Inventory of Historic places must be obtained from the Secretary of the

## Attachment A – Proposed Text Amendment

Interior or the State Historic Preservation Officer. Any exemption from ordinance requirements will be the minimum necessary to preserve the historic character and design of the structure.-

MM. VE Zone – An area that is known as a Coastal High Hazard area, and is inundated by a one percent annual chance flooding, with velocity hazard (wave action) and for which BFEs have been determined.

NN. Violation - The failure of a structure or other development to be fully compliant with the County's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this manual or the Prince William County Zoning Ordinance is presumed to be in violation until such time as that documentation is provided.

OO. Watercourse - A lake, river, creek, stream, wash, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

### **730.03 Designation of the Floodplain Administrator:**

The Director of Public Works administers and implements these regulations and is referred to herein as the Floodplain Administrator. The Floodplain Administrator may delegate duties and responsibilities set forth in these regulations to qualified technical personnel, plan examiners, inspectors, and other employees.

### **730.04 Duties and Responsibilities of the Floodplain Administrator**

A. Review applications for permits to determine whether proposed activities will be located in the SFHA.

B. Interpret floodplain boundaries and provide available BFE and flood hazard information.

C. Review applications to determine whether proposed activities will be reasonably safe from flooding and require new construction and substantial improvements to meet the requirements of these regulations.

D. Review applications to determine whether all necessary permits have been obtained from the Federal, State or local agencies from which prior or concurrent approval is required; in particular, permits from state agencies for any construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction (including bridges, culverts, structures), any alteration of a watercourse, or any change of the course, current, or cross section of a stream or body of water, including any change to the 100-year frequency floodplain of free-flowing non-tidal waters of the State.

E. Verify that applicants proposing an alteration of a watercourse have notified adjacent jurisdictions, DCR (Division of Dam Safety and Floodplain Management), and other appropriate agencies (including DEQ and USACE) and submitted copies of such notifications to FEMA.

F. Approve applications and issue permits to develop in flood hazard areas if these regulations have been met, or disapprove applications if these regulations have not been met, in coordination with the Zoning Administrator.

G. Inspect or cause to be inspected, buildings, structures, and other development for which permits have been issued to determine compliance with these regulations or to determine if non-compliance has occurred or violations have been committed.

H. Review Elevation Certificates and require incomplete or deficient certificates to be corrected.

I. Submit to FEMA, or require applicants to submit to FEMA, data and information necessary to maintain FIRMs, including hydrologic and hydraulic engineering analyses prepared by or for the County, within six months after such data and information becomes available if the analyses indicate changes in BFEs.

J. Maintain and permanently keep records that are necessary for the administration of these regulations, including:

1. FISs, FIRMs (including historic studies and maps and current effective studies and maps) and LOMC; and

## Attachment A – Proposed Text Amendment

2. Documentation supporting issuance and denial of permits, Elevation Certificates, documentation of the elevation (in relation to the datum on the FIRM) to which structures have been floodproofed, other required design certifications, variances, and records of enforcement actions taken to correct violations of these regulations.

K. In conjunction with the Zoning Administrator, enforce these regulations, investigate violations, issue notices of violations or stop work orders, and require permit holders to take corrective action.

L. In conjunction with the Zoning Administrator, advise the Board of Zoning Appeals regarding the intent of these regulations and, for each application for a variance, assist in preparing a staff report and recommendation.

M. Administer the requirements related to proposed work on existing buildings:

1. Make determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged.

2. Make reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct, and prohibit the non-compliant repair of substantially damaged buildings except for temporary emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.

N. Undertake, as determined appropriate by the Floodplain Administrator under the circumstances, other actions which may include but are not limited to: issuing press releases, public service announcements, and other public information materials related to permit requests and repair of damaged structures; coordinating with other Federal, State, and local agencies to assist with substantial damage determinations; providing owners of damaged structures information related to the proper repair of damaged structures in special flood hazard areas; and assisting property owners with documentation necessary to file claims for Increased Cost of Compliance coverage under NFIP flood insurance policies.

O. Notify the FEMA when the corporate boundaries of the County have been modified and:

1. Provide a map that clearly delineates the new corporate boundaries or the new area for which the authority to regulate pursuant to these regulations has either been assumed or relinquished through annexation; and

2. If the FIRM for any annexed area includes SFHAs that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the Board of County Supervisors for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to DCR (Division of Dam Safety and Floodplain Management) and FEMA.

P. Upon the request of FEMA, complete and submit a report concerning participation in the NFIP which may request information regarding the number of buildings in the SFHA, number of permits issued for development in the SFHA, and number of variances issued for development in the SFHA.

Q. It is the duty of the Floodplain Administrator to take into account flood, mudslide and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use throughout the entire jurisdictional area of the County, whether or not those hazards have been specifically delineated geographically (e.g. via mapping or surveying).

R. The Floodplain Administrator shall make interpretations, where needed, as to the exact location of SFHAs, floodplain boundaries, and floodway boundaries. The following shall apply to the use and interpretation of FIRMs and data:

1. Where field surveyed topography indicates that adjacent ground elevations:

a. Are below the base flood elevation, even in areas not delineated as a SFHA on a FIRM, the area shall be considered as SFHAs and subject to the requirements of these regulations;

## Attachment A – Proposed Text Amendment

b. Are above the base flood elevation, the area shall be regulated as SFHA unless the applicant obtains a LOMC that removes the area from the SFHA.

2. In FEMA-identified SFHAs where BFE and floodway data have not been identified and in areas where FEMA has not identified SFHAs, any other flood hazard data available from a Federal, State, or other source shall be reviewed and reasonably used.

3. BFEs and designated floodway boundaries on FIRMs and in FISs shall take precedence over BFEs and floodway boundaries by any other sources if such sources show reduced floodway widths and/or lower base flood elevations.

4. Other sources of data shall be reasonably used if such sources show increased BFEs and/or larger floodway areas than are shown on FIRMs and in FISs.

5. If a preliminary FIRM and/or a preliminary FIS has been provided by FEMA:

a. Upon the issuance of a Letter of Final Determination by FEMA, the preliminary flood hazard data shall be used and shall replace the flood hazard data previously provided from FEMA for the purposes of administering these regulations.

b. Prior to the issuance of a Letter of Final Determination by FEMA, the use of preliminary flood hazard data shall be deemed the best available data and used where no BFEs and/or floodway areas are provided on the effective FIRM.

c. Prior to issuance of a Letter of Final Determination by FEMA, the use of preliminary flood hazard data is permitted where the preliminary BFEs or floodway areas exceed the BFEs and/or designated floodway widths in existing flood hazard data provided by FEMA. Such preliminary data may be subject to change and/or appeal to FEMA.

### **730.035 Floodplain Studies:**

A. Floodplain studies shall be required whenever the drainage area is greater than one hundred (100) acres.

B. Drainage studies may be required for drainage areas greater than forty (40) acres if building lots (zoned for less than one acre minimum lot requirement) are proposed adjacent to the stream.

C. Minor drainage studies may only be required with a drainage area less than forty (40) acres if there are lots proposed adjacent to the stream on which the proposed building site is less than ten (10) feet above flow line of the stream. In lieu of a drainage study, a flood hazard area may be shown on the plan, coinciding as a minimum, with the contour which is ten (10) feet above the flow line of the stream. No permanent construction shall be permitted within this flood hazard area.

D. In addition to determining the one hundred (100) year floodplain, calculation of a floodway shall be required for drainage areas of one square mile or larger.

E. The areas as established by the floodplain studies above shall be identified with boundary lines with bearings and distances and identified as a flood hazard area.

F. In Zone A, obtain, review and reasonably utilize any BFE and floodway data available from a Federal, State or other source.

G. In Zone A, new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is lesser, must include within such proposals BFE data.

## Attachment A – Proposed Text Amendment

### **730.046** Platting Lots within the One Hundred (100) Year Floodplain:

A. Residential lots in zoning districts where the required lot area is ten thousand (10,000) square feet or less shall not be platted within the one hundred (100) year floodplain as established in accordance with this section. This includes lots with no minimum area requirements.

B. In all other residential zones (other than those listed in A. above), lots may be platted within the one hundred (100) year floodplain as established in accordance with this subsection provided that all primary and accessory structures and onsite sewage disposal systems including septic tanks and drainfields are located outside of the floodplain:

1. For lots where the minimum required area is up to five (5) acres, the minimum lot area required by the particular zone, or one acre, whichever is less, shall be located outside the limits of the one hundred (100) year floodplain; or
2. For lots where the minimum required area is greater than five (5) acres, a minimum of two (2) acres shall be located outside the limits of the one hundred (100) year floodplain.

### **730.07** Variances

Non-compliance with the minimum NFIP floodplain regulations shall require a Variance in accordance with County Code Sec. 32-501.14 of the Prince William County Zoning Ordinance.

### **730.058** Waivers:

Waivers of standards that exceed, or are not part of, the minimum NFIP floodplain regulations shall require approval of the Floodplain Administrator.

No waiver shall be granted for any proposed use, development, or activity within any Floodway District that will cause any increase in the one percent chance flood elevation.

A. In reviewing waivers for activities in the flood hazard overlay district, the ~~director of Public Works~~Floodplain Administrator shall consider the following factors:

1. The relative danger to life and property due to increased flood heights or velocities caused by encroachments.
2. The relative danger that materials may be swept onto other lands or downstream to the injury of others.
3. The degree to which the proposed water supply and sanitation systems are able to prevent disease, contamination and unsanitary conditions.
4. The degree to which the proposed facility and its contents is susceptible to flood damage and the effect of such damage on the individual owners.
5. The degree to which the proposed facility provides public service.
6. The need that facility has for a waterfront location.
7. The availability of alternative locations within the flood hazard area for the proposed use.
8. The extent to which the proposed use is compatible with existing development and development anticipated in the foreseeable future.
9. The extent to which the proposed use is compatible with the Comprehensive Plan.
10. The extent to which the property is safely accessible in time of flood.

## Attachment A – Proposed Text Amendment

11. The expected height, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.

12. The repair or rehabilitation of historic structures upon determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the waiver is the minimum necessary to preserve the historic character and design of the structure.

13. Such other factors which are relevant to the purpose of this section of the manual.

B. Waivers shall be issued only after the ~~director of Public Works~~Floodplain Administrator has determined that the granting of such will not result in (a) unacceptable or prohibited increases in flood height, as identified in Section 731.01(A), (B) and 731.04(~~BG~~); (b) additional threats to public safety; (c) extraordinary public expense; (d) and will not create nuisances; (e) cause fraud or victimization of the public; or (f) conflict with local laws or ordinances. Waivers will be issued only after the ~~director of Public Works~~Floodplain Administrator has determined that ~~variances~~deviations will be the minimum required to provide relief from any hardship to the applicant. The ~~director~~Floodplain Administrator shall notify the applicant for a waiver, in writing, that the issuance of a waiver to construct a structure below the one ~~hundred (100) year~~percent chance flood elevation (a) increases the risks to life and property, and (b) will result in increased premium rates for flood insurance.

C. A record shall be maintained of the above notification as well as all waiver actions, including justification for the issuance of the waivers. Any waivers which are issued shall be noted in the annual or biennial report submitted to the federal insurance administrator.

**730.069 Nonconforming Use Policy:** A structure or the use of a structure or premises which was lawful before September 23, 1975, or the date of adoption of an applicant amendment to this article, but which is not in conformity with the provisions of this article, may be continued subject to the following conditions:

A. No structural alterations, additions, or repairs singularly or cumulatively to any nonconforming structure shall exceed fifty percent (50%) of its current appraised value, unless the structure is permanently changed to a conforming use in compliance with USBC and the floodplain regulations.

B. Any modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use located in any floodplain areas to an extent or amount of less than 50% of its market value shall conform to the USBC and the floodplain regulations.

BC. If a nonconforming use is discontinued for twelve (12) consecutive months, any future use of the building/premises shall conform to this article.

CD. If any nonconforming use or structure is destroyed by any means, including floods, to an extent of fifty percent (50%) or more of its value, it shall not be reconstructed, except in conformity with the provisions of this article. ~~The Department of Public Works may permit reconstruction, if the use of the structure(s) is located outside the floodway, and upon reconstruction, is adequately and safely flood proofed, elevated, or otherwise protected.~~

**730.0710 Conflicting Provisions Policy:**

A. Whenever any provisions of this section impose a greater requirement or a higher standard than is required in a state or federal regulation or other provision of this manual, or other County ordinances or regulations, the provisions of this section shall govern.

B. Whenever any provisions of any state or federal statute or other provision of this manual or other County ordinances or regulations impose a greater requirement or a higher standard than is required by this section, the provisions of the state or federal ~~status~~statute or other provisions of this manual or other County ordinances or regulations shall govern.

**730.0811 Disclaimer of Liability ~~for Areas Outside Flood Hazard Districts:~~**

## Attachment A – Proposed Text Amendment

A. The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions, or flood heights may be increased by man-made or natural causes, such as bridge openings restricted by debris. This article does not imply that areas outside the one hundred (100) year floodplain or land uses permitted within such districts will be free from flooding or flood damages.

B. The granting of a permit or approval of a site development plan in an identified flood hazard area shall not constitute a representation, guarantee, or warranty of any kind by any official or employee of the County of the practicability or safety of the proposed use and shall create no liability upon the County, its officials, or employees.

### 731.00 FLOODPLAIN MANAGEMENT - PLANNING AND DESIGN:

#### 731.01 Determination of Floodway and Limits of the Regulatory Flood:

A. In the floodway district no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in the one hundred (100) year base flood elevation within the County during the occurrence of the base flood discharge. Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the areas of special flood hazard, designated as Zone AE (not located in Tidal Flood Zone District) on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the County.

B. In unstudied (areas outside of the AE zones) or approximate floodplain areas, computation of the floodway shall be based on the area required to convey the regulatory base flood without increasing flood heights more than one-half (1/2) foot at any point. Computation of increases in flood heights caused by an encroachment shall be based upon equal conveyance reduction on both sides of the watercourse within that reach. The Department of Public Works may allow use of the floodway delineation for streams studied in detail (Zone AE) in the flood insurance study, if determined to be an accurate representation of current conditions, and no floodplain disturbance is proposed.

C. For any floodplain disturbance or modification, the water surface elevations shall be established in accordance with Section 732.02 of this manual.

**731.02 Floodplain Studies:** The following procedure shall be used by the Department of Public Works in reviewing the computations for establishment of water surface elevations and balance of energy of flowing streams and their floodplains. Floodplain studies for VE Zones shall comply with FEMA requirements.

A. Examination of the topography of the floodplain 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. Review of the water surface profiles for the one hundred (100) year discharges using the U.S. Army Corps of Engineers' HEC-2 water surface profiles program, and HEC-RAS.

D. Comparisons of determined values with available gauge data, USGS regional equations, or any existing reports by federal, state, or local agencies.

E. Check of the hydrologic models in the following areas:

1. Model representation of the watershed (schematic);
2. Tabular data for cross-sections and structures;



## Attachment A – Proposed Text Amendment

3. Precipitation data;
4. Drainage areas;
5. Runoff curve numbers;
6. Times of concentration;
7. Reservoir and channel routing parameters;
8. Miscellaneous items (assumptions, back-up data, other input parameters etc.)

F. Check of the hydraulic models in the following areas:

1. Length of study and relationship with other cases.
2. Discharges check.
3. Starting water surface elevations.
4. Manning's "n" values and contraction and expansion coefficients.
5. Cross-section spacing and accuracy.
6. Bridge modeling.
7. Floodway computations, if applicable.
8. Miscellaneous items (assumptions, critical depths, etc.).

G. Check of the representation of the hydrologic and hydraulic analyses on the plans and profiles.

### 731.03 Effects of Fills:

A. Filling within the one hundred (100) year floodplain of the original stream will frequently create an obstruction that will cause higher water levels upstream during flood flows. Such filling in floodplains is not allowed, except for road crossings, SWM facilities, or as allowed by Section 740.00 of this manual must conform to NFIP and County floodplain regulations, including Section 731.01A, unless a CLOMR and LOMR are obtained from FEMA.

B. When filling of floodplain is allowed, hydrologic analyses shall be prepared and backwater curves should be carefully calculated based on the presence of the fill or other obstructions. Included shall be a comparison of the flood level at the upstream and downstream property line for existing and modified channel cross conditions.

C. If filling within the one hundred (100) year floodplain impacts offsite properties with regard to floodplain boundaries, the developer shall procure necessary flood hazard areas from the offsite property owners and duly record the flood hazard areas. In addition, the developer shall obtain necessary approvals from the County and FEMA, as applicable.

**731.04 Flood Damage Control:** When a development is permitted in the flood hazard overlay district, it shall, at a minimum, comply with the following standards, except that the Department of Public Works may impose more restrictive standards as warranted:

A. All development proposals shall be consistent with the need to minimize flood damage.

B. All development proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.



## Attachment A – Proposed Text Amendment

C. All development proposals shall have adequate drainage provided to reduce exposure to flood hazards.

D. New construction or substantial improvement of any residential structure (including manufactured homes) in Zones AE, and A (including Coastal Zone A as defined in Section 730.02G) with detailed BFEs shall have the lowest floor, including basement, elevated to at least 18 inches above the BFE for developed conditions.

E. New construction or substantial improvement of any commercial, industrial, or non-residential building (or manufactured home) shall have the lowest floor, including basement, elevated to at least 18 inches above the base flood level for developed conditions. A- Nonresidential structures, or parts thereof, may be constructed below the ~~one hundred (100)-year base flood water surface~~ elevation for developed conditions, provided these structures are ~~designed to preclude or withstand inundation~~ flood-proofed, being water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy to an elevation of at least ~~eighteen (18)~~ inches above the ~~one hundred (100)-year base~~ flood water surface elevation for developed conditions. A registered professional engineer or architect shall certify that the requirements of this subsection are satisfied. Such certification, including the specific elevation (in relation to mean sea level) to which such structures are floodproofed, shall be maintained by the Director of Public Works.

F. Space Below the Lowest Floor:

In zones A and AE, fully enclosed areas of new construction or substantially improved structures, which are below the regulatory flood protection elevation shall:

1. not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).

2. be constructed entirely of flood resistant materials below the regulatory flood protection elevation.

3. include measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must either be certified by a professional engineer or architect or meet the following minimum design criteria:

a. Provide a minimum of two openings on different sides of each enclosed area subject to flooding.

b. The total net area of all openings must be at least one square inch for each square foot of enclosed area subject to flooding.

c. If a building has more than one enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.

d. The bottom of all required openings shall be no higher than one foot above the adjacent grade.

e. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.

f. Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

~~BC.~~ Uses shall not be permitted in flood fringes and approximated floodplains, including fills and landfills, unless the applicant has demonstrated through the delineation of a floodway that the proposed uses, in combination with all other existing and reasonably anticipated uses, will not raise the ~~water level of the~~ predeveloped ~~one hundred (100)-year base~~ flood elevation more than one-half (1/2) foot at any point, ~~unless additional flood hazard areas are reserved to accommodate increases over one half (1/2) foot.~~

## Attachment A – Proposed Text Amendment

~~C. When located within floodplains, new utilities shall be located and constructed to minimize or eliminate flood damage.~~

~~DH.~~ Fill shall comply with the following:

1. The fill shall be sloped to provide positive drainage away from any building or structure and shall extend fifteen (15) feet beyond the limits of such building or structure to a point which is no lower than the regulatory flood elevation for the particular area.
2. All fill shall consist of soil or small rock materials only. Sanitary and/or debris landfills shall be prohibited. The fill materials shall be compacted to provide the necessary permeability and resistance to erosion or scouring.
3. Fill slopes shall be no steeper than one (1) vertical unit to three (3) horizontal units, unless substantiating data justifying steeper slopes are submitted to and approved by the Department of Public Works.
4. The toe of fill shall not be within the designated floodway.
5. Compensatory excavation shall normally be required for fills in the floodplain, unless waived for environmental reasons.

~~EI.~~ Placement of buildings and structures shall comply with the following:

1. All buildings and structures shall be designed, constructed and placed on the lot so as to offer the minimum obstruction to the flow of water according to the USBC.
2. Fences, except two-wire fences, and other structures or matter which may impede, retard or change the direction of the flow of water, or may catch or collect debris carried by such water, or that could be carried downstream by the natural flow of the stream, shall not be placed in the floodway.
3. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
4. New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.

~~FJ.~~ Anchoring shall comply with the following:

1. Buildings or structures shall be firmly anchored to prevent floatation, lateral movement or collapse from the action of the regulatory flood.
2. Air ducts, large pipes, and storage tanks located at or below the regulatory flood elevation shall be firmly anchored to prevent floatation.
3. Minor structures which may be allowed within areas subject to major flooding (e.g., possible park structures, picnic tables, etc.) should be considered from the viewpoint of what will happen when a major flood occurs. Anchoring such structures will prevent them from being floated downstream to block a major culvert.

~~GK.~~ Wood flooring used below an elevation of ~~eighteen (18)~~ inches above the ~~one hundred (100)-year~~ base flood elevation shall be installed to accommodate a lateral expansion of the flooring, perpendicular to the flooring grain, without incurring structural damage to the building.

~~HL.~~ Electrical systems shall comply with the following:

1. All electrical water heaters, electric furnaces and other critical electrical installations shall be prohibited below an elevation of ~~eighteen (18)~~ inches above the ~~regulatory~~ base flood elevation.

## Attachment A – Proposed Text Amendment

2. Electrical distribution panels shall be placed at least ~~three (3)~~ feet above the ~~regulatory-base~~ flood elevation. Separate electrical circuits serving areas below the ~~regulatory-base~~ flood elevation shall be dropped from above.

~~IM~~. Plumbing and other mechanical installations shall comply with the following:

1. Water heaters, furnaces, ~~ventilation, air conditioning equipment~~ and other critical mechanical installations shall be prohibited below an elevation of ~~eighteen (18)~~ inches above the ~~regulatory-base~~ flood elevation except for nonresidential structures which are floodproofed.

2. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

~~23~~. Gas and oil supply systems shall be designed to preclude the infiltration of flood waters into the systems and discharges from the systems into flood waters. Additional provisions shall be made for the drainage of these systems in the event that flood water infiltration occurs.

~~34~~. No part of an on-site disposal system, including drainfields, shall be allowed within the one hundred (100) year floodplain.

~~IN~~. Paints and adhesives shall comply with the following:

1. Adhesives used below an elevation of ~~eighteen (18)~~ inches above the ~~regulatory-base~~ flood elevation shall have a bonding strength that is unaffected by inundation.

2. Doors and wood trim used below an elevation of ~~eighteen (18)~~ inches above the ~~regulatory-base~~ flood elevation shall be sealed with a waterproof paint or similar product.

3. Paints or other finishes used below an elevation of ~~eighteen (18)~~ inches above the ~~regulatory-base~~ flood elevation shall be capable of surviving inundation.

~~KQ~~. Materials that are buoyant, flammable, explosive, or in times of flooding could be injurious to human, animal, or plant life, shall not be stored in the ~~one hundred (100)~~ year floodplain, unless they are properly anchored or flood proofed to preclude their causing damage to life or property.

~~LP~~. Sanitary sewers designed for flooding conditions shall comply with the following:

1. Sanitary sewers through areas which are frequently subject to flooding should be designed to prevent flood water infiltration into the systems and discharges from the systems into flood waters as would occur through ordinary vented manhole covers when placed at elevations below the flood surface.

2. Aerial sewers crossing a stream on supports should be designed with consideration of possible erosive scour around pier footings and for the prevention of access by children to such utility installations.

~~—~~3. Design consideration should also be given to preventing a "picket fence" effect caused by using very closely placed piers which would act as a natural trap for debris.

~~MQ~~. Recreational vehicles placed within flood hazard areas shall be on the site for fewer than one hundred eighty (180) consecutive days, be fully licensed and ready for highway use, or meet the permit requirements for placement and the elevation and anchoring requirements for manufactured homes as contained in ~~the Virginia Uniform Statewide Building Code Sections 731.04D and 731.04R~~. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

R. All manufactured homes placed, or substantially improved, on individual lots or parcels, must meet all the requirements for new construction, including the elevation and anchoring requirements in Section 731.04D, E and J as

## Attachment A – Proposed Text Amendment

well as Section 731.04W in VE Zones. Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement shall be in addition to and consistent with applicable State anchoring requirements for resisting wind forces.

S. Prior to any proposed alteration or relocation of any channels or of any watercourse within the County, a permit shall be obtained from the U. S. Corps of Engineers, DEQ, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, the applicant shall notify all affected adjacent jurisdictions, the DCR (Department of Dam Safety and Floodplain Management), FEMA, and all other required federal and state departments and agencies of the proposal.

T. The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.

U. The applicant shall provide the following factual information as certified by a registered professional engineer, surveyor or architect:

1. The base flood water surface elevation(s) on the development plan;
2. Proposed structure or substantial modifications to the floodplain that will not adversely affect the predeveloped base flood level;
3. Verify the lowest floor elevation (including basement) of the proposed structure (including manufactured homes) is located at least 18 inches above the base flood elevation for developed conditions;
4. Verify the minimum horizontal distance of 15 feet is provided between the base flood water surface and the structure proper (the 15-foot setback requirement may be waived for specially-designed commercial structures);
5. Adequate emergency access available to the structure during periods of maximum flooding.
6. The elevation of the lowest floor (including the basement), or in VE and Coastal A Zones, the lowest horizontal structural member of all structures.
7. For structures to be flood-proofed (non-residential only), the elevation to which the structure will be flood-proofed.

V. Buildings and structures within the Coastal A Zone shall have the lowest floor elevated to or above the base flood elevation plus 18 inches of freeboard.

W. For structures (including manufactured homes) located within the VE Zone, the following additional requirements shall apply:

1. All new construction and substantial improvements in the VE Zone shall be elevated on pilings or columns so that:
  - a. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to at least 18 inches above the base flood elevation; and,
  - b. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one percent chance of being equaled or exceeded in any given year (one-percent annual chance).
2. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice.

## Attachment A – Proposed Text Amendment

3. The Floodplain Administrator shall obtain the elevation (in relation to mean sea level) of the bottom of the lowest horizontal structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures in Zone VE. The Floodplain Administrator shall maintain a record of all such information.

4. All new construction shall be located landward of the reach of mean high tide.

5. All new construction and substantial improvements shall have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood-lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this section, a breakaway wall shall have a design safe loading resistance of not less than 10 and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:

a. Breakaway wall collapse shall result from water load less than that which would occur during the base flood; and

b. The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have a one percent chance of being equaled or exceeded in any given year.

6. The enclosed space below the lowest floor shall be used solely for parking of vehicles, building access, or storage. Such space shall not be partitioned into multiple rooms, temperature-controlled, or used for human habitation.

7. The use of fill for structural support of buildings is prohibited. When non-structural fill is proposed in a coastal high hazard area, appropriate engineering analyses shall be conducted to evaluate the impacts of the fill prior to issuance of a development permit.

1. The man-made alteration of sand dunes, which would increase potential flood damage, is prohibited.

2. Recreational vehicles placed within VE Zones shall meet the requirements of Section 731.04Q.

### **732.00 FLOODPLAIN MANAGEMENT - SUBMISSION REQUIREMENTS:**

#### **732.01 General Requirements:**

A. The data required under this section and sections 730.00 through 732.00 of this manual shall be submitted to the Department of Public Works for technical evaluation and approval before development in the flood hazard overlay district. When development within the floodplain will cause or causes a change in the BFE, the applicant, including State agencies, shall obtain ~~The issuance of~~ a conditional letter of map ~~amendment (CLOMA) or~~ revision (CLOMR) from FEMA ~~is required~~, prior to the approval of site development or construction plans, and prior to issuance of any building or flood hazard use permits. An escrow or bond equal to the cost of processing a final letter of map ~~amendment (LOMA) or~~ revision (LOMR) shall be posted with the construction plans. The occupancy of any structures built within the flood overlay district will be contingent upon obtaining a LOMR and the submission of a certified FEMA elevation certificate. The issuance of a ~~LOMA or a~~ LOMR shall be required prior to the release of the escrow or construction bonds.

B. Plans drawn to scale, showing the base flood ~~elevation-of the one hundred (100)-year flood~~, topographic information showing existing and proposed ground elevations, the nature, location, dimensions and elevation of the lots, existing or proposed structures, fill, storage of materials, streets, water supply, sanitary facilities, flood proofing measures, and the relationship of the above to the location of the channel. For structures to be elevated, the elevation of the lowest floor

## Attachment A – Proposed Text Amendment

(including basement) must be shown. For nonresidential structures to be flood proofed, show the elevation to which the structure will be flood proofed.

C. If required, a floodplain study as described in Section 731.02 of this manual, or the file number of the approved floodplain study shall be submitted to the ~~Office of Planning~~Department of Development Services.

**732.02 Floodplain Study Criteria:** The following items provide general criteria to be used in the preparation of floodplain studies.

A. Friction coefficient, "n" factor, both on-site and off-site shall be computed using the approved form (see Exhibit 16). Photographs of the stream, taken at appropriate cross-sections shall be submitted with the computations. The "n" factor must be approved prior to the submission of the floodplain study.

B. The discharge (Q) and the time of concentration shall be determined in accordance with Section 701.~~00-06~~and Section 702.00 of this manual. Runoff curve numbers or coefficient of runoff shall be established based on ultimate development of the watershed in accordance with the current Comprehensive Land Use Plan and consultation with the Department of Public Works.

C. Field or certified aerial run topography of the stream through the site is required. The topography must extend three hundred (300) feet up and downstream from the property lines or to a control section. Field run or certified aerial topography shall extend to cover the limits of the floodplain freeboard, except in cases of abrupt change in the characteristics of the terrain. Additional topography may be required.

D. The cross-sections shall be perpendicular to the stream channel and/or floodplain and taken at all constrictions and other areas of change in the channel and/or floodplain.

E. For streams not identified as special flood hazard areas (~~Zone A and AE~~) in the flood insurance study of Prince William County, the ~~one hundred (100)-year base flood~~ discharge for predeveloped and developed conditions shall be provided. The discharges shall be determined using the methodology stated in Section 701.~~00-06~~and Section 702.00 of this manual. The water surface elevations shall be computed using the methodology stated in Section 731.02 of this manual. For minor floodplain studies, normal depth calculations, using Manning's equation, shall be accepted.

F. For streams identified in the flood insurance study of Prince William County, the hydrologic and hydraulic analysis shall be prepared in conformance with the National Flood Insurance Program Regulations as stated in Parts 60, 65, 70 and 72 (Title 44) of the Code of Federal Regulations (CFR) as applicable. In addition, ~~one hundred (100)-year base flood~~ discharges and water-surface elevations for developed conditions shall be submitted to the Department of Public Works for review.

G. All hydrologic and hydraulic computations shall be submitted in hard copy and digital format.

H. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers who shall certify that the technical methods used correctly reflect currently-accepted technical concepts.

**732.03 Plan Elements:** The following information shall be provided on the plans:

A. Drainage divides of contributing areas and their relation to the site in question at a maximum scale of one (1) inch equals one thousand (1,000) feet, or smaller as requested by the director of Public Works, using the County topographic maps as a base.

B. Cross-sections every one hundred (100) feet shall be plotted at a scale of one (1) inch equals ten (10) feet vertically, and one (1) inch equals fifty (50) feet horizontally. In cases of extremely flat terrain, a scale of one (1) inch equals five (5) feet vertically, and one (1) inch equals fifty (50) feet horizontally, shall be used. The cross-sections shall show existing and developed water surface elevations for the one hundred (100) year storms.

## Attachment A – Proposed Text Amendment

C. A profile of the floodplain and stream bed indicating the elevation of the water surface and invert of the stream every fifty (50) feet for the full length of the floodplain study area shall be submitted with the cross-sections. The scale of the profile shall be one (1) inch equals five (5) feet vertically, and one (1) inch equals fifty (50) feet horizontally. The profile shall show the ~~one hundred (100)-year water surface~~base flood elevations for developed conditions.

D. A written description of the methodology used to determine hydrologic and/or hydraulic parameters.

E. Delineation of the ~~one hundred (100)-year~~base flood boundaries predeveloped and developed conditions and floodway, and the location and alignment of cross-sections used in the hydraulic model.

1. This information ~~should~~shall be shown on maps of suitable scale and topographic definition to provide reasonable accuracy.

2. All items ~~should~~shall be labeled for easy cross-referencing to the hydrologic and hydraulic models and summary tables.

3. All lots and structures adjacent to the floodplain ~~should~~shall be shown.

F. Source data, engineering documentation, and back-up data, for the previously mentioned items, as well as a reference list of other sources of information used.

G. The flood hazard areas shall be placed on all plats and plans for the site. Flood hazard areas shall coincide with the ~~one hundred (100)-year~~base flood boundaries for developed conditions. The mathematical ties between the flood hazard area and the lot lines shall be required on the plats. The plats and plans shall also describe flood hazard area with metes and bounds. The following notes shall be clearly shown: "No use shall be made of, nor shall any improvements be made in the flood hazard area, without specific authorization from the Department of Public Works." In addition, a flood hazard use permit (FHUP) shall be required for any work within the flood hazard area.

H. Once the floodplain modifications are completed, the floodplain study shall be resubmitted and shall include construction plans for as-built conditions, if applicable. This as-built package is required as per part 65.6 (C), Title 44, CFR, and will be submitted to FEMA to obtain a revision of the flood maps.

### 732.04 Watercourse Stabilization:

A. Once the adequate capacity of the watercourse has been established, the engineer ~~should~~shall provide details of the work required to maintain a stable channel and floodplain, and to prevent erosion or other adverse effects which could place an extreme maintenance burden on future users of the area.

B. All watercourse improvements and maintenance shall be in accordance with Section 740.00 of this manual.

C. Every plan submitted for areas containing a watercourse shall, in addition to the floodplain studies, be accompanied by a written report, signed by a professional engineer, setting forth his or her study, conclusions, and recommendations regarding the following factors and any others that may be pertinent to particular conditions:

1. Predeveloped watercourse conditions: The original condition of the watercourse and floodplain area, including such matters as probable velocities for the two (2) and ten (10) year storm under present watershed conditions (prior to development), particularly where no continuous channel improvements are proposed, the presence or absence of a meander pattern that may be shifting, areas of existing erosion processes, or where sedimentation is taking place, whether the watercourse appears to be perennial or merely wet weather, the material forming the bed of the natural channel (rock, cobbles, sediment and soil materials, etc.), the state of natural stability of banks and adjacent slopes, whether they are present within the floodplain, abandoned or cut off former courses of the stream, natural levees, etc.

2. Effect of developed conditions on the existing watercourse: For comparison, the velocity of the two (2) and ten (10) year flows, if the stream is left in an entirely natural condition, but after all of the watershed area has been completely developed according to the Comprehensive Land Use Plan, or in lieu of same, according to reasonable



## Attachment A – Proposed Text Amendment

estimates of future development (where no continuous channel improvements are planned). These comparative calculations are to serve as a guide in assessing the probable effect on the stream of increased water discharges.

3. Proposed modifications: If the foregoing comparison, and other investigations made by the engineer, indicate that watershed environmental changes due to development will adversely affect the stream and probably create a heavy maintenance burden (unless modifications are made to the channel), then a thorough discussion of proposed modifications necessary to eliminate undue maintenance shall be included. Factors involved in such modifications include the use of concrete lining, rubble riprap lining, etc. Possible needed improvements could involve natural levees or abandoned portions of the old meander pattern. In certain areas, these may be for depressions with imperfect natural drainage, which are swampy in times of heavy rainfall, which may be valuable as a natural water quality element to remain.

4. Other uses as affected: Other proposed uses should also be covered in this report such as utility lines, road crossings, park and recreation areas and trails, etc.

5. Detailed hydraulic considerations: Adequate measures shall be proposed to prevent erosion from any entering flows, i.e., pipes or streams. Channel changes or partial linings should take into consideration increased erosive forces at bends. Wave action in supercritical flow should be allowed in linings. Riprap should be designed to withstand anticipated velocities. The effects of increased velocity on immediate downstream areas should be considered. Proposed channel changes which decrease velocity should be considered to determine if silt deposition will occur.

6. Effects on downstream and upstream lands: The engineer's report shall include a discussion of the effects of increased runoff on developed downstream and upstream properties and any mitigation measures.

### **~~732.05 Flood Damage Control for Structures:~~**

~~A. The applicant shall provide the following factual information as certified by a registered professional engineer, surveyor or architect:~~

~~1. Proposed structure or substantial modifications to the floodplain that will not adversely affect the predeveloped one hundred (100) year flood level;~~

~~2. The lowest floor elevation (including basement) of the proposed structure located at least eighteen (18) inches above the one hundred (100) year water surface elevation for developed conditions;~~

~~3. The minimum horizontal distance of fifteen (15) feet provided between the one hundred (100) year water surface and the structure proper (the fifteen [15] foot setback requirement may be waived for specially designed commercial structures);~~

~~4. Adequate emergency access available to the structure during periods of maximum flooding.~~

~~B. The applicant shall specify the one hundred (100) year flood water surface elevation(s) on the plan.~~

### **732.05 Submission of Technical Data:**

A community's BFEs may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the Floodplain Administrator shall notify FEMA of the changes by submitting technical or scientific data. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data



## Attachment B – BOCS Initiating Resolution

**MOTION: MAY**

**October 7, 2014  
Regular Meeting  
Res. No. 14-618**

**SECOND: PRINCIPI**

**RE: INITIATE A FLOOD INSURANCE RATE MAP UPDATE FOR  
COASTAL AREAS AND RELATED AMENDMENTS TO THE ZONING  
ORDINANCE AND THE DESIGN AND CONSTRUCTION STANDARDS  
MANUAL – COUNTYWIDE**

**ACTION: APPROVED**

**WHEREAS**, in accordance with Section 15.2-2285 of the Code of Virginia, Ann., the Board of County Supervisors may amend the Zoning Ordinance whenever it determines that public necessity, health, safety, convenience, general welfare and good zoning practice necessitate such change; and

**WHEREAS**, the Prince William County Design and Construction Standards Manual (DCSM) was adopted to assist the public in knowing the policies, regulations and standards that apply to land development in the County; and

**WHEREAS**, the Federal Emergency Management Agency (FEMA) has updated the Flood Insurance Rate Maps for Prince William County with additional coastal flood hazard information; and

**WHEREAS**, the map updates are proposed only for the coastal areas to account for the storm surges and wave actions that affect regulatory flood zone designations and flood elevations; and

**WHEREAS**, FEMA has established a new flood zone designation applicable to the coastal portions of Prince William County; and

**WHEREAS**, the new flood zone designation contains additional standards that must be incorporated into the County's floodplain management regulations; and

**WHEREAS**, the County has been directed by the Virginia Department of Conservation and Recreation and FEMA to amend its local ordinances by early 2015 to ensure its compliance with the National Flood Insurance Program's floodplain regulations; and

**WHEREAS**, the regulatory changes are required in the DCSM, as well as in the Zoning Ordinance; and

**WHEREAS**, amending the Zoning Ordinance and the DCSM for the above-referenced issue is required by public necessity, convenience, general welfare and good zoning practice, and is consistent with the intent of Section 15.2-2283 of the Code of Virginia, Ann., and the DCSM; and

## Attachment B – BOCS Initiating Resolution

October 7, 2014  
Regular Meeting  
Res. No. 14-618  
Page Two

**WHEREAS**, the Prince William Board of County Supervisors believes that public general welfare as well as good zoning practices are served by the initiation of these amendments to the Zoning Ordinance and DCSM;

**NOW, THEREFORE, BE IT RESOLVED** that the Prince William Board of County Supervisors does hereby initiate a Flood Insurance Rate Map update for coastal areas and related amendments to the Zoning Ordinance and the Design and Construction Standards Manual.

**Votes:**

**Ayes:** Caddigan, Candland, Jenkins, May, Nohe, Principi, Stewart

**Nays:** None

**Absent from Vote:** None

**Absent from Meeting:** None

**For Information:**


Public Works Director

Development Services Director

Planning Director

County Attorney

ATTEST: \_\_\_\_\_

  
Clerk to the Board