

**FLOODPLAIN MANAGEMENT  
DESKTOP PROCEDURE  
August 25, 2006**

This procedure outlines the process to be used to identify and review development located in and around designated flood hazard areas. It is written primarily for in-house use, but can be distributed to the public as an informational tool.

**Program Components**

The components of a sound floodplain management program are:

- 1) An updated floodplain management ordinance addressing the proper development performance standards
- 2) A flood development permit/application form
- 3) A written process addressing the issuance of permits
- 4) Procedure for obtaining Elevation and Floodproofing Certificates (included in Item 3)
- 5) Proper variance procedures (included in Item 1)
- 6) Complete record keeping system to track, record and maintain all floodplain development activity in the community

For the purpose of this procedure, the following names or titles apply:

Administrator: Director of Public Works/City Engineer  
City: City of Chesterfield, MO, Community No.: 290896  
Current Flood Damage Prevention Regulations: Chapter 14 of the City Code last revised  
by Ordinance No. 2284, August 21, 2006

**Floodplain Development Permit Process**

The Administrator or his designated representative, while meeting with a developer and reviewing the proposed development, provides the information necessary to compare the site of that development to the Flood Insurance Rate Map (FIRM), which in Chesterfield also depicts the Floodway Boundary and Base Flood Elevation. The maps have been issued to those communities that have had a Flood Insurance Study (FIS) completed by FEMA. In all cases, a FEMA map adopted by the City indicating the Special Flood Hazard Area (SFHA) should be available for review. Note that the location of the regulatory floodplain is determined by the graphical depiction on the FIRM, not the elevation stated for the BFE.

If the property in question is located in the Chesterfield Valley, the 100-year high water elevations as determined by the current version of the Chesterfield Valley Master Storm Water Plan Model must also be analyzed to determine their affect on the proposed development. In areas where both the FEMA data and Chesterfield Valley Master Storm Water Plan data apply, the higher of the BFE and the 100-year high water elevation is the regulatory elevation.

During the initial meeting with the developer, it should also be noted that the City has created a Supplemental Protection Area (SPA) adjacent to the SFHA. The SPA was created to provide an added level of protection for those properties immediately adjoining the SFHA. Although

### Floodplain Development Permit Process (cont.)

structures located just outside the SFHA are considered technically outside the regulatory floodplain, the structures may still be subject to damage from subsurface hydrostatic pressure during the base flood and inundation by surface water from higher magnitude flood events.

Any development in the SFHA, areas of 100-year high water, or the SPA will require a Floodplain Development Permit.

After confirming that the proposed work is in or within 200 feet of the SFHA, refer to the definition of development in City Code, Chapter 14, Flood Damage Prevention, to determine if a permit is required. Note that the site plan must be reviewed regarding impact on the SPA, SFHA, and the floodway portion of the SFHA. The floodway location was established during FEMA's study by determining the limit of the SFHA that could be filled without causing more than a one foot increase in the 100-year water surface elevation. The area that is left unfilled, nearest the stream, is the floodway. Work in the floodway requires additional study and a certification of "No Rise" by the engineer.

After a submittal containing a floodplain development permit has been received, the following procedure should be utilized:

#### **1) Review the Floodplain Development Permit Application Package for Completeness**

The application package should include an application signed by the owner, signed and sealed by the engineer, technical documentation, and additional permits as required. Applications for improvements/repairs to existing structures should include a cost analysis to assist in the determination of "substantial improvement" (>50% value of structure prior to improvement, which means the elevation of the lowest floor needs to comply with the ordinance requirements).

The application form should indicate the type and extent of work proposed in or within 200 feet of the SFHA. If a grading permit precedes improvement plan approval, and both involve work in or near the SFHA, separate applications are required for each phase of work. (NOTE: the application for the grading permit should not indicate any "improvements", aka structures, are being constructed.

Plans should depict existing and proposed topographic information, boundaries of the floodway and SFHA, elevations of the BFE or 100-year high water in the Chesterfield Valley, and elevation of the lowest floor or lowest sill as it applies, for all proposed structures. Structures must be elevated such that they comply with the elevational requirements summarized below in item 2. Non-residential structures may employ floodproofing as an alternative to obtain the necessary level of protection. (NOTE: For those structures in the SFHA, Elevation and/or Floodproofing Certificates are required after construction of structures to provide a record of the as-built elevation of the lowest floor and/or height of floodproofing. FEMA forms 81-31 and 81-65 must be used. For those structures located in the SPA, either FEMA's Elevation Certificate or the City of Chesterfield's Supplemental Protection Area Alternate Elevation Certification Form may be used to verify elevations. The City's form is not acceptable for structures located in the SFHA.)

### Floodplain Development Permit Process (cont.)

Certification of “No Rise” in the flood heights is required if any part of the proposed project is located in the floodway. SEMA has developed a form to be used. Requirements for the accompanying hydraulic computations are listed in the FEMA Region VII No Rise Certification procedure.

If enclosures below the lowest floor are designed using an alternative to the minimum standard for openings prescribed in the NFIP requirements, certification from a registered professional engineer or architect that the design accounts for the effects of hydrodynamic loads and buoyancy must be submitted.

Documentation regarding other Federal and State permits should also be included in the package.

#### **2) Review the Floodplain Development Application Package for Compliance with the Technical Requirements of the City Code, Chapter 14, Flood Damage Prevention.**

In addition to topographic and floodplain information referenced above, the site plan should accurately depict property lines, proposed development, streets, watercourses, and existing and proposed structures.

Flood elevation data should correspond with data in the Flood Insurance Study (FIS), Flood Insurance Rate Map (FIRM), and the current version of the Chesterfield Valley Master Storm Water Plan Model if applicable. Location of floodway and SFHA on the site plan should correspond with the location depicted on the FIRM.

Structures must comply with the following elevation requirements:

- Residential construction in the SFHAs outside the Chesterfield Valley must have the lowest floor including basement elevated to a minimum of two (2) feet above the BFE.
- Residential construction in the SFHAs inside the Chesterfield Valley must have the lowest floor elevated to a minimum of one (1) foot above the BFE and 100-year high water elevation of the Chesterfield Valley Master Storm Water Plan Model.
- Non-residential construction in the SFHAs outside the Chesterfield Valley must have the lowest floor, including basement, elevated to a minimum of two (2) feet above the BFE or the structure floodproofed to an elevation two (2) feet above the BFE.
- Non-residential construction in the SFHAs inside the Chesterfield Valley must have the lowest floor elevated to a minimum of one (1) foot above the BFE and 100-year high water elevation or the structure floodproofed to an elevation one (1) foot above the BFE and 100-year high water elevation of the Chesterfield Valley Master Storm Water Plan Model.

Floodplain Development Permit Process (cont.)

- Residential and non-residential construction in areas outside the Chesterfield Valley and within the SPA must meet the following requirements:

**Supplemental Protection Area Requirements (outside Chesterfield Valley)**

Distance From the SFHA Boundary to Structure (Feet)	Minimum Residential Lowest Floor/Sill Elevation*	Minimum Non-Residential Lowest Sill or Lowest Floor/Floodproofing Elevation*
0 – 49.99	lowest floor 2 feet above BFE**	lowest floor 2 feet above BFE
50 – 99.99	lowest sill 2 feet above BFE	lowest sill 2 feet above BFE
100 - 200	lowest sill 1 foot above BFE	lowest sill 1 foot above BFE

\* Including basement

\*\* Lowest floor of proposed structures in subdivisions for which improvements plans were approved after October 1, 2005 and before February 28, 2006 shall be at least 1 foot above the BFE

- Residential and non-residential construction in areas inside the Chesterfield Valley and within the SPA must meet the following requirements:

**Supplemental Protection Area Requirements (inside Chesterfield Valley)**

Distance From the SFHA Boundary or 100-Year High Water to Structure (Feet)	Minimum Residential Lowest Floor Elevation	Minimum Non-Residential Lowest Floor or Floodproofing Elevation
0 - 200	1 foot above BFE or 100-Year High Water	1 foot above BFE or 100-Year High Water

Hydrologic and hydraulic calculations are needed to address proposed floodway encroachments; loading calculations and method of construction relative to floodproofing, minimum openings for enclosures below the lowest floor, and design and construction methods for breakaway walls that exceed a loading resistance of 20 lb/sf.

Wet floodproofing must limited to areas that 1) are used solely for parking, building access or limited storage; 2) are designed to allow for the automatic entry and exit of flood waters through the use of openings; and 3) are constructed of flood resistant materials.

Additional requirements for substantial improvements to existing structures and placement of manufactured homes can be found in the City Code, Chapter 14, Flood Damage Prevention.

If the project involves an alteration or relocation of a watercourse, notify adjacent communities, SEMA, and FEMA. A proposal to change a floodway delineation or a floodplain boundary must be reviewed and approved by FEMA as well as by the City.

### **3) Issue a Permit when the Application package addresses all requirements**

After the Administrator approves the application, it becomes a permit. The floodplain development permit is not a grading permit, building permit nor zoning/land use permit, but a certification by the Administrator that the required process has been followed and the plans are in keeping with the City's Flood Damage Prevention Code. The floodplain development permit should be issued concurrently with construction plan approval. In addition, the letter transmitting the permit should include a reminder if an elevation certificate is required.

### **4) Inspect Sites**

Site inspections during construction are performed by the engineering construction inspector assigned to the project. Specific items to be addressed include: elevation of lowest floor and/or floodproofing, certification of elevation of lowest floor (including basement) after it is constructed; slope and surface treatment of fills; size and location of enclosures below the lowest floor of structures; breakaway walls; floodway encroachment; and anchoring systems for manufactured homes.

Elevation and/or Floodproofing certifications are required after construction of structures in the SFHA or SPA, and should be duly noted in the transmittal of the permit to the applicant. Elevation and Floodproofing Certificates provide a record of the as-built elevation of the lowest floor and/or height of floodproofing. FEMA forms 81-31 and 81-65 must be used for structures in the SFHA. In the SPA, either the FEMA's forms or the City's Supplemental Protection Area Alternate Elevation Certification Form can be used. The City's form may only be used for those structures in the SPA; the City's form is not acceptable for structures located in the SFHA.

These certifications provide final verification that the development meets the standards of the permit. Once the lowest floor is constructed, and prior to occupancy, these certificates should be submitted, filed permanently and remain a public record.

### **5) Proof of Compliance**

Prior to occupancy of a structure, and after completion of the work, the permittee is required to obtain certification of compliance from the Department of Public Works. In no case shall any structure be occupied prior to an elevation certificate being submitted to and approved by the Department of Public Works.

### **5) Violations**

Enforcement procedures include notice of violations, stop work orders, and prosecution through the City court which can result in fines or imprisonment.

### **5) Variance and Appeals Process**

Variances to standards required by ordinance are discouraged. The Flood Damage Prevention Code outlines requirements for issuance of variances.

## **6) Maintain Records**

All records for floodplain development, including copies of the flood development permit/application and elevation/floodproofing certificates shall be maintained in the floodplain files. A comprehensive list of permits, elevation certificates, and letters of map change shall be maintained to facilitate retrieval of information. Additional documents to be kept on file include: findings of fact relative to variances and appeals; NFIP biennial reports, NFIP correspondence; “No-Rise” certifications; and current FEMA and NFIP forms. Current forms can be obtained at the SEMA website, <http://www.sema.dps.mo.gov/NFIP%20Page.htm> .

## **7) Maintain Floodplain Maps and Flood Data**

Maintain maps and flood data by recording all corrections and amendments on the official administrative copy. Graphical depiction of LOMR’s and LOMA’s should be attached to the FIRM’s as appropriate. The original LOMR’s and LOMA’s shall be filed by subdivision in the floodplain files. A comprehensive list of LOMR’s and LOMA’s shall be maintained.

The Floodplain Administrator is responsible for making this information available to the public, insurance agents, lending institutions, appraisers, SEMA and FEMA.

## **8) Biennial Reports**

FEMA will send forms requesting information concerning changes to the flood hazard area, development activities, and verification of number of floodplain residences and structures. These forms should be completed and returned within 30 days.

Items of Note:

- Correct preprinted information as appropriate
- Section I: Refers to changes and activities in the floodplain. Changes in corporate limits should be noted as Yes to Question A and a copy of the new boundaries should be included.
- Question C: Man-made changes refers to the replacement of culverts or bridges, construction of dikes or drainage projects - physical changes which affect the characteristics of flooding. Localized projects such as resurfacing parking lots, building retention basins, or minor drainage projects need not be mentioned.
- Section II: Asks about the number of permits issued only since the last report was made. Number of variances granted, if any, also need to be reported.
- Community Data: Asks for City-wide population and structure data, then flood hazard areas only. Changes should be made to correct figures that are no longer accurate.

## **9) Investigate Complaints**

Follow up on all unpermitted activities in the floodplain. Appropriate permits must be obtained or the development must be removed to abate the violation.

### **Additional Resources**

For assistance required in administration of the floodplain regulations, consult the SEMA documents in Floodplain Management in Missouri – Quick Guide and Local Officials Reference Manual, the SEMA website <http://www.sema.dps.mo.gov>, or call SEMA at 573-526-9119 or FEMA Region VII at 816-283-7009.

## FLOODPLAIN MANAGER REVIEW CHECKLIST

\_\_\_\_\_   
Project Name

### COMPLIANCE WITH REGULATIONS

- \_\_\_\_\_ Compared proposed development to existing flood information, FIRM (as amended by LOMR/LOMA), FIS profiles, and if applicable the Chesterfield Valley Master Storm Water Plan Model
- \_\_\_\_\_ Compared proposed development in SPA to elevational requirements
- \_\_\_\_\_ Meets NFIP development standards Yes \_\_\_\_\_ No \_\_\_\_\_
- \_\_\_\_\_ Acceptable No Rise Certificate submitted if work in floodway
- \_\_\_\_\_ Reviewed hydrologic and hydraulic calculations
- \_\_\_\_\_ Reviewed loading calculations and methods of construction
- \_\_\_\_\_ Reviewed alternative designs for meeting minimum opening requirements
- \_\_\_\_\_ Reviewed design and methods of construction for breakaway walls

### NOTIFICATIONS

\_\_\_\_\_ Alteration or relocation of watercourse Yes \_\_\_\_\_ No \_\_\_\_\_  
Affected Communities \_\_\_\_\_  
\_\_\_\_\_

Notification made \_\_\_\_\_

\_\_\_\_\_ FEMA Region VII notified of proposed development \_\_\_\_\_  
Contact person \_\_\_\_\_ Date \_\_\_\_\_

### OTHER DOCUMENTS REQUIRED

CLOMR required	Yes _____ No _____	Obtained _____
LOMR required	Yes _____ No _____	Obtained _____
LOMA required	Yes _____ No _____	Obtained _____

Elevation Certificate (as-built) required	Yes _____ No _____	Provided _____
Floodproofing Certificate (as-built) required	Yes _____ No _____	Provided _____

(non-residential only)

### RECORD MAINTENANCE

- \_\_\_\_\_ Permit file given to Engineering Secretary for addition to permit list and filing by address (Copy of permit information gets filed in subdivision/project file)
- \_\_\_\_\_ Elevation/Floodproofing Certificates given to Engineering Secretary for addition to Elevation Certificate list and filing. One copy in the permit file; one in the elevation certificate file by address
- \_\_\_\_\_ LOMR/LOMA information labeled on Administrative copies (upstairs and down) of FIRM's and given to Engineering Secretary for addition to the LOMR/LOMA list and filing by subdivision.