

## Article 9.3. Floodprone Area Regulations

### Sec. 9.3.1. Floodprone Areas

#### A. Mapped Floodprone Areas

1. The mapped floodprone areas are divided into 3 primary areas:
  - a. Floodway areas;
  - b. Floodway fringe areas; and
  - c. Future conditions flood hazard areas.
2. Floodprone areas are identified under the Cooperating Technical State (CTS) agreement between the State of North Carolina and the Federal Emergency Management Agency (FEMA) in its flood insurance study and accompanying flood insurance rate maps, flood hazard soil maps and drainage basin study maps. These maps together with all explanatory matter attached to them are adopted and incorporated by reference into this UDO.
3. Floodprone area regulations are superimposed on the zoning districts established in *Article 1.3. Zoning Districts* and the requirements of this Article apply in addition to any base zoning requirement.
4. The City Council may, on its own motion or upon petition after public notice and hearing amend, supplement, change, modify or repeal the regulations and the flood hazard boundary maps and the delineated flood storage area maps. Amendment to flood insurance rate maps originating from the Federal Insurance Administration shall not become official until a letter stating approval from the Federal Insurance Administration is received by the City.

#### B. Additional Floodprone Areas

Floodprone areas adjoining creeks, streams, tributaries and watercourses not defined on the flood hazard boundary maps include the following.

1. Watercourses that drain 1 square mile or more, lying 5 vertical feet from the outer limit of the flood hazard soils or the made land which spans flood hazard soils lying along such watercourses; and
2. Watercourses draining less than 1 square mile are defined as those areas lying within 2 additional feet vertical from the outer limits of the flood hazard soils or made land which traverses such soils.

### Sec. 9.3.2. Flood Hazard Soils

- A. Flood hazard soils are shown on aerial photographic base maps prepared by the U.S. Soil Conservation Service and the North Carolina Agricultural Experiment Station from a soil survey.
- B. The outer limits of flood hazard soils may be specifically described by metes and bounds or other means from detailed surveys by owners of property on which they lie, provided the accuracy of such description is reviewed and approved by the Public Works Director and that maps or plats of such description are filed with the Clerk of the Superior Court and with the Register of Deeds of Wake County.
- C. Upon approval by the Public Works Director, drainage basin study maps may supersede flood hazard soil maps. Floodprone areas and flood elevation data shall be obtained from the most current drainage basin study maps or the flood studies.

### Sec. 9.3.3. Rules for Interpretation of Boundaries

- A. The boundaries of floodprone areas shown on flood insurance rate maps shall be initially determined from the information obtained from the Corps of Engineers and presented in the flood insurance rate maps and the flood insurance study by FEMA.
- B. Floodprone boundaries shall be based on the engineering data that most accurately reflects actual field and hydrologic conditions. Field and hydraulic conditions shall prevail over mapped boundaries shown on flood insurance study profiles, flood hazard soils and drainage basin study maps.
- C. In areas between official cross-sections, floodprone area boundaries shall be determined by scaling distances on the flood insurance rate maps. Where interpretation of the lateral location of scaled distances is needed to determine the actual field location of these boundaries, the Public Works Director is directed to make the necessary interpretation and corrections of flood insurance rate maps applying the following:
  1. The base flood elevation shall be the controlling factor in locating the outer limits of a floodway fringe or future conditions flood hazard area boundary;
  2. Interpretations of floodway boundaries on flood insurance rate maps shall be based on the current procedures for interpreting floodways in accord with the FEMA guidelines; and

3. Interpretation of the flood hazard soils boundaries shall be based upon hydrologic analysis and hydraulic routing methods used by the Corps of Engineers to establish flood insurance rate maps. These methods are contained in the flood insurance study for Wake County as published by FEMA. Approved interpretations of flood hazard soils boundaries may be described by bearings and distances and drawn with elevations in mean sea level datum given for each cross-section used in the routing computations.
- D. All interpretation requests shall be accompanied with a list of the names, mailing addresses and Wake County tax parcel numbers of any property owner, including the petitioner, affected by the requested interpretation. The Public Works Director shall give notice by certified or registered mail, return receipt requested or by personal service to such property owners. The notices required to be given in this section are for the convenience of property owners and any defect or omission shall not impair the validity of any hearing or decision with respect to any interpretation.
- E. The notice shall inform affected property owners that within 14 days of the date of the letter, they may direct the Public Works Director to conduct a public hearing on the matter. All requests for a public hearing shall be directed to the Public Works Director. At least 10 days prior to a requested public hearing, the Public Works Director must by certified or registered mail-return receipt requested or by personal service give notice of the time and place of the hearing to the petitioner and to affected property owners. Hearings shall follow the procedures prescribed by law for hearings before the Board of Adjustment. The establishment and documentation of field conditions used in interpretations shall be based on certified testimony or information supplied by a licensed registered land surveyor and all calculations shall be made and certified by a registered and qualified professional.
- F. Upon rendering a decision, the Public Works Director shall immediately give notice by certified or registered mail, return receipt requested or by personal service to the petitioner and to affected property owners. Within 15 days after receipt of written notice of the interpretation, any affected property owner, including petitioner, may appeal the decision of the Public Works Director to the City Council.
- G. All approved interpretations of floodprone boundaries shall be described on maps or plats, which shall then be filed with the Clerk of the Superior Court and with the Register of Deeds of Wake County. The map or plats shall show the

locations of all cross-sections, the elevation at the boundary of the floodway fringe areas, future conditions flood hazard area and flood storage area at the cross-section, the location of a benchmark used for vertical control; its elevation in reference to mean sea level datum, all floodplain boundaries and the source of the floodplain area. The map or plats shall also bear the name, title and professional seal of the person who supplied the survey and the calculation as well as the date the interpretation was approved by the Public Works Director.

### Sec. 9.3.4. Floodway and Non-Encroachment Areas

#### A. Prohibited Uses

1. No encroachments, including fill, new construction, substantial improvements, structures, manufactured homes, use and other developments, are permitted within the floodway or non-encroachment areas unless it has been demonstrated that the proposed encroachment would not:
  - a. Adversely affect the capacity of the channel's floodway and non-encroachment areas or drainage facilities or systems;
  - b. Redirect velocities of water of the base flood or future conditions flood onto adjacent properties; or
  - c. Result in any increase in flood levels during the occurrence of the base flood or future conditions flood based on hydrologic and hydraulic analyses. Hydrologic and hydraulic analyses shall be performed in accordance with standard engineering practice and presented to the floodplain administrator prior to issuance of flood permit or Conditional Letter of Map Revision has been approved by FEMA. A Letter of Map Revision must also be obtained upon completion of the proposed encroachment.
2. No chemical storage facilities which store or process acetone, acetylene gas, ammonia, benzene, calcium carbide, carbon disulfide, celluloid, chlorine, gasoline, hydrochloric acid, hydrocyanic acid, magnesium, materials or fuel which are flammable or explosive, nitric acid, oxides of nitrogen, petroleum products, phosphorus, potassium, sodium, sulfur or any other item which in time of flooding is buoyant or could be injurious to human, animal or plant life is allowed in the floodway and non-encroachment areas.
3. No new solid waste disposal facilities, hazardous waste management

facilities and salvage yards are allowed in the floodway or non-encroachment areas.

## B. Allowed Uses

Provided they are not otherwise prohibited in this UDO, the following uses are allowed within floodway and non-encroachment areas.

1. General farming, pasture, outdoor plant or nurseries, horticulture, forestry, wildlife sanctuary, game preserves and other similar agricultural wildlife and related uses.
2. Lawns, yards, gardens, parking areas, play areas and other similar uses.
3. Golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, parks, greenways, bikeways, hiking or horseback-riding trails, botanical gardens, open space and other similar private and public recreational uses.
4. Any other use not employing a structure and not subject to floating away during a flood.
5. Any use employing a structure, provided all portions of any structure, including foundation and supports, shall be located outside the floodway area and that any structure which overhangs the floodway is elevated above the depth of the 500-year flood.
6. Other encroachments, including fill, new construction, substantial improvements, structures as defined in the North Carolina State Building Code, manufactured homes, use and other developments when it has been demonstrated that the proposed encroachment would not do any of the following:
  - a. Adversely affect the capacity of the channels floodway and non-encroachment areas or drainage facilities or systems;
  - b. Redirect velocities of water of the base flood or future conditions flood onto adjacent properties; and
  - c. Result in any increase in the flood levels during the occurrence of the base flood or future conditions flood all based on hydrologic and hydraulic analyses performed in accordance with standard engineering practice and presented to the floodplain administrator prior to issuance of floodplain development permit or a Conditional Letter of Map Revision has been approved by FEMA. A Letter of Map Revision must also be obtained upon completion of the proposed encroachment.

## C. Restrictions on Existing Structures

1. No structure existing and lying within a floodway shall be considered a nonconforming structure. All such structures may be repaired, improved, strengthened and enlarged; provided that no construction is permitted which will:
  - a. Enlarge the foundation area of the structure within the floodway;
  - b. Increase the bulk of the building or structure within the floodway below the base flood or future conditions flood level; or
  - c. Enlarge the surface area perpendicular to the direction of flow of the watercourse to which the floodway relates.
2. In the event of damage to an existing structure in a floodway by flood or other means that requires a substantial improvement of the structure, the structure may be repaired; provided that:
  - a. The surface area of the floodway formerly occupied by the structure shall not be increased;
  - b. The repairs to the structure shall incorporate appropriate floodproofing measures; and
  - c. The repairs shall not increase the bulk of the structure below the base flood or future conditions flood level.
3. Additions may be made to existing structures located in a floodway upon recommendation from the Corp of Engineers and upon a letter of approval from FEMA to the City Council that the impact of the proposed addition would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

## Sec. 9.3.5. Floodway Fringe and Future Hazard Areas

### A. Prohibited Uses

1. The storage or processing of acetone, ammonia, benzene, calcium carbide, carbon disulfide, celluloid, chlorine, hydrochloric acid, hydrocyanic acid, magnesium, nitric acid, oxides of nitrogen, phosphorous, potassium, sodium, sulphur or any other item which in time of flooding could be caustic is prohibited.
2. New solid waste disposal facilities, hazardous waste management facilities

and salvage yards are prohibited in the floodway fringe areas and future conditions flood hazards areas.

3. In flood hazard soils, areas of watercourses that drain areas less than 1 square mile may use a structure or encroachment, including fill, which is located within 90% of the distance of the outer limits of the flood hazard soils, as measured from either side of the center line of the stream channel or the low point when there is no stream channel, or the midpoint, when there is no stream channel or low point and which increases the elevation of the base flood or future conditions flood at any point by more than ½ foot, is prohibited.
4. Nothing in this section prevents a landowner from redelineating flood hazard soils areas of water courses which drain less than 1 square mile to accommodate more than a ½ foot rise of the base flood or future conditions flood if:
  - a. All of the more than ½ foot flood rise for the base flood or future conditions flood remains on the property of petitioner;
  - b. The establishment and documentation of field conditions used in the redelineation are based on information supplied by a licensed registered land surveyor and all calculations are made and certified by a licensed professional engineer;
  - c. Any sanitary sewer manholes in an area of increased depth are floodproofed by the petitioner;
  - d. The petitioner notifies by certified or registered mail, return receipt requested, all adjoining property owners and tenants, including the petitioning property. Such notice shall explain the proposed redelineation and it shall inform such persons that they can appeal the proposed redelineation to the Public Works Director within 10 days after receipt of the letter;
  - e. Appeals from decisions of the Public Works Director shall be to the City Council; and
  - f. Upon the approval of the revised delineation by the City, the new delineation is recorded with the Register of Deeds of Wake County. Recorded delineations shall mark any additional lands subject to flooding as a “flood storage area.”

## B. Allowed Uses

Provided they are not otherwise prohibited in this UDO, the following uses are allowed within floodway fringe and future conditions flood hazard areas.

### 1. Uses Allowed Below the Regulatory Flood Protection Elevation

- a. Uses permitted and regulated in floodways.
- b. Nonresidential structures and residential accessory structures which comply with *Sec. 11.4.6.B.2.* or *Sec. 11.4.6.B.3.* subject to *Sec. 9.3.5.C.* below.
- c. Underground storage and structure foundations and supports which are watertight and substantially impermeable to the passage of water and are designed to withstand the flood depths, pressure, velocities, impact and uplift forces associated with the base flood or future conditions flood at the location of the structure.

### 2. Uses Allowed Above the Regulatory Flood Protection Elevation

- a. Structures which comply with *Sec. 11.4.6.*
- b. Manufactured homes and additions to manufactured homes that comply with *Sec. 11.4.6.*
- c. Structures constructed on fill so that the lowest floor is above the regulatory flood protection elevation, provided the top of the fill is no lower than 1 foot below the regulatory flood protection elevation for the area and extends in all directions at least 15 feet beyond the limits of any structure or building.
- d. Open storage of materials subject to floating away during a flood provided the storage is placed on fill at least 1 foot above the regulatory flood protection elevation.

## C. Limits of Development

The lot coverage of any lot may not exceed 50% of the portion of the floodway fringe or future conditions flood hazard areas on that lot, with the following exceptions.

1. Uses permitted in floodways.
2. Ground level loading areas, parking areas, heliports and other similar ground level uses.
3. Any lot ½ acre or less in size which was recorded prior to May 2, 2006.

4. No existing or approved structure, for which a building permit has been issued prior to May 2, 2006, shall be considered a nonconforming structure. In the event of damage to such a structure by flood or other casualty requiring a substantial improvement of said structure, the structure may be repaired or rebuilt with:
  - a. An administrative approval by the Floodplain Administrator, if all of the following are met:
    - i. The land use existing at the time of the flood or other casualty remains the same;
    - ii. The area of the footprint of the structure does not increase; and
    - iii. There is no rise in the Base Flood Elevation or, if there is any rise in the Base Flood Elevation, as determined by a Flood Study identifying upstream and downstream structures that will be impacted, it will:
      - a) Not raise the levels of the base flood or future conditions flood onto impacted structures; and
      - b) Not redirect velocities of water onto impacted structures.
  - b. A variance by the City Council, if all of the following are met:
    - i. The land use existing at the time of the flood or other casualty remains the same;
    - ii. The area of the footprint of the structure does not increase;
    - iii. There are unique circumstances applicable to the site such that strict adherence to the provisions of this Article will result in unnecessary hardship or create practical difficulties; and
    - iv. The variance granted is the minimum necessary to maintain the land use
    - v. A written request for a variance shall be submitted to the City Clerk and shall state the specific variance sought, the justification for the variance and what measures will be taken to ensure the requirements of this Article have been met to the maximum extent practicable.
  - c. An administrative approval by the Floodplain Administrator for any redevelopment that does not increase the flood elevation and that decreases the bulk of an existing building or structure below the base flood or future conditions flood level by at least 25% of the portion exceeding 50% of the floodway fringe or future conditions flood hazard areas. Any additional fill or material being added as a part of

the redevelopment shall be included for calculation of the bulk of the proposed redevelopment. A written request for a variance shall be submitted to the Floodplain Administrator.

5. Notwithstanding the preceding exceptions, the City Council may approve a variance to the 50% lot coverage limitation where the following conditions are met:
  - a. There are unique circumstances applicable to the site such that strict adherence to the provisions of this Article will result in unnecessary hardship or create practical difficulties;
  - b. The variance is in harmony with the general purpose and intent of this Article; and
  - c. In granting this variance, public safety and welfare has been assured and substantial justice has been done.
  - d. A written request for a variance shall be submitted to the City Clerk and shall state the specific variance sought, the justification for the variance and what measures will be taken to insure the requirements of this Article have been met to the maximum extent practicable.
6. Upon a determination that the extent of the development limit will deprive the land owner of reasonable use of their property, the City Council may allow development in excess of the 50% lot coverage limitation of the floodway fringe or future conditions flood hazard areas.

### Sec. 9.3.6. Street Crossings Watercourses

- A. All streets and driveways or any bridge or culvert associated with any street or driveway, crossing a watercourse, shall be designed and constructed in accordance with City standards.
- B. Street crossings of natural resource buffer yards shall be as close to a perpendicular angle as possible.
- C. Any street, driveway, bridge or culvert associated with any street or driveway, which is located in a floodprone area draining less than 1 square mile and not shown on a FEMA map or located outside a floodprone area, may either increase the flow levels and area of flooding of the 10 through 100 year frequency floods or redirect floodwaters if the following is met:
  1. Copies of recorded flood easements or flood easements on recorded plats

adequate to contain the increased flow levels are first submitted to the City;  
and

2. Land areas contained within the easement boundaries shall be delineated as flood storage areas.
- D. The following additional standards shall apply to all streets and driveways crossing watercourses draining 10 acres or more and which are located inside floodprone areas.
  1. Any street, driveway, bridge or culvert associated with any street or driveway shall pass the 100 year flood crest, under free flow conditions that will not result in any increase in the elevation of the 10- through 100-year floods above those specified in the Flood Insurance Study, City of Raleigh, Federal Emergency Management Agency, latest publication.
  2. If the drainage areas exceed 1 square mile, the maximum rise allowed for the 100-year flood shall not exceed a total of 1 foot above the base flood elevation established for flood hazard soil areas or those elevations specified either in the drainage basin study maps or in the Flood Insurance Study, City of Raleigh, Federal Emergency Management Agency, latest publication.
  3. Base flood elevations for return periods of less than 100-years may be increased to exceed 1 foot, provided that the portion of the flood increase which is greater than 1 foot is either limited to the site boundaries of the property of the owner requesting this increase or restricted to flood storage areas shown on a recorded plat.

### Sec. 9.3.7. Streets in Floodprone Areas

- A. All streets in floodprone areas shall be designed and constructed to provide a minimum of 2 feet of vertical freeboard, as measured from the predicted 10 year flood peak water surface elevation to the low point of the top of curb or edge of pavement for streets without curbs. The following are exceptions to this standard:
  1. Those portions of streets within allowable vertical and horizontal controls which act as a transition to existing streets; or
  2. When the City Council finds that the public benefit derived from the construction of the thoroughfare or collector street would be better served if these standards were varied.
  3. All thoroughfares in floodprone areas shall be designed and constructed

so as not to be overtopped during the predicted 50 year storm. All other streets in floodprone areas shall be designed and constructed so as not to be overtopped during the predicted 25-year storm.

- B. For any street in floodprone areas, any proposed increase above floodway levels specified in the Flood Insurance Study, City of Raleigh, Federal Emergency Management Agency, latest publication may be allowed, provided that the change is approved by the Federal Insurance Administration.
- C. Any proposed street or driveway, bridge or culvert associated with a street or driveway (including fill), located in the floodprone area must be accompanied by a sealed written statement by a registered professional engineer licensed in North Carolina certifying that such structure is designed and constructed in accordance with this section and shall specify which provision applies.
- D. Outside of regulated discharge floodplain areas, the maximum depth of any overtopping flow during the predicted 100 year flood shall not exceed 1 foot. The downstream slope of the roadway section shall be protected from erosion due to the overtopping flow. Streets located within regulated discharge floodplain areas must be located at or above the 100 year flood elevation, consistent with the regulations of Sec. 9.3.5.A.

### Sec. 9.3.8. Warning & Disclaimer of Liability

- A. The degree of flood protection required by this Article is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes.
- B. This Article does not imply that areas outside the boundaries of floodprone areas or land uses permitted within such areas will be free from flooding or flood damages.
- C. This Article shall not create liability on the part of the City or by any officer or employee for any flood damages that result from reliance on this Article or any administrative decision lawfully made.

## Sec. 9.3.9. Penalties

### A. Civil Penalties

1. Any person controlling or managing any building or land where there is placed or there now exists anything in violation of this Article; or, any person who shall commit or assist in the commission of any violation of this Article; or, any person who shall build contrary to this Article after plans and specifications have been submitted to and approved by the Public Works Director; or, any person who shall omit, neglect or refuse to do any act provided for in this Article shall be subject to a civil penalty of \$100 per day of continuing noncompliance.
2. No penalty shall be assessed until the person alleged to be in violation is served by registered mail notice to comply. The notice shall set forth a description of the violation for which the penalty has been invoked.
3. As an additional remedy or in lieu of other remedies, the City Council may either before or after the institution of any other action or proceeding authorized by this section, institute any appropriate action or proceeding to restrain or prevent any violation of this Article or the City Council may direct the removal or abatement of any obstruction which violates this Article and direct the restoration of conditions existing before the placement of the unlawful obstruction.
4. The institution of an action for abatement or injunctive relief shall not relieve any party to such proceeding from any civil or criminal penalty prescribed for violations of this Article.

### B. Criminal Penalties

1. Any person controlling or managing any building or land where there is placed or there now exists anything in violation of this Article or any person who shall assist in the commission of any violation of this Article; or any person who shall build contrary to this Article after plans and specifications have been submitted to and approved by the Public Works Director; or any person who shall omit, neglect or refuse to do any act provided for in this Article shall be guilty of a misdemeanor.
2. Failure to correct an identified violation shall constitute a separate violation for each 10 days that such failure continues after written notice has been received.