

**ARTICLE 4**  
**DESIGN CRITERIA AND PERFORMANCE STANDARDS**

**4.1 Design Criteria** – The City of Jonesboro’s Stormwater Drainage Design Manual (Drainage Manual) latest version shall be the accepted design document. It is the responsibility of the Developer and the Engineer of Record to verify that they are using the latest version of the Drainage Manual in the design of their proposed development. Unless otherwise provided, the following rules shall govern the design and improvements with respect to managing stormwater runoff:

- A. Method of Determining Stormwater Runoff – Developments where the upstream drainage area contributing runoff is less than 100 acres should be designed using the SCS, Type II 24-hour distribution, TR-55 Hydrograph Method for calculating runoff. Developments where the area contributing runoff is greater than 100 acres shall use the City of Jonesboro basin analysis for calculating runoff. If not available, the FEMA Data shall be used for calculating runoff. If neither the basin analysis nor the FEMA Data is available, the SCS TR-55 Hydrograph Method for calculating runoff shall be used.
- B. Differential Runoff – The total volume, peak flow rate, and velocity of stormwater runoff from a site, post-development, should to the extent practicable approximate that of the site prior to the development.
- C. Development Design – Developments shall be located and laid out in such a manner as to minimize the velocity of overland flow, allow maximum opportunity for infiltration of stormwater into the ground, preserve and utilize existing and planned streams, channels, detention basins, retention basins, and include wherever possible, streams and floodplains within parks and other public grounds.  
  
Streets, curbs and gutters, parking areas, enclosed conveyance systems, detention basins, retention basins, and other generally accepted practices and methods for stormwater control may be a part of the overall stormwater runoff management systems for a particular site. To the maximum extent possible, these facilities shall be concurrently designed to effectively manage stormwater runoff in accordance with these regulations.
- D. Enclosed Systems and Open Channels – Enclosed systems and open channels shall be designed in accordance with the Drainage Manual.
- E. Evaluation of Downstream Flooding – The Engineer of Record shall evaluate whether the proposed plan will cause or increase downstream flooding conditions within the drainage sub-basin in which the project is located or if it will otherwise increase peak flows from the drainage sub-basin. This evaluation shall be made on the basis of existing downstream development and an analysis of stormwater runoff with and without the proposed development. When it is determined that the proposed development will cause or increase downstream flooding conditions, provisions to correct such cause or increase shall be included in the overall design of the stormwater management system improvements. Such provisions may include downstream improvements or detention of stormwater

runoff and its regulated discharge to the downstream storm drainage system, or both.

When it is determined that a localized flooding condition exist downstream of a proposed development, the Engineer of Record for the project shall notify the City Engineer of this discovery and include sufficient documentation in the project submittals to assist in the delineation of the identified Special Flood Hazard Area (SFHA).

F. Detention – The following design criteria shall govern the design of detention facilities:

1. Release Rate – The release rate from any detention facility shall be equal to or less than that of the site prior to the proposed development.
2. Freeboard – Detention storage areas shall have adequate capacity to contain the storage volume of tributary stormwater runoff with freeboard in accordance with the Drainage Manual.
3. Outlet Control Works
  - (a.) Outlet works shall not include any mechanical components or devices and shall function without requiring attendance or control during operation.
  - (b.) Size and hydraulic characteristics shall be such that all water and detention storage is released to the downstream stormwater conveyance systems within 24 hours after the end of the design rainfall. Normal time for discharge ranges from 3 to 24 hours.
4. Spillway – Emergency spillways shall be provided in accordance with the Drainage Manual.
5. Design Data Submittal – In addition to complete plans, all design data shall be submitted as required in the detention design data submittal section of the Drainage Manual.
6. Detention Methods – Depending upon the detention alternative or alternatives selected by the Engineer of Record, the design criteria for detention shall follow those given in the Drainage Manual.

G. Alternatives to On-site Detention

1. Alternative Methods – Where on-site detention is deemed inappropriate, alternatives to on-site detention shall be permitted. The methods may include off-site detention or improvements.

Determinations regarding the appropriateness of on-site detention shall be made by the City Engineer based upon the impact of the proposed development on existing drainage networks and the location of the project in relation to existing floodplains, regional

detention facilities, and other planned drainage or channel improvements. Disputes, if any, shall be resolved by the Stormwater Management Board.

Determinations regarding the appropriateness of off-site detention or comparable improvements shall be made by the City Engineer based upon the impact of the proposed development on existing drainage networks and the location of the project in relation to existing floodplains, regional detention facilities, and other planned drainage or channel improvements. Disputes, if any, shall be resolved by the Stormwater Management Board.

2. Excess Stormwater Storage Credit – A Developer may receive credit for excess stormwater storage (in acre-ft) created on one site that may be applied to another site within the same watershed. The transfer of storage volume credit (in acre-ft) shall not be allowed when the site where credited storage is proposed to be transferred has an existing flooding condition downstream or the proposed development will cause downstream flooding.

#### **4.2 Performance Standards**

- A. Stormwater Channel Location – Generally acceptable locations of stormwater runoff channels may include but not be limited to the following:
  1. In a depressed median of a double roadway, street or parkway provided the median is wide enough to permit maximum three (3) to one (1) side slopes;
  2. Along the roadway, street, or parking; or,
  3. Located along lot lines within the rear yards of lots or parcels. Stormwater runoff channels located along front and side lot lines shall be enclosed with conduits sized in accordance with the Drainage Manual. Channels along rear lot lines can be open ditch. In all cases, provisions (site grading, berms, dikes, swales, etc.) shall be provided for the safe containment or conveyance of the base flood along these routes.
- B. Easements – Drainage easements for access maintenance, detention and conveyance of stormwater shall be provided and shown on the final plat. Easements shall be required for all drainage ways serving two or more lots or parcels and shall be designated for drainage only. Minimum required dimensions for drainage easements are included in the Drainage Manual (Figures 1 and 2; Appendix 2), but in no case shall the prescribed easements be less than that required to convey or detain the 100-yr runoff. All drainage easements shall have a maintenance agreement approved before final acceptance of the improvements. **No buildings or other structures shall be erected or placed in a drainage easement. Fencing of drainage easements is by permit only in accordance with Section 117-329 of Chapter 117. Fencing, if permitted, must be able to pass a 3-inch object without obstruction, and be gated to facilitate access to the easement for inspection and maintenance.**

- C. Storm Sewer Outfall – The storm sewer outfall shall be designed in accordance with the Drainage Manual so as to provide adequate protection against downstream erosion and scouring.
- D. Lot Lines – Whenever the plans call for the passage or storage of floodwater, surface runoff, or stormwater along lot lines, grading of all such lots shall be prescribed and established for the safe passage or storage of the waters.,~~and~~ ~~No structures including fences may be erected, shrubbery or trees planted, or~~ changes shall be made to the prescribed grades and contours of the specified floodways, ~~except by permit in accordance with Section 112-106 of Chapter 112. which will obstruct the flow of stormwater.~~ No trees or shrubbery should be planted in the drainage way that will obstruct the flow of stormwater.
- E. Manholes – All sanitary sewer manholes constructed in a floodplain or in an area designed for the storage or passage of flood or stormwater, shall be provided with either a watertight manhole cover or be constructed with a rim elevation of a minimum one (1) foot above the high water elevation of the base flood, whichever is applicable to the specific area. The Engineer of Record shall identify which sanitary sewer manholes within the project limits are subject to this requirement, and coordinate with City Water and Light regarding the appropriate remedy.
- F. Floor Elevations –
- (1) Any proposed lot or lots located in a local or FEMA Special Flood Hazard Area (SFHA) shall be identified as such on the record plat along with the effective Base Flood Elevation (BFE).
  - (2) The proposed lowest floor of any structure to be located in a local or FEMA designated SFHA shall be established by a Professional Engineer registered in the state, using good engineering practice.
  - (3) An Elevation Certificate (FEMA Form 81-31) shall be used to certify the elevation of any structure to be constructed in local or FEMA designated SFHA. Certificates may be prepared and sealed by either a Professional Engineer or a Land Surveyor provided that person is registered in the state.

An elevation certificate must be prepared, submitted, and approved at the following times during the construction of any structure in a local or FEMA designated SFHA:

- i. Construction Drawings- before a building permit is issued for the anticipated construction activity;
- ii. Building Under Construction- before the framing of any building wall system. Not required, but is recommended that this certification be performed before any slab on grade or elevated slab is poured; and,
- iii. Finished Construction- prior to issuance of Certificate of Occupancy and only after all construction has been completed.