# ARTICLE 9

# PERFORMANCE GUIDELINES

## 9.1 GENERAL

### 9.1.1 Purpose:

The sections enumerated in this article are guidelines, and are intended to be benchmark indicators of what standards could be acceptable. They are further intended to allow alternate designs which would produce results similar to these performance standards and similar protection to the public. The objective of these performance standards is not to suggest single methodological standards of acceptance exclusive of all others. Rather they establish what would otherwise be allowed in the absence of an acceptable alternative.

### 9.1.2 Constraints:

The alternative design solutions are constrained by the Design Requirements of Article 5, the Access Requirements and Street and Right-of-Way Requirements and the Street Construction Standards of Article 6, and the Grading, Detention, Drainage Requirements of Article 8, as well as the Purpose and Intent of these Regulations.

### 9.1.3 Documentation Required:

In the event that the applicant suggests an alternative, studies and reports conducted by professionals currently licensed in the State of Georgia will be required to be submitted to and approved by the City. These studies and reports must clearly relate to the desired results and purposes expressed or implied in the applicable performance standard. Once the City has approved an alternative, it shall become a required standard applicable to the specific approved permit only.

## 9.2 LOTS

9.2.1 Lots should be designed generally such that they are no more than four (4) times as deep as they are wide at the building setback line, unless excepted by the City.

a. The City may require notation that a House Location Plan (HLP) is required to be approved prior to issuance of a building permit on certain lots when particular care in

locating the house or other improvements will be necessary. Such lots include, but are not limited to:

(1) a lot which presents particular or unusual difficulties for a builder to meet minimum required building setbacks;

(2) a lot upon which is located an easement of unusual configuration;

(3) a lot containing floodplain but upon which no fill or other encroachment into the floodplain is anticipated at the time the Final Plat is filed;

(4) a lot upon which is located all or a part of a storm water detention facility;

(5) a lot upon which is located a buffer which was required by the Zoning Ordinance as a condition of zoning approval;

(6) all duplex lots; and

(7) all lots within, or partially within, the Chattahoochee River Corridor, or containing a River Corridor Tributary Buffer Zone.

b. The City may require notation that a Residential Drainage Plan (RDP) is required to be approved prior to issuance of a building permit on certain lots where additional (site specific) engineering will be necessary to properly grade the lot or locate the building or other improvements. Such lots include, but are not limited to:

(1) a lot containing floodplain where fill or other encroachment into the floodplain is planned or reasonably expected;

(2) a lot containing severe topographic features indicating the building site; and

(3) a lot containing a drainage easement with a pipe discharge or other facilities, or flow characteristics which may adversely affect the location of a building or other site improvements.

c. The City may require notation that a Residential Drainage Study (RDS) is required to be approved prior to issuance of a building permit on certain lots where particular attention to site grading will be necessary, but formal engineering is not needed. Such an RDS is conducted in the field where the effect of the site grading must be accomplished with adequate care so as not to create a drainage problem on neighboring property.

9.2.2 Side lot lines generally should be at right angles (90 degrees) to straight street lines or radial to curved street lines as much as practical. Side lot lines should be radial to the radius points of all cul-de-sacs. Variations of more than ten (10) degrees shall require approval of the City, but shall be approved when appropriate to the reasonable lotting pattern of the subdivision, efficient use of the land relative to topographic conditions, or provision of improved building sites over those which would result without variation of the side lot lines.

9.2.3 Corner lots shall be sufficiently larger so that they have the same width between minimum side setback lines as an interior lot, but in no case shall more than seventy-five (75) feet between side setback lines on a corner lot be required.

## 9.3 BLOCKS

9.3.1 The length, widths, and shapes of blocks shall be determined with regard to:

a. Provision of adequate building sits suitable to the special needs of the type of use contemplated.

b. Application zoning requirements as to lot size and dimensions.

c. Needs for convenient access, circulation, control, and safety of street traffic.

d. Limitations and opportunities of topography.

9.3.2 In blocks over one thousand (1,000) feet long, the City may, when existing or proposed pedestrian circulation patterns or public gathering places so justify, require pedestrian ways or pedestrian access easements, as appropriate, through the block.

## 9.4 ACCESS

A maximum number of two hundred (200) residential dwelling units shall be allowed to be constructed with only one (1) street outlet on an existing public street. If a second access to an existing public road is not available or, in the opinion of the City, could induce non-residential traffic through the development, a single entrance may be allowed if designed with a traffic signal and/or sufficient right-of-way and improvements to provide a protected left-turn lane, subject to the approval of the City Engineer.

## 9.5 ROADWAY DESIGN

### 9.5.1 Street Grades and Design Speeds:

a. Minimum grade for all local and minor collector streets shall be one and one-half (1.5) percent. Minimum grades for all major collector and arterial streets shall conform to Georgia DOT practice.

b. Minimum grade of less than one and one-half (1.5) percent on a local street may be approved by the City, based on adequate engineering designs, where at least one and one-half (1.5) percent cannot reasonably be achieved due to topographical limitations imposed by the land. In such cases, a record drawing and such computations as necessary shall be provided after construction to establish that the street will drain in accordance with these Regulations. Street sections where unacceptable pooling, excessive spread at catch basins or other hazardous conditions occur shall be reconstructed or otherwise improved to eliminate such conditions.

c. Minimum vehicle design speeds and maximum grades allowable in the City of Buford by street classification shall be as shown in Table 9-A.

d. Maximum grade on any cul-de-sac turnaround shall be six (6) percent.

TABLE 9-A

MINIMUM DESIGN SPEEDS AND MAXIMUM GRADES

| STREET CATEGORY | MAXIMUM GRADE | DESIGN SPEED |
|---|---|---|
| Principal Arterial | 6% | 60 MPH |
| Major Arterial | 8% | 50 MPH |
| Minor Arterial | 10% | 40 MPH |
| Major Collector | 10% | 40 MPH |
| Minor Collector | 10% | 30 MPH |
| Local | 15% * | 20 MPH |

* Grades between 12% and 14% shall not exceed a length of one hundred and fifty (150) feet and shall require an "as graded" survey prior to the installation of the curb or utilities. The distance shall be measured as the tangent length between points of curvature.

9.5.2 Vertical Street Alignment:

a. All changes in street profile grades having an algebraic difference greater than one (1) percent shall be connected by a parabolic curve having a minimum length (L) equal to the product of the algebraic difference between the grades in percent (A) and the design constant (K) assigned to the street according to its category (i.e., L = KA).

b. Constant (K) values are shown in the Table 9-B for both desirable and minimum acceptable ("hardship") conditions. In all cases, the "desirable" value shall be used, unless it cannot be achieved due to topographic conditions beyond the developer's control. In such hardship situations, the City may approve a lesser value to the extent required by the hardship situation, but in no event less than the value shown in the table as "minimum".

TABLE 9-B

CONSTANT (K) VALUES FOR VERTICAL CURVES

| STREET CATEGORY | CREST CURVES MINIMUM | CREST CURVES DESIRABLE | SAG CURVES MINIMUM | SAG CURVES DESIRABLE |
|---|---|---|---|---|
| Principal Arterial | 200 | 320 | 125 | 155 |
| Major Arterial | 100 | 170 | 80 | 110 |
| Minor Arterial | 55 | 80 | 55 | 70 |
| Major Collector | 55 | 80 | 55 | 70 |
| Minor Collector | 30 | 30 | 35 | 35 |
| Local | 10 | 10 | 20 | 20 |

9.5.3 Horizontal Street Alignment:

a. All new streets shall adhere to the following standards governing horizontal curvature and super-elevation:

TABLE 9-C

HORIZONTAL CURVES

| STREET CATEGORY | MINIMUM RADIUS (FT) | MAXIMUM SUPER-ELEVATION |
|---|---|---|
| Principal Arterial | 1333 | 0.06 |
| Major Arterial | 833 | 0.06 |
| Minor Arterial | 560 | 0.04 |
| Major Collector | 560 | 0.04 |
| Minor Collector | 300 | 0.04 * |
| Local | 120 | 0.00 |

* No super-elevation will be allowed on Minor Collectors internal to residential subdivisions.

b. Super-elevation for horizontal curves shall be calculated utilizing the following formula:

R = minimum radius of curve

$$R = \frac{v^2}{15 (e + f)}$$

v = vehicle design speed, (MPH)
e = rate of super-elevation (decimal of a foot rise per foot of roadway width)
f = side friction factor, as follows:

| Vehicle Design Speed (v) | 30 | 40 | 50 | 60 |
|---|---|---|---|---|
| Side Friction Factor (f) | .16 | .15 | .14 | .12 |

c. Widening section along existing streets shall be designed reflecting existing curvature and super-elevation, if any, unless the existing street has been included in a specific design by the County or Georgia DOT which calls for different standards, in which case the project will be coordinated with the overall design.

d. Super-Elevation Runoff:

Roadway edge curves shall be provided for tangent runout (bringing edge from a normal crown to centerline elevation) and super-elevation runoff (from the end of tangent runout to the point of design super-elevation) in accordance with design standards of the Georgia DOT or other professional engineering standards.

e. Tangents and Compound Curves:

Between reverse horizontal curves, there shall be not less than the minimum centerline tangents shown in Table 9-D unless otherwise specified by the Georgia DOT Compound radii curves are prohibited. At least the “desirable” length shall be provided unless hardship conditions of topography or property configuration will not allow lengths greater than those shown as “minimum”. For compound circular curves, the ratio of the flatter radius to the sharper radius shall not exceed one and one-half (1.5) to one (1).

TABLE 9-D

TANGENTS

| STREET CATEGORY | MINIMUM TANGENT LENGTH | DESIRABLE TANGENT LENGTH |
|---|---|---|
| Principal Arterial | 150 | 180 Feet |
| Major Arterial | 125 | 150 Feet |
| Minor Arterial | 100 | 120 Feet |
| Major Collector | 100 | 120 Feet |
| Minor Collector | 75 | 90 Feet |
| Local | 50 | 60 Feet |

NOTE: Minimum tangents are based on the distance traveled in 1.7 seconds at the design speed for each category of street. Desirable length is based on distance traveled in 2.0.

9.5.4 Horizontal and Vertical Clearances:

a. Horizontal Clearances:

(1) A shoulder of no less than eleven (11) feet from the back of curb or edge of pavement, appropriately graded and having gentle slopes of not more than one-half (½) inch per foot and rounded cross-sectional design shall be maintained along all streets. Beyond the shoulder but within the right-of-way, slopes shall not exceed one (1) foot of rise for each two (2) feet of horizontal distance on a cut slope, and one foot of fall for each three (3) feet of horizontal distance on a fill slope.

(2) Along all public streets, a clear zone shall be provided for a minimum distance of six (6) feet from back of curb or edge of pavement wherein nothing may be located above ground except traffic/street signs and yielding mail boxes. The clear zone shall be clear of all unyielding objects such as trees, or unyielding signs, structures around mail boxes, utility poles, light poles, and any other fixed objects that might severely damage an out-of-control vehicle.

(3) At selected locations, such as the outside of a sharp curve, a wider clear zone with greater horizontal

clearances provided to any roadside obstruction may be required.

b. Vertical Clearances:

Vertical clearance at underpasses shall be at least fourteen and one-half (14.5) feet over the entire roadway width.

## 9.6 STREET INTERSECTIONS

### 9.6.1 Angle of Intersection:

Intersections shall generally be at right angles and shall not be at an angle of less than eighty five (85) degrees unless approved by the City, nor less than eighty (80) degrees unless the intersection is signalized in which case the angle of the intersection may be reduced subject to the review and approval of the City.

### 9.6.2 Maximum Grade

Street intersection should be designed with a flat grade wherever possible, but in no case should the grade exceed two (2) percent in normal situations (or four (4) percent in topographical hardship situations on local streets).

### 9.6.3 Intersection Approaches: Horizontal Alignment

a. New local streets which approach an intersection with a street in a category higher than itself on a horizontal curve having a centerline radius less than one hundred and forty (140) feet shall provide a tangent section of roadway at least thirty (30) feet long. Minor collectors approaching an intersection with a major thoroughfare on a horizontal curve having a centerline radius of less than five hundred and fifty (550) feet shall also provide the thirty (30) foot tangent section. The tangent length shall be measured along the centerline of the street, from the right-of-way line of the intersecting street, extended to the point of tangency with the centerline of the curve section.

b. New major thoroughfares shall provide tangent sections at intersections with streets in equal or higher categories as needed too provide adequate stopping distances at their design speeds.

9.6.4 Intersection Approaches: Vertical Alignment:

a. For intersections with local or minor collector streets, a leveling of the street at a grade not exceeding two (2) percent shall be provided but no level approach distance is required for streets approaching at less than seven (7) percent, and a minimum twenty-five (25) foot level approach distance shall be provided for streets approaching at a grade of seven (7) percent or more. (See Standard Drawings.)

b. As a street approaches an intersection with a major thoroughfare, there shall be a suitable leveling of the street at a grade not exceeding two (2) percent and for a distance not less than the following minimums:

TABLE 9-E

APPROACH DISTANCES AT MAJOR INTERSECTIONS

| APPROACHING STREET CATEGORY | MINIMUM APPROACH DISTANCE * |
|---|---|
| Principal Arterial | 100 Feet |
| Major Arterial | 100 Feet |
| Minor Arterial | 100 Feet |
| Major Collector | 75 Feet |
| Minor Collector | 75 Feet |
| Local | 50 Feet |

***** Distance of the approach is measured from edge of pavement of the intersecting street to the point of curvature in the approaching street.

9.6.5 Intersection Radii:

Intersection radii for roadways measured at back of curb and for the right-of-way lines shall be as follows. For intersecting streets of different classification, the large radii shall be provided. In all cases, adequate right-of-way shall be provided to maintain a minimum of eleven (11) feet from back-of-curb. Larger radii may be

required for streets intersecting at angles less than ninety (90) degrees.

TABLE 9-F

INTERSECTION RADII

| STREET CATEGORY | ROADWAY RADII | R-O-W RADII * |
|---|---|---|
| Arterial | 40 Feet | 20 Feet |
| Major Collector | 40 Feet | 20 Feet |
| Minor Collector – Residential | 25 Feet | 9 Feet |
| Minor Collector – Non-Residential | 40 Feet | 20 Feet |
| Local – Residential | 20 Feet | 9 Feet |
| Local – Commercial or Office | 25 Feet | 11 Feet |
| Local – Industrial | 40 Feet | 25 Feet |

* Intersecting right-of-way lines may be joined by an arc having the minimum radius shown, or by a miter which cuts across the right-of-way lines connecting the points where the required radius would have otherwise been tangent.

9.6.6 Islands:

Islands in street intersections shall conform to the design requirements of the Standard Drawings. In no case shall anything in an island extend more than three (3) feet above the street grade within the right-of-way, except traffic regulatory devices and other infrastructure erected or approved by the City of Buford. No island shall be approved which contains less than one hundred (100) square feet.

9.6.7 Intersection Corner Sight Distance:

a. Intersections shall be designed with adequate corner sight distance for each street which approaches a street in an equal or higher street category (except an intersection of two local streets). Where necessary, backslopes shall be

flattened and horizontal or vertical curves lengthened to provide the minimum required sight distance.

b. The minimum corner sight distance from the approaching street shall be equal to or exceed ten (10) times the regulated speed of the intersecting street, as measured from the center of the approaching street in both directions along the right-of-way line of the intersecting street. As an alternative, the minimum corner sight distance requirement may be calculated using AASHTO "Policy on Geometric Design of Highways and Streets", Chapter 9 (at-grade intersection), latest edition. The sight distance shall provide clear visibility of an object four (4) feet above the intersecting street viewed from the centerline of the approaching street at the right-of-way of the intersecting street, at a height of three and one-half (3.5) feet above the ground.

9.6.8 Obstructing Visibility at Intersections:

On any corner lot, within an area formed by the lot lines on the street sides of such lot and a line (miter) joining points on such lots lines located at a distance of twenty (20) feet from the point of their intersection, the following shall apply:

a. There shall be no fence or wall or hedge higher than three (3) feet.

b. There shall be no obstruction to vision, other than a post or column or tree (except standards erected by the City of Buford) not exceeding one (1) foot in greatest cross-sectional dimension, between a height of three (3) feet and a height of fifteen (15) feet above the established grade of either of the intersecting streets.

9.6.9 Turning Lanes at Intersections:

Left turning lanes shall be provided on all new internal project streets approaching an intersection with a major thoroughfare, and may be required in other locations to meet traffic demand and safe operations. Right turning lanes may be required to meet traffic demands or safety concerns. When provided, turning lanes shall meet the following criteria:

a. Storage Length – A minimum of one hundred fifty (150) feet of storage length for turning lanes on any arterial roadway shall be used. A minimum of one hundred (100) feet of storage length for turning lanes on all collectors shall be used.

b. Taper Length – The minimum taper length shall be fifty (50) feet.

c. Left turning lanes from arterial roads shall be subject to longer storage lengths and tapers and as determined on a case by case basis.

## 9.7 DRIVEWAY INTERSECTIONS

### 9.7.1 Angle and Improvements:

Driveways shall generally intersect streets at right angles. The portion of a driveway located within a public right-of-way shall be paved, if any. Driveways providing access to parking lots, which contain six (6) or more spaces, shall be paved in accordance with the parking lot requirements of the Zoning Ordinance.

### 9.7.2 Driveway Design Standards:

a. Driveways serving single-family detached or duplex residences may be no less than ten (10) feet wide at the right-of-way line and shall provide a radius to the back of curb or edge of pavement of the roadway of no less than five (5) feet. All other driveway curb cuts on public streets shall conform to the standards shown on the driveway details contained in the Standard Drawings, by land use type as follows:

(1) Driveway Detail 1 (32’ Width, 25’ Radius) for:

(a) Service Stations;
(b) Commercial Sites (over 80,000 square feet);
(c) Office/Institutional Complexes (over 100,000 square feet;
(d) Apartment/Condo Complexes (over 200 units); and,
(e) Mobile Home Complexes (over 200 lots).

(2) Driveway Detail 2 (28’ Width, 25’ Radius) for:

(a) Commercial Sites (80,000 square feet or less);
(b) Office/Institutional Complexes (100,000 square feet or less);
(c) Apartment/Condo Complexes (200 units or fewer); and,
(d) Mobile Home Complexes (200 units or fewer).

(3) Driveway Detail 3 (32’ Width, 40’ Radius) for:

(a) Industrial Sites

(4) Driveway Detail 4 (Optional Design with Island) for:

(a) Private Commercial/Office Street Entrances;
(b) Private Entrances to Apartment/Condo Complexes (over 200 units); and,
(c) Private Entrances to Mobile Home Complexes (over 200 lots).

b. All driveways and driveway curb cuts on State highways shall conform to Georgia DOT standards unless City requirements are more restrictive.

9.7.3 Auxiliary Lanes:

Along any arterial or collector street, a deceleration lane, acceleration lane, larger turning radius, traffic islands, or other devices or designs may be required to avoid specific traffic hazards created by the proposed driveway section unless extraordinary circumstances prevent such actions as determined by the Planning Director.

9.7.4 Corner Sight Distance:

All driveways approaching a minor collector or major thoroughfare shall provide adequate corner sight distance. The minimum corner sight distance from the driveway shall be equal to or exceed ten (10) times the regulated speed of the intersecting street, as measured from the center of the driveway in both directions along the right-of-way line of the intersecting street. As an alternative, the minimum corner sight distance requirement may be calculated using AASHTO “Policy on Geometric Design of Highways and Streets”, Chapter 9 (at grade intersections), latest edition. The sight distance shall provide clear visibility of an object four (4) feet above the intersecting street viewed from the centerline of the driveway at the right-of-way line of the intersecting street, at a height of three and one-half (3.5) feet above the ground.

9.7.5 Separation and Spacing:

All driveways except those serving residential units on individual lots shall be recommended to meet the following criteria:

a. Minimum separation from a street intersection: one hundred (100) feet from centerline of driveway to nearest right-of-way line of the intersecting street, extended. For any driveway on a major thoroughfare having a centerline between one hundred (100) feet and two hundred (200) feet from the intersecting street right-of-way line, access restrictions may be imposed to avoid traffic hazards. Greater separation may be required for safe operation of a free-right lane, acceleration or deceleration lane, etc.

b. Minimum separation between driveways along the same side of a major thoroughfare: one hundred (100) feet between centerline as measured along the roadway edge or back of curb.

c. Whenever possible, proposed driveways along one side of a street shall coincide with existing or proposed driveways on the opposite side of such street.

d. Maximum number of driveways serving a single project: one (1) for each four hundred (400) feet of property frontage, or fraction thereof per street, along a major thoroughfare. This is not meant to be a spacing standard only at expression of the total number of driveways that permitted serving a single project. Provided however, that Buford Highway/Highway 23 shall not be subject to the above guideline but shall be subject to the Buford Highway Masterplan duly adopted by the City of Buford and incorporated by reference herein.

## 9.8 STORMWATER DETENTION GUIDELINES

### 9.8.1 General:

a. Stormwater detention facilities shall be designed so that their peak release rates, when combined with those of all detention bypass areas in the same basin, produce peak flow rates and flow velocities at the site's boundary line no greater than those which occurred at the same location for pre-developed conditions.

b. The positive effects of stormwater management via on-site detention facilities diminish rapidly as the distance downstream from the point of discharge increases, and the smaller the facility's contribution is, as a percentage of the total runoff contributing to downstream flow, the shorter the distance downstream that the benefits are realized. Because of these limitations, on-site detention is effective at

controlling flooding only when flow from the facility is a significant percentage of the total flow at the point of interest, and only if the point of interest is “immediately” downstream. The concepts of “immediately downstream” and “significant percentage” of total flow are inseparable. The portion of a receiving watercourse (one which receives and conveys runoff from a site) which lies downstream from the site to the point where the area of the site is ten (10) percent of the total drainage area, shall generally be considered to constitute that portion of the watercourse which is “immediately” downstream. However, the total flow in the receiving watercourse may become very large, relative to the flow contributed by the project site, within a much shorter distance. For this reason, the “substantial percentage” test must also always be applied. For purposes of these Regulations, the flow from a site represents a “significant percentage” of the total flow in a watercourse only when the ratio of the peak flow rate from the site to the peak flow rate in the watercourse (including the contribution from the project site) is greater than five (5) percent.

c. Peak flow rate control shall normally be provided only for the 2-year, 5-year, 10-year, and 25-year frequency storm events. However, under certain conditions, the 100-year event must also be detained to the pre-developed rate. Such control of the 100-year event shall be provided when failure to do so would result in flooding of other habitable dwellings, property damage, or public access and/or utility interruption.

d. For any stormwater analysis, the composite “C” (Rational Method) or CN (SCS Method) used for analysis of pre-development conditions shall not exceed 0.25 or 60, respectively, unless prior approval has been obtained from the City. A pre-design conference between the design engineer and appropriate City personnel, which may in certain straightforward cases, be conducted via the telephone if required.

e. Rational Method runoff coefficients used for analysis of pre- and post-development conditions shall be consistent with those shown in Table 9-G.

TABLE 9-G

RATIONAL METHOD RUNOFF COEFFICIENTS

| LAND USE | TYPE OF TERRAIN STEEP (Over 7&) | ROLLING (2% - 7%) | FLAT (Under 2%) |
|---|---|---|---|
| Wooded: | | | |
| Heavily | .21 | .18 | .15 |
| Moderately | .25 | .21 | .18 |
| Lightly | .30 | .25 | .21 |
| Lawns/Grassed Areas | .35 | .30 | .26 |
| Bare Soil (Uncompacted) | .60 | .60 | .50 |
| Impervious | .98 | .95 | .95 |
| Residential: | | | |
| 25,500 S. F. Lots | .40 | .36 | .32 |
| 15,000 S. F. Lots | .50 | .45 | .40 |
| 12,000 S. F. Lots | .50 | .45 | .40 |
| Townhomes (45% Impervious) | .65 | .60 | .55 |
| Apartments (75% Impervious) | .82 | .79 | .74 |
| Pasture: | | | |
| Good Condition | .25 | .21 | .18 |
| Average Condition | .45 | .40 | .36 |
| Poor Condition | .55 | .50 | .45 |
| Farmland (Non-Growing Season) | .50 | .46 | .41 |
| Lakes & Detention Basins | 1.00 | 1.00 | 1.00 |
| Commercial & Industrial | (Calculate on case-by-case basis.) | | |

9.8.2 Dam Design and Construction Criteria:

a. Detention facilities, which take the form of normally dry basins, ponds, or lakes usually, are created by damming a drainage way or watercourse. Such dams can take a variety of different forms, the most common being earthen embankments and reinforced concrete walls. Each type of dam has different characteristics, and the selection of the most appropriate type for a particular site should be made by a professional engineer and based on the physical features of the dam site, the purpose of the dam, the type of impoundment, safety, and maintenance requirements.

b. For purposes of these Regulations, dams will be addressed separately for each of the three (3) most frequently encountered types of detention facilities: normally dry

basins, ponds, and lakes. A normally dry basin is one designed to impound stormwater runoff for only a brief period of time following a storm event. The vast majority of the time, the basin will completely dry except for any normal stream flows which pass through unimpeded. Lakes and ponds, on the other hand, are designed to impound a body of water at least several feet in depth on a more-or-less permanent basis. Lakes and ponds vary from one another only in terms of magnitude. The magnitude of a lake is determined primarily from the height of its dam, the size of its contributing drainage area, and the volume of water it is capable of impounding. For purposes of these Regulations, a pond is any lake having a dam height of less than twenty (20) feet, a drainage area of less than one hundred (100) acres, and which is incapable of impounding more than ten (10) acre-feet of water.

c. All dam design is to be certified by a professional engineer currently registered in the State of Georgia.

d. Dams for normally dry detention basins shall conform to the following:

(1) Dams for normally dry detention basins may be constructed of earth, reinforced concrete, mortared rubble, or other suitable materials.

(2) The design of any concrete or rubble wall over five (5) feet in height shall be certified by a Structural engineer currently registered as a professional engineer in the State of Georgia, and the structural design shall be based on soil tests certified by a geotechnical engineer currently registered as a professional engineer in the State of Georgia.

(3) Any non-earthen structure shall be designed to prevent piping failure through its subgrade and abutments.

(4) The construction of walls over five (5) feet in height shall be monitored and approved by a qualified material testing company.

(5) Earthen dams for normally dry detention basins shall have a top width of no less than eight (8) feet.

(6) For earthen dams for normally dry detention basins, there shall be at least one and one-half (1½) feet of

vertical separation between the 100-year ponding elevation in the basin and the low point on the top of the dam. One (1) foot of this distance is to provide a margin of safety against overtopping of the dam and the other six (6) inches is to allow for settlement. No separation is required for a non-earthen dam, if it has been designed to overtop safely.

(7) More stringent design and construction criteria shall be sued for dams for normally dry detention basins whenever the probable consequences of dam failure are severe.

e. Dams for ponds shall conform to the following:

(1) Any engineer responsible for the design of a dam for a pond is expected to be knowledgeable of the criteria contained within the Georgia Safe Dams Act, Georgia Department of Natural Resources “Rules for Dam Safety” publication, and the U.S.D.A. Soil Conservation Service’s Technical Release No. 60 “Earth Dams and Reservoirs”. The provisions of each are to be applied wherever applicable. Applicability shall be determined based upon site-specific constraints and downstream conditions. Consultation with appropriate City personnel both prior to and throughout the design process is encouraged.

f. Dams for lakes shall conform to the following:

Any engineer responsible for the design of a dam for a lake is expected to the thoroughly familiar with the criteria contained within the Georgia Safe Dams Act, Georgia Department of Natural Resources “Rules for Dam Safety” publication, and the U.S.D.A. Soil Conservation Service’s Technical Release No. 60 “Earth Dams and Reservoirs”. All design is to be in accordance with the applicable requirements contained in each of the above referenced publications.

9.8.3 Detention Facility Outlet Devices:

a. Because of the variables that may be associated with the choice of an outlet device for any given conditions, the design consultant is responsible for the selection of the device, subject to the review and approval of the City.

b. The City will include in its consideration the ease of maintenance, longevity of the system, freedom from congestion, practicality, and aesthetics in its review of the outlet device. The consultant should be guided by the Cityal preference of vertical weir designs since they have proven to generally meet most of the considerations expressed herein.

c. No orifice shall be smaller than three (3) inches in diameter. A trash rack shall protect an orifice smaller than fifteen (15) inches in diameter. A trash rack protecting an orifice shall have a surface area of at least ten (10) square feet. No opening in the trash rack shall have an area more than one-half (½) the size of the area of the orifice being protected. Two-stage trash racks, or screens having progressively smaller openings placed in series, are suggested. To facilitate outlet operation, curved or inclined trash racks designed to allow debris to rise with the water level are preferred. In all cases, trash racks shall be either hinged or removable to facilitate maintenance operations.

d. If the primary detention facility outlet is a conduit through a dam, and there is not an orifice, weir-box, or other flow-control device affixed to the upstream end, then the conduit shall be analyzed for both inlet and outlet control conditions. If an orifice or weir-box is affixed, then the conduit shall be analyzed to determine if any flows will occur for which outlet control conditions in the conduit, rather than the hydraulic characteristics of the flow-control structure, will determine the total flows occurring. In any case where the conduit through the dam is less than fifteen (15) inches in diameter, the trash rack provisions of “c” above shall be followed.

e. Unless the 100-year maximum flow velocity in a conduit through a dam forming a pond or a lake is less than ten (10) feet per second, and the hydraulic grade line for the 100-year condition is at or below the crown of the conduit for at least ninety (90) percent of its length, the conduit must be equal or superior to Class V reinforced concrete pipe in its structural characteristics.

9.8.4 Emergency Overflow Requirements:

a. For every type of detention facility, a planned safe flow path must be provided for conveyance of flows of water in excess of those for which the detention facility was designed. In many instances, this function can be provided through installation of an emergency spillway. Emergency spillways

are usually excavated open channels, either vegetated or paved with reinforced concrete.

b. Every earthen dam shall be provided with an open-channel emergency spillway, unless all of the following apply:

(1) The principal spillway is a closed conduit having a cross-sectional area that can pass one hundred twenty-five (125) percent of the 100-year storm routed peak discharge.

(2) The principal spillway is a closed conduit having a cross-sectional area of at least one (1) square foot per each three (3) acres of drainage area, of a maximum of twenty (20) square feet of surface area, whichever is less.

(3) The principal spillway capacity is at least equal to the capacity required for an open-channel emergency spillway.

(4) The low point of the dam crest is not in a fill section except for roadway embankments.

(5) A trash rack or other debris protection is provided on the outlet control.

c. Any portion of an emergency spillway excavated into a dam embankment or other fill section must be paved. Pavement material shall be either reinforced concrete or asphalt, as dictated by the design life of the dam and the potential consequences of its failure. Any portion of any emergency spillway excavated into natural ground shall be vegetated in accordance with the practices described in the “Manual for Erosion and Sediment Control in Georgia”.

d. In determining the necessary dimensions of an open-channel spillway for a normally dry basin, a pond, or a lake, the methodology contained in the “Earth Emergency Spillway Design Data” section of the “Manual for Erosion and Sediment Control in Georgia” should be used.

e. Emergency spillway capacity for earthen dams shall be as follows:

(1) For normally dry detention basins, ponds, and lakes having a dam height of less than nine (9) feet, and which are incapable of impounding more than twenty

(20) acre-feet of water, and for which the probable consequences of dam failure are not severe, an emergency spillway should be provided. Its capacity should be at least equal to the routed 100-year peak flow out of the detention facility assuming the principal spillway is blocked.

(2) For normally dry detention basins, ponds, and lakes, having a dam height of nine (9) feet or more and which are capable of impounding twenty (20) acre – feet or more of water, an emergency spillway should be provided. Its capacity should be at least equal to the greater of either the routed 100-year peak flow rate out of the facility assuming the principal spillway is blocked, or the routed one-fourth (¼) PMF hydrograph out of the facility. In cases when State or Federal regulations may require greater spillway capacity, those more stringent regulations shall govern.

f. Emergency overflow for non-earthen dams may take the form of planned structure overtopping. In such cases, however, care must be taken to prevent flows from eroding supporting soils along the toe of or immediately downstream from the dam so as to cause it to be undermined. The profile of the tope of the dam shall be so designed as to prevent flows along the ends of the structure, which might result in abutment erosion.

9.8.5 Parking Lot Detention Facilities:

a. Parking lot detention facilities shall generally be of one (1) of the two (2) following types:

(1) Depressed areas of pavement at drop inlet locations; and,

(2) Ponding areas along sections of raised curbing. The curbing in these areas is usually higher than a standard curbed section.

b. The Rational Method shall be utilized for all parking lot detention facility design.

c. Parking lot detention areas shall be located so as to restrict ponding to areas other than parking spaces ear buildings and to not encroach upon entrance drives.

d. The maximum depth of detention ponding in a parking lot, except at a flow control structure, shall be six (6) inches for a 10-year storm, and nine (9) inches for a 100-year storm. The maximum depth of ponding at a flow control structure shall be twelve (12) inches for a 100-yer storm.

e. In truck parking areas, the maximum depth of ponding shall be twelve (12) inches for the 10-year storm.

f. Detention ponding areas are to be drained within thirty (30) minutes after the peak inflow occurs.

g. Parking lot detention areas shall have a maximum surface slope of one (1) percent, and a maximum slope of five (5) percent.

9.8.6 Underground and Rooftop Detention Facilities:

The design of underground or rooftop detention facilities shall be in accordance with current engineering standard practice, and shall conform to the general spirit and intent of this Article. In the case of rooftop detention, permissible structural loads and weatherproofing shall be governed by the Building Code as adopted by the City of Buford.

9.8.7 Sediment Basins:

a. Stormwater management and sediment trapping functions should be separated whenever possible. Every erosion control design should seek first, to prevent erosion from occurring; secondly, to trap sediments as close to their sources as possible; and thirdly, provide a second-tier or backup line of defense against sediments leaving the project site. This backup defense will usually consist of check dams and/or sediment basins.

b. Whenever a sediment basin and a detention facility are both required on the same watercourse, the sediment basin should be located immediately upstream of the detention facility.

c. In unusual cases where a normally dry detention basin is planned to be used to trap sediment as well as provide stormwater control, the basin may be undercut to accommodate the sediment so that the required detention characteristics, particularly volume, will be maintained.

d. The design of sediment basins shall be in accordance with Appendix C of the “Manual for Erosion and Sediment Control in Georgia”.

9.8.8 Ponds and Lakes Not Used for Detention:

In such cases where a pond or lake is provided as part of a development, but is not planned to function as a stormwater detention facility, the same general and specific criteria contained in these Regulations shall apply, but may be modified in instances where a specific requirement is clearly detention oriented rather than safety-based.

## 9.9 CULVERTS AND PIPE COLLECTION SYSTEM GUIDELINES

9.9.1 Culverts:

a. Single-barrel or single-cell culvert structures are less prone to clogging and require less maintenance than multi-barrel or multi-cell installation and should therefore be used whenever feasible.

b. The maximum velocity in a culvert for the 100-year flow shall be fifteen (15) fps (feet per second). Velocities over ten (10) fps shall be considered a special design with particular attention required to pipe or structure invert protection and to fill slope, streambed, and stream bank stability.

c. The minimum allowable slope shall be that which produces a 2-year flow velocity of two and one-half (2.5) fps.

9.9.2 Piped Collection Systems:

a. The maximum velocity in a piped system for the design flow shall be fifteen (15) fps. Velocities over ten (10) fps shall be considered a special design with particular attention required to pipe invert protection and the ability of one receiving waterway or detention facility to accept the flow without damage.

b. The minimum allowable slope shall be that which produces a 2-year flow velocity of two and one-half (2.5) fps.

c. The maximum allowable slope for a storm drainage pipe shall be twenty-five (25) percent. Greater slopes may be approved if installation is in accordance with manufacturer’s recommendations. In cases where the slope is in excess of ten (10) percent, anchor collars may be required.

d. A minimum pipe cover of one (1) foot shall be required.

9.9.3 Outlet Location – Culverts and Piped Stems:

a. Outlet structures (such as headwalls) shall not be located closer to the project site's property line with an adjoining property than a flow distance equal to six (6) pipe diameters. For non-circular conduits, this distance shall be six (6) times the rise dimension of the conduit.

b. The invert elevations of a culvert or pipe outlet shall be no more than two (2) feet above the elevation of the bottom or the receiving watercourse at the outlet.

9.9.4 Energy Dissipation:

The maximum developed condition flow velocity at the project site's downstream property line with an adjoining tract shall not exceed the maximum pre-developed condition velocity. Calculations may be required to support this velocity standard on a case-by-case basis.

9.9.5 Discharge of Concentrated Flows:

a. The discharge of concentrated flows of stormwater into public roadways shall be avoided. In no case shall such concentrated flows, including flows from swales, ditches, draws, driveways, or piped systems, exceed the allowable peak flow rates in Table 9-H below.

b. In residential subdivisions, the peak flow rate associated with a 2-year storm shall not exceed one (1.0) cubic feet per second (cfs) along any property line between lots within fifty (50) feet of the building setback line for either lot, unless contained within a piped drainage system or maintained in a natural watercourse. This maximum flow rate may be increased to one and one-half (1.5) cfs in individual cases where there can be determined to be more than the normal separation between the dwellings on the affected lots.

TABLE 9-H

MAXIMUM FLOWS INTO STREETS

| STREET CLASSIFICATION | ALLOWABLE PEAK FLOW RATE FOR A 2-YEAR STORM |
|---|---|
| Local | 2.0 cfs |
| Minor Collector | 1.0 cfs |
| Other | 0.5 cfs |

## 9.10. POST-DEVELOPMENT STORMWATER MANAGEMENT FOR NEW DEVELOPMENT AND REDEVELOPMENT

### 9.10.1 Purpose and Intent

The purpose of this article is to protect, maintain and enhance the public health, safety, environment and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased post-construction stormwater runoff and nonpoint source pollution associated with new development and redevelopment. Proper management of post- construction stormwater runoff will minimize damage to public and private property and infrastructure, safeguard the public health, safety, environment and general welfare of the public, and protect water and aquatic resources. Additionally, the City of Buford is required to comply with several State and Federal laws, regulations and permits and the requirements of the Metropolitan North Georgia Water Planning District's regional water plan related to managing the water quantity, velocity, and quality of post- construction stormwater runoff.

### 9.10.2. Definitions

For this Article, the terms below shall have the following meanings:

*"administrator"* means the person appointed to administer and implement this Article on Post-Construction Stormwater Management for New Development and Redevelopment in accordance with Section 9.10.4.

*"applicant"* means a person submitting a land development application for approval.

*"BMP"* or "*best management practice"* means both structural devices to store or treat stormwater runoff and non-structural programs or practices which are designed to prevent or reduce the pollution of the waters of the State of Georgia.

*"BMP landscaping plan"* means a design for vegetation and landscaping that is critical to the performance and function of the BMP including how the BMP will be stabilized and established with vegetation. It shall include a layout of plants and plant names (local and scientific).

*"channel"* means a natural or artificial watercourse with a definite bed and banks that conveys continuously or periodically flowing water.

*"detention"* means the temporary storage of stormwater runoff in a stormwater detention facility for the purpose of controlling the peak discharge.

*"detention facility"* means a structure designed for the storage and gradual release of stormwater runoff at controlled rates.

*"development"* means new development or redevelopment.

*"extended detention"* means the storage of stormwater runoff for an extended period of time.

*"extreme flood protection"* means measures taken to prevent adverse impacts from large low-frequency storm events with a return frequency of 100 years or more.

*"flooding"* means a volume of surface water that exceeds the banks or walls of a BMP, or channel; and overflows onto adjacent lands.

*"GSMM"* means the latest edition of the Gwinnett County Stormwater Management Manual and its Appendices.

*"hotspot"* means a land use or activity on a site that has the potential to produce higher than normally found levels of pollutants in stormwater runoff. As defined by the administrator, hotspot land use may include gasoline stations, vehicle service and maintenance areas, industrial facilities (both permitted under the Industrial Stormwater General Permit and others), material storage sites, garbage transfer facilities, and commercial parking lots with high-intensity use.

*"impervious surface"* means a surface composed of any material that significantly impedes or prevents the natural infiltration of water into the soil.

*"Industrial Stormwater General Permit"* means the National Pollutant Discharge Elimination System (NPDES) permit issued by Georgia Environmental Protection Division to an industry for stormwater discharges associated with

industrial activity. The permit regulates pollutant levels associated with industrial stormwater discharges or specifies on-site pollution control strategies based on Standard Industrial Classification (SIC) Code.

*"infiltration"* means the process of percolating stormwater runoff into the subsoil.

*"inspection and maintenance agreement"* means a written agreement providing for the long-term inspection, operation, and maintenance of the stormwater management system and its components on a site.

*"land development application"* means the application for a land development permit on a form provided by City of Buford along with the supporting documentation required in Section 9.10.10(a).

*"land development permit"* means the authorization necessary to begin construction-related, land-disturbing activity

*"land disturbing activity"* means any activity which may result in soil erosion from water or wind and the movement of sediments into state water or onto lands within the state, including but not limited to clearing, dredging, grading, excavating, and filling of land. Land disturbing activity does not include agricultural practices as described O.C.G.A. 12-7-17(5) or silvicultural land management activities as described O.C.G.A. 12-7-17(6) within areas zoned for these activities.

*"linear transportation projects"* means construction projects on traveled ways including but not limited to roads, sidewalks, multi-use paths and trails, and airport runways and taxiways.

*"MS4 Permit"* means the NPDES permit issued by Georgia Environmental Protection Division for discharges from the City of Buford's municipal separate storm sewer system.

*"new development"* means land disturbing activities, structural development (construction, installation or expansion of a building or other structure), and/or creation of impervious surfaces on a previously undeveloped site.

*"nonpoint source pollution"* means a form of water pollution that does not originate from a discrete point such as a wastewater treatment facility or industrial discharge, but involves the transport of pollutants such as sediment, fertilizers, pesticides, heavy metals, oil, grease, bacteria, organic materials and other contaminants from land to surface water or groundwater via mechanisms such as precipitation, stormwater runoff, and leaching. Nonpoint source pollution is a by-product of land use practices such as agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

*"overbank flood protection"* means measures taken to prevent an increase in the frequency and magnitude of out-of-bank flooding (i.e. flow events that exceed the capacity of the channel and enter the floodplain).

*"owner"* means the legal or beneficial owner of a site, including but not limited to, a mortgagee or vendee in possession, receiver, executor, trustee, lessee or other person, firm or corporation in control of the site.

*"person"* means any individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, city, county or other political subdivision of the State, any interstate body or any other legal entity.

*"post-construction stormwater management"* means stormwater best management practices that are used on a permanent basis to control and treat runoff once construction has been completed in accordance with a stormwater management plan.

*"post-development"* means the conditions anticipated to exist on site immediately after completion of the proposed development.

*"practicability policy"* means the latest edition of the City's Policy on Practicability Analysis for Runoff Reduction.

*"pre-development"* means the conditions that exist on a site immediately before the implementation of the proposed development. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the existing conditions at the time before the first item being approved or permitted shall establish pre-development conditions.

*"pre-development hydrology"* means (a) for new development, the runoff curve number determined using natural conditions hydrologic analysis based on the natural, undisturbed condition of the site immediately before implementation of the proposed development; and (b) for redevelopment, the existing conditions hydrograph may take into account the existing development when defining the runoff curve number and calculating existing runoff, unless the existing development causes a negative impact on downstream property.

*"previously developed site"* means a site that has been altered by paving, construction, and/or land disturbing activity.

*"redevelopment"* means structural development (construction, installation, or expansion of a building or other structure), creation or addition of impervious surfaces, replacement of impervious surfaces not as part of routine maintenance, and land disturbing activities associated with structural or impervious development on a previously developed site. Redevelopment does not include such activities as exterior remodeling.

*"routine maintenance"* means activities to keep an impervious surface as near as possible to its constructed condition. This includes ordinary maintenance activities, resurfacing paved areas, and exterior building changes or improvements which do not materially increase or concentrate stormwater runoff, or cause additional nonpoint source pollution.

*"runoff"* means stormwater runoff.

*"site"* means an area of land where development is planned, which may include all or portions of one or more parcels of land. For subdivisions and other common plans of development, the site includes all areas of land covered under an applicable land development permit.

*"stormwater concept plan"* means an initial plan for post-construction stormwater management at the site that provides the groundwork for the stormwater management plan including the natural resources inventory, site layout concept, initial runoff characterization, and first round stormwater management system design.

*"stormwater management plan"* means a plan for post-construction stormwater management at the site that meets the requirements of Section 9.10.8(d) and is included as part of the land development application.

*"stormwater management standards"* means those standards set forth in Section 9.10.7.

*"stormwater management system"* means the entire set of non-structural site design features and structural BMPs for collection, conveyance, storage, infiltration, treatment, and disposal of stormwater runoff in a manner designed to prevent increased flood damage, streambank channel erosion, habitat degradation and water quality degradation, and to enhance and promote the public health, safety and general welfare.

*"stormwater runoff"* means flow on the surface of the ground, resulting from precipitation.

*"subdivision"* means when used as a verb means any division or redivision of a lot, tract or parcel, regardless of its existing or future use, into two or more lots, tracts or parcels. The term "subdivision" shall mean the act or process of dividing property. When used as a noun, where appropriate to context, the term "subdivision" also may be used in reference to the aggregate of all lots in common ownership at the time of division. The following properties, however, shall not, for the purpose of this ordinance, be deemed subdivisions: A). The combination or recombination of portions of previously platted lots of record, where the total number of lots is not increased and the resultant lots of record are in compliance with the Zoning Ordinance, B) Division of land into parcels having five (5) or more acres where no new street or roadway is involved, C) Division of land into five (5) or fewer lots, provided: 1) each lot abuts an existing public

street, 2) no alteration of existing utility installations is involved, and 3) the Planning Commission is notified of such division through a plat and executes a formal release of the property for recording and development purposes.

Other terms used but not defined in this Article shall be interpreted based on how such terms are defined and used in the GSMM and the City of Buford's MS4 permit.

9.10.3. Adoption and Implementation of the GSMM; Conflicts and Inconsistencies

(a) In implementing this Article, the City of Buford shall use and require compliance with all relevant design standards, calculations, formulas, methods, and other guidance from the GSMM as well as all related appendices.

(b) This Article is not intended to modify or repeal any other Article, ordinance, rule, regulation or other provision of law, including but not limited to any applicable stream buffers under state and local laws, and the Georgia Safe Dams Act and Rules for Dam Safety. In the event of any conflict or inconsistency between any provision in the City of Buford's MS4 permit and this Article, the provision from the MS4 permit shall control. In the event of any conflict or inconsistency between any provision of this Article and the GSMM, the provision from this Article shall control. In the event of any other conflict or inconsistency between any provision of this Article and any other ordinance, rule, regulation or other provision of law, the provision that is more restrictive or imposes higher protective standards for human health or the environment shall control.

(c) If any provision of this Article is invalidated by a court of competent jurisdiction, such judgment shall not affect or invalidate the remainder of this Article.

9.10.4. Designation of Administrator

The City Manager or the City Manager's designee may from time to time appoint someone to administer and implement this Article.

9.10.5. Applicability Criteria for Stormwater Management Standards

This Article applies to the following activities:

(a) New development that creates or adds 5,000 square feet or greater of new impervious surface area or that involves land disturbing activity of 1 acre of land or greater;

(b) Redevelopment (excluding routine maintenance and exterior remodeling) that creates, adds, or replaces 5,000 square feet or greater of new impervious surface area or that involves land disturbing activity of 1 acre or more;

(c) New development and redevelopment if

(i) such new development or redevelopment is part of a subdivision or other common plan of development, and

(ii) the sum of all associated impervious surface area or land disturbing activities that are being developed as part of such subdivision or other common plan of development meets or exceeds the threshold in (a) and (b) above;

(d) Any commercial or industrial new development or redevelopment, regardless of size, that is a hotspot land use as defined in this Article; and

(e) Linear transportation projects that exceed the threshold in (a) or (b) above, unless exempt by the City of Buford per Section 9.10.6.

9.10.6. Exemptions from Stormwater Management Standards

This Article does not apply to the following activities:

(a) Land disturbing activity conducted by local, state, authority, or federal agencies, solely to respond to an emergency need to protect life, limb, or property or conduct emergency repairs;

(b) Land disturbing activity that consists solely of cutting a trench for utility work and related pavement replacement;

(c) Land disturbing activity conducted by local, state, authority, or federal agencies, whose sole purpose is to implement stormwater management or environmental restoration;

(d) Repairs to any stormwater management system deemed necessary by the administrator;

(e) Additions or modifications to existing single-family detached or duplex residential structures;

(f) Individual single-family residential lots that are not part of a subdivision or phased development project.

(g) Agricultural practices as described O.C.G.A. 12-7-17(5) within areas zoned for these activities with the exception of buildings or permanent structures that exceed the threshold in 9.10.5 (a) or (b);

(h) Silvicultural land management activities as described O.C.G.A. 12-7-17(6) within areas zoned for these activities with the exception of buildings or permanent structures that exceed the threshold in 9.10.5 (a) or (b);

(i) Installations or modifications to existing structures solely to implement Americans with Disabilities Act (ADA) requirements, including but not limited to elevator shafts, handicapped access ramps and parking, and enlarged entrances or exits; and

(j) Linear transportation projects being constructed by City of Buford to the extent the administrator determines that the stormwater management standards may be infeasible to apply, all or in part, for any portion of the linear transportation project.

9.10.7. Stormwater Management Standards

Subject to the applicability criteria in Section 9.10.5 and exemptions in Section 9.10.6, the following stormwater management standards apply. Additional details for each standard can be found in the GSMM:

(a) Design of Stormwater Management System: The design of the stormwater management system shall be in accordance with the applicable sections of the GSMM as directed by the administrator. Any design which proposes a dam shall comply with the Georgia Safe Dams Act and Rules for Dam Safety as applicable.

(b) Natural Resources Inventory: Site reconnaissance and surveying techniques shall be used to complete a thorough assessment of existing natural resources, both terrestrial and aquatic, found on the site. Resources to be identified, mapped, and shown on the Stormwater Management Plan, shall include, at a minimum (as applicable):

(i) Topography (minimum of 2-foot contours) and Steep Slopes (i.e., Areas with Slopes Greater Than 15%),
(ii) Natural Drainage Divides and Patterns,
(iii) Natural Drainage Features (e.g., swales, basins, depressional areas),
(iv) Natural feature protection and conservation areas such as wetlands, lakes, ponds, floodplains, stream buffers, drinking water wellhead protection areas and river corridors,
(v) Predominant soils (including erodible soils and karst areas), and

(vi) Existing predominant vegetation including trees, high quality habitat and other existing vegetation.

(c) Better Site Design Practices for Stormwater Management: Stormwater management plans shall preserve the natural drainage and natural treatment systems and reduce the generation of additional stormwater runoff and pollutants to the maximum extent practicable. Additional details can be found in the GSMM.

(d) Stormwater Runoff Quality/Reduction: Stormwater Runoff Quality and Reduction shall be provided by using the following:

(i) For development with a stormwater management plan submitted before January 5, 2021, the applicant may choose either (A) Runoff Reduction or (B) Water Quality.

(ii) For development with a stormwater management plan submitted on or after January 5, 2021, the applicant shall choose (A) Runoff Reduction and additional water quality shall not be required. To the extent (A) Runoff Reduction has been determined to be infeasible for all or a portion of the site using the Practicability Policy, then (B) Water Quality shall apply for the remaining runoff from a 1.2 inch rainfall event and must be treated to remove at least 80% of the calculated average annual post-development total suspended solids (TSS) load or equivalent as defined in the GSMM.

(A) Runoff Reduction - The stormwater management system shall be designed to retain the first 1.0 inch of rainfall on the site using runoff reduction methods, to the maximum extent practicable.

(B) Water Quality – The stormwater management system shall be designed to remove at least 80% of the calculated average annual post-development total suspended solids (TSS) load or equivalent as defined in the GSMM for runoff from a 1.2 inch rainfall event.

(iii) If a site is determined to be a hotspot as detailed in Section 9.10.5, the City of Buford may require the use of specific or additional components for the stormwater management system to address pollutants of concern generated by that site.

(e) Stream Channel Protection: Stream channel protection shall be provided by using all of the following three approaches:

(i) 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event;

(ii) Erosion prevention measures, such as energy dissipation and velocity control; and

(iii) Preservation of any applicable stream buffer.

(f) Overbank Flood Protection: Downstream overbank flood protection shall be provided by controlling the post-development peak discharge rate to the pre-development rate for the 25-year, 24-hour storm event.

(g) Extreme Flood Protection: Extreme flood protection shall be provided by controlling the 100-year, 24-hour storm event such that flooding is not exacerbated.

(h) Downstream Analysis: Due to peak flow timing and runoff volume effects, some structural components of the stormwater management system fail to reduce discharge peaks to pre-development levels downstream from the site. A downstream peak flow analysis shall be provided to the point in the watershed downstream of the site or the stormwater management system where the area of the site comprises 10% of the total drainage area in accordance with Section 3.1.9 of the GSMM. This is to help ensure that there are minimal downstream impacts from development on the site. The downstream analysis may result in the need to resize structural components of the stormwater management system.

(i) Stormwater Management System Inspection and Maintenance: The components of the stormwater management system that will not be dedicated to and accepted by the City of Buford, including all drainage facilities, best management practices, credited conservation spaces, and conveyance systems, shall have an inspection and maintenance agreement to ensure that they continue to function as designed. All new development and redevelopment sites are to prepare a comprehensive inspection and maintenance agreement for the on-site stormwater management system. This plan shall be written in accordance with the requirements in Section 9.10.19.

9.10.8. Pre-Submittal Meeting, Stormwater Concept Plan, and Stormwater Management Plan Requirements

(a) Before a land development permit application is submitted, an applicant may request a pre-submittal meeting with the City of Buford. The pre-submittal meeting should take place based on an early step in the development process such as before site analysis and inventory (GSMM Section 2.4.2.4) or the stormwater concept plan (GSMM Section 2.4.2.5). The purpose of the pre-submittal meeting is to discuss opportunities,

constraints, and ideas for the stormwater management system before formal site design engineering. To the extent applicable, local and regional watershed plans, greenspace plans, trails and greenway plans, and other resource protection plans should be consulted in the pre-submittal meeting. Applicants must request a pre-submittal meeting with the City of Buford when applying for a Determination of Infeasibility through the Practicability Policy.

(b) The stormwater concept plan shall be prepared using the minimum following steps:

(i) Develop the site layout using better site design techniques, as applicable (GSMM Section 2.3).

(ii) Calculate preliminary estimates of the unified stormwater sizing criteria requirements for stormwater runoff quality/reduction, channel protection, overbank flooding protection and extreme flood protection (GSMM Section 2.2).

(iii) Perform screening and preliminary selection of appropriate best management practices and identification of potential siting locations (GSMM Section 4.1).

(c) The stormwater concept plan shall contain:

(i) Common address and legal description of the site,
(ii) Vicinity map, and

(iii) Existing conditions and proposed site layout mapping and plans (recommended scale of 1” = 50’), which illustrate at a minimum:

(A) Existing and proposed topography (minimum of 2-foot contours),

(B) Perennial and intermittent streams,

(C) Mapping of predominant soils from USDA soil surveys,

(D) Boundaries of existing predominant vegetation and proposed limits of clearing and grading,

(E) Location and boundaries of other natural feature protection and conservation areas such as wetlands, lakes, ponds, floodplains, stream buffers and other setbacks (e.g., drinking water well setbacks, septic setbacks, etc.),

(F) Location of existing and proposed roads, buildings, parking areas and other impervious surfaces,

(G) Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements,

(H) Preliminary estimates of unified stormwater sizing criteria requirements,

(I) Preliminary selection and location, size, and limits of disturbance of proposed BMPs,

(J) Location of existing and proposed conveyance systems such as grass channels, swales, and storm drains,

(K) Flow paths,

(L) Location of the boundaries of the base flood floodplain, future-conditions floodplain, and the floodway (as applicable) and relationship of site to upstream and downstream properties and drainage, and

(M) Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings.

(d) The stormwater management plan shall contain the items listed in this part and be prepared under the direct supervisory control of either a registered Professional Engineer or a registered Landscape Architect licensed in the state of Georgia. Items (iii), (iv), (v), and (vi) shall be sealed and signed by a registered Professional Engineer licensed in the state of Georgia. The overall site plan must be stamped by a design professional licensed in the State of Georgia for such purpose. (GSMM Section 2.4.2.7)

(i) Natural Resources Inventory
(ii) Stormwater Concept Plan
(iii) Existing Conditions Hydrologic Analysis
(iv) Post-Development Hydrologic Analysis
(v) Stormwater Management System
(vi) Stormwater Quality Site Development Review Tool
(vii) Downstream Analysis
(viii) Erosion and Sedimentation Control Plan
(ix) BMP Landscaping Plan
(x) Inspection and Maintenance Agreement
(xi) Evidence of Acquisition of Applicable Local and Non-Local Permits
(xii) Determination of Infeasibility (if applicable)

(e) For redevelopment and to the extent existing stormwater management structures are being used to meet stormwater management standards the

following must also be included in the stormwater management plan for existing stormwater management structures

(i) As-built Drawings
(ii) Hydrology Reports
(iii) Current inspection of existing stormwater management structures with deficiencies noted
(iv) BMP Landscaping Plans

9.10.9. Application Fee

The fee for review of any land development application shall be based on the fee structure established by the City of Buford, and payment shall be made before the issuance of any land disturbance permit or building permit for the development.

9.10.10. Application Procedures

Land development applications are handled as part of the process to obtain the land disturbance permit pursuant to Article 4 of the Development Regulations or building permit pursuant to Article 4 of the Development Regulations or Section 1501 of the Zoning Ordinance and, as applicable. Before any person begins development on a site, the owner of the site shall first obtain approval in accordance with the following procedure:

(a) File a land development application with the City of Buford on the City of Buford's form of application with the following supporting materials:

(i) the stormwater management plan prepared in accordance with Section 9.10.8 (d),
(ii) a certification that the development will be performed in accordance with the stormwater management plan once approved,
(iii) a Preliminary Determination of Infeasibility, as applicable, prepared in accordance with the practicability policy, and
(iv) an acknowledgement that applicant has reviewed the City of Buford's form of inspection and maintenance agreement and that applicant agrees to sign and record such inspection and maintenance agreement before the final inspection.
(v) a maintenance bond, if applicable
(vi) an inspection and maintenance agreement in accordance with Section 9.10.19

(b) The administrator shall inform the applicant whether the application and supporting materials are approved or disapproved.

(c) If the application or supporting materials are disapproved, the administrator shall notify the applicant of such fact in writing. The applicant may then revise any item not meeting the requirements hereof and resubmit the same for the administrator to again consider and either approve or disapprove.

(d) If the application and supporting materials are approved, the City of Buford may issue the associated land disturbance permit or building permit, provided all other legal requirements for the issuance of such permits have been met. The stormwater management plan included in such applications becomes the approved stormwater management plan.

9.10.11. Compliance with the Approved Stormwater Management Plan

All development shall be:

(a) consistent with the approved stormwater management plan and all applicable land disturbance and building permits, and

(b) conducted only within the area specified in the approved stormwater management plan.

No changes may be made to an approved stormwater management plan without review and advanced written approval by the administrator.

9.10.12. Stormwater Quality Site Development Review Tool

An automated spreadsheet tool was developed to facilitate the consistent review of development projects across the 15-county Metropolitan North Georgia Water Planning District (the district), of which the city is a part. The tool was specifically designed to meet the unified sizing and water quality performance criteria outlined in the Georgia Stormwater Management Manual. The overall goal is to provide an effective tool for city review staff and the development community to quickly evaluate the water quality performance of stormwater management plans for development sites. It allows the developer to use a variety of BMPs and provides incentives for leaving key areas, particularly stream buffers, undisturbed. The city requires every project, unless otherwise exempt, to use the latest stormwater quality site development review tool.

9.10.13. Inspections to Ensure Plan Compliance During Construction

Periodic inspections of the stormwater management system during construction shall be conducted by the staff of the City of Buford or conducted and certified by a professional engineer who has been approved by the City of Buford. Inspections shall use the approved stormwater management plan for establishing compliance. All inspections shall be documented with written reports that contain the following information:

(a) The date and location of the inspection;

(b) Whether the stormwater management system is in compliance with the approved stormwater management plan;

(c) Variations from the approved stormwater management plan; and

(d) Any other variations or violations of the conditions of the approved stormwater management plan.

9.10.14. Final Inspection; As-Built Drawings; Delivery of Inspection and Maintenance Agreement

Upon completion of the development, the applicant is responsible for:

(a) Certifying that the stormwater management system is functioning properly and was constructed in conformance with the approved stormwater management plan and associated hydrologic analysis,

(b) Submitting as-built drawings showing the final design specifications for all components of the stormwater management system as certified by a professional engineer,

(c) Certifying that the landscaping is established and installed in conformance with the BMP landscaping plan, and

(d) Delivering to City of Buford a signed inspection and maintenance agreement that has been recorded by the owner in the property record for all parcel(s) that make up the site.

The required certification under part (a) shall include a certification of volume, or other performance test applicable to the type of stormwater management system component, to ensure each component is functioning as designed and built according to the design specifications in the approved stormwater management plan. This certification and the required performance tests shall be performed by a qualified person and submitted to the City of Buford with the request for a final inspection. The City of Buford shall perform a final inspection with applicant to confirm applicant has fulfilled these responsibilities.

9.10.15. Violations and Enforcement

Any violation of the approved stormwater management plan during construction, failure to submit as-built drawings, failure to submit a final BMP landscaping plan, or failure of the final inspection shall constitute and be addressed as violations of, or failures to comply with, the underlying land disturbance permit pursuant to Article 4 of the Development Regulations or the underlying building permit pursuant to Article 4 of the Development Regulations or Section 1501 of the Zoning Ordinance. To address a violation of this Article, the City of Buford shall have all the powers and remedies that are available to it for other violations of building and land disturbance permits, including without limitation the right to issue notices and orders to ensure compliance, stop work orders, and penalties as set forth in the applicable ordinances for such permits. Any such action or inaction which is continuous with respect to time is deemed to be a public nuisance and may be abated by injunctive or other equitable relief. The imposition of any of the penalties described below shall not prevent such equitable relief. The imposition of any of the penalties described below shall not prevent such equitable relief.

(a) Notice of Violation

If the City determines that an applicant or other responsible person has failed to comply with the terms and conditions of a permit, an approved stormwater management plan or the provisions of this ordinance, it shall issue a written notice of violation to such applicant or other responsible person. Where a person is engaged in activity covered by this ordinance without having first secured a permit therefore, the notice of violation shall be served on the owner or the responsible person in charge of the activity being conducted on the site.

The notice of violation shall contain:

(i) The name and address of the owner or the applicant or the responsible person;

(ii) The address or other description of the site upon which the violation is occurring;

(iii) A statement specifying the nature of the violation;

(iv) A statement requiring the person to whom the notice of violation is directed to develop and implement a plan of the remedial measures necessary to bring the action or inaction into compliance with the permit, the stormwater management plan or this ordinance and the date for the completion of such remedial action;

(v) A statement of the penalty or penalties that may be assessed against the person to whom the notice of violation is directed; and,

(vi) A statement that the determination of violation may be appealed to the City by filing a written notice of appeal within thirty (30) days after the notice of violation, except, that in the event the violation constitutes an immediate danger to public health or public safety, twenty four (24) hours notice shall be sufficient.

(b) Penalties

In the event the remedial measures described in the notice of violation have not been completed by the date set forth for such completion in the notice of violation, any one or more of the following actions or penalties may be taken or assessed against the person to whom the notice of violation was directed. Before taking any of the following actions or imposing any of the following penalties, the City shall first notify the applicant or other responsible person in writing of its intended action, and shall provide a reasonable opportunity, of not less than ten (10) days, except, that in the event the violation constitutes an immediate danger to public health or public safety, twenty four (24) hours notice shall be sufficient, to cure such violation. In the event the applicant or other responsible person fails to cure such violation after such notice and cure period, the City may take any one or more of the following actions or impose any one or more of the following penalties.

(i) Stop Work Order -The City may issue a stop work order that shall be served on the applicant or other responsible person. The stop work order shall remain in effect until the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise cured the violation or violations described therein, provided the stop work order may be withdrawn or modified to enable the applicant or other responsible person to take the necessary remedial measures to cure such violation or violations.

(ii) Withhold Certificate of Occupancy - The City may refuse to issue a certificate of occupancy for the building or other improvements constructed or being constructed on the site until the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise cured the violations described therein.

(iii) Suspension, Revocation or Modification of Permit - The City may suspend, revoke or modify the permit authorizing the land development project. A suspended, revoked or modified permit

may be reinstated after the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise cured the violations described therein, provided such permit may be reinstated upon such conditions as the City may deem necessary to enable the applicant or other responsible person to take the necessary remedial measures to cure such violations.

(iv) Civil Penalties - In the event the applicant or other responsible person fails to develop and implement the remedial measures required in the notice of violation or otherwise fails to cure the violations described therein within ten (10) days, or such greater period as the City shall deem appropriate, except, that in the event the violation constitutes an immediate danger to public health or public safety, twenty four (24) hours notice shall be sufficient, after the City has taken one or more of the actions described above, the City may impose a penalty not to exceed $1,000 (depending on the severity of the violation) for each day the violation remains unremedied after receipt of the notice of violation.

(v) Criminal Penalties - For intentional and flagrant violations of this ordinance, the City may issue a citation to the applicant or other responsible person, requiring such person to appear in City court to answer charges for such violation. Upon conviction, such person shall be punished by a fine not to exceed $1,000 or imprisonment for sixty (60) days or both. Each act of violation and each day upon which any violation shall occur shall constitute a separate offense.

9.10.16. Maintenance by Owner of Stormwater Management Systems Predating Current GSMM.

For any stormwater management systems approved and built based on requirements predating the current GSMM and that is not otherwise subject to an inspection and maintenance agreement, such stormwater management systems shall be maintained by the owner so that the stormwater management systems perform as they were originally designed.

9.10.17. Maintenance by private parties

On all commercial sites and on residential property where stormwater management facilities exist, the maintenance is the responsibility of the owner or operator of the property. It shall be the responsibility of the owner or operator to repair deficiencies in a timely manner.

9.10.18. Maintenance by property or homeowners association

When a subdivision or industrial/commercial park has a homeowners association or other legal entity upon approval of the Final Plat, the association will be responsible for maintenance of all drainage easements and all stormwater facilities within the development. This shall include all stormwater facilities or pipe networks located on private property, common or open space areas, or any within private drainage easements. The association shall be formed prior to final plat approval.

9.10.19. Inspection and Maintenance Agreements

(a) Stormwater management facilities and practices included in a stormwater management plan which are subject to an inspection and maintenance agreement must undergo ongoing inspections to document maintenance and repair needs and ensure compliance with the requirements of the agreement, the plan and this ordinance. A stormwater management facility or practice shall be inspected on a periodic basis by the responsible person in accordance with the approved inspection and maintenance agreement. In the event that the stormwater management facility has not been maintained and/or becomes a danger to public safety or public health, the City shall notify the person responsible for carrying out the maintenance plan by registered or certified mail to the person specified in the inspection and maintenance agreement. The notice shall specify the measures needed to comply with the agreement and the plan and shall specify the time within which such measures shall be completed. If the responsible person fails or refuses to meet the requirements of the inspection and maintenance agreement, the City, may correct the violation. Inspection programs by the City may be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in stormwater management facilities; and evaluating the condition of stormwater management facilities and practices.

(b) The owner shall execute an inspection and maintenance agreement with the City of Buford obligating the owner to inspect, clean, maintain, and repair the stormwater management system; including vegetation in the final BMP landscaping plan. The form of the inspection and maintenance agreement shall be the form provided by the City of Buford. After the inspection and maintenance agreement has been signed by the owner and the City of Buford, the owner shall promptly record such

agreement at the owner's cost in the property record for all parcel(s) that make up the site.

(c) The inspection and maintenance agreement shall identify by name or official title the person(s) serving as the point of contact for carrying out the owner's obligations under the inspection and maintenance agreement. The owner shall update the point of contact from time to time as needed and upon request by the City of Buford. Upon any sale or transfer of the site, the new owner shall notify the City of Buford in writing within 30 days of the name or official title of new person(s) serving as the point of contact for the new owner. Any failure of an owner to keep the point of contact up to date shall, following 30 days' notice, constitute a failure to maintain the stormwater management system.

(d) The inspection and maintenance agreement shall run with the land and bind all future successors-in-title of the site. If there is a future sale or transfer of only a portion of the site, then:

(i) The parties to such sale or transfer may enter into and record an assignment agreement designating the owner responsible for each portion of the site and associated obligations under the inspection and maintenance agreement. The parties shall record and provide written notice and a copy of such assignment agreement to the City of Buford.

(ii) In the absence of a recorded assignment agreement, all owners of the site shall be jointly and severally liable for all obligations under the inspection and maintenance agreement regardless of what portion of the site they own.

(e) The inspection and maintenance agreement, if applicable, must be approved by the city prior to plan approval, and recorded in the deed records upon final plat approval.

(f) As part of the inspection and maintenance agreement, a schedule shall be developed for when and how often routine inspection and maintenance will occur to ensure proper function of the stormwater management facility or practice. The agreement shall also include plans for annual inspections to ensure proper performance of the facility between scheduled maintenance and shall also include remedies for the default thereof.

### 9.10.20. Maintenance Bond

After the acceptance of a Final Plat for a development and prior to the issuance of the first Certificate of Occupancy for a development, the owner shall provide the City a maintenance bond to assure the faithful performance of all maintenance defined by the approved Stormwater Management Plan. The term

of the bond shall be 18 months from the date the bond is accepted by the City. The amount of the bond shall not be less than the Estimate of Plan Annual Maintenance Costs provided as a part of the Stormwater Management Plan application.

The bond is to be payable to the City, be with surety by a company entered and licensed to do business in the State of Georgia and be acceptable to the City Manager.

The City may accept, in lieu of a maintenance bond as set forth in this Section, a letter of credit issued from a bank located within the metropolitan Atlanta area and licensed to do business in the State of Georgia. The term and amount of the letter credit shall be the same as a performance maintenance bond. The letter of credit shall be payable to the City of Buford.

### 9.10.21. Right of Entry for Maintenance Inspections

The terms of the inspection and maintenance agreement shall provide for the City of Buford's right of entry for maintenance inspections and other specified purposes. If a site was developed before the requirement to have an inspection and maintenance agreement or an inspection and maintenance agreement was for any reason not entered into, recorded, or has otherwise been invalidated or deemed insufficient, then the City of Buford shall have the right to enter and make inspections pursuant to the City of Buford's general provisions for property maintenance inspections pursuant to the City of Buford Zoning Ordinance and Development Regulations.

### 9.10.22. Owner's Failure to Maintain the Stormwater Management System

The terms of the inspection and maintenance agreement shall provide for what constitutes a failure to maintain a stormwater management system and the enforcement options available to City of Buford. If a site was developed before the requirement to have an inspection and maintenance agreement or an inspection and maintenance agreement was for any reason not entered into, recorded, or has otherwise been invalidated or deemed insufficient, then:

(a) An owner's failure to maintain the stormwater management system so that it performs as it was originally designed shall constitute and be addressed as a violation of, or failure to comply with, owner's property maintenance obligations pursuant to City of Buford Zoning Ordinance and Development Regulations, and

(b) To address such a failure to maintain the stormwater management system, the City of Buford shall have all the powers and remedies that are

available to it for other violations of an owner's property maintenance obligations, including without limitation prosecution, penalties, abatement, and emergency measures.

(c) If a responsible person fails or refuses to meet the requirements of the inspection and maintenance agreement, the City, after thirty (30) days written notice (except, that in the event the violation constitutes an immediate danger to public health or public safety, twenty four (24) hours' notice shall be sufficient), may correct a violation of the design standards or maintenance requirements by performing the necessary work to place the facility or practice in proper working condition. The City may obtain reimbursement under a performance maintenance bond or letter of credit where such instruments are available or may assess the owner(s) of the facility for the cost of repair work that shall be a lien on the property, and may be placed on the ad valorem tax bill for such property and collected in the ordinary manner for such taxes.