



City of Lilburn
Lilburn, Georgia

Ordinance
#2020-557

Date of Reading and Adoption: November 9, 2020
At the meeting of the Lilburn City Council held at 340 Main Street Lilburn,
Georgia.

**AN ORDINANCE TO AMEND THE DEVELOPMENT REGULATIONS; TO AMEND TEXT, to
ADD OR AMEND DEFINITIONS, REPEAL CONFLICTING ORDINANCES; PROVIDE FOR A
POST CONSTRUCTION STORMWATER CODE; AND TO PROVIDE FOR AN EFFECTIVE
DATE**

**IT IS HEREBY ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF LILBURN,
GEORGIA,** that The Development Regulations, Article 1, Section 1.3, Article 2, Section 2.1.2 and
2.2 shall be amended, Article 8.- shall be renamed *Site Grading and Post Construction Stormwater
Management* and all sections amended, and Article 9.-Performance Guidelines will be deleted as
provided for in Attachment A.

NOW THEREFORE BE IT ORDAINED that said ordinance amendments are adopted and
approved by the City Council of the City of Lilburn, Georgia, and are effective immediately.

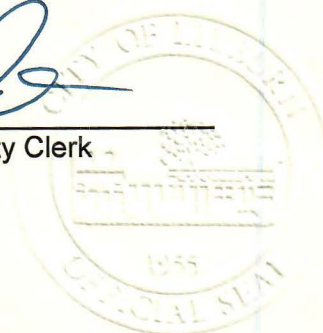
SO ORDAINED AND EFFECTIVE this 9th day of November 2020.

APPROVED:

Tim Dunn, Mayor

ATTEST/AUTHENTICATED:

Melissa L. Penate, City Clerk



Attachment A - Proposed Amendments to APPENDIX B - DEVELOPMENT REGULATIONS –to accommodate a Post Construction Stormwater code. Edits may be distinguished by red or blue strikethrough to indicate deleted text and blue underline to indicate new text. Highlighted text is to be confirmed with Municode from a previous Ordinance.

ARTICLE 1. - AUTHORITY, TITLE, PURPOSE AND INTENT

Sec. 1.1. - Authority And Title.

1.1.1 These rules and regulations are adopted under the authority of the Constitution of the State of Georgia and laws enacted pursuant thereto.

1.1.2 These regulations shall be known as "The Development Regulations of the City of Lilburn, Georgia," and may be referred to generally as "The Development Regulations," or, as used herein, "these Regulations."

Sec. 1.2 - Purpose.

1.2.1 These regulations are intended to serve the following purposes:

- a. To protect and promote the public health, safety, and general welfare.
- b. To provide a system for the subdividing of lands and the accurate recording of land titles.
- c. To provide assurance that lots shown on recorded subdivision plats are usable by the purchasers for their intended and permitted functions.
- d. To encourage economically sound and orderly land development in accordance with the policies and objectives of the Comprehensive Plan of the City of Lilburn.
- e. To assure the provision of required streets, utilities, and other facilities and services to new land developments in conformance with public improvement policies of the city.
- f. To assure adequate provision of safe and convenient traffic access and circulation, both vehicular and pedestrian, in new land developments.
- g. To assure the provision of needed open spaces and public facility sites in new land developments through the dedication or reservation for purchase of land for public purposes.
- h. To assure equitable review and approval of all subdivision and site plans by providing uniform procedures and standards for the developer.

Sec. 1.3. - Intent And Application.

It is the intent of these regulations that they apply to and provide guidance for the development of any lands within unincorporated area of City of Lilburn, whether the development involves the subdivision of the land for sale to individual users or pertains only to the construction of buildings or other improvements on a single parcel.

ARTICLE 2. - DEFINITIONS

Sec. 2.1. - Use Of Words And Interpretation.

2.1.1 For the purposes of these Regulations, the following shall apply to the use of all words:

- a. When appropriate to the context, words used in the singular shall include the plural, and the plural the singular; words used in the present tense shall include the future tense, and vice versa.
- b. Words in the masculine gender shall include the feminine.

- c. The word "shall" is mandatory and not discretionary.
 - d. The word "may" is permissive.
 - e. Use of the word "and" is inclusive and requires that all of the component phrases so connected must be present or fulfilled for sufficiency.
 - f. Use of the word "or" is not exclusive (as in "either ... or"), and requires that at least one of the component phrases so connected must be present or fulfilled for sufficiency. The word "or" may allow more than one component phrase to be present or fulfilled, as is implied by the common term "and/or."
- 2.1.2 The following shall control the interpretation of words and phrases as used in these Regulations:
- a. Words and phrases defined in this Article shall be interpreted as defined herein without regard to other meanings in common or ordinary use, unless the context of the word indicates otherwise.
 - b. Words or phrases not defined herein shall be interpreted as defined in the Zoning Resolution of the City of Lilburn, or as defined in the City's Soil Erosion, [and Sedimentation and Pollution Control Ordinance](#), [Buffers, Landscaping and Tree Protection Ordinance](#), [Vegetation Ordinance](#), or [Mobile Home Park Regulations](#), as applicable to the use of the word within the context of these Regulations.
 - c. Words not defined herein or in the Zoning Resolution or any other applicable code, regulation, or ordinance of City of Lilburn shall be construed to have the meaning given by common and ordinary use, and shall be interpreted within the context of the sentence, section, and article in which they occur.

Sec. 2.2. - Definitions Of Words And Phrases.

Certain words or phrases in these Regulations are defined for their use herein as follows:

Alley or Service Drive-. A minor, permanent, public service-way which is used primarily for vehicular service access to the back or the side for properties otherwise abutting on a street.

Administrator. [The person appointed to administer and implement this Article on Post-Construction Stormwater Management for New Development and Redevelopment in accordance with Section 8.2.3.](#)

Applicant . A person, either the owner or the bona fide representative of the owner of land or structures governed by these regulations, who seeks authority to use, develop, construct upon or otherwise enjoy the use of property through any of the procedures established under these regulations.

Arterial. A Principal Arterial, Major Arterial, or Minor Arterial street as defined and designated in the Comprehensive Plan of City of Lilburn [or Long Range Road Classification Map of Gwinnett County](#).

"As-Built". Survey See Record Drawing.

Authorized Registered Professional. [A. A landscape architect who possesses a current certificate of registration issued by the State of Georgia in accordance with Georgia Law; or, B. A land surveyor who possesses a current certificate of registration issued by the State of Georgia in accordance with Georgia Law; or, C. A professional engineer who possesses a current certificate of registration. issued by the State of Georgia in accordance with Georgia Law.](#)

BMP or "best management practice". [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. 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).

"Base flood". The flood which has a one percent probability of occurring in any calendar year (i.e., the 100-year frequency flood). The flood having a one percent or greater chance of being equaled or exceeded in any given year, also known as the 100-year flood.

Base flood elevation. The highest water surface elevation anticipated at any given point during the base flood.

Block. A piece or parcel of land entirely surrounded by public streets, other than alleys.

Buildable Lot of Record. A lot or parcel of land which existed as a single parcel of ownership, recorded as such in its entirety and present boundaries with the Clerk to Superior Court prior to June 2, 1970, or which is shown in its entirety and present boundaries on a Final Plat or Exemption Plat duly approved under these or any previously applicable regulations providing for the subdivision of land in City of Lilburn and recorded with the Clerk to Superior Court of ~~City of Lilburn~~ Gwinnett County.

Building Setback Line. A line across a lot parallel to a street right-of-way or other property line establishing the minimum open space to be provided between any principal building and the street or other property line. All building setback lines shall be at least as restrictive as the corresponding minimum yard setbacks required in the Zoning Resolution. On corner lots, the minimum required front yard setback shall be provided along all abutting streets.

Certificate of Development Conformance. Final approval issued by the Department for completion of land development activities for a subdivision or project for which a Development Permit was issued.

Certificate of Occupancy. Final approval by the Department for the use or occupancy of a structure for which a Building Permit was issued.

Channel. A natural or artificial watercourse with a definite bed and banks that conveys continuously or periodically flowing water.

City. City of Lilburn, Georgia

City Council, The Mayor and City Council of City of Lilburn, Georgia.

Clearing. The removal of trees or other vegetation, but not including grubbing activities.

Comprehensive Plan. A plan summarizing and illustrating the adopted goals and objectives of the City Council regarding the future location and character of anticipated land uses, transportation, and other public facilities in City of Lilburn. The term "Comprehensive Plan" includes component or functional plans for the city, including but not limited to a plan for land use (i.e., Land Use Plan) or a plan for transportation facilities, and includes the classification of streets and thoroughfares as shown on the Gwinnett County adopted Long Range Road Classification Map.

Concept Plan. A drawing which shows the overall concept (e.g. a concept plan) of a proposed development, and which may include lots and streets in a subdivision or the general location of buildings and improvements for a multi-family or non-residential project, and which may be drawn to approximate dimensions in a freehand style. A Sketch Plan as required by the 1970 Subdivision Regulations is equivalent to a Concept Plan under these Regulations.

Condominium. A form of property ownership in which the buildings or portions of the buildings, whether residential or non-residential in use, are owned by individuals separate from the lands which surround the buildings, said lands held in common ownership by the owners of the several buildings.

County. Gwinnett County, Georgia.

Cul-De-Sac. A street having one end open to traffic and being permanently terminated within the development by a vehicular turnaround. For the purpose of designation, a cul-de-sac street shall be interpreted to begin at the intersection of two or more streets nearest to the vehicular turnaround.

Department. The Department of Planning and Economic Development of the City of Lilburn, Georgia.

Detention. The temporary storage of stormwater runoff in a stormwater detention facility for the purpose of controlling the peak discharge.

Detention facility. A structure designed for the storage and gradual release of stormwater runoff at controlled rates.

Developer. Any person, individual, firm, partnership, association, corporation, estate, trust, or any other group or combination acting as a unit who directs the undertaking or proposes to undertake development activities as herein defined, whether the development involves the subdivision of the land for sale to individual users, the construction of buildings or other improvements on a single land ownership, or both.

Development. 1. (verb) All activities associated with the conversion of land or the expansion or replacement of an existing use to any new use intended for human operation, occupancy or habitation, other than for agricultural purposes devoted strictly to the cultivation of the land, dairying or animal husbandry. Such activities include land disturbance (clearing and grubbing the land of vegetation and stumps, and grading) and the construction of improvements such as but not limited to streets, driveways or parking areas, water or sewer mains, storm water drainage facilities, sidewalks or other structures permanently placed on or in the property. 2. (noun) Where appropriate to the context, the term "development" also may be used to denote a specific subdivision or project which is a single entity or intended to be constructed as an interrelated whole, whether simultaneously or in phases.

Development Permit. An official authorization issued by the Department permitting clearing, grubbing, grading, or construction of storm drainage facilities, utilities, access drives, streets, parking or other improvements exclusive of buildings.

Development Plans. Those detailed and professional plans showing the layout and design, site work and construction activities proposed for a project (other than architectural building plans) and including the Preliminary Plat or Site Plan (as applicable), Grading Plan, Tree Protection Plan, Erosion and Sediment Control Plan, Buffer and Landscape Plan, and construction drawings for streets, storm water drainage facilities, sanitary sewers, water supply facilities, and other site improvements.

Diameter Breast Height (DBH). The diameter of a tree measured at a point four and one-half feet above the ground.

Director. The Director of the Department of Planning or his/her designee.

Drainage Improvements. Those facilities and structures intended to control and direct the passage of storm waters and other surface water flows from and across a property; including, but not limited to, swales and ditches, cross drains and other piping systems, catch basins, detention ponds, and velocity dissipation devices.

Dripline. A line on the ground established by a vertical plane extending from a tree's outermost branch tips down to the ground; i.e., the line enclosing the area directly beneath the tree's crown from which rainfall would drip.

Driveway. A vehicular access way in private ownership, other than a Private Street, which provides access primarily to only one property, or to no more than two single-family detached residences.

Easement. Recorded authorization for a specified purpose by a property owner for the use of any designated part of the real property by another entity.

Engineering Department. The City of Lilburn or Gwinnett County Department of Engineering.

Erosion Control Regulations. The City of Lilburn Soil Erosion and Sedimentation and Pollution Control Ordinance.

Exemption Plat. A subdivision plat drawn to Final Plat standards, as contained herein, prepared in accordance with one of the exemptions provided under Article 3 of these Regulations.

Extended Detention. The storage of stormwater runoff for an extended period of time.

Extreme Flood Protection. Measures taken to prevent adverse impacts from large low-frequency storm events with a return frequency of 100 years or more.

Fee Simple. A form of property ownership in which the buildings and surrounding lands are owned by the same person.

Federal Emergency Management Agency (FEMA). The Federal Agency which administers the National Flood Insurance Program. This Agency prepares, revises and distributes the maps and studies referenced in these Regulations.

Final Plat. A finished drawing of a subdivision showing completely and accurately all legal and boundary information and certification required by these Regulations.

Fire Services Division . A division of the Gwinnett County Department of Public Safety charged with the responsibility of enforcing the County's Fire Prevention and Life Safety Codes, and Gwinnett Handicap Ordinance.

Flood or Flooding. A general and temporary condition of partial or complete inundation of normally dry land areas resulting from - (1) The overflow of inland waters; or (2) The unusual and rapid accumulation or runoff of surface waters from any source.

Flood Boundary and Floodway Map. The official map issued by the Federal Emergency Management Agency, where the boundaries of the floodways are shown and the areas of Special Flood Hazard have been defined as Zone "A".

Flood Insurance Rate Map (FIRM). An official map on which the Federal Emergency Management Agency has delineated both the areas of Special Flood Hazard and the applicable risk premium zones.

Flood Insurance Study. The official report provided by the Federal Emergency Management Agency. The report contains flood profiles, as well as the Flood Boundary and Floodway Map and the water surface elevation of the base flood.

Floodway. The channel of a river or other watercourse and the adjacent areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

Flood prone area. See the Floodplain Management Ordinance of City of Lilburn.

Flood Hazard Area. See Floodplain

Floodplain . Those lands subject to flooding, which have at least a one percent probability of a flooding occurrence in any calendar year based on the basin being fully developed as shown on the current land use plan.; i.e., the regulatory flood. See Floodplain Management Ordinance for ancillary terms.

Flood Related Definitions . See the Floodplain Management Ordinance, for specific definitions of terms used in relation to flooding, alteration of floodplains, construction of structures in or adjacent to floodplains, etc.,

Freeboard. The distance between the maximum water surface~~base flood~~ elevation and the top of a storm water detention structure.

GCSMM. The latest edition of the Gwinnett County Stormwater Management Manual, Volume 2: Technical Handbook, and its Appendices, and all amendments.

Georgia DOT. The Department of Transportation of the State of Georgia.

Grading. The movement, removal or addition of earth on a site by the use of mechanical equipment.

Grading Permit. An official authorization issued by the Department permitting grading of a site, and may include installation of attendant storm water drainage facilities.

Green Infrastructure. An interconnected natural system and/or engineered system that strengthens and mimics natural hydrologic functions and processes through the use of plants and soil to slow, filter, evapotranspire, and infiltrate stormwater runoff close to its source; or the capture and reuse of stormwater runoff.

Grubbing. The removal of stumps or roots from a property.

Health Department. The Gwinnett, Newton, and Rockdale County Health Department, Environmental Health Services Division of the Georgia Department of Human Resources for Gwinnett County.

Hotspot. An area where the use of the land has the potential to generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in storm water or to violate water quality standards. 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.

House Location Plan (HLP). A drawing showing lot information and all improvements, as outlined in Article 10, Section 10.46.

Impervious surface. A surface composed of any material that significantly impedes or prevents the natural infiltration of water into the soil.

Industrial Stormwater General Permit. 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. The process of percolating stormwater runoff into the subsoil.

Inspection and maintenance agreement. A written agreement providing for the long-term inspection, operation, and maintenance of the stormwater management system(s) and its components on a site.

Land Disturbance Application. The application for a land development permit on a form provided by city of Lilburn along with the supporting documentation required in Section 8.2.9.

Land Disturbing Activity. 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.

Land Disturbance Permit. Any permit other than a Building Permit issued by the City of Lilburn, Gwinnett County that authorizes clearing or grading activities on a site or portion of a site. Said permit may be a Clearing, Clearing and Grubbing, Grading, or Development Permit as defined and authorized herein.

Linear Feasibility Program. A feasibility program developed by the City of Lilburn and submitted to the Georgia Environmental Protection Division, which sets reasonable criteria for determining when implementation of stormwater management standards for linear transportation projects being constructed by the City of Lilburn is infeasible.

Linear Transportation Projects. Construction projects on traveled ways including but not limited to roads, sidewalks, multi-use paths and trails, and airport runways and taxiways.

Lot. A portion of a subdivision, or any other parcel of land, intended as a unit for transfer of ownership or for development or both. In determining the area and dimensions of a lot, no part of the right-of-way of a road or crosswalk may be included.

Lot, Corner. A lot abutting upon two or more streets at their intersection.

Lot, Double Frontage. A lot other than a corner lot abutting upon two or more streets.

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

Major Thoroughfare. Any public street, existing or proposed, which is shown on the Gwinnett County Long Range Road Classification Map in the Comprehensive Plan as an arterial or major collector.

Mean Sea Level. The average height of the sea for all stages of the tide. It is used as a reference for establishing various elevations within the floodplain. For purposes of this Ordinance, the term is synonymous with National Geodetic Vertical Datum (NGVD) and/or North American Vertical Datum (NAVD) of 1988. The average height of the sea for all stages of the tide. It is used as a reference for establishing various elevations within the floodplain. For purposes of these Regulations, the term is synonymous with National Geodetic Vertical Datum (NGVD).

Minor Collector. A through street having the primary function of connecting subdivisions or other areas to Major Collector streets or other major thoroughfares, or functioning as a central route within a subdivision channeling traffic from the local streets to an abutting major thoroughfare or another Minor Collector street. For the purposes of these Regulations, a central but non-through route within a subdivision or other project will be considered as a Minor Collector, only if the Average Daily Traffic generated by the development on the route will exceed 2000 trips.

New Development. 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. 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. 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. A person having a majority fee simple interest in real property, or a majority interest through any other form of ownership. 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

Pedestrian Way. A right-of-way within a block dedicated to public use, intended primarily for pedestrians and from which motor propelled vehicles are excluded.

Commented [LF1]: Should remove all references to road projects and handle on a case by case basis?

Commented [JW2R1]: yes

Person. An individual, firm, partnership, corporation, joint venture, association, social club, fraternal organization, estate, trust, business trust, receiver, syndicate, or other group or combination acting singly or collectively for a common purpose, and the duly authorized agents thereof.

Planning Commission. The ~~Municipal~~-City of Lilburn Planning Commission.

Plat. A map indicating the subdivision, resubdivision, or recombination of land.

Post-construction Stormwater Management. 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. The latest edition of the Metropolitan North Georgia Water Planning District's Policy on Practicability Analysis for Runoff Reduction.

Pre-development. 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. (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.

Preliminary Plat. A drawing which shows the perimeter boundary, topography, lotting arrangements, street layout, and other features of a proposed subdivision, as specified in these Regulations.

Previously Developed Site. A site that has been altered by paving, construction, and/or land disturbing activity.

Project. A principal building or structure, or group of buildings or structures, planned and designed as an interdependent unit together with all accessory uses or structures, utilities, drainage, access, and circulation facilities, whether built in whole or in phases. Examples include: a principal building on a lot, a residential subdivision, a multi-family development, a shopping center or an office park.

Public Utilities Department. The ~~Gwinnett County Department of Water Resources, City of Lilburn Department of Public Utilities, which includes the Water Pollution Control Division and the Water System Division.~~

Record Drawing. A survey or other drawing based on a field survey which shows existing features or components and horizontal or vertical information (grades or location of improvements).

Redevelopment. Development on a previously developed site; but excludes ordinary/routine-maintenance activities, ~~remodeling of existing building interiors, resurfacing of paved areas, and exterior building changes or improvements which do not materially increase or concentrate storm water runoff, or cause additional nonpoint source pollution.~~ Redevelopment includes 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

Responsible Party. In the context of enforcement procedures, a person (as defined above) who is alleged to have committed, caused, continued or created a violation of the

terms, requirements, regulations, or provisions of these Regulations whether as a direct act, through lack of action or neglect, or at the direction of or on behalf of others. A responsible party may be the owner of a premises where a violation has occurred; an occupant whether through ownership, lease or other tenancy; a contractor, builder or developer; an agent of or person otherwise acting on behalf of the aforementioned parties; or other person acting in violation of these regulations.

"Road". See "Street, Public."

Roadway. The paved portion of a street from back of curb to back of curb (or edge to edge of pavement for streets not having curbs) but excluding driveway aprons, bridges, and large single and multi-cell culverts which in an hydrologic sense can be considered to function as a bridge.

Routine Maintenance. 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. Stormwater runoff.

Runoff Reduction. The interception, evapotranspiration, infiltration or capture and reuse of stormwater runoff.

Sheet Flow. Diffused water running overland to a defined watercourse.

Site. 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.

Site Work. Development activity to prepare a property for construction of buildings or finished structures, including clearing, grubbing, grading, and installation of soil sedimentation and erosion control facilities.

Sketch Plan. See Concept Plan.

Street, Private. An access way similar to and having the same function as a public street, providing access to more than one property, but held in private ownership (as distinct from a "driveway").

Street, Public. A right-of-way dedicated to and accepted by the City of Lilburn and/or Gwinnett County for vehicular traffic or over which the City of Lilburn and/or Gwinnett County may hold a prescriptive easement for public access, and including designated and numbered U.S. and State Highways. For the purposes of these Regulations, the term "public street" shall be limited to those which afford or could afford a direct means of vehicular access to abutting property, and exclude limited access roadways which abut a property but from which direct access may not be allowed under any circumstances.

Street, Local Nonresidential. A surface street intended primarily to provide local access to adjacent existing or planned commercial or industrial development and not for through traffic.

Street, Local Residential. A surface street intended primarily to provide local access to adjacent residential development and not for through traffic.

Street, Marginal Access. A local street which is parallel to and adjacent to a major thoroughfare and which provides access to adjacent properties and protection from through traffic.

Stormwater Concept Plan. 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. A plan for post-construction stormwater management at the site that meets the requirements of 8.2.7 and is included as part of the land development application.

Stormwater Management Standards. Those standards set forth in Section 8.2.6.

Stormwater Management System. 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. The flow on the surface of the ground, resulting from precipitation.

Structure. Anything constructed or erected on the ground or attached to something on the ground.

Subdivider. Any person, individual, firm, partnership, association, corporation, estate, trust, or any other group or combination acting as a unit dividing or proposing to divide land so as to constitute a subdivision as herein defined, including an agent of the subdivider.

Subdivision. 1. (verb) 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. 2. (noun) Where appropriate to the context, the term "subdivision" also may be used in reference to the aggregate of all lots held in common ownership at the time of division.

Tie Point. The point of reference for a boundary survey. Said point of reference shall be an established, monumented position which can be identified or relocated from maps, plats, or other documents on public record.

Traffic Engineer. The ~~City Director of Planning or~~ designated head of the ~~Traffic and Transportation Bureau of the~~ Gwinnett County Department of ~~Transportation Engineering~~, or his designee.

Tree. Any self-supporting woody perennial plant, usually having a main stem or trunk and many branches, and at maturity normally attaining a trunk diameter greater than three inches at any point and a height of over ten feet.

Tree Diameter. The widest cross-sectional dimension of a tree trunk measured at diameter breast height (DBH) or at any point below DBH for new trees or multi-trunked species, but in no case less than 6 inches from the ground.

Tree Protection Area. Any portion of a site wherein are located existing trees which are proposed to be retained in order to comply with the buffer requirements of the Zoning Resolution or the requirements of the Tree Protection Ordinance.

Tree Protection Plan. A plan that identifies tree protection areas, existing trees to be retained and proposed trees to be planted on a property to meet minimum requirements of the Tree Protection Ordinance, as well as methods of tree preservation to be undertaken on the site and other pertinent information.

~~Water Pollution Control Division.~~ A division of the Public Utilities Department charged with the responsibility for the design, installation, inspection, approval, and maintenance of the public sanitary sewer system and wastewater treatment in unincorporated Gwinnett County.

~~Water System Division.~~ A division of the Public Utilities Department charged with the responsibility for the design, installation, and maintenance of the public water supply and distribution system in unincorporated Gwinnett County.

Watercourse. A channel with a defined bed and banks, including lakes, ponds, and marshes.

Zoning Resolution. The adopted Zoning Resolution of the City of Lilburn, Georgia, as amended from time to time.

(Ord. No. 012-01, 12-10-2001; Ord. No. 113-04, 3-8-2004)

ARTICLE 8. - SITE GRADING ~~AND~~ POST CONSTRUCTION STORMWATER MANAGEMENT STORMWATER DETENTION, CULVERTS AND PIPED DRAINAGE SYSTEMS AND SOIL SEDIMENT CONTROL REQUIREMENTS

Sec. 8.1. - Site Grading.

8.1.1 Grading shall be done in accordance with the lines and grades shown on the approved Grading Plan.

8.1.2 Grading plans shall show existing and proposed contour lines at an interval of no more than two feet. Grading plans shall outline the areas which are required to remain undisturbed (i.e., Tree Protection Areas, buffers, etc.) and shall indicate protective fencing or staking to be placed surrounding such areas.

~~8.1.3 If the property is within the jurisdiction of the Metropolitan River Protection Act, the grading shall be consistent with the River Corridor Certificate approved for the project.~~

~~8.1.34 Embankments shall be placed in uniform layers not to exceed a compacted thickness of six inches per layer and shall be compacted to a density of 95 percent of the maximum laboratory dry weight per cubic foot as determined by AASHTO Method T-99 in all areas where structures, parking lots and drives, streets, and utilities are to be placed. All other embankments are to be compacted to at least 85 percent. Embankment layering shall be consistent with the Gwinnett County Stormwater Management Manual.~~

~~8.1.45 The maximum slopes for cut or fill shall be 2:1 (two feet of horizontal run for each foot of rise or fall), except 1) for earthen dam embankments, 2) for rock cuts, 3) where certified by a professional geotechnical engineer or 4) as discussed in Section 8.1.56 below.~~

~~8.1.5 Earthen dam embankments shall be 3:1 maximum unless a modification application is approved. The intent of the earthen dam embankment slope regulation is to provide for public safety, soil stability, and dam maintenance considerations. The depth of cut referred to herein shall be the maximum cut or fill that shall be allowed to occur in any one section of cut or fill. The slope of cut or fill shall be uniform throughout for each section of cut or fill unless benching is approved by the citycounty.~~

~~When a cut is made in rock that requires blasting, the slope may be steeper if presplitting is employed and upon submission of a geotechnical report which substantiates the integrity of the rock in the steeper condition, subject to the review and approval of the Director. (Note: No blasting shall occur unless a permit has been obtained from the Fire Marshall's office.) Refer to the Standard Drawings for grading section and retaining wall details.~~

~~8.1.6 While most soils in the area can be safely stabilized at a 2:1 slope, some soils exhibit a low shearing resistance and a low cohesiveness. These soils typically are micaceous silts and sandy soils with little or no clay. If the 2:1 slope shows evidence of shearing, non-cohesiveness, sliding, or inability to maintain compaction, the slope shall be stabilized at 3:1 or by using such mechanical methods as needed (such as retaining walls or "grow mats" stapled in place) to maintain slope, height, and integrity.~~

~~8.1.67. A grading plan showing building pad locations shall be submitted for residential subdivisions, unless a modification application is approved, zoned for a lot size of less than 12,000 square feet or a density of four units per acre or more. The intent of this regulation is to ensure adequate lot to lot drainage. Granting a modification will not nullify the intent of these regulations, when the layout has a minimum lot area of 14,520 square feet and a minimum lot width of 90 feet. The grading plan may~~

be used as a construction document prior to approval of the Final Plat or as a guidance document for individual lot grading after approval of the Final Plat.

(Ord. No. 055-02, 11-11-2002; Ord. No. 113-04, 3-8-2004)

Sec. 8.2. Post Construction Stormwater Management.

8.2.1 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 Lilburn 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.

8.2.2 Adoption and Implementation of the GCSMM; Conflicts and Inconsistencies.

- a. In implementing this Article, the City of Lilburn shall use and require compliance with all relevant design standards, calculations, formulas, methods, and other guidance from the Gwinnett County Stormwater Management Manual (GCSMM) as well as all related appendices.
- b. This Article is not intended to modify or repeal any other Section, 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 Lilburn'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 GCSMM, 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.

8.2.3 Designation of Administrator. The City of Lilburn Planning and Development Department (P&D) shall implement this Article but may, from time to time, appoint someone to administer and implement this Article.

8.2.4 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.

8.2.5 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 conducted by local, state, authority, or federal agencies, whose sole purpose is to implement stormwater management or environmental restoration;
- c. Repairs to any stormwater management system deemed necessary by the administrator;
- d. 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 8.2.4 (a) or (b);
- e. 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 8.2.4 (a) or (b);
- f. 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
- g. Linear transportation projects being constructed by the City of Lilburn to the extent the Department determines that the stormwater management standards may be infeasible to apply, all or in part, for any portion of the linear transportation project. For this exemption to apply, an infeasibility report ~~that is compliant with the City of Lilburn linear feasibility program~~ shall first be submitted to the Department that contains adequate documentation to support the evaluation for the applicable portion(s) and any resulting infeasibility determination, if any, by the Department.

8.2.6 Stormwater Management Standards. Subject to the applicability criteria in Section 8.2.4 and exemptions in Section 8.2.5, the following stormwater management standards apply.

- a. Design of Stormwater Management System: The design of the stormwater management system shall be in accordance with the applicable sections of the GCSMM and/or 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
- c. _____
- d. 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

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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.

e. 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.

f. Stormwater Runoff Quality/Reduction: Stormwater Runoff Quality/Reduction: For projects submitted on or after January 8, 2018, the applicant shall provide runoff reduction in accordance with the requirements of the Gwinnett County Stormwater Management Manual. To the extent Runoff Reduction has been determined to be infeasible for all or a portion of the site using the Planning and Development Practicability Policy, then water quality shall apply for the remaining runoff from a 1.2 inch rainfall event. The design professional shall schedule a meeting with Planning and Development when requesting removal or reduction of the runoff reduction requirement.

(i) Runoff Reduction - The stormwater management system shall be designed and sized to retain the first 1.0 inch of rainfall on the site using runoff reduction methods, to the maximum extent practicable. Runoff reduction practices are stormwater best management practices, BMPs, used to disconnect impervious and disturbed pervious surfaces from the stormwater drainage system to reduce the post-construction stormwater runoff rates, volumes, and pollutant loads. If the Runoff Reduction cannot be met in whole or in part, then the water quality standards shall be used to treat the remainder.

(ii) Water Quality-The stormwater management system shall be designed to detain or treat the runoff from 85% of the storms that occur in an average year and reduce the average annual post-development total suspended solids (TSS) loadings by 80% in order to meet the water quality requirement. The water quality requirement can be waived if the entire 100% of runoff reduction is provided. Water quality and runoff reduction can also be provided in conjunction in order to meet the water quality requirements outlined in the Gwinnett County Stormwater Management Manual (GCSMM)

(iii) If a site is determined to be a hotspot as detailed in Section 8.2.4, the City of Lilburn may require the use of specific or additional components for the stormwater management system to address pollutants of concern generated by that site.

g. Stream Channel Protection. The increase in the frequency and duration of bankfull conditions in stream channels due to urban development is the primary cause of stream bank erosion and the widening and downcutting of stream channels. Channel protection is not required if the post development discharges are less than 2 cfs at each individual discharge location for the 1-yr storm event.

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. This standard is intended to reduce the frequency, magnitude, and duration of post-development bankfull conditions. The volume to be detained is also known as the channel protection volume (CPv).
 - (ii) Erosion prevention measures, such as energy dissipation and velocity control to prevent downstream erosion and stream bank damage.
 - (iii) Preservation of any applicable stream buffer. Stream buffers not only provide channel protections but also water quality benefits and protection of stream side properties from flooding.
- h. 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.
- i. Extreme Flood Protection: Extreme flood protection shall be provided by controlling the 100-year, 24-hour storm event such that flooding is not exacerbated.
- j. 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 GCSMM. 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.
- k. 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 Lilburn, 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 8.2.15.

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

- a. Before a land development permit application is submitted, a pre-submittal meeting with the City of Lilburn Planning Department is required. The pre-submittal meeting should take place before site analysis and inventory. The purpose of the pre-submittal meeting is to discuss opportunities, constraints, and ideas for the stormwater management system before formal site design engineering. Applicants must request a pre-submittal meeting with the City of Lilburn 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.
 - (ii) Perform screening and preliminary selection of appropriate best management practices and identification of potential siting locations.

C. The stormwater concept plan shall contain:

- (i) Common address and legal description of the site.
- (ii) Vicinity map, and Existing conditions and proposed site layout which illustrate at a minimum:
- (iii) Existing and proposed topography (minimum of 2-foot contours).
- (ii) Perennial and intermittent streams.
- (iii) Mapping of predominant soils from USDA soil surveys.
- (iv) Boundaries of existing predominant vegetation and proposed limits of clearing and grading.
- (v) Approximate 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.).
- (vi) Location of existing and proposed roads, buildings, parking areas and other impervious surfaces.
- (vii) Existing and proposed accommodations for utilities (e.g., water, sewer, gas, electric).
- (viii) Preliminary selection and location, size, and limits of disturbance of proposed BMPs.
- (ix) Location of existing and proposed conveyance systems such as grass channels, swales, and storm drains.
- (x) 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
- (xi) Preliminary location 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 and certified by a qualified professional 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.

- (i) Natural Resources Inventory
- (ii) Stormwater Concept Plan
- (iii) Existing Conditions Hydrologic Analysis

For any stormwater analysis, the composite "C" (Rational Method) or CN (SCS Method) used for analysis of pre-development conditions shall be consistent with those shown in the Gwinnett County Stormwater Management Manual.

- (iv) Post-Development Hydrologic Analysis

Analysis of the off-site properties shall anticipate future development in addition to addressing existing conditions.

- (v) Stormwater Management System
- (vi) Downstream Analysis

For the purposes of these regulations, the words "downstream" and "analysis" shall have the following meanings. The analysis of downstream conditions in the report shall address each and every point or area along the project site's boundaries at which runoff will exit the property. The analysis shall focus on the portion of the drainage way "immediately" downstream from the project. This area shall extend downstream from the project to a point in the drainage basin where the project area is 10 per- cent of the total basin area. The analysis shall be in accordance with the Gwinnett County Stormwater Management Manual.

- (vii) Erosion and Sedimentation Control Plan. (See Section 109 Article III, Soil Erosion, Sedimentation and Pollution Control ordinance)
- (viii) BMP Landscaping Plan prepared by a registered professional
- (ix) Inspection and Maintenance Agreement

- (x) Evidence of Acquisition of Applicable Local and Non-Local Permits
- (xi) 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

(a) A new survey, drawing and certification showing that the outlet structure is constructed as approved, will function as designed, and the flood storage and water quality volume of the facility is equal to or greater than the volume required when the facility was approved.

(ii) Hydrology Reports

(iii) Current inspection of existing stormwater management structures with deficiencies noted

(iv) BMP Landscaping Plans if required at time of BMP construction

8.2.8 Application Fee. The fee for review of any land development application shall be based on the fee structure established by the City of Lilburn and payment shall be made at the time of application or building permit for the development.

8.2.9 Application Procedures. Land development applications and permit shall be obtained pursuant to the Zoning Ordinance Article 12 and the Development Regulations, or a building permit shall be obtained per Zoning Ordinance Section 1202, and the Development Regulations Article 4. Before any person begins development on a site, the owner of the site shall first obtain approval in accordance with the following procedure:

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a. Submit a land development permit application to the City of Lilburn on the city's application form with the following supporting materials:

- (i) the stormwater management plan prepared in accordance with Section 8.2.7 (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 the applicant has reviewed the City of Lilburn's Inspection and Maintenance Agreement and that applicant agrees to sign and record such Inspection and Maintenance Agreement before the Certificate of Occupancy/Approval.

b. The administrator shall inform the applicant whether the application and supporting materials are complete and approved or incomplete or denied 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(s) 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 Lilburn may issue the associated land disturbance permit or building permit, provided all other legal requirements for the issuance of such permits have been met including acquisition of all applicable non-local permits and

Gwinnett County approvals. The stormwater management plan included in such applications becomes the approved stormwater management plan.

8.2.10 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.

8.2.11 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 Lilburn or conducted and certified by a professional engineer or a Level 2B certified third party inspector who has been approved by the City of Lilburn. 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.

8.2.12 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.

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 Lilburn with the request for a final inspection. The City of Lilburn shall perform a final inspection with applicant to confirm applicant has fulfilled these responsibilities.

- b. Submitting as-built drawings showing the final design specifications for all components of the stormwater management system(s) as certified by a professional engineer. A certified record survey of each facility shall be prepared by an authorized professional currently registered in the State of Georgia. A certified record drawing of the facility/facilities shall be prepared based upon this survey. The authorized registered professional shall certify that the facility/facilities functions hydraulically as designed. Documentation demonstrating the required testing outlined in the Gwinnett County Stormwater Management Manual for the proposed stormwater BMP shall also be provided. The record drawing shall be submitted to the Department at least three weeks prior to the issuance of a Certificate of Occupancy, Certificate of Approval or Final Plat approval (as appropriate for the project). Record drawings of off-site facilities shall be recorded at least one week prior to the recording of the Final Plat.

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

d. Delivering to City of Lilburn a signed inspection and maintenance agreement for review by the city. Once approved, the maintenance agreement shall be recorded by the owner in the property record for all parcel(s). Documents shall be recorded at the Gwinnett County Clerk of Superior Court's office.

8.2.13 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 the Zoning Ordinance Article 13 and Development Regulations Article 13 or the underlying building permit. To address a violation of this Article, the City of Lilburn 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.

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8.2.14 Maintenance by Owner of Stormwater Management Systems Predating Current GCSMM. For any stormwater management systems approved and built based on requirements predating the current GCSMM 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.

It shall be the responsibility of the property owner to maintain the operational characteristics of any facility constructed on their property for storm water management pursuant to City requirements, to keep the access drive free of obstructions, and to maintain the facility free of obstruction, silt or debris.

8.2.15 Inspection and Maintenance Agreements.

(a) The owner shall execute an inspection and maintenance agreement with the City of Lilburn 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 Lilburn. After the inspection and maintenance agreement has been signed by the owner and reviewed and approved by the City of Lilburn, 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. The document shall be recorded at the Gwinnett County Clerk of Superior Courts' office. A copy of the recorded inspection and maintenance agreement shall be provided to the City of Lilburn.

(b) 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 Lilburn.

(c) 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 Lilburn.

(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.

8.2.16 Right of Entry for Maintenance Inspections. The terms of the inspection and maintenance agreement shall provide for the City of Lilburn'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 Lilburn shall have the right to enter and make inspections pursuant to the City of Lilburn's general provisions for property maintenance inspections pursuant to Chapter 105, Article III.

8.2.17 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 the City of Lilburn. 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 Article III Property Maintenance.

(b) To address such a failure to maintain the stormwater management system, the City of Lilburn 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.

8.2.18 Stormwater BMPs Location and Easement Criteria not otherwise provided for in the GCSMM:

- a. A non-residential subdivision is not required to locate an on-site stormwater management facility on a separate lot. The property owners served by a stormwater management facility that meets the stormwater standards for more than one property owner or is located off-site shall enter into a maintenance agreement acceptable to the city for the facility's maintenance. However, if desired by the developer, the facility may be located on a separate lot if it is owned and maintained by a mandatory property owners' association.
- b. Stormwater management facilities may be located within utility easements or rights-of-way, or encroach upon utility easements or rights-of-way, upon receipt by the Department of written permission from both the property and utility owners.
- c. If a single family detached residential development is provided with an on-site stormwater management facility, a mandatory homeowners association shall be established for its ownership and maintenance. The facilities shall be located on a single lot within the development and owned by the homeowners' association. If the project is provided with an off-site stormwater management facility, a mandatory property owners' association shall be established for its maintenance. The association bylaws shall be recorded concurrently with the recording of a final subdivision plat.
- d. No portion of any stormwater management facility shall disturb any required (as opposed to voluntary) buffer, landscape strip, or tree protection area.
- e. No portion of a private stormwater management facility shall not encroach upon a public right-of-way.
- f. A stormwater management facility may be located within or encroach upon a floodplain in accordance with the Floodplain Management Ordinance.
- g. In a non-residential subdivision or project, an access easement at least 20 feet in width shall be required to provide access to all storm water management facilities from a public street.
- h. In a residential subdivision, an easement at least 20 feet in width shall be required to provide access to all detention/retention facilities from a public street

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i. All other stormwater BMPs access easement requirements shall, at a minimum, meet the requirements outlined in the GCSMM.

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j. The following stormwater BMP's must be located on a separate lot, owned by the HOA, if not located in a common or recreation area and within an access and maintenance easement:

(i) Bio-retention Areas

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(ii) Dry/Dry Extended Ponds

(iii) Stormwater Ponds

(iv) Stormwater Wetlands

(v) Submerged Gravel Wetlands

(vi) Underground Detention

(vii) Multi-purpose Detention Areas

8.2.19 Stormwater Conveyance Facilities

Stormwater conveyance facilities, which may include but are not limited to culverts, storm drainage pipes, catch basins, drop inlets, junction boxes, headwalls, gutters, swales, channels, and ditches, shall be provided for the protection of public rights-of-way and private properties adjoining projects sites and/or public rights-of-way.

8.2.19(a) Standard specifications

a. Unless otherwise specifically set forth herein or in the Gwinnett County's Pipe Standards and/or Gwinnett County Stormwater Management Manual, all of the materials, methods of the construction, and workmanship for the work covered in reference to stormwater conveyance facility construction shall conform to the most recent Standard Specifications of the Georgia Department of Transportation (Georgia DOT).

8.2.1 Stormwater Management Report Required

a. Every project shall provide a Stormwater Management Report prepared by a Professional Engineer currently registered in the State of Georgia. The purpose of this report shall be to formulate a plan to manage stormwater runoff so that stormwater runoff hazards are not created and existing runoff-related problems are not exacerbated, either upstream or downstream from or within the boundaries of the property being developed.

b. The Storm Water Management Report shall identify the locations and quantities of storm water runoff entering and exiting the site for both pre- and post-developed conditions. Analysis of the off-site properties shall anticipate future development in addition to addressing existing conditions.

All culverts, pipe systems, and open channel flow systems shall be sized based on all on-site upstream areas being developed in accordance with the development plans and the off-site upstream areas being fully developed in accordance with the Land Use Plan with no detention. Upstream detention may be included when determining flows, provided the engineer calculates the reduced flows by routing the developed flows through any storm water facility included in the analysis rather than assuming the reduction will occur. The engineer shall show that detention facilities used in the analysis will remain, be properly maintained and the storage volume and outlet structure is based on current conditions.

Detention facilities shall be designed using pre-development flows based on existing conditions for all upstream areas including existing on-site lakes and detention. Post-development flows, except the 100-year flow, shall be based on on-site upstream areas being developed per the development plans and existing conditions for off-site upstream areas. The 100-year flow shall be based on on-site upstream areas

being developed per the development plans and the off-site upstream areas being developed per the Land Use Plan with no detention. Upstream detention may be included if it meets the conditions as described for culverts and pipe systems. Existing conditions shall be defined as the conditions of the site at the time of application for a land disturbance permit. The existing condition includes on-site lakes and ponds. Pre-development flows shall be determined by routing the pre-development flows through these storm water facilities. Flows used to size the outlet structures for detention facilities that exceed the 25-year design flow, shall be sized as described for culverts and pipe systems.

When more than 50 percent of the property of a developed project site is disturbed for either redevelopment or improvement, the Storm Water Management Report shall be prepared for the entire site and existing impervious areas shall be treated as forest in the pre-developed analysis. When 50 percent or less of the property is disturbed, detention shall be provided as required by these regulations for the disturbed area and existing impervious areas which are disturbed shall be treated as forest in the pre-developed analysis.

The report shall contain drainage area delineation maps and other exhibits at satisfactory scale and sufficient in quantity and scope to define the boundaries of the site, and off-site areas, relative to watercourses, drainage divides, drainage structures, and other pertinent features. The County's Geographical Information System (GIS) mapping information shall be used where appropriate.

- c. The analysis of downstream conditions in the report shall address each and every point or area along the project site's boundaries at which runoff will exit the property. The analysis shall focus on the portion of the drainageway "immediately" downstream from the project. This area shall generally extend a flow distance of about one-half mile from the project's boundary line, but shall be longer for projects contributing relatively large amounts of runoff to the study area, and shorter for small runoff contributions. In all cases, the most critical downstream area investigation shall be conducted relative to existing and anticipated land uses on tracts which adjoin the project site.
- f. When a development uses an existing facility where the last approved certification and record drawing of the facility was over 18 months prior to the new development's submittal, the engineer shall provide one of the following:
 - 1) A new survey, drawing and certification showing that the outlet structure is constructed as approved and the flood storage and water quality volume of the facility is equal to or greater than the volume required when the facility was approved.
 - 2) Construction plans and calculations showing that the outlet structure will function as designed and the flood storage and water quality volume of the facility will be equal to or greater than the volume required when the facility was approved once the proposed maintenance has been performed.
 - 3) A new record survey, drawing, study and certification showing that the facility meets the development requirements when the facility was approved.

g. Design Criteria — General:

All design related to storm water shall be in accordance with the Gwinnett County Storm Water Design Manual.

h. Evidence of Acquisition of Applicable Non-Local Permits

The applicant shall certify and provide documentation that all other applicable environmental permits have been acquired for the site prior to approval of the Storm Water Management Report.

(Ord. No. 113-04, 3-8-2004)

8.2.2 — Stormwater Detention Required

- a. Whenever a Stormwater Management Report indicates that adverse stormwater runoff related impact is expected to result from the development of a property, that project shall be required to provide stormwater detention facilities such that peak flows from the developed site do not exceed those associated with predevelopment conditions.

b. The following criteria shall be evaluated by the Engineer preparing the Stormwater Management Report, and in determining whether or not detention should be required for any portion of any site:

1. Existing land uses downstream;
2. Anticipated future land uses downstream;
3. Magnitude of increase in peak flows due to development;
4. Presence of existing drainage problems;
5. Capacity of existing and anticipated drainage systems;
6. Creation of concentrated flows where none had occurred previously;
7. Availability of feasible locations for detention facilities;
8. Existing flows generated off-site which pass through the project site;
9. Anticipated future flows generated off-site which pass through the project site; and
10. The nature of the receiving watercourse.

b. [c.] Storm water detention facilities required in Subsection 8.2.2.a shall be provided, unless the authorized registered professional (refer to Subsection 8.2.1. Paragraph a.) certifies and provides certified documentation supporting the conclusion to the Director that at least one of the following is true and correct as applicable:

- (1) The non-detained, post-development runoff will leave the project site as sheet flow, and will not have an adverse impact upon downstream properties. The increase for a 25-year storm should not exceed one CFS over a length perpendicular to the flow of 100 feet.
- (2) The effect of detention would be to concentrate flows where sheet flow had occurred under pre-developed conditions, and any impact of increase sheet flows upon downstream properties would be less adverse than that which would result from the concentrated flows from a detention facility even if energy dissipation devices were employed.
- (3) The undetained flow will pass through downstream properties, in drainage easements obtained by the developer, to an existing detention facility that has been designed to manage the upstream property's runoff or to the point in the downstream analysis (see 8.2.1.c) which shows that detention is not required.
- (4) Where the site runoff will flow directly into a stream or lake without crossing off-site properties:
 - a. 24-hour detention of the one-year storm is required if water quality protection is required for the project.
 - b. Only peak detention for the two-year though the 25-year storm is not required if the downstream analysis using timing of the hydrographs shows no adverse impact from the exit of the site to the point immediately downstream from the project in the drainage basin where the project area is ten percent of the total drainage basin area.

d. In the event that the Professional Engineer has concluded that storm water detention may not be necessary as compliance with Section 8.2.2.c is anticipated, a pre-design conference with the Department shall be required before the submittal of plans.

(Ord. No. 113-04, 3-8-2004)

8.2.3 Detention design criteria — general

- a. All stormwater detention design calculations shall be certified by a Professional Engineer currently registered in the State of Georgia.
- b. All storm water detention facilities shall be designed to detain the one-year storm runoff for the area draining to the pond, for 24 hours. For the project, this volume, called the channel protection volume, shall be equal

to or greater than the one-year storm runoff volume from the project. In addition, these facilities shall control the peak flow rates associated with storms having two-year, five-year, ten-year, and 25-year return frequencies so that flows from the developed site do not exceed those associated with predevelopment conditions at the project boundary nor increase the peak flows downstream from the project to the point in the drainage basin where the project area is ten percent of the total basin. Where adverse impacts, as defined in section 8.2.2.a, occur during the 100-year storm, the 100-year storm shall also be regulated.

c. A variety of methods of achieving stormwater management goals shall be acceptable in providing detention facilities. The type of facility provided shall be based on the following criteria:

1. The type of development for which the detention facility is being provided;
2. The type of development which the detention facility is intended to protect;
3. Volume of stormwater to be stored;
4. Origin and magnitude of the flows to be managed;
5. Topographic opportunities and limitations;
6. Safety considerations;
7. Maintenance requirements;
8. Aesthetic considerations;
9. Likelihood of facility operation interfering with access to public or private facilities;
10. Proximity of facility to property lines, utilities, buffers, etc., and
11. Similar site-specific constraints.

d. Detention facilities may be of any of the following types, and two or more types may be used in combination with one another:

1. Normally-dry basins, whether excavated or created by damming a natural drainage feature, or a combination of both methods;
2. Lakes and ponds, whether excavated or created by damming a natural drainage feature, or a combination of both methods;
3. Parking lot facilities;
4. Underground facilities; and
5. Roof top facilities.

e. Reservoir routing methods shall be used for all detention facility design. The size of the orifice to detain the one-year storm for the facility shall be computed using the following orifice equation with a 24-hour draw down time from the elevation of the total channel protection volume (CPV) and an orifice coefficient of 0.60. The minimum elevation of the two-year control shall be at the maximum routed pool elevation of the one-year storm and not pool elevation of the total one-year storm volume.

h = head measured in feet from the elevation needed to store the total 1-year runoff volume (CPV) to the centroid of the orifice;

Qa = average CPV outflow rate in CFS;

$Qa = CPV / 3600 \times 24$;

A = required orifice area in square feet;

$A = Qa / (0.6 \times (64.4 \times h / 2)^{0.5})$;

f. The detention methodology required for any given project shall conform to the following table. Although the various methods shown are authorized, it shall be the responsibility of the design Engineer to use the correct coefficients and applications which will result in compliance with the requirements of this Article and the intent of these Regulations.

TABLE 8-A
DETENTION METHODOLOGY
DRAINAGE BASIN SIZE BY

TOTAL ACRES WITHIN BASIN	METHODOLOGY
Up to 10	Rational
Over 10 to 500	Rational or SCS
Over 500 to 2,000	SCS or HEC-1
Over 2,000	HEC-1 or TR-20

1. For the purpose of these Regulations, a drainage basin includes all of the acreage which will contribute flow to a study point (or area) along a downstream property line of the site being developed.
2. All sub-basins draining a project which fall within the same size category above should be analyzed using the same methodology.
3. Under no circumstances will the "bowstring" method be acceptable.
- g. Runoff coefficients used for pre- and post-development conditions for the Rational Method shall be consistent with those shown in Table 9-F. For the SCS method the runoff Curve Numbers found in the "Manual for Erosion and Sediment Control in Georgia" shall be used.
- h. If either the Rational Method or the SCS Method is used for detention design, calculations shall be provided showing how all times of concentration or lag times were computed, both for pre- and post-developed conditions. Likewise, adequate support must be provided for all composite runoff coefficients or curve numbers used.
- i. If a computer program is used for detention design, including generating and routing hydrographs, the output from the program shall be summarized in the Stormwater Management Report, and the same and version of the program shall be indicated. Computer output sheets may be attached to the report if desired by the design engineer or if requested by the Department.
- j. The design of every detention facility of any type shall consider the effects both of inflows in excess of those the facility is designed to accommodate and of malfunctioning of the primary outlet system. A safe path for overflow condition flows shall be provided.

(Ord. No. 055-02, 11-11-2002; Ord. No. 113-04, 3-8-2004)

8.2.4 Detention facility location criteria

- a. For purposes of these Regulations, a detention facility shall be deemed to consist of the area within the maximum design ponding limits, the dam (if one) including all embankment slopes and wall footings (if applicable), primary and emergency outlet works, any drainage and access easements, and any energy dissipation devices.
- b. Detention facilities, to the greatest extent feasible, shall be located so as to minimize the amount of flow generated on-site which by-passes the facility.
- c. No portion of any detention facility shall disturb any required (as opposed to voluntary) buffer, landscape strip, or tree protection area.
- d. The 100-year ponding limits of a detention facility shall not encroach upon a public right-of-way.

- e. ~~Detention facilities may be located within utility easements or rights-of-way, or encroach upon utility easements or rights-of-way, upon receipt by the Department of written permission from both the property and utility owners.~~
- f. ~~A detention facility may be located within or encroach upon a floodplain in accordance with the Floodplain Management Ordinance.~~
- g. ~~If a residential subdivision is provided with an on-site detention facility not located within a recreation area as specified in 8.2.4.g.f. above, a mandatory property owners' association shall be established for its ownership and maintenance. The facility shall be located on a single lot within the development and owned by the property owners association. The lot shall have a minimum of 30 feet of public road frontage and a minimum lot width of 30 feet. If the project is provided with an off-site detention facility, a mandatory property owners' association shall be established for its maintenance. The association bylaws shall be recorded concurrently with the recording of a final subdivision plat. The association bylaws shall include the same provisions as specified in Subsection 5.9.2, Paragraph b. of this regulation.~~

(Ord. No. 012-01, 12-10-2001)

8.2.5 ~~Detention facility easement requirements~~

- a. ~~In a non-residential subdivision or project, an easement at least 20 feet in width shall be required so as to provide access to all detention facilities from a public street.~~
- b. ~~In a residential subdivision, an easement at least 30 feet in width shall be required so as to provide access to all detention facilities from a public street.~~
- c. ~~Access Easement.~~
 - 1. ~~The access easement shall be cleared, grubbed and graded so that it can be utilized by rubber-tired construction vehicles.~~
 - 2. ~~The minimum drive width shall be 15 feet.~~
 - 3. ~~The drive shall be grassed or paved.~~
 - 4. ~~The maximum slope shall be 20 percent (5H:1V).~~
 - 5. ~~Access easements may be combined with drainage easements containing an open channel; however, the combined easement shall be a minimum of 30 feet in width and shall be wide enough for the drainage channel and the drive.~~
 - 6. ~~A drive to the bottom of the pond shall be provided when the facility is over ten feet deep from the bench elevation, or the facility is wider than 50 feet as measured from bench to bench.~~
- d. ~~Every normally dry detention basin, lake, or parking lot detention facility shall be completely enclosed within a drainage easement. The drainage easement shall extend at least ten feet beyond the 100-year flooding limits of the detention facility.~~

(Ord. No. 012-01, 12-10-2001)

8.2.6 ~~Detention facility maintenance~~

- a. ~~The detention storage capacity or function of any detention basin, pond or other impoundment, whether natural or man-made, shall not be removed or diminished without the express approval of the City.~~
- b. ~~In a residential subdivision, it shall be the responsibility of the mandatory property owner's association to maintain the operational characteristics of any facility constructed on their property for storm water management pursuant to City requirements, to keep the access drive free of obstructions, and to maintain the facility free of obstruction, silt or debris.~~
- c. ~~In a non-residential subdivision or project served by a facility that provides storm water management for more than one property or by an off-site facility, the property owners shall enter into a maintenance~~

agreement acceptable to the City for maintenance of the operational characteristics of the facility pursuant to City requirements, to keep the access drive free of obstructions, and to maintain the facility free of obstruction, silt or debris.

- d. In a non-residential project with an on-site facility which serves only that project, the property owner shall be responsible to maintain the operational characteristics of the facility pursuant to City requirements, to keep the access drive free of obstructions, and to maintain the facility free of obstruction, silt or debris.
- e. Where no maintenance agreement has been recorded, it shall be the responsibility of the property owner to maintain the operational characteristics of any facility constructed on their property for storm water management pursuant to City requirements, to keep the access drive free of obstructions, and to maintain the facility free of obstruction, silt or debris.
- f. Prior to the issuance of a Development Permit, the owner shall submit a detailed schedule of long-term maintenance and inspection activities. This schedule of activities shall be incorporated into a maintenance agreement to be entered into between the City and the owner. The schedule shall describe all maintenance and inspection activities and the parties responsible. The maintenance agreement shall be in a form acceptable to the City and shall be recorded in the deed records of the Clerk of Superior Court of Gwinnett County.

(Ord. No. 012-01, 12-10-2001)

8.2.7 Detention facility construction standards

- a. Stormwater detention facilities shall be constructed in accordance with plans reviewed and approved by the Department, and shall be in place and inspected prior to the initiation of other improvements. If the detention facility is planned to be a lake, temporary detention facilities shall be provided and shall remain in place until such time as the lake has become effective in providing stormwater management.
- b. Within a detention basin, all stumps are to be cut flush with the ground or removed and all debris is to be removed below a 1.2" rainfall event ponding elevation. Trees or shrubs may be allowed to remain below this ponding elevation only upon certification of the survivability of the vegetation.

(Ord. No. 055-02, 11-11-2002)

- c. Detention slopes which are disturbed are to be grassed. The ground cover within the basin shall be well established with all exposed areas covered prior to the end of the maintenance period.
- d. If the developer desires to place a fence around a detention facility, it shall be a minimum four foot high fence of durable material, with a 12 foot wide access gate. The fence shall be contained with an easement at least 20 feet wide, shall not encroach upon the detention facility (although their easements may overlap by up to ten feet), and shall comply with the locational requirements of the Zoning Resolution.
- e. The side slope in graded areas is recommended to be 3H: 1V or flatter. The normal ponding surface elevation shall be defined as the elevation when the volume contained in the facility equals the runoff from a 1.2" rainfall event. When the depth to the normal ponding surface is greater than 4 feet and the side slope is steeper than 4H:1V, a bench shall be provided. The bench shall be at least ten feet in width and is recommended to be 15 feet in width. The slope of the bench shall be 10H:1V. The bench shall be located so that the normal ponding surface elevation is between the top and bottom edge of the bench. See Storm Water Standard Drawing.
- f. The bottom of the pond shall be graded for positive drainage. See Storm Water Standard Drawing.

(Ord. No. 055-02, 11-11-2002)

8.2.8 Detention Facility Certification and Record Drawings

- a) When a new facility is constructed in a development, a certified record survey of each detention facility shall be prepared by a land surveyor currently registered in the State of Georgia. A certified record drawing of

~~the facility shall be prepared based upon this survey. Based on the actual parameters established on the record drawing, an addendum to the Storm Water Management Report shall be prepared which demonstrates that the facility, as constructed, complies with the requirements of these Regulations. The amended Storm Water Management Report shall be certified by the authorized registered professional (refer to Subsection 8.2.1, Paragraph a.). The survey shall be performed after substantial completion and stabilization of the project has occurred. The record drawing and addendum to the Storm Water Management Report shall be submitted to the City at least one week prior to the issuance of a Certificate of Occupancy or Final Plat approval (as appropriate to the project).~~

- b) ~~When a development uses an existing facility without an existing storm water maintenance bond, the facility shall be cleaned out if necessary and a new record survey, drawing and certification showing that the outlet structure exists as approved and the flood storage and water quality volume of the facility is equal to or greater than the volume required when the facility was approved. As an alternative, a new record survey, drawing, study and certification showing that the facility meets the development requirements when the facility was approved shall be submitted. The survey shall be performed after substantial completion and stabilization of the project has occurred. The certification and supporting data shall be submitted to the City at least one week prior to the issuance of a Certificate of Occupancy or Final Plat approval (as appropriate to the project).~~

(Ord. No. 113-04, 3-8-2004)

Sec. 8.3. – Culverts And Piped Drainage Systems.

8.3.1—Drainage improvements required

~~Stormwater conveyance facilities, which may include but are not limited to culverts, storm drainage pipes, catch basins, drop inlets, junction boxes, headwalls, gutters, swales, channels, and ditches, shall be provided for the protection of public rights-of-way and private properties adjoining projects sites and/or public rights-of-way.~~

8.3.2—Standard specifications

- a. ~~Unless otherwise specifically set forth herein or in the City of Lilburn's Standard Drawings, all of the materials, methods of the construction, and workmanship for the work covered in reference to stormwater conveyance facility construction shall conform to the most recent Standard Specifications of the Georgia Department of Transportation (Georgia DOT).~~
- b. ~~Allowable pipe material for all applications in drainage easements and public street rights-of-way shall be Reinforced Concrete Pipe (RCP).~~
- c. ~~Unless otherwise specifically set forth herein or in the City of Lilburn's Standard Drawings, all of the materials, methods of the construction, and workmanship for the work covered in reference to stormwater conveyance facility construction shall conform to the most recent Standard Specifications of the Georgia Department of Transportation (Georgia DOT).~~
- d. ~~Allowable pipe material for all applications in drainage easements and public street rights-of-way shall be Reinforced Concrete Pipe (RCP).~~
- e. ~~For roads constructed with public funds, either wholly or in part, or roads classified as Major Thoroughfares, materials which meet the Georgia DOT design standards shall be used unless an alternative is specifically approved by the Gwinnett Department of Transportation.~~
- f. ~~Only Reinforced Concrete Pipe (RCP) shall be used for all dams nine feet or more in height with an impounding capacity of 20 acre-feet or more, unless the Georgia Safe Dams Program requires another material.~~
- g. ~~Reinforced Concrete Pipe (RCP) shall be used under non-local roads.~~
- h. ~~The Department of Public Utilities may approve an alternative pipe material.~~

Pipe Material Requirements

-Delete entire table

TYPE OF PIPE INSTALLATION			C O N C R E T E	METAL PRODUCTS		PLASTIC	
S T O R M D R A I N				Aluminum Coated (Type 2) Corrugated Steel AASHTO M-36 and AASHTO M274	Plain uncoated corrugated aluminum alloy AASHTO M-196	Corrugated Polyethylene AASHTO M-252 AASHTO M-294 and AASHTO MP7	Smoothed Lined Corrugated Polyethylene Type "S" and "D"
	LONGITUDINAL INTERSTATE AND TRAFFIC BEARING		X				
	LONGITUDINAL NON-INTERSTATE AND NON-TRAFFIC BEARING		X				
	NON- LOCAL ROAD	Cross Drain Grade <10%	X				
		Cross Drain Grade >10%	X				
	LOCAL ROAD	Cross Drain Grade <10%	X				
SIDE DRAIN			X				
PERMANENT SLOPE DRAIN			X				
PERFORATED UNDER DRAIN			X				
DAMS H>9' and V>20 Ac Ft			X				

(Ord. No. 013-01, 12-10-2001)

8.3.3—Design criteria—general

- a.—All stormwater conveyance facility design calculations shall be certified by a Professional Engineer currently registered in the State of Georgia.
- b.—Stormwater flows from drainage areas up to 500 acres in size may be calculated using the Rational Method. Flows from drainage areas between 10 and 2,000 acres in size may be calculated using the SCS Method. Flows for drainage areas larger than 2,000 acres in size must be calculated using published flood-frequency relations for the Atlanta area.
- c.—All portions of a stormwater conveyance system which drain areas falling within the same size category above shall be analyzed using the same methodology.
- d.—Run-off coefficients used for the Rational Method shall be consistent with those shown in Table 9-F. For the SCS Method, the Runoff Curve Numbers found in the "Manual for Erosion and Sediment Control in Georgia" shall be used.

8.3.4—Design criteria—culverts

- a.—Culverts (structures designed to convey water from one side of a public right-of-way to the other) and which carry the runoff from a contributing drainage area of at least 20 acres shall be designed to pass the peak flow associated with a 100-year storm with at least one foot of freeboard between the 100-year ponding elevation and the top of the roadway shoulder, without rising the 100-year flood elevation on upstream properties, and in accordance with Floodplain Management Ordinance.
- b.—The 100-year ponding limits above the culvert shall be shown on the Development Plans and on the Final Plat (if applicable).
- c.—The minimum allowable culvert diameter shall be 18 inches.
- d.—Culvert design is to be in accordance with the methods contained in the Georgia DOT "Drainage Manual for Highways", Chapter 7, and shall include a thorough analysis of both inlet and outlet control structures.

8.3.5—Piped collection systems

- a.—The preliminary design (initial pipe sizing and profile design) of piped collection systems required under 8.3.1 herein shall be based upon conveyance of the peak flows associated with a ten-year storm with the hydraulic grade line being at or below the crown of the pipe throughout the system.
- b.—Once the preliminary design of a piped collection system has been prepared, it shall be analyzed for its behavior during conditions of 100-year flow, with the objective of this analysis being to ascertain the quantities of flow and the flowpaths followed by flows exceeding the capacity of the system, whether these pond at inlets or flow along the ground's surface.
- c.—Based on the analysis of 100-year conditions, the preliminary design shall be revised where necessary to produce a final design for which the likelihood of dwelling flooding, major property damage, or substantial public access and/or utility interruption shall be less than one chance in 100 years.
- d.—The minimum allowable pipe diameter shall be 15 inches.
- e.—Catch basins shall be spaced so that the spread in the street for a ten-year design flow shall not exceed eight feet, as measured from the face of the curb.:

Gutter spread calculations shall be submitted to the Storm Water Management Division of the Department of Public Utilities for review and approval prior to issuance of a Development Permit.

- f. Complete flow, velocity, and hydraulic grade line computations, shall be provided for all portions of a piped collection system. Hydraulic grade lines shall be shown on the storm drainage profiles contained with the Development Plans for the ten-year storm.

(Ord. No.011-01, 12-10-2001)

8.3.6—Energy dissipation—piped systems and culverts

- a. Energy dissipation devices, such as splashpads, rip-rap, stilling basins, etc., shall be provided at the outlet of every culvert and piped collection system. (Please refer to the Standard Drawings.)
- b. Energy dissipation devices shall be located entirely within the project site, and shall not encroach upon any required buffer.
- c. When uniform, graded stone rip-rap is used for energy dissipation, ultraviolet resistant filter fabric (200-pound test) shall be used between the stone layers.

8.3.7—Minimum pipe and pipe coating requirements

The type of pipe material used shall be in accordance with Section 8.3.2 of these regulations (i.e., concrete pipe only).

- a. Reinforced concrete pipe shall be in not less than 8 foot joint lengths. All joints shall be bell and spigot type with a rubber gasket conforming to ASTM C-443. Pipe shall be manufactured in accordance with AASHTO M-170 and/or ASTM C-76. Class of pipe and wall thickness shall be in accordance with 1030-D, Georgia DOT specification, Table No. 4.
 - 1. All corrugated galvanized pipe not carrying a live stream located within a street right-of-way, drainage easement, or detention facility shall be asphalt coated only. Except for culverts under driveways, all corrugated galvanized pipe which will carry a live stream, within a street right-of-way, drainage easement, or in a detention facility shall be either 1) asphalt coated with a paved invert per AASHTO M-190, Type C, or 2) asphalt coated with a concrete lining. The lining shall be plant applied so as to produce a homogeneous non-segregated lining throughout. The lining shall have a nominal thickness of one-fourth inch above the crest of the corrugations.
 - 2. See the Standard Drawings for minimum acceptable combinations of gages, diameters, and corrugation configurations for corrugated steel pipe and pipe arches.
 - 3. Each end of each pipe section, to be joined by a coupling band, shall have a minimum of two annular corrugations. Coupling bands shall be so constructed as to lap on an equal portion of each of the pipe sections to be connected. The connecting bands shall have a minimum of two annular corrugations and shall fully engage, over the entire pipe periphery, one corrugation on each pipe end. Bands shall be fabricated from the same material as is the pipe, and the gauges shall be as specified in Section 9.2 of AASHTO M-36.
 - 4. Gaskets may be required as determined by the Department in the field and shall be either sleeve type or O-ring type, and shall meet the requirements for gaskets as specified in Section 9.3 of AASHTO M-36.
- b. Reinforced concrete pipe shall be in not less than 8' joint lengths. All joints shall be bell and spigot type, using an O-ring gasket conforming to ASTM C-443. Pipe shall be manufactured in accordance with AASHTO M-170 and/or ASTM C-76. Class of pipe and wall thickness shall be in accordance with 1030-D, Georgia D.O.T. specification, Table No. 4.
- c. Aluminized steel coated pipe shall comply with AASHTO M-274 for the coating and AASHTO M-36 for the pipe fabrication. Aluminum alloy pipe shall comply with AASHTO M-196 for material and fabrication.
 - 1. Except for culverts under driveways, all corrugated aluminized or aluminum pipe within a street right-of-way, drainage easement, or in a detention pond, shall be as follows:

diameters of 30 inches and less may be plain; diameters greater than 30 inches shall have paved inverts pursuant to AASHTO M-190, Type C, except that the pipe need not be fully coated.

2. See the Standard Drawings for the minimum acceptable combinations of gages, diameters, and corrugation configurations for corrugated aluminum pipe and pipe arches, and for corrugated aluminized steel pipe and pipe arches.
3. Each end of each pipe section, to be joined by a coupling band, shall have a minimum of two annular corrugations. Coupling bands shall be so constructed to lap on an equal portion of each of the pipe sections to be joined. The connecting bands shall have a minimum of two annular corrugations and fully engage, over the entire pipe periphery, one corrugation on each pipe. Bands shall be fabricated from the same material as the pipe. The minimum band gauges for aluminum pipe and aluminized pipe shall be as specified in AASHTO M-196, Section 19, and AASHTO M-36, Section 9, respectively.
4. Gaskets may be required as determined by the Department in the field, and shall be either sleeve type or O-ring type and shall meet the requirements for gaskets as specified in AASHTO M-36, Section 9.3.

d. Structural plate drainage structures shall conform to the following specifications:

- (1) Corrugated steel structural plate pipe, pipe arches, and arches shall consist of galvanized plates, bolts and nuts of the size, shape and thickness as shown on the approved plans. These structures shall conform to the requirements of AASHTO M-167.
- (2) Corrugated aluminum alloy structural plate pipe, pipe arches and arches shall consist of aluminum plates and galvanized bolts and nuts of the size, shape and thickness as shown on the approved plans. These structures shall conform to the requirements of AASHTO M-219.

(Ord. No. 013-01, 12-10-2001)

8.3.8—Pipe Length

- a. Culverts carrying live streams shall extend to where the crown of the pipe intersects the roadway slope.
- b. Pipes that do not carry live streams shall extend at least 50 feet beyond the front building setback lines, and may be required to extend farther where necessary to provide an adequately protected building site on the property. In nonresidential subdivisions, these pipes may temporarily end at the right-of-way line, but shall be extended as part of a subsequent development permit approved for the individual site.

8.3.9—Pipe Installation

Reinforced concrete pipe shall be installed in accordance with Section 550 of the Georgia DOT Standard Specifications, Construction of Road and Bridges. Prior to approval of a Final Plat, the City may require the submittal of certification from a mandrel testing agency indicating that all installed pipe does not exceed 5% deflection. Based on field inspections, video surveillance may be conducted by the City or required by the City on storm drain installations before approval of the Final Plat or issuance of the Certificate of Occupancy. If required, video surveillance should be done after completion of all activities that may damage the pipe but prior to placement of base, paving or landscaping over or near the pipe. If video surveillance indicates problems such as pipe deformation, cracking or joint separation, the pipe shall be removed and replaced before approval.

a. Bedding:

All pipe structures shall be placed on stable earth or fine granular foundation, the characteristics of which would be expected to provide long-term stability. In all live stream pipe

installations, in areas of low bearing solid or non-uniform foundations, in area where rock is encountered at the foundation level, or in other locations where conditions warrant, a minimum of six inches of crushed stone bedding is required, (maximum size of stone shall be three-fourths inch). Geotextiles or geogrids may also be required by the City in problem areas.

b. ~~Backfilling:~~

~~Backfill on all pipe installations shall be constructed using foundation backfill material Type I or Type II, as specified in Section 812.01 and 812.02 respectively, in Georgia DOT Standard Specifications. These materials shall be placed in layers of not more than six inches loose. Compaction of these materials shall be accomplished by hand tamping or machine tamping. Required compaction levels are as follows:~~

- ~~(1) Backfill within all street rights-of-way shall be compacted to 95 percent maximum density, tested using the AASHTO Method T-99.~~
- ~~(2) Backfill in all other areas shall be compacted to 85% maximum density, tested using the AASHTO Method T-99.~~

c. ~~Construction loads and minimum covers:~~

~~If drainage pipe is installed prior to the completion of grading, a minimum of four feet of fill should be provided where needed to adequately protect the drainage structure during the land development phase, unless the structure itself is designed to withstand the anticipated live load during construction.~~

~~(Ord. No. 013-01, 12-10-2001)~~

8.3.10 ~~End Finish~~

~~Headwalls or other end treatments are required on all culverts (except under residential driveways) and at the outlet of all piped collection systems.~~

- ~~a. Headwalls are to be precast concrete, stone masonry with reinforced concrete footings, or poured-in-place, reinforced concrete with reinforced concrete footings.~~
- ~~b. End treatments that conform to the slope may be pre-cast concrete end sections, reinforced poured-in-place slope collars, or grouted rip-rap.~~

~~(Ord. No. 013-01, 12-10-2001)~~

8.3.11 ~~Junction boxes and catch basins~~

~~Junction boxes and catch basins shall have metal manhole frames and lids for access.~~

8.3.12 ~~Other Structures~~

~~Natural bottom arches and box culverts may be used in accordance with the latest Standard Specifications of the Georgia Department of Transportation.~~

~~Sec. 8.4. – Surface Drainage.~~

8.4.1 ~~Design Standards~~

- ~~a. All new proposed channels shall be designed to carry at least the ten-year storm with one foot of freeboard.~~
- ~~b. Transition channels shall be provided at the inlet and outlet ends of all culverts and pipe systems, unless otherwise provided herein.~~
- ~~c. The maximum flow velocity at the project site's downstream property line shall not exceed the predeveloped velocity.~~

- d. In cases of potential erosion due to irregular channel alignment, extreme velocities, or excessive slopes, a paved ditch may be required. However, if, in the opinion of the Department, the expected long-term maintenance of a surface drainage system could prove impractical, a pipe design may be required.
- e. The cross-sectional shape of channels shall be as found in the Standard Drawings. "V" shaped cross-sections are not permitted in grassed channels.
- f. If the channel will be affected by backwater from culverts, bridges, other structures or floodplains, backwater curves shall be shown in profiles of the channel.
- g. All channels, must be capable of conveying flows sufficient to ensure that overflow of the channel would not result in a likelihood of dwelling flooding, property damage or public access and/or utility interruption shall be greater than one chance in 100 years.

8.4.2 Construction Standards

- a. The channels shall be shaped to the dimensions specified on the approved plans and shall be free of overfalls, gullies, or other irregularities.
- b. Channels in fills shall be lined.
- c. Protective cover in grassed channels shall be installed as soon as the earthwork is completed.

Sec. 8.5. Erosion Control.

8.5.1 Design Standards

- a. The procedures and requirements of the Gwinnett County Soil Erosion and Sediment Control Ordinance, as may be revised from time to time, shall be applicable whenever any land disturbance is proposed to occur, and shall continue to apply until the project has been completed. In those instances wherein these Regulations are silent, the "Manual for Erosion and Sediment Control in Georgia" shall apply.
- b. No permit shall be issued authorizing any land disturbing activity unless erosion and sediment control plans have first been submitted to and approved by the Department in accordance with these Regulations.

8.5.2 Construction Standards

- a. All erosion control structures and/or appurtenances as shown on the approved plans shall be in place and operational, inspected and approved by the Department, prior to the beginning of construction, and shall be maintained in operational condition until the phase or project has been completed. (See also requirements for initiation of development activities under Article 11.4.)
- b. Temporary and permanent ground covers are required.
- c. Upon project completion, erosion control devices and temporary siltation facilities shall be maintained in place while the individual lots are being developed, or until all disturbed areas are fully stabilized.
- d. Erosion controls and siltation facilities shall be installed and maintained on each building lot during building construction and site development, as required by the Soil Erosion and Sediment Control Ordinance and consistent with the provisions of the "Manual for Erosion and Sediment Control in Georgia".

8.5.3 Abandoned Projects

Any project whose permit has lapsed under the terms expressed in Article 4, shall immediately proceed to stabilize all disturbed areas. This responsibility shall fall upon the owner, developer, contractor, or any and all other responsible parties involved in the land disturbance activity.

Sec. 8.7. Extended Detention.

~~8.7.1. Wet Extended Detention Facility Design Requirements.~~

~~Wet extended detention facilities shall be designed and constructed to meet the following requirements:~~

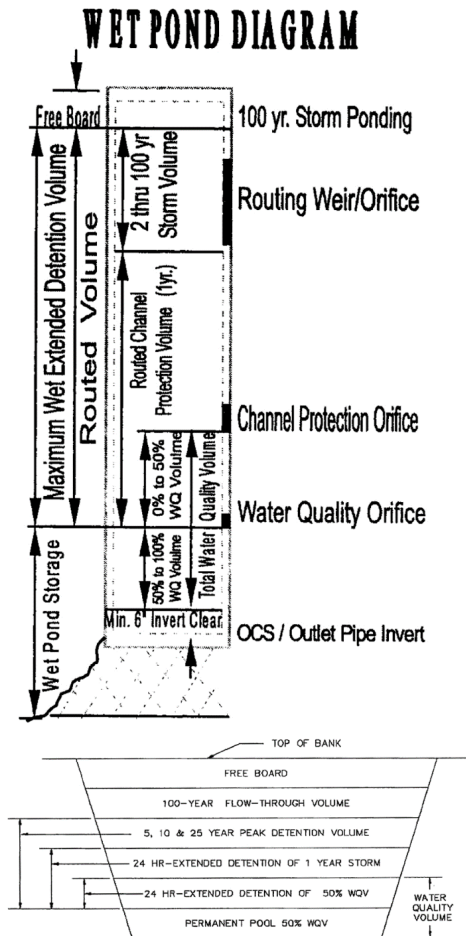
~~a. Minimum and Maximum Drainage Area.~~

~~The minimum drainage area for a wet detention facility should be at least 20 acres. The maximum drainage area should be 100 to 300 acres. The maximum drainage area of highly impervious drainage areas should be restricted to the lower end of the range (100 acres) and low-density residential watersheds should be restricted to a maximum of 300 acres.~~

~~b. Storage Volume of Permanent Pool.~~

~~The permanent pool storage (VB) shall be at least 50 percent of the Water Quality Volume (WQV) defined in section 8.9.1. The part of the WQV (50 percent or less) not used in the permanent pool shall be detained for 24 hours and the storage volume may be used as part of the detention requirements. The WQV to be stored shall be based upon the project area. The project area compensated for in a pond shall not exceed the total drainage area draining to the pond. Off-site areas that do not drain through other water quality BMP's may be used to compensate for areas that by-pass the pond. By-passed areas shall be minimized as much as practical. Off-site areas exceeding the project site area may bypass the pond.~~

Substitute a new "Wet Pond Diagram," below, for the existing figure:



(Ord. No. 113-04, 3-8-2004)

c.—Depth of Permanent Pool.

(1)—Mean Depth.

The mean depth (Z) of the permanent pool shall be between three feet and seven feet and is calculated by dividing the permanent pool storage volume (Vb) by the surface area (As) ($Z = Vb/As$).

(2)—Maximum Depth.

The maximum depth of the permanent pool shall be no greater than 12 feet unless a modification is approved. The intent of these regulations is to ensure that the depth of the facility is not out of proportion with the surface area of the facility. Granting of a modification will not

nullify these regulations when the depth and surface area of the facility is based on existing natural topography.

d. Minimum Surface Area of Permanent Pool.

The minimum surface area (As) of the permanent pool should be 0.25 acres. The minimum ratio of surface area to drainage area used to calculate the permanent pool (Aw) in residential watersheds shall be 1 percent unless a modification is approved. The intent of these regulations is to ensure that the depth is minimized to increase removal efficiencies. Granting of a modification will not nullify these regulations when the depth and surface area of the facility is based on existing natural topography. As/Aw ratios in excess of 3 percent are desirable for nonresidential watersheds with relatively high levels of imperviousness.

e. Side Slopes Along the Shoreline.

- (1) The side slope in graded areas is recommended to be 3H:1V or flatter. When the depth of the permanent pool is greater than four feet and the slope is steeper than 4H:1V, a bench shall be provided. The bench shall be ten feet in width and is recommended to be 15 feet in width. The bench shall have a slope of 10H:1V. The bench shall be located so that the permanent pool elevation is between the top and bottom edge of the bench. See Storm Water Standard Drawing.
- (2) Side slopes shall be topsoiled, nurtured or planted from two feet below to one foot above the permanent pool control elevation to promote wetland vegetative growth. Below the safety ledge, the pond side shall be sloped to meet topographic or volumetric constraints.

f. Length: Width Ratio of Permanent Pool.

The minimum length: width ratio of the permanent pool shall be 2:1. The length shall be measured at the shortest flow path from the inlet to the outlet. The width shall be calculated as the surface of the pond divided by the length. In addition, the location of the outlet structure within the basin shall maximize travel time from the inlet to the outlet. Baffles or islands may be installed within the permanent pool to increase the flow path length and to minimize short-circuiting.

g. Soil Permeability.

In cases where relatively permeable soils are encountered, water drawdown rates should be minimized by either compacting the permanent pool soils during construction, incorporating clay into the soil, or by installing an artificial liner.

h. Spillway and Dam Design.

The principal spillway, emergency spillway, and dam shall be designed in accordance with Sections 8.2, 8.6 and 9.8 of these regulations.

i. Forebay

- (1) To facilitate major cleanout activities, a sediment forebay shall be constructed near the inlet to the permanent pool to trap coarse sediment particles. The forebay volume may be included in the permanent pool volume requirements. The forebay storage capacity shall be ten percent of the water quality volume (WQV) defined in section 8.9.1.
- (2) The facility shall be dredged to ensure that all of the permanent pool storage volume is available after the upstream area has been stabilized. All temporary sediment control measures employed during land disturbing activities to trap sediment shall be located outside of state waters.
- (3) The forebay shall be distinguished from the permanent pool. Options which may be used include: a lateral sill with wetland vegetation; two ponds in series; differential pool depth; rock-filled gabions or a retaining wall; or a horizontal rock filter placed laterally across the permanent pool.

j. Inlet and Outlet Structures.

- (1) ~~The inlet design shall dissipate flow energy and diffuse the inflow plume where it enters the forebay or permanent pool. Options that may be used include: drop manholes; energy dissipaters at the bottom of paved ditches; a lateral bench with wetland vegetation; and the placement of large rock deflectors at each inlet.~~
- (2) ~~The outlet design shall consist of a riser with a hood or trash rack to prevent clogging and an adequate antivortex device for facilities serving large drainage areas. The outlet may be sized to achieve the flood control performance standards contained in Sections 8.2, 8.6 and 9.8 of these regulations. An emergency spillway shall be provided in accordance with Section 9.8.4 of these regulations.~~
- (3) ~~The channel that receives the discharge from the basin's outfall pipe shall be protected from erosive discharge velocities. Options which may be used include: rip-rap lining of the channel; or, the provision of stilling basins, check dams, rock deflectors or other devices to reduce outfall discharge velocities to non-erosive levels.~~
- (4) ~~An orifice for any required extended detention volume shall be sized using the same criteria as required in section 8.7.2.~~

k. ~~Access.~~

~~Access requirements shall be as specified in Section 8.2.5 of these regulations.~~

l. ~~Easement Requirements.~~

~~Easement requirements shall be as specified in Section 8.2.5 of these regulations with the change that the easement enclosing the facility shall be named a Best Management Practice (BMP) easement.~~

m. ~~Engineer's Certification and Record Drawings.~~

~~A land surveyor currently registered in the State of Georgia shall prepare a certified record survey of each facility. A certified record drawing of the facility shall be prepared based upon this survey. The design engineer shall certify that the facility functions hydraulically as designed. The record drawing shall be submitted to the department at least one week prior to the issuance of a Certificate of Occupancy or Final Plat approval (as appropriate to the project). Record drawings of off-site facilities shall be recorded at least one week prior to the recording of the Final Plat.~~

~~(Ord. No. 012-01, 12-10-2001; Ord. No. 045-02, 8-12-2002; Ord. No. 055-02, 11-11-2002)~~

8.7.2. ~~Dry Extended Detention Facilities~~

~~Extended detention facilities with wetland plantings shall be designed and constructed to meet the following requirements:~~

a. ~~Maximum Drainage Area.~~

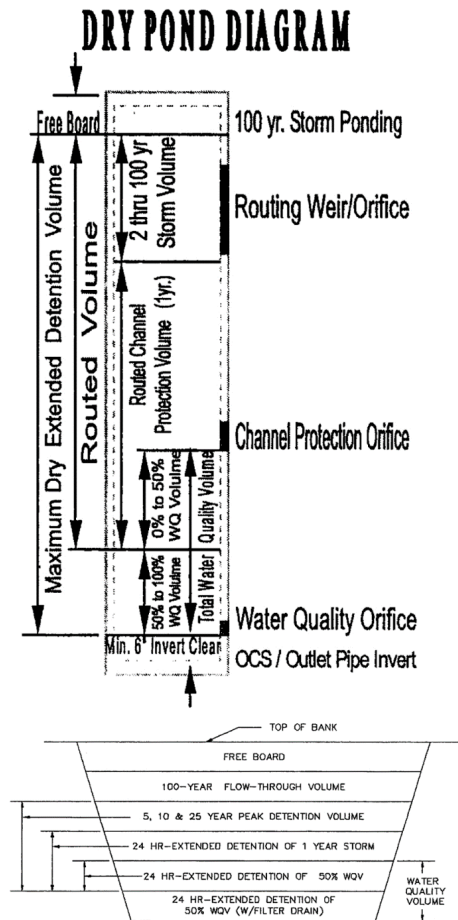
~~The maximum drainage area for which the facility shall be allowed to be constructed should be 20 acres (DA = drainage area in acres);~~

b. ~~Storage Volume.~~

~~The Water Quality Volume (WQV) to be stored is defined in section 8.9.1. Up to fifty percent of the storage volume shall be detained for 24 hours and may be used for detention requirements. The remaining portion (fifty percent or greater) shall be drained through a filter drain in 24 hours. The filter drain shall be the only outlet draining the WQV.~~

~~S = BMP storage volume in cubic feet;~~

Substitute a new "Dry Pond Diagram," below, for the existing figure:



(Ord. No. 113-04, 3-8-2004)

c.—Minimum Surface Area.

The facility should have a minimum surface area of one percent of the total drainage area when the volume contained in the facility equals the required BMP storage volume.

d.—Side Slopes Along the Shoreline.

The side slope in graded areas is recommended to be 3H:1V or flatter. The normal ponding surface elevation shall be defined as the elevation when the volume contained in the facility equals the required water quality volume. When the depth to the normal ponding surface is greater than four feet and the side slope is steeper than 4H:1V, a bench shall be provided. The bench shall be at least ten feet in width and is recommended to be 15 feet in width. The slope

of the bench shall be 10H:1V. The bench shall be located so that the normal ponding surface elevation is between the top and bottom edge of the bench. See Storm Water Standard Drawing.

e. Length: Width Ratio.

The length: width ratio shall be maximized. The length shall be measured as the shortest flow path from the inlet to the outlet. The width shall be calculated as the surface area of the pond divided by the length.

f. Depth of Facility.

The average cross-sectional area of the facility shall be calculated as the volume of the pond divided by the length. The water velocity shall be determined by dividing the maximum outflow rate by the average cross-sectional area. The maximum desired water velocity shall be 0.5 feet per second.

g. Spillway and Dam Design.

The principal spillway, emergency spillway and dam shall be designed in accordance with Sections 8.2, 8.6 and 9.8 of these regulations.

h. Forebay.

The forebay requirements are the same as for wet extended detention (Section 8.7.1.i)

i. Inlet and Outlet Structures.

(1) Inlet and outlet structures shall meet the same requirements as wet detention facilities.

(2) The size of the orifice for the facility shall be computed using the following orifice equation with a 24-hour draw down time from the full pool BMP volume (S) and an orifice coefficient of 0.60:

h = head measured in feet from the elevation at the required BMP storage to the centroid of the orifice;

Q_a = average BMP outflow rate in cfs;

$Q_a = S/3600 \times 24$;

A = required orifice area in square feet;

$A = Q_a / (0.6 \times (64.4 \times h/2)^{0.5})$.

(3) An allowance for base flow shall be provided. The designer either shall determine the base flow using a factor of 1.6 cfs per square mile or may use another standard engineering practice if warranted.

j. Access.

Access requirements shall be as specified in Section 8.2.5 of these regulations.

k. Easement Requirements.

Easement requirements shall be as specified in Section 8.2.5 of these regulations with the exception that the easement enclosing the facility shall be named a Best Management Practice (BMP) easement.

l. Engineer's Certification and Record Drawings.

A Land Surveyor currently registered in the State of Georgia shall prepare a certified record survey of each facility. A certified record drawing of the facility shall be prepared based upon this survey. The design engineer shall certify that the facility functions hydraulically as designed. The record drawing shall be submitted to the department at least one week prior to the issuance of a Certificate of Occupancy or Final Plat approval (as appropriate to the project). Record drawings of off-site facilities shall be recorded at least one week prior to the recording of the final subdivision plat.

m. ~~Wetland Plantings.~~

~~The facility bottom shall be planted with plantings indigenous to local wetlands.~~

n. ~~The bottom of the pond shall be graded for positive drainage. See Storm Water Standard Drawing.~~

(Ord. No. 045-02, 8-12-2002; Ord. No. 055-02, 11-11-2002)

8.7.3. ~~(Reserved)~~

(Ord. No. 045-02, 8-12-2002)

8.7.4. ~~Stream Buffers and Impervious Surface Setbacks.~~

~~Refer to the Zoning Resolution for buffer and impervious surface setback requirements from streams.~~

(Ord. No. 045-02, 8-12-2002)

8.7.5. ~~Wet and Extended Detention Facility Maintenance.~~

~~Maintenance requirements shall be as specified in Section 8.2.6 of these regulations.~~

(Ord. No. 045-02, 8-12-2002)

Sec. 8.8. ~~Reserved.~~

(Ord. No. 113-04, 3-8-2004)

Sec. 8.9. ~~Water Quality Best Management Practices.~~

8.9.1. ~~Treatment of Runoff.~~

a. ~~All projects, unless exempt pursuant to 8.9.1.d below, that meet one or more of the following criteria shall provide water quality treatment based on the modeled Total Suspended Solids (TSS) load of the project for post construction conditions. The determination of the TSS load shall be in accordance with the Storm Water Design Manual. The modeled TSS load shall not exceed 850 pounds/acre/year.~~

i. ~~New development that involves the creation of 5,000 square feet or more of impervious cover, or that involves other land development activities of one acre or more;~~

ii. ~~Redevelopment that includes the creation, addition or replacement of 5,000 square feet of more of impervious cover, or that involves other land development activity of one acre or more; or,~~

iii. ~~Land development activities that are smaller than the minimum applicability criteria set forth in items i and ii, above, if such activities are part of a larger common plan of development, even though multiple, separate and distinct land development activities may take place at different times on different schedules.~~

b. ~~The water quality volume (WQV) shall be the runoff from 1.2 inches of rain from the project site. The volume shall be calculated as:~~

$$WQV = 1.2 (Rv)A; \text{sub}\$ \text{sub}; / 12 \text{ (ft}^3\text{)}$$

Where $Rv = 0.05 + 1(0.009)$

I = Percent Impervious as a whole number

~~A;sub§\sub; = On-site area to be treated (ft²)~~

- ~~c. Runoff from any new development or redevelopment, regardless of size, that is defined by the Director or designee to be a hotspot land use or activity shall be adequately treated and addressed through the use of structural storm water controls, nonstructural practices and pollution prevention practices.~~
- ~~d. The following activities are exempt from providing treatment:~~
 - ~~i. Individual single-family or duplex residential lots that are not part of a subdivision or phased development project;~~
 - ~~ii. Additions or modifications to existing single-family or duplex residential structures; and,~~
 - ~~iii. Repairs to any storm water management facility or practice deemed necessary by the Director or designee.~~

~~(Ord. No. 046-02, 8-12-2002; Ord. No. 113-04, 3-8-2004)~~

~~8.9.2. Facility Location Criteria.~~

- ~~a. Facility location criteria shall be as specified for detention facilities in Section 8.2.4 of these regulations.~~
- ~~b. In a residential subdivision, the following Best Management Practices must be located on a separate lot in accordance with Section 8.2.4.g if not located on a recreation area lot as specified in 8.2.4.f:~~
 - ~~(1) Extended detention ponds;~~
 - ~~(2) Retention ponds;~~
 - ~~(3) Sand filters;~~
 - ~~(4) Constructed wetlands;~~
 - ~~(5) Infiltration trenches;~~
 - ~~(6) Oil/grit separators.~~

~~(Ord. No. 012-01, 12-10-2001; Ord. No. 046-02, 8-12-2002)~~

~~8.9.3. Easement Requirements.~~

- ~~a. Facility easement requirements shall be as specified in Section 8.2.5 of these regulations with the exception that the easement enclosing the facility shall be named a Best Management Practice (BMP) easement.~~
- ~~b. Stream Buffer Easements shall be shown on the final plat for areas that are claimed in the TSS model as Undisturbed Stream Buffers for the site. These areas shall be left in a natural, undisturbed condition except for walking trails. Trails shall not be allowed within 25 feet of a stream bank without a state waters buffer variance.~~
- ~~c. Upland Area Easements in non-residential subdivisions that are claimed, as undisturbed upland areas for the site shall be recorded in an easement acceptable to the County. These areas shall be left in a natural, undisturbed condition except for walking trails.~~

~~(Ord. No. 046-02, 8-12-2002)~~

~~8.9.4. Facility Maintenance.~~

- ~~a. Maintenance requirements shall be as specified in Section 8.2.6 of these regulations.~~

b. ~~Prior to or concurrent with the recording of a Final Plat for a subdivision, or issuance of a Certificate of Occupancy for a non-subdivision project, the developer shall provide acceptable surety such as a bond or letter of credit providing for the maintenance of the facility for a period of not less than 18 months. The amount of the surety shall be the greater of fifty percent of construction costs of the facility or 100 percent of the cost to clean out the facility. At the end of 18 months, the City may require the surety to be renewed due to anticipated maintenance caused by such concerns as future construction activity in the basin draining to the facility. A renewed surety may be required up to a total maximum of ten years. The surety for a facility shall be renewed during the ten years until:~~

- ~~(1) The surface water drainage area within the project has undergone final stabilization and all planned construction activity has been completed;~~
- ~~(2) All storm water runoff in the surface water drainage area within the project is coming from undisturbed or stabilized areas;~~
- ~~(3) At least 90 percent of the lots in that surface water drainage area within the project have been sold to an unrelated party, permanent structures completed and final stabilization achieved;~~
- ~~(4) The accumulation of acreage of undeveloped lots, lots with no completed permanent structure and no final stabilization, within the surface water drainage area within the project is less than five acres or ten percent of the total area of the common development draining to the facility, whichever is greater; and,~~
- ~~(5) Within two months of surety release, the facility shall be cleaned out, if necessary, and a new record survey, drawing and certification showing that the volume of the facility is equal to or greater than the volume shown in the record survey, drawing and certification when the facility was approved. As an alternative, a new record survey, drawing and certification showing that the facility complies with these regulations as specified in Section 8.2.8 shall be submitted.~~

~~(Ord. No. 046-02, 8-12-2002; Ord. No. 055-02, 11-11-2002)~~

~~8.9.5. Facility Certification and Record Drawings.~~

~~Requirements for a certified record survey and addendum to the Storm Water Management Report shall be the same for water quality facilities as for detention facilities in Section 8.2.8.~~

~~(Ord. No. 046-02, 8-12-2002)~~

~~8.9.6. Existing Subdivisions with Regional Water Quality Facilities.~~

~~Where the drainage is treated in a regional water quality facility approved between April 27, 1999, and January 1, 2001, lots in non-residential subdivisions (or phases in residential subdivisions) shall either conform to the permit and water quality regulations at the time of approval or conform to the current water quality regulations as stated in Section 8.9.~~

~~(Ord. No. 046-02, 8-12-2002)~~

~~8.9.7. Existing Subdivisions without Regional Water Quality Facilities.~~

~~Where drainage is treated in a regional detention facility approved before April 27, 1999, lots in non-residential subdivisions (or phases in residential subdivisions) shall conform to the current water quality regulations as stated in Section 8.9.~~

(Ord. No. 046-02, 8-12-2002)

8.9.8. Retrofitting of existing detention facilities for water quality treatment.

If water quality treatment for a proposed development is to be provided in an existing detention basin then treatment must be provided for the entire original project basin. A modification to the 25-year detention requirement may be granted for the purpose of retrofitting the detention pond to meet current water quality regulations. Granting of a modification will meet the intent and purpose of these regulations when:

- (1) The detention requirements of the current regulations are provided in the facility for the one-year, two-year, five-year and ten-year storm. For a retrofitted basin, the volume of the one-year storm shall be based on the original project area being detained instead of the total area draining to the basin;
- (2) The water quality requirements of the current regulations as stated in section 8.9 are provided for the original project area in the facility;
- (3) The ponding limits create a hardship if no modification is granted; and,
- (4) The outlet structure meets the requirements of the current regulations.

(Ord. No. 046-02, 8-12-2002)

8.9.9. Retrofitting of existing water quality facilities.

If water quality treatment for a proposed development is provided in an existing water quality facility then water quality treatment conforming to the current regulations must be provided for the entire original project basin.

(Ord. No. 046-02, 8-12-2002)

8.9.10. Redevelopment.

- a. When 5,000 square feet or more of new impervious surface area is added or one acre or more of a developed project site is disturbed for redevelopment and the disturbed area is more than 50 percent of the property, the water quality requirements of this section must be met for the entire site.
- b. When less than 5,000 square feet of new impervious surface area is added, or less than one acre of land of a developed project site is disturbed for redevelopment, the project is exempt from having to provide the water quality requirements of this section for the project or for the rest of the site.
- c. When 5,000 square feet or more of new impervious surface area is added or one acre or more of a developed project site is disturbed for redevelopment and the disturbed area is less than 50% of the property, the project shall provide water quality treatment for just the improvements on the site.

(Ord. No. 046-02, 8-12-2002; Ord. No. 113-04, 3-8-2004)

ARTICLE 9. PERFORMANCE GUIDELINES

Sec. 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 could produce results similar to these performance standards

and similar protection to the public. The objective of these performance standards is not to suggest a single methodological standard 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 an alternative is suggested by the applicant, studies and reports conducted by professionals currently certified in the State of Georgia will be required to be submitted to and approved by the Department. These studies and reports must clearly relate to the desired results and purposes expressed or implied in the applicable performance standard. Once an alternative has been approved by the Department, it shall become a required standard applicable to the specific approved Permit only.

Sec. 9.2—Lots.

9.2.1

- (a) The City requires notation that a House Location Plan (HLP) is required to be approved prior to issuance of a building permit on all lots.

(Res. of 5-12-1997)

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

- (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 Resolution as a condition of zoning approval;
 - (6) All duplex lots;
 - (7) All lots within, or partially within, the Chattahoochee River Corridor, or containing a River Corridor Tributary Buffer Zone.
- b. The Department 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 interdicting the building site;
 - (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 Department 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 liens 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 degrees shall require approval of the Department, 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 75 feet between side setback lines on a corner lot be required.

Sec. 9.3.—Blocks.

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

- a.—Provision of adequate building sites suitable to the special needs of the type of use contemplated;
- b.—Applicable 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 1,000 feet long, the Director 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.

Sec. 9.4.—Access.

A maximum number of 200 residential dwelling units shall be allowed to be constructed with only one 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 Director, 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 Engineering Department.

Sec. 9.5.—Roadway Design.

9.5.1—Street Grades and Design Speeds

- a.—Minimum grade for all local and minor collector streets shall be 1.5%. Minimum grades for all major collector and arterial streets shall conform to Georgia D.O.T. practice.
- b.—Minimum grade of less than 1.5% on a local street may be approved by the Department, based on adequate engineering designs, where at least 1.5% 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 Gwinnett County by street classification shall be as shown in Table 9-A.
- d.—Maximum grade on any cul-de-sac turnaround shall be 6%.

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

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*Grades between 12% and 14% shall not exceed a length of one hundred and fifty feet (150') 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.

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9.5.2—Vertical Street Alignment

- a.—All changes in street profile grades having an algebraic difference greater than one 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 Department 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."

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Table 9-B
CONSTANT (K) VALUES FOR VERTICAL CURVES

CREST CURVES STREET CATEGORY	SAG CURVES MINIMUM	DESIRABLE	MINIMUM	DESIRABLE
Principal Arterial	200	320	125	155
Major Arterial	100	170	80	110

Minor Arterial ↓	55	80	55	70
Major Collector or	55	80	55	70
Minor Collector or	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 superelevation:

Table 9-C
HORIZONTAL CURVES

MINIMUM STREET CATEGORY	MAXIMUM RADIUS (FT)	SUPERELEV
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 superelevation will be allowed on Minor Collectors internal to residential subdivisions.

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

R = minimum radius of curve v = vehicle design speed, (MPH)

e = rate of superelevation

v² (decimal of a foot rise per

R = _____ foot of roadway width)

15 (e + f) f = side friction factor,

as follows:

Vehicle Design Speed (v) 30 40 50 60

Side Friction Factor (f) .16 .15 .14 .12

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

d. Superelevation Runoff

Roadway edge curves shall be provided for tangent runoff (bringing edge from a normal crown to centerline elevation) and superelevation runoff (from the end of tangent runoff to the point of design superelevation) in accordance with design standards of the Georgia Department of Transportation 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 Department of Transportation. 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 1.5 to 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 seconds.

9.5.4 Horizontal and Vertical Clearances

a. Horizontal Clearances

- (1) A shoulder of no less than 11 feet from the back of curb or edge of pavement, appropriately graded and having gentle slopes of not more than one-half 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 foot of rise for each two feet of horizontal distance on a cut slope, and one foot of fall for each three 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 feet from the back of curb or edge of roadway pavement. Nothing may be located above ground level in this clear zone except traffic control and street signs, public utility structures, mail boxes, City approved street trees and City approved landscaping.

(Ord. No. 012-01, 12-10-2001)

- (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 14.5 feet over the entire roadway width.

Sec. 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 85 degrees unless approved by the Department, nor less than 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 Traffic Engineer.

9.6.2 — Maximum Grade

Street intersections should be designed with a flat grade wherever possible, but in no case should the grade exceed two percent in normal situations (or four 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 240 feet shall provide a tangent section of roadway at least 30 feet long. Minor collectors approaching an intersection with a major thoroughfare on a horizontal curve having a centerline radius of less than 550 feet shall also provide the 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 to 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 percent shall be provided but no level approach distance is required for streets approaching at less than seven percent, and a minimum 25 foot level approach distance shall be provided for streets approaching at a grade of seven 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 percent and for a distance not less than the following minimums:

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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 larger radii shall be provided. In all cases, adequate right-of-way shall be provided to maintain a minimum of 11 feet from back-of-curb. Larger radii may be required for streets intersecting at angles less than 90 degrees.

Table 9-E
INTERSECTION RADII

ROADWAY STREET CATEGORY	R-O-W RADII	RADII
Arterial	40 Feet	20 Feet
Major Collector	40 Feet	20 Feet
Minor Collector-Residential	25 Feet	9 Feet
Minor Collector-Nonresidential	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 feet above the street grade within the right-of-way, except traffic regulatory devices and other infrastructure erected or approved by Gwinnett County. No island shall be approved which contains less than 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 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 intersections), latest edition. The sight distance shall provide clear visibility of an object 4 feet above the intersecting street viewed from the centerline of the approaching street at the right-of-way line of the intersecting street, at a height of 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 lot lines located at a distance of 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 feet.
- b.—There shall be no obstruction to vision, other than a post or column or tree (except standards erected by Gwinnett County) not exceeding one foot in greatest cross-sectional dimension, between a height of three feet and a height of 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 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 150 feet of storage length for turning lanes on any arterial roadway shall be used. A minimum of 100 feet of storage length for turning lanes on all collectors shall be used.
- b.—Taper Length—The minimum taper length shall be 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.

Sec. 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. The entire portion of a driveway shall be paved, except those residential lots which would require a driveway in excess of 100 feet. Driveways providing access to parking lots which contain six or more spaces shall be paved in accordance with the parking lot requirements of the Zoning Resolution.

(Res. of 10-9-1995)

9.7.2—Driveway Design Standards

- a. ~~Driveways serving single-family detached or duplex residences may be no less than ten 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 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 feet Width, 25 feet 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 feet Width, 25 feet 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 Lots or Fewer).~~
 3. ~~Driveway Detail 3 (32 feet Width, 40 feet 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 County Requirements are more restrictive.~~

9.7.3—Auxiliary Lanes

~~Along any major thoroughfare, a deceleration lane, acceleration lane, larger turning radius, traffic islands, or other devices or designs may be required to avoid specific traffic hazards which would otherwise be created by the proposed driveway location.~~

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 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 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 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: 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 100 feet and 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: 100 feet between centerlines 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 for each 400 feet of property frontage, or fraction thereof per street, along a major thoroughfare. This is not meant to be a spacing standard only an expression of the total number of driveways that permitted serving a single project.

Sec. 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 by-pass areas in the same basin, produce peak flowrates 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 within a flow distance of one-half mile (2,640 linear feet) downstream from the site, 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 the 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 flowrate in the watercourse (including the contribution from the project site) is greater than 5 percent.
- c. Peak flowrate control shall normally be provided only for the two-year, ten-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 Department. A pre-design conference between the design engineer and appropriate Department personnel, which may in certain straightforward cases be conducted via the telephone, is required.
- e. Rational Method runoff coefficients used for analysis of pre- and post-development conditions shall be consistent with those shown in Table 9-F.

TABLE 9-F
RATIONAL METHOD RUNOFF COEFFICIENTS

TYPE OF TERRAIN LAND-USE	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	.24	.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 drainageway 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 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 be 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 20 feet, a drainage area of less than 100 acres, and which is incapable of impounding more than 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 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 nonearthen structure shall be designed to prevent piping failure through its subgrade and abutments.
 - 4.—The construction of walls over five feet in height shall be monitored and approved by a qualified materials testing company.
- (5)—Earthen dams for normally-dry detention basins shall have a top width of no less than 8 feet.

6. For Earthen dams for normally-dry detention basins, there shall be at least one and one-half feet of vertical separation between the 100-year ponding elevation in the basin and the low point on the top of the dam. One foot of this distance is to provide a margin of safety against overtopping of the dam and the other six inches is to allow for settlement. No separation is required for a nonearthen dam, if it has been designed to overtop safely.

7. More stringent design and construction criteria shall be used 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 Department 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 be 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.

(Ord. No. 055-02, 11-11-2002)

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 condition, the design consultant is responsible for the selection of the device, subject to the review and approval of the Department.

b. The Department 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 Departmental 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 3 inches in diameter. An orifice smaller than 15 inches in diameter shall be protected by a trash rack. A trash rack protecting an orifice shall have a surface area of at least ten square feet. No opening in the trash rack shall have an area more than one-half 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 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 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 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 flowpath 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 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 square foot per each three acres of drainage area, or a maximum of twenty 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 any 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 dams shall be as follows:~~
 - (1) ~~For normally dry detention basins, ponds, and lakes, having a dam height of less than nine feet and which are incapable of impounding more than 20 acre-feet of water, and for which the probable sequences 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 feet or more and which are capable of impounding 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 flowrate out of the facility assuming the principal spillway is blocked, or the routed one-fourth 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 top of the dam shall be so designed as to prevent flows along the ends of the structure which might result in abutment erosion.~~

(Ord. No. 055-02, 11-11-2002)

9.8.5—Parking Lot Detention Facilities

- a.—Parking lot detention facilities shall generally be of one of the two 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 near 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 inches for a ten-year storm, and nine inches for a 100-year storm. The maximum depth of ponding at a flow control structure shall be 12 inches for a 100-year storm.
- e.—In truck parking areas, the maximum depth of ponding shall be 12 inches for the ten-year storm.
- f.—Detention ponding areas are to be drained within 30 minutes after the peak inflow occurs.
- g.—Parking lot detention areas shall have a minimum surface slope of one percent, and a maximum slope of five 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 Standard Building Code as amended by Gwinnett County.

9.8.7—Sediment Basins

- a.—Stormwater management and sediment trapping functions should be separated whenever possible. Every erosion control design should seek to: first, prevent erosion from occurring; second, trap sediments as close to their sources as possible, and; third, 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 instance where a specific requirement is clearly detention oriented rather than safety-based.

Sec. 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 installations and should therefore be used whenever feasible.

- b. The maximum velocity in a culvert for the 100-years flow shall be 15 fps (feet per second). Velocities over ten 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 two-year flow velocity of 2.5 fps.

9.9.2 Piped Collection Systems

- a. The maximum velocity in a piped system for the 100-year flow shall be 15 fps. Velocities over ten fps shall be considered a special design with particular attention required to pipe invert protection and the ability of the receiving waterway or detention facility to accept the flow without damage.
- b. The minimum allowable slope shall be that which produces a two-year flow velocity of 2.5 fps.
- c. The maximum allowable slope for a storm drainage pipe shall be 25 percent. Greater slopes may be approved if installation is in accordance with manufacture's recommendations. In cases where the slope is in excess of ten percent, anchor collars may be required.
- d. A minimum pipe cover of one foot shall be required.

9.9.3 Outlet Location - Culverts and Piped Systems

- 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 pipe diameters. For non-circular conduits, this distance shall be six times the rise dimension of the conduit.
- b. The invert elevation of a culvert or pipe outlet shall be no more than two feet above the elevation of the bottom of 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 predeveloped 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 flowrates in Table 9-G, below.
- b. In residential subdivisions, the peak flowrate associated with a two-year storm shall not exceed 1.0 cubic feet per second (cfs) along any property line between lots within 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 flowrate may be increased to 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-G
MAXIMUM FLOWS INTO STREETS

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

j. Directional flow arrows for street drainage.

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k. Contour lines based on sea level datum, or other datum acceptable to the Department. These shall be drawn at intervals of not more than two feet. Contour lines shall be based on field surveys or photogrammetric methods from aerial photographs. The basis for the topographic contour shown shall be specified and dated.

l. Natural features within the proposed subdivision, including drainage channels, bodies of water, and other known significant features such as extensive exposed rock. On all water courses leaving the tract, the direction of flow shall be indicated. The 100-year floodplain shall be outlined and the source of the depicted floodplain information shall be indicated. For those lots containing floodplain, a Floodplain Lot Chart shall be provided showing the area (in square feet) of each lot lying inside and outside of the floodplain as though the land disturbance activity were completed.

m. Man-made and cultural features existing within and adjacent to the proposed subdivision including existing right-of-way measured from centerline, pavement widths, and names of existing and platted streets; all easements, city, and County jurisdiction lines; existing structures on the site and their disposition, Chattahoochee River Corridor information and limits of Chattahoochee River Tributary Protection Area (if applicable); and other significant information. Location and dimensions of existing bridges; water, sewer, and other existing utility lines and structures; culverts and other existing features should be indicated.

n. Proposed layout including lot lines, lot numbers, and block letters; proposed street names, roadway and right-of-way lines; and, sites reserved through covenants, easement, dedication, or otherwise for public uses. Lots shall be numbered in numerical order and blocks lettered alphabetically. The minimum building setback line from all streets. Streets shall be dimensioned to show right-of-way and roadway widths, central angles, intersection radii, and cul-de-sac roadway and right-of-way radii. Centerline curve data shall be provided for all roadway curves [radius, length, amount of superelevation (if any), point of curvature (P.C.), point of tangency (P.T.), etc.] if not shown separately on construction drawings.

o. Identify unit number, division, or stage of development, if any, as proposed by the subdivider.

p. Existing zoning of the property. Rezoning and variance case numbers, dates of approval and conditions (as applicable). Note minimum lot size and minimum yard setback requirements, and other applicable zoning requirements. Show and dimension any required buffers, landscape strips, no-access easements, etc. Note any approved Waivers from these Regulations.

q. All adjoining property owners, subdivision names, lot numbers and lot lines, block letters, and zoning.

r. Location of all known existing or previously existing landfills.

s. Proposed recreation area, if any; area of the site; area and percent of site within the 100-year floodplain; proposed disposition of the site (public ownership, homeowners association, etc.).

t. ~~Such additional information as may be reasonably required to permit an adequate evaluation of the subdivision.~~

Article 9. ~~Performance Guidelines~~— deleted in its entirety. *Reserved.*