



# Stormwater Development Guidelines

August 2024



**Quality Water, Quality Service**



## Revisions Tracking Sheet

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## Acronyms and Abbreviations

ADA	Americans with Disabilities Act
BMP	Best Management Practice
CCTV	Closed-circuit Television
CCWA	Clayton County Water Authority
FBFM	Flood Boundary and Floodway Map
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GA EPD	Georgia Environmental Protection Division
GA SDP	Georgia Safe Dams Program
GDOT	Georgia Department of Transportation
GSMM	Georgia Stormwater Management Manual
HDPE	high-density polyethylene
MACP	Manhole Assessment and Certification Program
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O.C.G.A.	Official Code of Georgia Annotated
O&M	Operations and Maintenance
PACP	Pipeline Assessment Certification Program
PCSTAP	Post-Construction Stormwater Technology Assessment Protocol
PPR	Plat and Plan Review
QPL	Qualified Product List
ROW	Right-of-Way
SWU	Stormwater Utility
USACE	U.S. Army Corps of Engineers
WP	Watershed Protection



## 1. Introduction

### 1.1 Legal Authority

The Clayton County Water Authority (CCWA), Clayton County, and the cities of Forest Park, Jonesboro, Lake City, Lovejoy, Morrow, and Riverdale are required by federal and state laws to protect waterways from harmful pollutants carried by stormwater runoff within their jurisdiction. CCWA is authorized by intergovernmental agreements and ordinances to administer the Stormwater Utility (SWU) and provide stormwater management services for the permittees – unincorporated areas of Clayton County and within the cities of Forest Park, Jonesboro, Lake City, Lovejoy, Morrow, and Riverdale (Clayton County and the six Cities).

CCWA provides the following stormwater management services:

- A Initiate proactive operations and maintenance (O&M) programs and make repairs on stormwater infrastructure within permittee-owned property or within public right-of-way (ROW) not managed by Georgia Department of Transportation (GDOT); stormwater infrastructure includes inlets, catch basins, drop inlets, culverts, and drainage pipes.
- B Stormwater management facilities on permittee-owned property or within the SWU-maintained public ROW are maintained and repaired by CCWA to function as designed.
- C Rivers and streams on permittee-owned property, within the SWU-maintained public ROW, and directly downstream and upstream of permittee-owned stormwater infrastructure, are maintained and repaired when there is clear evidence of water quality impacts from stormwater runoff.
- D Authority to inspect structural stormwater control facilities on private property to ensure that proper maintenance has been completed by the property owner.

CCWA assumes no responsibility for service, maintenance, and repair of stormwater infrastructure that are not included in the program:

- A The small portion of College Park within Clayton County is not included in the program.
- B GDOT-administered ROW on State routes in Clayton County.
- C Stormwater management facilities, stormwater infrastructure, and pipe systems on private property are the responsibility of the property owner.
- D All privately owned or privately installed stormwater infrastructure and pipe systems, including but not limited to those within, on, or attached to any public ROW.
- E The SWU has no responsibility for maintenance of stormwater infrastructure on private property or privately owned or installed stormwater infrastructure within, on, or attached to any public ROW. This includes but is not limited to natural stormwater conveyances (rivers and streams) and constructed stormwater conveyances (catch basins, drop inlets, culverts, drainage pipes, ditches, and drainage easements).

The responsible parties defined in Appendix A oversee the stormwater runoff associated with new land development and redevelopment.

## 1.2 How to Use the Stormwater Development Guidelines

The Stormwater Development Guidelines is an essential tool to successfully navigate the overall land development and redevelopment process. Figure 1-1 provides an overview of the CCWA plat and plan review process (PPR), including the processes, steps, and roles and responsibilities of the local jurisdiction, Design Professional/Developer, and CCWA through each development phase. The CCWA process for stormwater management planning, design, permitting, and construction is outlined in this section. Each step in the CCWA process for stormwater management is linked to the CCWA PPR process by the PPR Step numbers (#'s) included as follows:

### 1 PRE-SUBMITTAL SITE INVESTIGATION (PPR STEP #1-3)

- a Natural Resources Inventory
- b Better Site Design Practices
- c Nonstructural Stormwater Credits
- d Coordinate with Local Jurisdiction and CCWA for Review of Preliminary Plat Review (where applicable)
- e Conceptual Stormwater Management Plan development
- f Prepare requests for waivers and approvals and required documentation (where applicable)

### 2 PRE-SUBMITTAL MEETING (PPR STEP # 1-3)

*Optional unless requesting a waiver or approval prior to developing the Stormwater Management Plan*

- a Documentation of meeting general exemptions from stormwater management standards
- b Request for a linear transportation project waiver for stormwater management standards
- c Request for runoff reduction waiver
- d Request CCWA Administrator approval for Non-standard Stormwater Management Facilities
- e Request CCWA Administrator approval for Proprietary Stormwater Management Facilities
- f Request CCWA Administrator approval for Regional Stormwater Management Facilities

### 3 STORMWATER CONCEPT PLAN DEVELOPMENT (PPR STEP # 1-3)

- a Existing conditions and proposed site layout mapping and plans
- b Preliminary estimates of the unified stormwater sizing criteria requirements for stormwater Runoff Quality/Reduction, Channel Protection, Overbank Flooding Protection, and Extreme Flood Protection
- c Screening and preliminary selection of appropriate stormwater management facilities, identification of potential siting locations, size of facilities, and limits of land disturbance
- d Existing and proposed stormwater drainage systems onsite and on upstream and downstream properties
- e Preliminary location and dimensions of proposed natural stream channel modifications, such as bridge or culvert crossings

**4 DETAILED DESIGN PHASE (PPR STEP # 4–8)**

- a Hydrology Analysis
- b Conveyance Design
- c Stormwater Management Facility Design
- d Permanent Easement Design
- e Floodplain Management/Flood Damage Prevention Plan (where applicable)
- f Erosion, Sedimentation & Pollution Control Plan Design
- g Construction Plans Design
- h ENVIRONMENTAL PERMITTING
  - i Stream Buffer Protection Variance per the local jurisdiction (where applicable)
  - ii Stream Buffer Protection Variance per Georgia Environmental Protection Division (EPD) (where applicable)
  - iii Site-specific Wetlands Identification for Wetlands and Jurisdictional Waters (where applicable)
  - iv U.S. Army Corps of Engineers (USACE) "Letter of Permission" or Section 404 permit (where applicable)
  - v Georgia Safe Dams Program for determining classification of dams and compliance with program
- i STORMWATER MANAGEMENT PLAN DEVELOPMENT
  - i Natural Resources Inventory
  - ii Stormwater Concept Plan
  - iii Existing Conditions and Post-Development Hydrology Analyses
  - iv Stormwater Management System
  - v Downstream Analysis
  - vi Erosion, Sedimentation & Pollution Control Plan
  - vii Landscaping Plan
  - viii Inspection and Maintenance Agreement
  - ix Evidence of acquisition of applicable local and non-local permits
  - x Determination of Infeasibility (if applicable)
  - xi Existing Stormwater Management Facility As-built Drawings, Hydrology Reports, Current Inspection Report, and Landscaping Plan

**5 COORDINATE WITH LOCAL JURISDICTION (PPR STEP # 4–5)**

*For review of Construction Plans, ES&PC Plans, Buffer Variance applications, and other local requirements*



- 6 STORMWATER MANAGEMENT PLAN REVIEW (PPR STEP # 4–10)**
  - a Owner prepares required documentation and submits to CCWA
  - b CCWA reviews submitted plans and provides comments and checklists
  - c Owner addresses comments and resubmits required documentation
  - d Owner submits final set of required documentation to CCWA for approval
  - e Review continues until CCWA approval received by applicant
- 7 CONSTRUCTION PHASE (PPR STEP # 11–13)**
  - a Facilitate pre-construction meeting
  - b Owner to provide 48-hour notice before stormwater management system construction
  - c Development construction
  - d Construction inspections
  - e Inspection and Maintenance Agreement
    - i Owner prepares exhibits and draft agreement
    - ii CCWA reviews exhibits and draft agreement until CCWA Approval
    - iii Owner records approved agreement
- 8 PROJECT CLOSEOUT DOCUMENTATION REVIEW (PPR STEP # 14–15)**
  - a Submit Engineer's Certificate of Construction Conformance for Green Infrastructure Stormwater Management Facility (where applicable)
  - b Submit Stormwater Management Facility As-Built Certification Form
  - c Submit closed-circuit television (CCTV) footage
  - d Submit recorded inspection and maintenance agreement
  - e CCWA and applicant complete final stormwater inspection
  - f Review continues until CCWA approval received by applicant

These Stormwater Development Guidelines are organized in accordance with the current version of the Georgia Stormwater Management Manual (GSMM), which provides the primary guidance for the design and evaluation of stormwater management systems unless otherwise noted. To avoid redundancies, these guidelines reference additional information in the GSMM, when applicable.

As an overview, a brief annotation of each section within the Stormwater Development Guidelines is provided below:

**Section 1: Introduction** – Provides background on CCWA's role in managing stormwater, lists the watershed responsibilities of the local jurisdictions, guidance on the application and exemption of these regulations for new developments, redevelopment projects, and existing stormwater management facilities.

**Section 2: Planning and Design of Stormwater Management Systems** – Provides guidance on stormwater management standards, Better Site Design Practices, Nonstructural Stormwater Credits, and other stormwater design requirements.

**Section 3: Hydrology** – Specifies the hydrology calculations required to meet the stormwater management standards.

**Section 4: Stormwater Management Facilities** – Provides an overview of the design criteria and selection of stormwater management facilities, as well as specific requirements for select facilities.

**Section 5: Stormwater Drainage System** – Provides an overview of the design criteria and procedures for stormwater inlets, pipes and culverts, drainage ditches, natural stream channels, and energy dissipation.

**Section 6: Floodplain Management** – Provides an overview of the design criteria and procedures for preparation of a floodplain management plan.

**Section 7: Inspections and Maintenance** – Establishes inspection procedures and maintenance responsibilities for existing and new stormwater management facilities and systems.

**Appendices** – Include requirements for stormwater management plan, standard templates for inspection and maintenance agreement and as-built certification, review checklists, and select standard details.

# Clayton County Water Authority Stormwater Development Guidelines

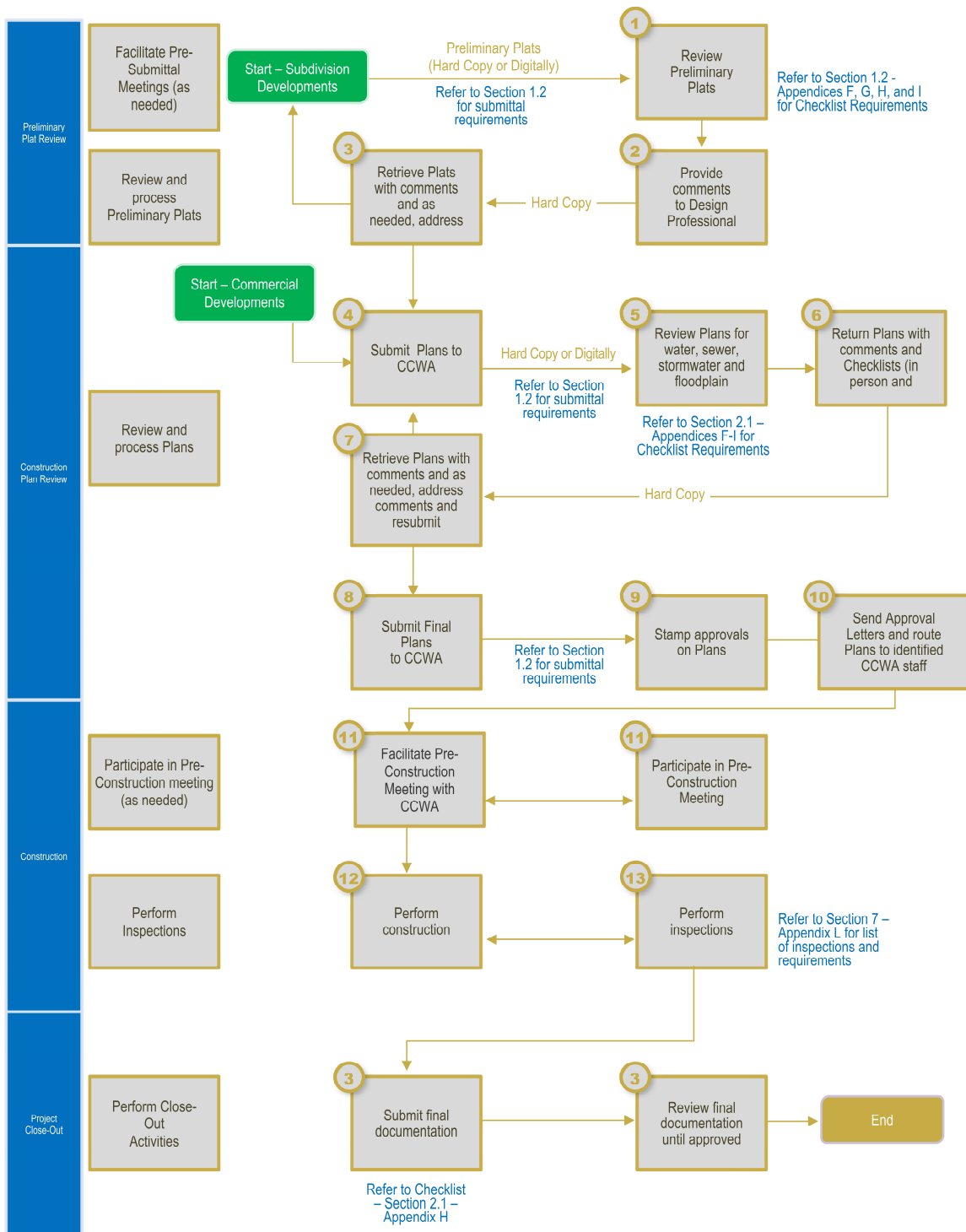


Figure 1-1. CCWA Plat and Plan Review Process

### 1.3 Purpose

The purpose of these Stormwater Development Guidelines is to:

- A Establish minimum post-development stormwater management standards, design and materials requirements, and construction standards set forth in the Stormwater Utility, post-construction stormwater management ordinances, and aligned with guidance in the GSMM, except as otherwise noted in these Stormwater Development Guidelines.
- B Establish application and performance criteria for construction and use of stormwater management facilities to meet minimum post-construction stormwater management standards.
- C Consolidate the minimum post-construction stormwater management design standards and requirements of each jurisdiction participating in the Stormwater Utility into a consistent set of stormwater development guidelines for all jurisdictions. CCWA shall amend the Stormwater Development Guidelines as required due to changes in applicable local, state, and federal regulations. The Stormwater Program Director of the CCWA shall approve amendments in writing.
- D Comply with National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit requirements, and other federal, state, and local rules, laws, and ordinances related to the design, installation, and maintenance of stormwater management systems. The Design Professional should refer to the following local ordinances related to stormwater management activities.
  - CCWA's Stormwater Utility
  - Post-Construction Stormwater Ordinance
  - Floodplain Management/Flood Damage Prevention
  - Illicit Discharge and Illegal Connection
  - Soil Erosion and Sedimentation Control
  - Stream Buffers
  - Conservation Districts and/or Subdivisions
  - Watershed Protection District

These ordinances are available on the Municode Library or upon request from CCWA or the local jurisdiction.

### 1.4 Applicability

The provisions of the Stormwater Development Guidelines shall apply throughout Clayton County. The stormwater management standards identified in these Stormwater Development Guidelines, which are consistent with the GSMM and stormwater management ordinances, are applicable for land development activities that meet any of the following criteria:

- A New development that creates or adds 5,000 square feet or greater of impervious surface area or that involves land-disturbing activity of 1 acre or greater.
- B Redevelopment (excluding routine maintenance and exterior remodeling) that creates, adds, or replaces 5,000 square feet or greater of impervious surface area or that involves land-disturbing activity of 1 acre or more.

- C New development or redevelopment if:
  - 1 Part of subdivision or other common plan of development.
  - 2 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 the Post-Construction Stormwater Management for New Development and Redevelopment ordinances.
- E Linear transportation projects that exceed the threshold in A or B above.

## 1.5 Exemptions

The following development activities are exempt from the stormwater management standards. These exemptions do not apply to the inspections and maintenance requirements established in these Stormwater Development Guidelines, which shall be fulfilled irrespective of the exemptions listed below.

- A Land disturbance areas 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 disturbances that consist solely of cutting a trench for utility work and related pavement replacement.
- C Land disturbances conducted by local, state, and federal agencies whose sole purpose is to implement stormwater management or environmental restoration.
- D Repairs to any stormwater management system components deemed necessary by CCWA.
- E Agricultural practices as described in Official Code of Georgia Annotated (O.C.G.A.) Section 12-7-17(5), within areas zoned for these activities with the exception of buildings or permanent structures that exceed the threshold in Section 1.04 C. 1. or C. 2.
- F Silvicultural land management activities as described in O.C.G.A. Section 12-7-17(6) within zoned areas for these activities with the exception of buildings or permanent structures that exceed the threshold in Section 1.04 C. 1. or C. 2.
- G Installation or modifications to existing structure 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
- H Linear transportation projects constructed by Clayton County or one of the six Cities to the extent the CCWA Administrator determines the stormwater management standards may be infeasible to apply, in 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 CCWA linear feasibility program (see Appendix B) shall first be submitted to the CCWA Administrator that contains adequate documentation to support the evaluation for the applicable portion(s) and any resulting infeasibility determination, if any, by the CCWA Administrator.

## 1.6 Definitions

The listed words or acronyms shall mean the following:

**Applicant:** A person submitting a land development application for approval.

**Area of Special Flood Hazard:** The land subject to a one percent or greater chance of flooding in any given year. This includes all floodplain and flood prone areas at or below the base flood elevation (including A, A1-30, A-99, AE, AO, AH and AR on the Flood Hazard Boundary Map (FHBM) or the Flood Insurance Rate Map [FIRM]), all floodplain and flood prone areas at or below the future-conditions flood elevation, and all other flood prone areas as referenced in the Flood Insurance Study, any flood or flood related study conducted by any local, State or Federal agency applicable to the local jurisdiction or any base or future-conditions flood study authored by a registered professional engineer in the State of Georgia which has been prepared by FEMA approved methodology and approved by CCWA. In addition, all streams with a drainage area of 100 acres or more have an area of special flood hazard.

**Base Flood Elevation:** The highest water surface elevation anticipated at any given point during the base flood or 100-year flood.

**BMP or Best Management Practice:** The stormwater management facilities or structural stormwater controls that store or treat stormwater runoff and the nonstructural programs or practices which are designed to prevent or reduce the pollution of the waters of the State of Georgia.

**CCWA:** Clayton County Water Authority.

**CCWA Administrator:** The person(s) appointed to administer and implement the requirements as provided in these Stormwater Development Guidelines and related stormwater management ordinances.

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

**Cities:** Cities of Forest Park, Jonesboro, Lake City, Lovejoy, Morrow, and Riverdale.

**Developer:** Any person, firm, corporation, association or partnership or an agent thereof who undertakes or proposes to undertake the development of land so as to constitute a residential subdivision, apartment complex, condominium or commercial/industrial/institutional establishment.

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

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

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

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

**FBFM:** Flood Boundary and Floodway Map

**FEMA:** Federal Emergency Management Agency

**FHBM:** Flood Hazard Boundary Map



**Flooding:** The volume of surface water that exceeds the banks or walls of a stormwater management facility, or channel; and overflows onto adjacent lands.

**Flood Insurance Study or FIS:** The official report by the Federal Insurance Administration evaluating flood hazards and containing flood profiles and watersurface elevations of the base flood.

**FIRM:** Flood Insurance Rate Map

**Floodway or “Regulatory Floodway”:** The channel of a stream or other watercourse and the adjacent areas of the **floodplain** which is necessary to contain and discharge the base flood flow without cumulatively increasing the base flood elevation more than one foot.

**Floodplain:** Any land area susceptible to flooding.

**Future-Conditions Floodplain:** Any land area susceptible to flooding by the future-conditions flood (the flood having a one percent chance of being equaled or exceeded in any given year based on future-conditions hydrology. Also known as the 100-year future-conditions flood).

**GDOT:** Georgia Department of Transportation

**GSMM:** The latest edition of the Georgia Stormwater Management Manual, and its appendices.

**Hotspot:** The 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 CCWA 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), materials storage sites, garbage transfer facilities, and commercial parking lots with high-intensity use.

**Impervious Surface:** The surface composed of any material that significantly impedes or prevents the natural infiltration of water into the soil. The following types of surfaces will be considered “impervious surfaces”: the projected area of buildings; asphalt-, concrete-, brick-, or stone-paved areas; improved vehicular drives and parking areas; compacted gravel and soil surfaces; fabric or plastic coverings; and other surfaces that prevent or impede the natural infiltration of stormwater runoff or that change the hydrologic response of the property that existed prior to development.

**Industrial Stormwater General Permit:** A National Pollutant Discharge Elimination System (NPDES) permit issued by Georgia Environmental Protection Division to an industry for stormwater discharges associated with industrial activity. This permit regulates pollutant levels associated with industrial stormwater discharges or specific on-site pollution control strategies based on Standard Industrial Classification Code.

**Infiltration:** The process of percolating stormwater runoff into the subsoil.

**Inspection and Maintenance Agreement:** The written agreement providing the long-term inspection, operation, and maintenance of the stormwater management system and its components on a site.

**Land Development Permit:** The authorization necessary to begin construction-related, land-disturbing activity.

**Land-disturbing Activity:** Any activity that results in soil erosion from water or wind and moves sediments into state water or onto lands within the state, including but not limited to clearing, dredging, grading, excavating and filing of land. Land-disturbing activities do not include agricultural practices as described in O.C.G.A. Section 12-7-17(5), or silvicultural land management activities as described in O.C.G.A. Section 12-7-17(6), within areas zoned for these activities.

**Landscaping Plan, Stormwater Management Facility:** The design for vegetation and landscaping that is critical to the performance and function of the stormwater management facility including how the facility will be stabilized and established with vegetation including the layout location and names.

**Linear Feasibility Program:** The feasibility program, CCWA Policy on Practicability Analysis for Linear Transportation Projects (see Appendix B), developed by CCWA 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 Clayton County or the six Cities is infeasible.

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

**New Development:** Any land-disturbing activity, 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:** The 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.

**Nonstructural Stormwater Control:** Any natural or planted vegetation or other nonstructural component of the stormwater management plan that provides for or enhances stormwater quantity and/or quality control or other stormwater management benefits, and includes, but is not limited to, riparian buffers, open and greenspace areas, overland flow filtration areas, natural depressions and vegetated channels.

**Overbank Flood Protection:** The 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).

**Post-Construction Stormwater Management:** The 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:** The conditions anticipated to exist on site immediately after completion of the proposed development.

**Practicability Policy:** The latest edition of the CCWA Policy on Practicability Analysis for Runoff Reduction (see Appendix C).

**Pre-Development:** The condition that exists immediately before implementation of the proposed development. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the existing conditions at the time prior to the first item being approved or permitted will 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 exiting runoff, unless the existing development causes a negative impact on downstream property.

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

**Routine Maintenance:** The activities to keep an impervious surface as near as possible to its constructed condition. This includes ordinary maintenance activities, resurfacing paved areas, full depth removal of paving and equal replacement of impervious cover, and exterior building changes or improvements which do not materially change surface grades or drainage patterns, increase or concentrate stormwater runoff, or cause additional nonpoint source pollution.

**Stormwater Control:** Refer to structural and nonstructural stormwater controls.

**Stormwater Management:** Collection, conveyance, storage, treatment and disposal of stormwater runoff in a manner intended 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 Management Facility:** Structural stormwater control or device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release and the velocity of flow of such runoff.

**Stormwater Management Plan:** A plan for post-construction stormwater management at the site that meets the requirements of Appendix D and is included as part of the land development application.

**Stormwater Management Plan, Conceptual:** The 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 preliminary stormwater management system design (see Appendix E).

**Stormwater Management Standards:** The standards set forth in these Stormwater Development Guidelines and consistent with the post-construction stormwater management ordinances adopted by Clayton County and the six Cities listed in Appendix A.

**Stormwater Management System:** The entire set of nonstructural site design features and structural stormwater management facilities 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.

**Structural Stormwater Control:** Stormwater management facility or device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release and the velocity of flow of such runoff.

**Subdivision:** The division of a tract or parcel of land resulting in one or more new lots or building sites for the purpose, whether immediately or in the future, of sale, other transfer or land development, and includes divisions of land resulting from or made in connection with the layout or development of a new street or roadway or a change in an existing street or roadway.

**Substantial Damage:** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

**Substantial Improvement:** Any combination of repairs, reconstruction, alteration, or improvements to a building, taking place during a 10-year period, in which the cumulative cost equals or exceeds 50% of the market value of the structure prior to the improvement. The market value of the building means (1) the appraised value of the structure prior to the start of the initial repair or improvement, or (2) in the case of damage, the value of the structure prior to the damage occurring. This term includes structures which have incurred “substantial damage” regardless of the actual amount of repair work performed. For the purposes of this definition, “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the building. The term does not, however, include those improvements of a building required to comply with existing health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, which have been pre-identified by the Code Enforcement Official, and not solely triggered by an improvement or repair project.

## 1.7 Resources

The resources listed below form the primary guidance required to adhere to these Stormwater Development Guidelines.

The following documents are made publicly available and may be accessed at the web link provided:

- A Georgia Stormwater Management Manual. Atlanta Regional Commission (<https://cdn.atlantaregional.org/wp-content/uploads/gsmm-2016-final.pdf>)
- B Stormwater Quality Site Development Review Tool (<https://atlantaregional.org/wp-content/uploads/site-development-review-tool-2-1.xlsm>)
- C Georgia Environmental Protection Division Rules for Dam Safety, Subject 391-3-8 (<http://rules.sos.ga.gov/gac/391-3-8>)

## 2. Planning and Design of Stormwater Management Systems

### 2.1 Stormwater Management Design Standards

The design, installation and construction of the stormwater management system shall be in accordance with the 13 stormwater management performance standards described in this section. Additional details for each standard can be found in the GSMM Volume 2, Section 4.2.3.

- A Natural Resources Inventory: Site reconnaissance and surveying techniques shall be used to complete a thorough assessment of existing natural resources, both terrestrial and aquatic, found on the site. Recommended components are listed in Appendix E.
- B 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.
- C Runoff Reduction: Runoff reduction practices reduce post-construction stormwater runoff rates, volumes and pollutant loads by disconnecting impervious and disturbed pervious surfaces from the storm drain, which contribute to all unified stormwater sizing criteria.
- D Water Quality: The stormwater management systems will be designed to retain or treat the runoff from 85% of the storms that occur in an average year and reduce average annual post-development total suspended solids loading by 80%.
- E Stream Channel Protection: Stream channel protection will be provided by using all of the following approaches: 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event; erosion prevention measures, such as energy dissipation and velocity control, and preservation of the applicable stream buffer.
- F Overbank Flood Protection: 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 design storm. However, if stream channel protection is exempted, the overbank flood protection measure must control peak discharge for the 2-year through the 25-year design storms.
- G Extreme Flood Protection: Extreme flood protection shall be provided by controlling and/or safely conveying the 100-year, 24-hour storm event either through stormwater management facilities that maintain the existing floodplain or through appropriately sized conveyances that discharge to protected floodplains without causing damage.
- H Downstream Analysis: Due to peak flow timing and runoff volume effects, some structural components of the stormwater management system fail to reduce discharge peaks to pre-development levels downstream from the site. A downstream peak flow analysis is required 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 GSMM Volume 2, Section 3.1.9. This is to help ensure that there are minimal downstream impacts from development on the site.
- I The downstream analysis may result in the need to resize structural components of the stormwater management system if the hydrology analysis determines that detrimental impacts will result after development without storage facilities. Detrimental downstream impacts could include flooding of existing stormwater structures, flooding of structural property, increased flooding of private property

below the development site, and increased stream bank erosion because of high velocity flows. The hydrology analysis shall also consider the areas upstream of the point of analysis to be fully developed based on their current zoning classification. If it is determined that storage is necessary, the structure shall be designed and built to ensure that the post-developed rate of runoff will not exceed the pre-developed rate of runoff for the required design storms. The need for emergency overflow facilities for the 100-year storm shall be evaluated.

- J Construction Erosion and Sedimentation Control: Erosion and sedimentation control practices shall be utilized during the construction phase of development or during any land-disturbing activities consistent with Georgia Erosion and Sedimentation Control Act and/or the NPDES General Permit for Construction Activities.
- K Inspection and Maintenance Plan: The components of the stormwater management system not to be dedicated to and accepted by CCWA, including all drainage facilities, stormwater management facilities, credited conservation spaces, and conveyance system are required to have an inspection and maintenance agreement for the on-site stormwater management system. This plan shall be in writing in accordance with the requirements described below in Section 7.1.
- L Pollution Prevention: The design of a pollution prevention plan and implementation of pollution prevention practices for development or redevelopment projects, to the maximum extent practicable.
- M Stormwater Management Plan: The comprehensive report that contains the technical information and analysis showing how the proposed new development or redevelopment project meets local stormwater requirements. This plan shall address all applicable requirements described in Appendix D (Detailed Components of a Stormwater Management Plan), Appendix F (Stormwater Technical Review Checklist), Appendix G (Preliminary Plat Checklist), and Appendix H (Final Plat Checklist).

### **2.1.1 Unified Stormwater Sizing Criteria**

The unified stormwater sizing criteria is an integrated set of engineering criteria (Runoff Reduction, Water Quality, Stream Channel Protection, Overbank Flood Protection, and Extreme Flood Protection), which have been developed for use in sizing stormwater management facilities.

- A Stormwater Runoff Reduction and Water Quality: Stormwater Runoff Quality/Reduction is required by using the following standards:
  - 1 For development with a stormwater management plan submitted before December 10, 2020, either Runoff Reduction or Water Quality is required,
  - 2 For development with a stormwater management plan submitted on or after December 10, 2020, Runoff Reduction and additional Water Quality shall not be required. To the extent Runoff Reduction has been determined to be infeasible for all or a portion of the site, as documented in the Determination of Infeasibility prepared through the Practicability Policy, then Water Quality shall apply for the remaining runoff from a 1.2-inch rainfall event and must be treated to remove at least 80% of the calculated average annual post-development total suspended solids load or equivalent as defined in the GSMM:
    - a Runoff Reduction – The stormwater management system shall be designed to retain the first 1.0 inch of rainfall on the site using runoff reduction methods, to the maximum extent practicable.



- b Water Quality – The stormwater management system shall be designed to remove at least 80% of the calculated average annual post-development total suspended solids load or equivalent as defined in the GSMM for runoff from a 1.2-inch rainfall event.
  - 3 If a site is determined to be a hotspot, CCWA may require the use of specific or additional components for the stormwater management system to address pollutants of concern generated by that site.
- B Stream Channel Protection: Stream channel protection is required by using the following three approaches:
- 1 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event;
  - 2 Erosion prevention measures, such as energy dissipation and velocity control, and
  - 3 Preservation of any applicable stream buffer.
- C Overbank Flood Protection: Downstream overbank flood protection is required by controlling the post-development peak discharge rate to the pre-development rate for the 25-year, 24-hour storm event.
- D Extreme Flood Protection: Extreme flood protection is required by controlling the 100-year, 24-hour storm event such that flooding is not exacerbated.

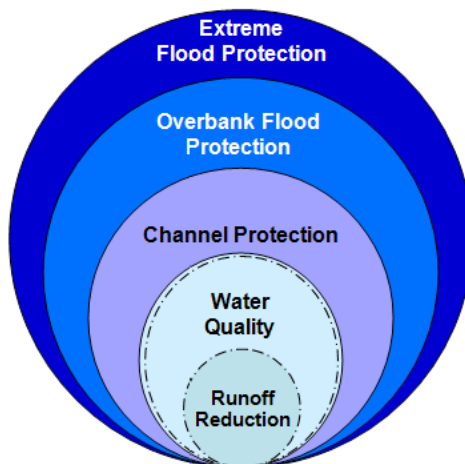


Figure 2-1. Representation of the Unified Sizing Criteria. GSMM, Volume 2, Section 2.2.3.

## 2.2 Site Planning and Design

### 2.2.1 Requirements for Site Planning and Design

The following should be considered in developing a stormwater management plan for a site design. Additional guidance can be found in the GSMM Volume 2, Section 2.4.1.2.

- A The site design should utilize an integrated approach to deal with stormwater quantity, quality, and streambank channel protection requirements.

- B Stormwater management practices should strive to utilize the natural drainage system and require as little maintenance as possible.
- C Stormwater management facilities should be implemented only after all better site design and nonstructural stormwater credit options have been exhausted.
- D Stormwater management facilities should attempt to be multi-purpose and be aesthetically integrated into a site's design.
- E "One size does not fit all" in terms of stormwater management solutions.

### **2.2.2 Better Site Design Practices**

The first step in the better site design process is to identify and preserve the natural features and resources that can be used in the protection of water resources by reducing stormwater runoff, providing runoff storage, reducing flooding, preventing soil erosion, promoting infiltration, and removing stormwater pollutants. The following better site design practices should be utilized in developing a stormwater management plan for a site design. Additional information can be found in the GSMM Volume 2, Section 2.3.2.

- A Preserve Undisturbed Natural Areas
  - Delineate natural areas before performing site layout and design.
  - Ensure that conservation areas and native vegetation are protected in an undisturbed state throughout construction and occupancy.
- B Preserve Riparian Buffers
  - Delineate and preserve naturally vegetated riparian buffers.
  - Ensure that buffers and native vegetation are protected throughout construction and occupancy.
- C Avoid Floodplains
  - Obtain maps of the 100-year floodplain from the local review authority.
  - Ensure that all development activities do not encroach on the designated floodplain areas.
- D Avoid Steep Slopes
  - Avoid development on steep slope areas, especially those with a grade of 15% or greater.
  - Minimize grading and flattening of hills and ridges.
- E Minimize Siting on Porous or Erodible Soils
  - Use soil surveys to determine site soil types.
  - Leave areas of porous or highly erodible soils as undisturbed conservation areas.
- F Fit Design to the Terrain
  - Develop roadway patterns to fit the site terrain. Locate buildings and impervious surfaces away from steep slopes, drainageways and floodplains.
- G Locate Development in Less Sensitive Areas
  - Lay out the site design to minimize the hydrologic impact of structures and impervious surfaces.

H Reduce Limits of Clearing and Grading

- Establish limits of disturbance for all development activities.
- Use site footprinting to minimize clearing and land disturbance.

I Utilize Open Space Development

- Use a site design which concentrates development and preserves open space and natural areas of the site.

### 2.2.3 Nonstructural Stormwater Credits

Site design credits for nonstructural stormwater control practices are not provided by CCWA.

### 2.2.4 Permanent Easements

- A The applicant must ensure access from public right-of-way to stormwater management facilities and stormwater drainage systems requiring regular maintenance at the site for the purpose of inspection and repair by securing all the maintenance access easements needed on a permanent basis. Such access shall be sufficient for all necessary equipment for maintenance activities. Upon final inspection and approval, a plat or document indicating that such easements exist shall be recorded and shall remain in effect even with the transfer of title of the property.
- B Access Easements for Stormwater Management Facilities: All stormwater management facilities must have access easements from a public right-of-way to the stormwater management facility. The access easement shall not be located over a drainage easement, sewer easement, stream buffer, wetland, or natural conservation area. No fences or shrub plantings shall be allowed within access easements.
- a For Single-Family Residential Developments and All Regional Stormwater Management Facilities: Access easements to public right-of-way shall be 20 feet wide and consist of the appropriate slope and surface stabilization to support maintenance equipment.
  - b For All Other Developments (e.g., condos, apartments, mobile homes in complexes that are master metered, duplexes, triplexes, quadraplexes, commercial, industrial, and other non-residential lands): Access to public right-of-way shall be 20 feet wide and consist of the appropriate slope and surface stabilization to support maintenance equipment.
- C Drainage Easements:
- 1 Stormwater Management Facilities: All stormwater management facilities must be contained within a drainage easement.
    - a For Single-Family Residential Developments and All Regional Stormwater Management Facilities: Drainage easements shall be 20 feet wide and extend from the edge of the 100-year ponding elevation.
    - b For All Other Developments (e.g., condos, apartments, mobile homes in complexes that are master metered, duplexes, triplexes, quadraplexes, commercial, industrial, and other non-residential lands): Drainage easements shall be 20 feet wide and extend from the edge of the 100-year ponding elevation.
  - 2 Green Infrastructure Stormwater Management Facilities: All green infrastructure stormwater management facilities must be contained within a drainage easement.

- a **For Single-Family Residential Developments:** Drainage easements shall be 20 feet wide and extend from the edge of the 1-year ponding elevation. For those facilities without surface ponding, drainage easement shall be 20 feet wide and extend from the edge of the facility footprint.
  - b For All Other Developments (e.g., condos, apartments, mobile homes in complexes that are master metered, duplexes, triplexes, quadraplexes, commercial, industrial, and other non-residential lands): Drainage easements shall be 20 feet wide and extend from the edge of the 1-year ponding elevation. For those facilities without surface ponding, drainage easement shall be 20 feet wide and extend from the edge of the facility footprint.
- 3 **Drainage Ditches:** All drainage ditches located outside the public right-of-way shall be contained in a drainage easement. The drainage easement width must be the greater of either 20 feet or equal to the top width of the drainage ditch at nominal grade. No permanent structures, excluding drainage structures, can be built within drainage easements.
- 4 **Pipes:** All pipes located outside the public right-of-way shall be contained in a drainage easement. The drainage easement width must be the greater of either 20 feet or twice the pipe trench depth (nominal surface grade to bottom of trench for pipe) plus outside width of pipe(s) installed in the trench. No permanent structures, excluding drainage structures, can be built within drainage easements.
- a For Single-Family Residential Developments:
    - i Drainage easements shall be donated to CCWA for those pipes within the public right-of-way. Drainage easements, which have the potential to be donated to CCWA in the future, are those pipes interconnected to the stormwater drainage system within the public right-of-way (all drainage pipes continuously connected, unless separated by breaks in the constructed drainage network). These pipes shall conform to the requirements of pipes maintained by CCWA as public assets, see Section 5 for detailed requirements.
    - ii Pipes not interconnected to the stormwater drainage system within the public right-of-way and those pipes otherwise beyond the public right-of-way will be privately owned and will remain within a dedicated drainage easement. These pipes shall conform to the requirements of pipes maintained by others as private assets, see Section 5 for detailed requirements.
  - b For All Other Developments:

For example, condos, apartments, mobile homes in complexes that are master metered, duplexes, triplexes, quadraplexes, commercial, industrial, and other non-residential lands

    - i All pipes directly connected to the stormwater drainage system, within the public right-of-way or outside the public right-of-way, will be privately owned and maintained and will remain in a dedicated easement for the purposes of conveying stormwater. These pipes shall conform to the requirements of pipes maintained by others as private assets, see Section 5 for detailed requirements.

### 3. Hydrology

Stormwater management facilities must be designed to meet the stormwater management standards in Section 2.2 using the following hydrology steps and calculations to produce hydrologic models. A list of hydrologic numerical models meeting the minimum requirement of the National Flood Insurance Program can be found at <https://www.fema.gov/flood-maps/products-tools/numerical-models/hydrologic>.

- A Calculate stormwater runoff to the proposed stormwater management facility using the appropriate runoff calculation methods described in the GSMM Volume 2, Section 3.1.
- B Calculate the runoff reduction and/or stormwater volume storage required to meet the stormwater management standards as presented in Section 2.01, using the appropriate methods described in the GSMM Volume 2, Sections 3.2 and 3.3.
- C Design appropriate stormwater management facilities to achieve the volume reduction and/or stormwater volume storage required to meet the stormwater management standards as presented in Section 2.1.1, using the appropriate design methods described in the GSMM Volume 2, Section 4.
- D Design the stormwater drainage system to meet the goals of the stormwater system in accordance with the GSMM Volume 2, Section 5.
- E Pre-developed and developed conditions will be analyzed for the following 24-hour design storm events:
  - 1-year
  - 2-year
  - 5-year
  - 10-year
  - 25-year
  - 50-year
  - 100-year

## 4. Stormwater Management Facilities

### 4.1 Requirements for Stormwater Management Facilities

Stormwater management facilities are designed to reduce and manage stormwater runoff, which mitigate the effects of increased stormwater runoff peak rate, volume, and velocity due to urbanization. All stormwater management facilities must be appropriately designed according to the GSMM to meet the intended function. Volume 1, Section 4 of the GSMM provides a comprehensive overview, specific design criteria, and examples of stormwater management facilities. Descriptions of each facility are provided in Table 4.1.1-1 in Volume 2, Section 4 of the GSMM. Design removal efficiencies, site applicability, and relative construction and maintenance costs for each stormwater management facility are provided in Table 4.1.3-1 in Volume 2, Section 4 of the GSMM. A detailed discussion of each facility, as well as design criteria and procedures for each, is found in Volume 2, Sections 4.2 through 4.29 of the GSMM.

### 4.2 Additional Requirements for Select Facilities

- A **General Requirements:** All stormwater management facilities shall be designed to meet the GSMM requirements.
- B **Cut and Fill Slopes:** Cut and fill slopes for stormwater management facilities shall be in accordance with specific stormwater facility design requirements as described in the GSMM Volume 2, Sections 4 and 5.
- C **Parking Lots:** Parking lots shall not be utilized for the storage or management of stormwater runoff.
- D **Fencing of Stormwater Management Facilities:** Stormwater management facilities greater than 4 feet in depth (measured from the invert of surface storage to the overflow/spillway invert elevation) must be enclosed behind a 5-foot-high PVC-coated chain link fence. The fence shall be installed according to the GDOT Standard 9031N (Chain Link Wire Fence). The fence is to be located 20 feet outside the 100-year ponding elevation limits or as practicable. Access from the public right-of-way to the stormwater management facilities requiring fence enclosures shall be provided by a minimum 16-foot-wide PVC-coated chain link double gate.
- E **Identification Number:** CCWA will assign a unique identification number to each of the public and private stormwater management facilities during the review process. The Design Professional shall show the identification numbers for all stormwater management facilities on the approved plans and as-built drawings of the development.
- F **Additional Facilities Beyond Minimum Controls:** At the discretion of the CCWA Administrator, additional stormwater management facilities may be necessary beyond the minimum control requirements to protect upstream and downstream properties and aquatic resources from damage due to increased runoff volume, frequency, and flow rates or increased nonpoint source pollution loads resulting from certain hydrologic conditions or land use activities.
- G **Hotspot Land Uses:** Developments including land uses that meet the definition of hotspot shall be required to meet the following criteria:
  - a No portion of the hotspot area shall bypass the stormwater management system.
  - b At a minimum, treatment method must be as specified in the GSMM and be designed for the specific pollutants associated with the hotspot land use.



- c To protect groundwater from potential contamination, runoff from designated hotspot land uses must not be infiltrated using stormwater management facilities. Infiltration-based stormwater management facilities should not be used for manufacturing or industrial sites, where there is a potential for high concentrations of soluble pollutants and heavy metals. In addition, infiltration-based stormwater management facilities should not be considered for areas with a high pesticide concentration.
  - d Hotspot land uses with commercial fueling areas shall be designed with a gravity (oil-grit) separator as part of the treatment in series.
- H **Stormwater Management Facilities in Single-Family Residential Developments:** Stormwater management facilities in single-family residential developments should be located on a separate, individual platted lot with required access easements. These facilities may be owned and maintained by the homeowner's association or other private entity, provided an inspection and maintenance agreement has been recorded (see Section 7.2 for additional details).
- I **Green Infrastructure Facilities in Single-Family Residential Developments:** Stormwater management facilities in single-family residential developments should be located on a separate, individual platted lot with required access easements. These facilities may be owned and maintained by the homeowner's association or other private entity, provided an inspection and maintenance agreement has been recorded (see Section 7.3 for additional details).
- J **Non-standard Stormwater Management Facilities:** Stormwater management facilities not documented in the GSMM, must provide effectiveness and pollutant removal rates through documentation of prior studies, literature reviews, or other means. The Design Professional shall receive approval from the CCWA Administrator before being included in the design of a stormwater management system.
- K **Proprietary Stormwater Management Facilities:** If a proprietary stormwater management facility is used, the Design Professional shall provide a certification from the manufacturer that the facility meets the GSMM requirements and is on the Metropolitan North Georgia Water Planning District PCSTAP List (<https://northgeorgiawater.org/pcstap-list/>). CCWA Administrator may accept the proprietary facility if it can retain the first 1.0 inch of rainfall on site or managing runoff from the 1.2-inch rainfall event, therefore removing 80% or greater of total suspended solids. Proprietary stormwater management facilities not on the District PCSTAP List, if accepted by the CCWA Administrator, will be treated as removing up to 60% of total suspended solids. The Design Professional shall receive approval from the CCWA Administrator before being included in the design of a stormwater management system.
- L **Regional Stormwater Management Facilities:** Regional stormwater management facilities or centralized stormwater management facilities may be approved for multiple sites, provided that the stormwater management facility is constructed and as-built are certified prior to issuance of a certificate of occupancy for any of the developments contributing runoff to the facility. The Design Professional shall receive approval from the CCWA Administrator before being included in the design of a stormwater management system.

## 5. Stormwater Drainage Systems

### 5.1 Requirements for Public Stormwater Assets and Private Roadways

Requirements within this section apply to all stormwater drainage system components currently maintained by CCWA as public assets (located within public and private right-of-way; previously donated to CCWA) and stormwater drainage system components that could be donated to CCWA in the future (located under private streets/roadways, unless exempt by the CCWA Administrator). Design shall follow GDOT construction standards and details. These are available at:

<http://mydocs.dot.ga.gov/info/gdotpubs/ConstructionStandardsAndDetails/Forms/AllItems.aspx>

#### 5.1.1 Inlets

- A **Design Storm:** All inlets shall be designed to accommodate the 25-year peak discharge. Sump inlets shall be designed to accommodate the 50-year peak discharge.
- B **Maintenance Access:** All storm drain inlets shall contain access covers and steps for maintenance access purposes. If the depth of the inlet exceeds 3 feet, the access cover must be located directly over the steps.
- C **Roadway Gutter Spread:** Catch basins should be located no more than 400 feet apart or a distance that will allow no more than 8 feet of gutter spread from the face of the curb during 25-year design storms.
- D **Catch Basins:** Catch basins shall be designed and constructed according to one of the following standards depending on the basin location:
  - 1 GDOT Standard 1010: Catch Basins with Cast Iron Grate Inlets.
  - 2 GDOT Standard 1013: Catch Basins with Castings.
  - 3 GDOT Standard 1033D or 1033D-Precast: Catch Basins for Use with Curb (6" or 8" height) and Gutter.
  - 4 GDOT Standard 1034D or 1034D-Precast: Catch Basins for Use with Curb (6" or 8" height) and Gutter (in Sags or Low Points).
  - 5 GDOT Standard 1035: Drain Inlet with Elbow Type.
  - 6 GDOT Standard 1040: Circular Base Units and Risers for Catch Basins and Drop Inlets.
- E **Drop Inlets without Weirs:** Drop inlets without weirs shall be designed and constructed according to the following standard:
  - 1 GDOT Standard 1019A or 1019A-Precast: Standard Drop Inlets.
  - 2 GDOT Standard 1019B: Drop Inlet Types V-1 and V-2.
- F **Drop Inlets with Weirs:** Drop inlets with weirs shall be designed and constructed according to the CCWA Standard 100.2.

- G **Junction Boxes:** Junction boxes are required where there are changes in direction, slope, size, elevation, or material of pipes. Junction boxes shall be designed and constructed according to the GDOT Standard 9031U (Precast or Built-in-Place Junction Boxes) . All junction boxes shall contain access covers and steps for maintenance access purposes. If the depth of the box exceeds 3 feet, the access cover must be located directly over the steps.
- H **Qualified Products:** All precast storm drain inlets including catch basins, drop inlets (with or without weirs), junction boxes, and inlet steps must be listed on the GDOT list of qualified products. A statement indicating this requirement must be shown in the construction drawings. The following Qualified Product List numbers are applicable:
- 1 Precast Storm Drain Inlets: QPL-4
  - 2 Inlet Steps: QPL-31

A list of approved qualified products is available at: <http://www.dot.ga.gov/PS/Materials/QPL>

### 5.1.2 Pipes and Culverts

- A **Design Storm:** Lateral closed systems shall be designed to accommodate the 25-year peak discharge. All culverts shall be designed to accommodate the 100-year peak discharge.
- B **Design Velocity:** Pipes shall be designed so that the velocity is at least 2.5 feet per second for the 2-year flow to ensure self-cleaning. The maximum allowable velocity for corrugated metal pipe is 15 feet per second. There is no specified maximum allowable velocity for concrete pipe, but energy dissipation per Section 5.3.2 (Energy Dissipation) shall be provided at outlets where the discharge exceeds the non-erosive velocities.
- C **Design Slope:** The maximum slope of concrete pipe shall be 10% and corrugated metal pipe is 14% before restraining methods (i.e., anti-seep collar) are used.
- D **Freeboard:** All culverts shall be designed with 18 inches of freeboard measured from the low point of the road at the crossing during the 100-year peak discharge.
- E **Pipe Diameter:** Residential driveway pipes shall be a minimum of 15 inches in diameter. All other drainage system pipes shall be a minimum of 18 inches in diameter.
- F **Pipe Material Under Roadways:** Only reinforced concrete pipes shall be used under public roads and gutters or private streets/roadways and gutters.
- G **Pipe Material Beyond Roadways:** Pipe materials specified below shall be used within the public right-of-way when installing pipe outside of roadway and gutter footprints.

The Design Professional shall select from the pipes specified below according to the appropriate location, and minimum class and thickness as specified on GDOT Standard 1030D, except for corrugated metal pipes exceeding 102 inches in diameter and concrete pipes. The class or thickness shall be determined based on the maximum height of fill above the top of the pipe.

- 1 Minimum 14 gauge Type 1 bituminous coated corrugated metal pipe
- 2 Reinforced concrete pipe
- 3 Minimum 14 gauge corrugated metal pipe with aluminized coating
- 4 High-density Polyethylene (HDPE) pipe meeting CCWA standards and specifications as shown on Appendix O

- 5 Reinforced concrete pipe, reinforced box culvert or HDPE pipe in flowing streams
  - 6 Reinforced concrete or HDPE pipe in structural controls' outlet devices
- H **Pipe Transitions:** Transitions between pipe materials shall be made using a junction box or other structure with manhole access for maintenance and inspection. The maximum drop in a junction box shall not exceed 10 feet.
- I **Pipe and Culvert Backfill:** The trench and bedding construction and backfill materials for concrete and metal pipes shall comply with the GDOT Standard 1030D (Trench Construction, Bedding and Backfilling of Concrete and Metal Pipe Culverts). The trench and bedding construction and backfill materials for HDPE pipes shall comply with the CCWA Standard 100.3 (HDPE Pipe Bedding) shown in Appendix M.
- 1 All pipes and culverts shall be backfilled with Class I or Class II soils per the GDOT Specification Section 810 (Roadway Materials).
  - 2 Backfills will be constructed in 6-inch to 12-inch vertical layers and thoroughly compacted. The compacted dry density for each layer of backfill will be at least 95% of the maximum laboratory dry density established by the Proctor Test.
- J **Extent of Stormwater Pipe:** In residential subdivisions, stormwater pipes conveying flow from the roadways shall extend to minimum of:
- 1 10 feet beyond the rear property line or vegetated buffer, as required;
  - 2 140 feet from the back of curb; or
  - 3 Where the invert of the pipe outfall remains above the 100-year floodplain's base flood elevation.
- K **Inlet/Discharge Points:** All inlet and discharge points for culverts and storm drain systems, other than under residential driveways, shall have concrete headwalls or flared end sections.
- L **Concrete End Sections:** Concrete headwalls shall be designed and constructed according to the GDOT Standard 1125 (Tapered Inlet Headwall-Outlet Headwall, Built-in-Place).
- M **Flared End Sections:** Flared end sections shall be designed and constructed according to the GDOT Standard 1120 (Flared End Sections for Pipes). Safety end treatments are required adjacent to vehicular traffic when guardrails are not present. Wingwalls for box culverts shall be designed according to the criteria in the GSMM.
- N **Installation of Pipes and Culverts by Open Cut:** Installation of pipes and culverts under existing pavement must comply with the GDOT Standard 1401 (Pavement Patching Details, Storm Drain or Utility Installations by Open Cut across Existing Pavement).
- O **Qualified Products:** All pipes and box culverts must be listed on the GDOT list of qualified products. A statement indicating this requirement must be shown in the construction drawings. The following Qualified Product List (QPL) numbers are applicable to the types of pipes approved by CCWA:
- 1 Reinforced Concrete Pipe and Precast Concrete Box Culverts: QPL-4
  - 2 Corrugated HDPE Pipe: QPL-51
  - 3 Corrugated Metal Pipe: QPL-56
  - 4 Precast Manhole and Structures: QPL-4

A list of approved pipe manufacturers is available at: <http://www.dot.ga.gov/PS/Materials/QPL>

### 5.1.3 Drainage Ditches

Drainage ditches are a type of open channel system that collects and conveys stormwater runoff across the site. Drainage ditches include manmade structures with vegetated linings, flexible linings, or rigid linings. Open channels classified as drainage ditches specifically exclude jurisdictional waters and stormwater management facilities listed in the GSMM.

- A **Design Storm:** Open channels shall be designed to accommodate the 25-year peak discharge.
- B **Design Standards:** Open channels shall be designed according to the CCWA Standard Detail 100.1 (Typical Drainage Ditch) see Appendix O. The channel dimensions shall be designed according to the criteria in the GSMM Volume 2, Section 5.4.
- C **Cut and Fill Slopes:** Cut and fill slopes for drainage ditches shall be 4:1 (H:V) or flatter.
- D **Easements:** The entire width of the drainage ditch's channel shall be contained within a permanent drainage easement, see Section 2.2.4 for additional information.

## 5.2 Requirements for Private Stormwater Assets

Inlets, pipes and culverts, and drainage ditches for all private asset stormwater drainage system components and those stormwater drainage system components that are not likely to be donated to CCWA in the future (not located under private streets/roadways) shall be designed according to the criteria in the GSMM Volume 2, Section 5 (Stormwater Drainage System Design).

## 5.3 Requirements for All Stormwater Assets

Natural stream channels and energy dissipation requirements within Section 5.3 and subsections apply to all stormwater drainage system components.

### 5.3.1 Natural Stream Channels

Natural stream channels are protected jurisdictional waters that limit impacts from land development activities and must be addressed in the Stormwater Management Plan. Jurisdictional protections apply to stream buffers, watershed protection districts, wetlands, and dams.

- A **Stream Buffer Protection:** If a stream is located on the development site, the Design Professional shall provide a 50-foot buffer measured horizontally on both banks of the stream as measured from the point of wrested vegetation on the stream bank. An additional setback shall be maintained for 25 feet, measured horizontally, beyond the undisturbed natural vegetative buffer, in which all impervious cover shall be prohibited. The stream buffer and the impervious setback shall be delineated in the Stormwater Management Plan. The Design Professional shall review the Stream Buffer Protection Ordinance of the local jurisdiction, shown in Appendix A, where the development site is located for additional requirements.
- B **Watershed Protection:** If a site is located within an area zoned as the Watershed Protection District (WP) by Clayton County and the six Cities, the Design Professional shall provide the required buffer and setbacks along the watercourses in the Stormwater Management Plan as specified in the applicable Zoning Ordinances of the local jurisdiction where the development site is located.

- C **Wetlands:** The Stormwater Management Plan shall identify any wetlands and jurisdictional waters on the property or within 200 feet of the construction limits. If necessary, the Developer will be requested to submit a site-specific Wetlands Identification prepared by USACE and/or his qualified Wetlands Specialist. If wetlands disturbance is indicated at the development site, CCWA will not approve the plan until documentation has been provided to show the applicant has approval from USACE in the form of a "Letter of Permission" or a Section 404 permit. Wetlands containing standing water could be considered State Waters and a buffer variance may be required to disturb these areas. The Design Professional shall consult the local jurisdiction, shown in Appendix A, on the buffer variance requirements.
- D **Dams:** All dams classified by the State of Georgia as Category 1 dams, that are greater than 25 feet in height or impounding greater than 100 acre-feet and where the operation or failure of the dam would result in probable loss of human life, are regulated by the Georgia Safe Dams Program (GA SDP).
- 1 Any development proposes to construct a Category 1 dam must obtain a permit from the GA SDP. The Design Professional shall review the Georgia Rules for Dam Safety 391-3-8 (<http://rules.sos.ga.gov/gac/391-3-8>) for design requirements. CCWA shall not approve the Stormwater Management Plan until the GA SDP approves the construction of the dam and a copy of the permit is submitted to CCWA.
  - 2 The design of dams not exceeding either one of the above criteria for Category 1 dams shall be reviewed by CCWA.
  - 3 When a development site is located downstream of a Category 2 dam, where the operation or failure of the dam would not expect to cause probable loss of human life, the Design Professional shall submit appropriate documentation to the GA SDP. The Design Professional shall consult the GA SDP on what type of documentation is needed to determine the classification of the dam. If the GA SDP changes the classification of the dam to a Category 1 dam, the Developer must submit a copy of the classification letter to CCWA. CCWA shall not approve the Stormwater Management Plan until the dam is brought up to compliance with the requirements of the GA SDP and a copy of the permit from the GA SDP is received or the Developer moves the development outside of the dam break zone.

### 5.3.2 Energy Dissipation

Energy dissipators are engineered devices that absorb the initial impact of flow and reduce the speed of the flow to a non-erosive velocity. Energy dissipators prevent scour at stormwater outlets, protect outlet structures and minimize potential downstream erosion. Energy dissipators include rip-rap aprons, stilling basins with pre-formed scour holes, or concrete baffles placed at the outlet of stormwater conveyances to reduce velocity, erosive energy, and turbulence of the outlet's flow. Energy dissipators will be designed consistent with the GSMM Volume 2, Section 5.5 and according to the following criteria:

- A Energy dissipators will be provided where stormwater outlet discharge velocities exceed the non-erosive velocity of the downstream channel lining.
- B Energy dissipators will be based on site-specific outlet discharges and tailwater conditions in the downstream channel.
- C Energy dissipators will provide uniform redistribution or spreading of the outlet flow without excessive flow separation or increased turbulence.

## 6. Floodplain Management

The Design Professional will prepare a floodplain management/flood damage prevention plan for new developments or substantial improvements located within areas of special flood hazard on the Flood Insurance Rate Maps (FIRM), including other high-risk areas as described in the applicable floodplain management ordinance. The floodplain management/flood damage prevention plan will align with the following checklist in Appendix I, and standards and associated requirements as detailed in the applicable local floodplain management ordinance listed in Appendix A:

- A The Design Professional shall provide CCWA with elevation certificates and/or floodproofing certificates according to the appropriate construction phase and structure type as detailed in the applicable local floodplain management ordinance.
- B The Design Professional shall show the floodplain boundaries on the floodplain management plan, and base flood elevations or future-conditions elevations for the appropriate flood zones, using approved flood studies as specified in the applicable local floodplain management ordinance. If future-condition elevation data is not available from the jurisdiction, then it shall be determined by a licensed professional engineer in the State of Georgia, using a method approved by local jurisdiction or their designee. A list of hydrologic numerical models meeting the minimum requirement of the National Flood Insurance Program can be found at <https://www.fema.gov/flood-maps/products-tools/numerical-models/hydrologic>.
- C The Design Professional shall show the boundaries of the floodway and topographic information on the floodplain management plan. Specific floodway boundary requirements and approved flood studies are detailed in the applicable local floodplain management ordinance.
- D The Design Professional shall adhere to the following standards, as specified in the applicable local floodplain management ordinance:
  - a General standards for development with floodplain encroachment
    - i CCWA may allow floodplain encroachments provided the Design Professional demonstrates through hydrologic and hydraulic analysis that the encroachment shall not result in any increase to the pre-project base flood elevations, floodway elevations, or floodway widths during the base flood discharge. The Design Professional shall submit a completed No-Rise Certification Form along with the hydrologic and hydraulic analysis supporting the certification to CCWA. The form and procedures for submitting the analysis are shown in Appendix J.
  - b Standards for development with floodway encroachment
  - c General standards for flood damage reduction
  - d Building standards for structures and buildings within the future-conditions floodplain
  - e Standards for buildings located adjacent to the Floodplain
  - f Building standard for residential single-lot developments on streams without established base flood elevations and/or Floodway (A Zones)
  - g Standards for buildings located in areas of shallow flooding (AO Zones)
  - h Standards for subdivisions



## 7. Inspection and Maintenance

This section establishes obligations for inspection and maintenance of existing and new stormwater management systems. Refer to the GSMM Volume 2, Appendix E for guidance on inspections and maintenance procedures, including maintenance checklists for stormwater management facilities.

For any stormwater management systems approved and built based on requirements predating the current GSMM and that are 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.

### 7.1 Inspection and Maintenance Agreement

- A The owner is required to execute an inspection and maintenance agreement with CCWA obligating the owner to inspect, clean, maintain, and repair the stormwater management system, including vegetation in the final stormwater management facility landscaping plan. The form for the Inspection and Maintenance Agreement can be found in Appendix K.
- B The inspection and maintenance agreement will include exhibits showing:
  - 1 The exact location of each stormwater management facility
  - 2 Name/model of the proprietary device or underground tank/vault
  - 3 Maintenance extents
  - 4 Checklists for each stormwater management facility, as shown in GSMM Volume 2, Appendix E
  - 5 Areas agreed to not be disturbed for nonstructural stormwater credits, as documented in a copy of the applicable conservation easement instrument, and a written description of how Natural Conservation Areas will be identified onsite and what measures will be taken to maintain and preserve these areas.
- C The inspection and maintenance agreement will be approved by CCWA prior to recording the agreement in the property records.
- D After the inspection and maintenance agreement has been approved by CCWA, signed by the owner, and signed by CCWA, then the owner is required to record the agreement at the owner's cost in the property record for all parcel(s) that make up the site.
- E The owner shall provide a copy of the recorded inspection and maintenance agreement to CCWA prior to project closeout.
- F The inspection and maintenance agreement must 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 is required to update the point of contact as needed and upon request by CCWA. Upon any sale or transfer of the site, the new owner is required to notify CCWA in writing within 30 days of the name or official title of new person(s) serving as the point of contact for the new owner. Any failure of an owner to keep the point of contact up to date shall, following 30 days' notice, constitute a failure to maintain the stormwater management system.

- G Stormwater management facilities and stormwater management systems situated on properties owned by a homeowners' association will be maintained by the homeowner's association according to the inspection and maintenance agreement.
- H The inspection and maintenance agreement will 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:
  - 1 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 CCWA.
  - 2 In the absence of a recorded assignment agreement, all owners of the site will be jointly and severally liable for all obligations under the inspection and maintenance agreement regardless of what portion of the site they own.
- I The terms of the inspection and maintenance agreement will provide for CCWA the 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 CCWA will have the right to enter and make inspections pursuant to CCWA general provisions for property maintenance inspections.
- J 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 Clayton County or the six Cities or their designee. 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:
  - 1 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 the local jurisdiction's applicable ordinances in Appendix A, and
  - 2 To address such a failure to maintain the stormwater management system, CCWA 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.

## **7.2 Stormwater Inspection During Construction**

The Developer shall provide the CCWA Administrator a 48-hour notice prior to commencing construction on a stormwater management system or stormwater management facility.

Periodic inspections of the stormwater management system during construction shall be conducted by the staff of CCWA or their designee. Inspections will use the approved stormwater management plan for establishing compliance. All inspections will be documented with inspection reports as shown in Appendix L, and GSMM Volume 2, Appendix E as included in the recorded Inspection and Maintenance

Agreement or documented in the approved stormwater management plan, and contain the following minimum 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
- D Any other variations or violations of the conditions of the approved Stormwater Management Plan

### **7.3 Final Stormwater Inspection and As-Built Certification**

Upon development completion, the following elements of a final stormwater inspection are required:

- A The Developer is required to submit a completed Engineer's Certificate of Construction Conformance for Green Infrastructure Stormwater Management Facility, as shown in Appendix M, for developments with one or more green infrastructure stormwater management facilities installed onsite.
- B The Developer is required to submit a completed Stormwater Management Facility As-Built Certification Form, as shown in Appendix N.
- C The Developer is required to submit CCTV footage using Pipeline Assessment Certification Program/Manhole Assessment and Certification Program (PACP/MACP) standards for all components of the stormwater management systems.
- D Submittal of a signed inspection and maintenance agreement that has been recorded by the owner in the property record for all parcels(s) that make up the site, as described in Section 7.1.
- E CCWA shall perform a final inspection with the applicant to confirm applicant has fulfilled these responsibilities. The final inspection occurs prior to issuance of a certificate of occupancy.

### **7.4 Post-Construction Stormwater Inspections**

As part of the NPDES MS4 permit for Clayton County and the six Cities, CCWA performs post-construction stormwater inspections of privately owned stormwater management systems upon completion of construction to verify GSMM design criteria were met, confirm as-built submittals, and to address customer complaints or service requests. For any stormwater management systems approved and built based on requirements predating the 2016 GSMM and that is not otherwise subject to an inspection and maintenance agreement, such stormwater management systems shall be maintained by the owner so that the stormwater management systems perform as they were originally designed. For any stormwater management systems approved and built based on the current GSMM requirements, refer to Appendix E of the GSMM, Operations and Maintenance (O&M) Guidance Document for the corresponding inspection forms.

**Appendix A**  
**Parties Responsible for Watershed**  
**Protection**

## Clayton County Water Authority

### Appendix A. Parties Responsible for Watershed Protection

Responsible Party	Watershed Protection Responsibility
<i>Watershed Protection Plan Owner</i>	
<p>Clayton County Water Authority                      1600 Battle Creek Rd.                      Morrow, GA 30260                      (770) 960-5200  <a href="https://www.ccwa.us/">https://www.ccwa.us/</a></p>	<ul style="list-style-type: none"> <li>▪ NPDES wastewater permittee</li> <li>▪ Surface water withdrawal permittee</li> <li>▪ Water system</li> <li>▪ Stormwater Utility</li> <li>▪ Drinking water production and wastewater treatment</li> <li>▪ Stormwater management</li> <li>▪ Responsible for the overall implementation of the Watershed Management Plan and stream water quality</li> <li>▪ Responsible for maintenance of stormwater systems owned and operated by Clayton County or the six Cities</li> </ul>

Responsible Party	Watershed Protection Responsibility
<b>Local Governments</b>	
<p>Clayton County                      112 Smith St.                      Jonesboro, GA 30236                      (770) 997-3690  <a href="https://www.claytoncountyga.gov/">https://www.claytoncountyga.gov/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Local issuing authority (Transportation &amp; Development), responsible for processing, regulating, and enforcing land disturbance permits, including enforcing local protective ordinances and the Georgia Erosion and Sedimentation Control Act (Official Code of Georgia Annotated [O.C.G.A.] 12-7-8 (a)).</li> <li>▪ Oversees the regulation of land use by the adoption of comprehensive development plans and planning and zoning ordinances.</li> <li>▪ Authority to enforce zoning ordinances.</li> <li>▪ Created the Clayton County Greenspace Land Trust that obtains grant funds to acquire and preserve property.</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>
<p>City of Forest Park                      745 Forest Pkwy.                      Forest Park, GA 30297                      (404) 366-4720  <a href="https://www.forestparkga.gov/">https://www.forestparkga.gov/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Local issuing authority, responsible for processing, regulating, and enforcing land disturbance permits, including enforcing local protective ordinances and the Georgia Erosion and Sedimentation Control Act (Official Code of Georgia Annotated [O.C.G.A.] 12-7-8 (a)).</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>

Appendix A Parties Responsible for Watershed Protection

Responsible Party	Watershed Protection Responsibility
<p>City of Jonesboro                      1859 City Center Way                      Jonesboro, GA 30236                      (770) 478-3800                      Fax: (470) 726-1646  <a href="https://www.jonesboroga.com/">https://www.jonesboroga.com/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Local issuing authority, responsible for processing, regulating, and enforcing land disturbance permits, including enforcing local protective ordinances and the Georgia Erosion and Sedimentation Control Act (Official Code of Georgia Annotated [O.C.G.A.] 12-7-8 (a)).</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>
<p>City of Lake City                      5455 Jonesboro Rd.                      Lake City, GA 30260                      (404) 366-8080  <a href="https://lakecityga.net/">https://lakecityga.net/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>
<p>City of Lovejoy                      2296 Talmadge Rd.                      P.O. Box 220                      Lovejoy, GA 30250                      (770) 471-2304  <a href="https://www.cityoflovejoy.com/">https://www.cityoflovejoy.com/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Local issuing authority, responsible for processing, regulating, and enforcing land disturbance permits, including enforcing local protective ordinances and the Georgia Erosion and Sedimentation Control Act (Official Code of Georgia Annotated [O.C.G.A.] 12-7-8 (a)).</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>
<p>City of Morrow                      1500 Morrow Rd.                      Morrow, GA 30260                      (770) 961-4000  <a href="https://www.morrowga.gov/">https://www.morrowga.gov/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Local issuing authority, responsible for processing, regulating, and enforcing land disturbance permits, including enforcing local protective ordinances and the Georgia Erosion and Sedimentation Control Act (Official Code of Georgia Annotated [O.C.G.A.] 12-7-8 (a)).</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>
<p>City of Riverdale                      7200 Church St.                      Riverdale, GA 32074                      (404) 997-8989  <a href="https://www.riverdalega.gov/">https://www.riverdalega.gov/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 1 MS4 NPDES permittee (responsible for implementing SWMP)</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>



Appendix A Parties Responsible for Watershed Protection

Responsible Party	Watershed Protection Responsibility
<p>Henry County                      140 Henry Pkwy.                      McDonough, GA 30253                      770-288-6000  <a href="https://www.co.henry.ga.us/">https://www.co.henry.ga.us/</a></p>	<ul style="list-style-type: none"> <li>▪ Phase 2 MS4 NPDES permittee (responsible for implementing SWMP, not included in CCWA SWMP)</li> <li>▪ Local issuing authority, responsible for processing, regulating, and enforcing land disturbance permits, including enforcing local protective ordinances and the Georgia Erosion and Sedimentation Control Act (Official Code of Georgia Annotated [O.C.G.A.] 12-7-8 (a)).</li> <li>▪ Responsible for litter control, street sweeping, and maintaining right-of-way (mowing, curb &amp; gutter, sidewalks, driveway aprons).</li> </ul>
<b>State Government</b>	
<p>Georgia Environmental Protection Division  <a href="https://epd.georgia.gov/">https://epd.georgia.gov/</a></p>	<ul style="list-style-type: none"> <li>▪ Local issuing authority for City of Lake City and City of Riverdale</li> <li>▪ Administers the Georgia Adopt-a-Stream Network, of which Clayton County is a member.</li> </ul>

**Appendix B**  
**Policy on Practicability Analysis for**  
**Linear Transportation Projects**

## Clayton County Water Authority

### Appendix B. Policy on Practicability Analysis for Linear Transportation Projects

#### Introduction

The Clayton County Water Authority (CCWA) Policy on Practicability Analysis for Linear Transportation Projects (Linear Transportation Policy) sets reasonable criteria for determining when implementation of post-construction stormwater management standards is infeasible for linear transportation projects being constructed by Clayton County or the six Cities. Linear transportation projects are defined as construction projects on travel corridors including but not limited to roads, sidewalks, multi-use paths and trails, and airport runways and taxiways. The Linear Transportation Policy defines the conditions and documentation to support the determination that the post-construction stormwater management standards may be infeasible to apply for entirety or a portion of a linear transportation project. The Linear Transportation Policy does not address runoff reduction stormwater management standards infeasibility for non-linear projects; refer to the Clayton County Water Authority Policy on Practicability Analysis for Runoff Reduction for additional information.

The Linear Transportation Policy recognizes that linear developments differ from other land development applications and that it may be challenging to implement post-construction stormwater management standards on linear projects because linear developments may include several drainage areas and are often constructed in narrow travel corridors, inhibiting the use of land-intensive stormwater management practices.

The Linear Transportation Policy outlines a tiered screening process to determine the exclusion or infeasibility of stormwater management facilities. The linear development is first evaluated at the project scale to determine if a Project Level Exclusion (PLE), which exempts the entire project from complying with MS4-related post-construction stormwater requirements, is applicable to the linear development. If a PLE does not apply, the development may be investigated further at the outfall or drainage basin level to determine if Outfall Level Exclusions (OLEs) are applicable. OLEs exempt the outfall's drainage area from MS4-related post-construction stormwater requirements through separate application to each of the major post-construction stormwater management requirements: runoff reduction, water quality, channel protection volume, overbank flood protection, and extreme flood protection. If OLEs do not apply, the development may be investigated further at each outfall drainage basin individually to determine if implementation of post-construction stormwater management facilities would be infeasible due to site constraints and other factors. A determination of PLE, OLE, or infeasibility does not remove the requirement for a Downstream Analysis to check for adverse impacts downstream of the project.

The Linear Transportation Policy is based on the following principles:

- Designed to help CCWA implement a process for granting a Determination of Infeasibility that supports efficient review of linear transportation projects.
- Applies to new development and redevelopment linear transportation projects being constructed by Clayton County or the six Cities with post-construction stormwater management facilities.

- It is part of the Metro District's Model Ordinance for Post-Construction Stormwater Management for New Development and Redevelopment and is part of the Post-Construction Stormwater Management Ordinance adopted by Clayton County and six Cities.
- Aligns with requirements for stormwater management standards in the Georgia Environmental Protection Division's permit to discharge from the municipal separate storm sewer system (MS4) permit.
- Focused on the site conditions and regulatory environment in Clayton County.
- Requires ensuring all attempts to meet the stormwater management standards have been exhausted when pursuing any determination of PLE, OLE, or infeasibility.
- Applicants must request a pre-submittal consultation with CCWA or their designee when applying for a determination of PLE, OLE, or infeasibility through this policy.
- For any determination of PLE, OLE, or infeasibility to apply, an infeasibility report that is compliant with the required documentation per this policy and contains adequate documentation to support the evaluation shall first be submitted to CCWA.

## Conditions and Documentation for Project Level Exclusion

PLEs exempt the entire project from post-construction stormwater treatment requirements. The following conditions and documentation may warrant a PLE. PLEs will be documented in Attachment B-1 and include the following required documentation:

**1. Facility is not owned by or operated by Clayton County or the six Cities.**

*Required Documentation:*

- *Identify owner/operator of property.*
- *Provide location map with the beginning/end of project demonstrating that it is not a County or City roadway.*

**2. Project is not within MS4 boundaries.** This PLE should not be applied unless it is applicable for the entire project. If the CCWA municipal separate storm sewer system (MS4) Permit requirements apply to a portion of the project, a PLE is not applicable.

*Required Documentation:*

- *Document in Cover Letter and Introduction narrative in the Stormwater Management Plan (Plan).*
- *Provide location map with the beginning/end of project demonstrating project does not drain to CCWA's MS4 system.*

**3. Maintenance and Safety Improvement project (disturbing less than 1 acre).** This includes repaving, bridge maintenance, maintenance projects that do not add impervious surface area, driveway access paving, shoulder paving and building, fiber optic line installation, sign addition, safety barrier installation, and sound barrier installation. There can be multiple non-connected projects or sites in the same plan set that each disturb less than 1 acre.

*Required Documentation:*

- *Provide a brief narrative indicating the type of project and the proposed disturbed area.*
- *Provide project plan sheets with disturbed area clearly delineated and hatched when applicable.*

**4. Road project disturbing less than 1 acre or facility project adding less than 5,000 square feet impervious area.** PLE could apply to expansions of existing facilities. For multiple non-connected projects or sites in the same plan set that each disturb less than 1 acre, the project could still be eligible for a PLE.

*Required Documentation:*

- *Provide a brief narrative indicating the type of project and the proposed disturbed and impervious areas documented.*
- *Provide project plan sheets with disturbed and impervious areas clearly highlighted.*

## Conditions and Documentation for Outfall Level Exclusion

OLEs exempt the outfall's drainage area from MS4-related post-construction stormwater requirements through separate application to each of the major post-construction stormwater management requirements: runoff reduction, water quality, channel protection volume, overbank flood protection, and extreme flood protection. Project outfalls are defined as the point where concentrated flows from the road drainage system leaves the ROW. Each outfall drainage area should not be confused with each receiving water's drainage area. The following conditions and documentation may warrant an OLE. OLEs will be documented in Attachment B-2 and include the following required documentation:

**1. Installation of a stormwater management facility is the sole reason requiring a change to the existing roadway alignment that would create a safety concern.**

*Required Documentation:*

- Provide a written explanation detailing the OLE and demonstrate how the stormwater management facility necessitated the impact.
- Provide roadway exhibit that clearly shows stormwater management facility causing OLE.

**2. Installation of a stormwater management facility is the sole reason requiring realignment and/or piping of a stream.**

*Required Documentation:*

- Provide a written explanation detailing the OLE and demonstrate how the stormwater management facility necessitated the impact.
- Provide roadway exhibit that clearly shows stormwater management facility causing OLE.

**3. Installation of stormwater management facility is the sole reason requiring impacts to an existing vegetated stream buffer or wetland.**

*Required Documentation:*

- Provide the Natural Resource Inventory showing buffers and wetland areas.
- Provide exhibit showing roadway alignment with topography that clearly shows stormwater management facility and resulting impacts to environmentally sensitive areas.

**4. Stormwater discharges from the project site are designed to exit the ROW as sheet flow (non-point source discharges).** CCWA Administrator approval is required to claim this OLE where stormwater discharges leave the ROW as sheet flow but channelize prior to discharging to a receiving stream or waterbody. If a ditch is visible in the cross-section, it is likely that this outfall level exclusion is not applicable. The designer should assess (and will be responsible for) sheet flow design in relation to causing instability, erosion, and flooding by visiting the site prior to design, and provide a written explanation with supporting evidence for the exclusion.

*Required Documentation:*

- Provide calculations and exhibit showing drainage basin delineation and roadway alignment showing all topographic features demonstrating stormwater leaves ROW as sheet flow.
- Designer must prove that sheet flow will not cause instability, erosion or flooding downstream of the project. (Reference Volume 2 Section 5.4.3 of 2016 GSMM for velocity limitations of channel linings for justification. A separate analysis must be completed to prove no downstream flooding.)

5. **Stormwater flows originate outside the ROW for Clayton County or the six Cities or are diverted flows from undisturbed areas.** This outfall level exclusion is most applicable to projects that only have a portion of the project subject to CCWA's MS4 Permit. For example, if only a portion of a project is located on a ROW for Clayton County or the six Cities, then the drainage areas located outside a ROW for Clayton County or the six Cities could claim this OLE.

*Required Documentation:*

- *Provide exhibit showing drainage basin delineation and roadway alignment clearly indicating that flows originate off project ROW.*

6. **Net impervious surface area within the outfall's drainage area has been reduced or remains the same as pre-developed conditions.** Special consideration may be given to an outfall's drainage area with a minimal increase in impervious area. Each minimal increase in impervious area claim at each outfall basin should be supported by calculations illustrating a negligible increase in post-condition flow rates. "Negligible" increases must be supported by reasons why the designer makes this claim and must also be agreed upon by CCWA. As general guidance, increases over one tenth of an acre in impervious surface per basin are not considered negligible.

*Required Documentation:*

- *Provide pre-and post-development roadway plans showing project footprint with limits of impervious areas delineated and labeled.*
- *If claiming "negligible increase", designer must provide analysis comparing pre-and post-developed percent increases in discharge, velocity, and depth. No numeric standards exist for "negligible;" therefore, engineering judgement must be used to determine if it is applicable based on the analysis. (The CCWA Administrator will issue determination of acceptability based on the submitted analysis.)*



## Conditions and Documentation for Stormwater Management Standard Infeasibility

Infeasibility criteria make compliance with post-construction requirements for a specific outfall's drainage area infeasible. The following conditions and documentation may warrant outfall post-construction stormwater management standards infeasible. Infeasibilities will be documented in Attachment B-2 and include the following required documentation:

1. **Cost of stormwater management facilities equals or exceeds 10 percent of the project costs for the drainage basin.** stormwater management facility costs should only be compared to the portion of the project within the stormwater management facility's associated drainage basin. The stormwater management facility costs should include additional ROW requirements, stormwater management facility construction, and other related design elements. stormwater management facility construction costs include the stormwater management facility and all associated elements (for instance, the costs to construct a maintenance access drive to the stormwater management facility). Design and permitting costs should not be included in the estimate. The project cost should include: ROW acquisition, roadway construction, utility relocation, and mitigation costs. Do not include maintenance costs. The project cost should be a quantified estimate within the associated drainage basin. Cost per linear foot or percent estimates are not permitted for determining project costs; must be actual cost of project within the associated basin.

*Required Documentation:*

- *Provide a detailed cost comparison of proposed roadway costs to additional stormwater management facility cost within the associated basin. Include ROW cost (include actual cost of acquisition in both or exclude altogether), roadway construction (actual cost for specific project segment), utility relocation, additional ROW requirements (specific to the stormwater management facility), stormwater management facility construction, and all related design elements.*
- *Summarize the detailed cost estimates in a summary table with cost categories and showing the additional cost due to the stormwater management facility as a percent of the roadway cost.*
- *If stormwater management facility cost is slightly above 10% of roadway cost, consider cost saving measures to lower stormwater management facility cost to under 10% (e.g., use of retaining walls in areas with high ROW cost).*

2. **Implementation of the stormwater management facility(s) will cause 90 days or greater of delays to the project.**

*Required Documentation:*

- *Describe how the inclusion of the stormwater management facility would increase the schedule.*
- *Clearly indicate the delay is solely due to the stormwater management facility. Note: this does not apply to design delays, only exceptional impacts or new ROW phases.*

3. **Implementation of the stormwater management facility(s) will cause loss of habitat for endangered or threatened species.** For endangered or threatened bat areas, loss of habitat only applies inside the tree line.

*Required Documentation:*

- *Provide applicable sections of reports showing habitat/resource locations (Protected Species Survey Report, Historical and Archeological Resources Survey Report).*

- *When available, provide Environment Resource Impact Table (ERIT).*
- *Provide a basin exhibit or plan sheets with roadway alignment and habitat/resource delineations demonstrating how any stormwater management facility would impact these areas. Label the areas.*

**4. Implementation of the stormwater management facility(s) will cause significant damage to a cultural or community resource (historical and archaeological sites, cemeteries, parks, wildlife refuges, nature trails, or school facilities).**

*Required Documentation:*

- *Provide applicable sections of reports showing habitat/resource locations (Protected Species Survey Report, Historical and Archeological Resources Survey Report).*
- *When available, provide Environment Resource Impact Table (ERIT).*
- *Provide a basin exhibit or plan sheets with roadway alignment and habitat/resource delineations demonstrating how any stormwater management facility would impact these areas. Label the areas.*

**5. Implementation of the stormwater management facility(s) would result in the displacement of a residence or business.** Resource impacts must be from the stormwater management facility only and not the other project elements.

*Required Documentation:*

- *Provide exhibit showing roadway alignment and home/business locations demonstrating that any stormwater management facility would impact these locations.*
- *Include cross sections and construction limits from the construction of the stormwater management facility.*

**6. Implementation of the stormwater management facility(s) would result in a violation of county, state, or federal law/regulation.**

*Required Documentation:*

- *Provide the specific statute or regulation that would be violated in order to construct a stormwater management facility.*

**7. Site limitations.** This includes shallow bedrock, contaminated soils, high groundwater, potential utility conflicts, or other underground facilities if avoidance or relocation is infeasible (cost of the relocation equals or exceeds the cost of the stormwater management facility).

*Required Documentation:*

- *Only the documentation relevant to the specific site limitation is needed.*
- *Utilize the Web Soil Survey website to give approximate data for bedrock and groundwater depths (Pre-submittal Consultation phase).*
- *Provide applicable sections of geotechnical report to show bedrock and groundwater table data (Stormwater Management Plan phase).*
- *Provide Soil Quality and Contaminant Survey Report to establish quality of soils to determine stormwater management facility feasibility.*

- *Provide aboveground utility location survey data on roadway plans as part of the stormwater management facility infeasibility exhibit.*
- *Use GPR or other subsurface utility surveys to locate underground facilities to determine stormwater management facility feasibility.*
- *Provide the cost to relocate utilities and the estimated cost of the stormwater management facility.*

**8. Soil infiltration capacity is limited, where the soil hydraulic conductivity (K) is less than 0.5 inches per hour ( $3.5 \times 10^{-4}$  centimeters per second).**

*Required Documentation:*

- *Provide calculations and exhibits showing roadway alignment and surveyed features along with alternatives analysis demonstrating that only infiltrating stormwater management facilities would be feasible for this basin.*
- *Utilize the Web Soil Survey website to give approximate data for soil infiltration capacity (Pre-submittal Consultation phase).*
- *Provide applicable section of geotechnical report to show bedrock, soils, and groundwater depth data (Stormwater Management Plan phase).*

**9. Site is too small to infiltrate a significant volume.**

*Required Documentation:*

- *Provide calculations and exhibits showing roadway alignment and surveyed features along with alternatives analysis demonstrating that only infiltrating stormwater management facilities would be feasible for this basin.*
- *Utilize the Web Soil Survey website to give approximate data for soil infiltration capacity (Pre-submittal Consultation phase).*
- *Provide applicable section of geotechnical report to show bedrock, soils, and groundwater depth data (Stormwater Management Plan phase).*

**10. Site does not allow for gravity flow to the appropriate stormwater management facility.**

*Required Documentation:*

- *Provide exhibit showing roadway alignment, survey features and contours demonstrating that topography does not provide adequate fall for flow into or out of the stormwater management facility.*

## **Obtaining a Determination of Infeasibility**

Determination of Infeasibility is not an all or nothing proposition. Design professionals must demonstrate that all avenues for meeting the stormwater management standards have been explored and the proposed linear transportation project is unable to achieve one or more stormwater management standard using the criteria described above. If a Determination of Infeasibility is obtained for the proposed linear transportation project, the design professional must show the project meets the stormwater management standards to the maximum extent feasible.

### ***Qualify for a Determination of Infeasibility?***

Answering “NO” to any of the following questions may indicate that the site qualifies for a determination of PLE, OLE, or infeasibility:

1. Can GSMM stormwater management facilities fully meet the stormwater management standards?
2. Does the site analysis show the conditions are supportive for managing the calculated stormwater management volumes needed for the site?
3. Can better site design practices (see GSMM, Volume 2, Section 2.3) be used to avoid challenging site conditions or constraints?
4. Can stormwater management facilities, such as green roofs and rainwater harvesting techniques, be used in ways that do not require infiltration into subsurface soils, but rather rely on evapotranspiration and reuse?
5. Can the installation of multiple stormwater management facilities in series (or “treatment train”), such as installing runoff reduction stormwater management facilities at higher elevations and channel protection/flood protection stormwater management facilities at lower elevations, manage the calculated stormwater management volumes needed for the site?

### ***Prior to Construction***

1. Prior to submittal of the land development permit application, the design professional identifies conditions that limit the project’s ability to meet the stormwater management standards onsite and requests a pre-submittal consultation with CCWA or their designee. CCWA will assess the need for a meeting with the design professional based on the project and site information provided with the Determination of Infeasibility application. If CCWA schedules a meeting with the applicant for the pre-submittal consultation, the following information is recommended for review during the meeting:
  - Stormwater Management Infeasibility (SMI) Form for Determination of Infeasibility on Linear Transportation Projects and an infeasibility report that is compliant with the required documentation per this policy.
  - Supporting documentation submitted with the Determination of Infeasibility application.
    - Conceptual Stormwater Management Plan that has been developed based on site analysis and natural resources inventory (including impracticability) in accordance with GSMM, Volume 2, Section 2.4.2.5.
    - GSMM Stormwater Quality Site Development Review Tool for the Conceptual Stormwater Management Plan.

- Written justification that the site cannot accommodate stormwater management facilities that rely on evapotranspiration and reuse such as rainwater harvesting or green roofs.
  - Documentation of pre-submittal consultation outcomes.
2. CCWA or their designee will evaluate the information provided by the design professional on a case-by-case basis; coordinate with the design professional to understand site-specific issues; and explore potential design strategies to achieve compliance with the stormwater management standards and specifications of the Post-Construction Stormwater Management Ordinance and GSMM.
  3. Based on pre-submittal consultation meeting and information provided by the design professional, the CCWA will provide one of the following determinations to the design professional:
    - Approval – preliminary Determination of Infeasibility issued; Linear Transportation Project must achieve the applicable stormwater management standard(s) to the maximum extent feasible.
    - Approval with conditions – preliminary Determination of Infeasibility issued with conditions to incorporate CCWA comments to achieve the applicable stormwater management standards.
    - Denial - revise the Conceptual Stormwater Management Plan to fully comply with the applicable stormwater management standards.
  4. Design professional may either:
    - Submit the land development application with the Stormwater Management Plan and preliminary Determination of Infeasibility (as applicable).
    - Appeal the “denial” or “conditions” following the appeals process outlined in the CCWA ordinance (Ord. No. 2006-44, Pt. 1, 3-21-06).

### ***During Construction***

1. During the development process, the owner encounters a site condition that would prevent building stormwater management facilities as specified in the Stormwater Management Plan. First, the design professional must evaluate modifications to the proposed stormwater management facilities or installation of alternative stormwater management facilities that will provide some or all stormwater management standards through an alternative method. Then the design professional will request a meeting with CCWA or their designee and provide the following information for review during the meeting:
  - Stormwater Management Infeasibility (SMI) Form for Determination of Infeasibility on Linear Transportation Projects and an infeasibility report that is compliant with the required documentation per this policy.
  - Supporting documentation submitted with the Determination of Infeasibility application.
    - Stormwater Management Plan that has been developed based on site analysis and natural resources inventory (including impracticability) in accordance with GSMM, Volume 2, Section 2.4.2.5.
    - GSMM Stormwater Quality Site Development Review Tool for the Stormwater Management Plan.
    - Written justification that the site cannot accommodate stormwater management facilities that rely on evapotranspiration and reuse such as rainwater harvesting or green roofs.
  - Documentation of pre-submittal consultation outcomes.

2. CCWA will evaluate Stormwater Management Infeasibility Form for Determination of Infeasibility on a case-by-case basis; coordinate with the design professional to understand site-specific issues; and explore potential design strategies to keep the stormwater management facilities identified in the Stormwater Management Plan.
3. Based on the Stormwater Management Infeasibility Form for Determination of Infeasibility and meeting, CCWA will provide one of the following determinations to the design professional:
  - Approval – Determination of Infeasibility is issued and attached to the land development permit; Linear Transportation Project must achieve the applicable stormwater management standard(s) to the maximum extent feasible.
  - Approval with conditions – preliminary Determination of Infeasibility issued with conditions to incorporate CCWA comments to achieve the applicable stormwater management standards.
4. Design professional may either:
  - Continue construction as outlined in the modified Stormwater Management Plan under the land development permit revision with an approved Determination of Infeasibility.
  - Appeal the “conditions” following the appeals process as outlined in the CCWA ordinance (Ord. No. 2006-44, Pt. 1, 3-21-06).

**Attachment B-1  
Stormwater Management Infeasibility  
(SMI) Form for Determination of  
Infeasibility**

## Clayton County Water Authority

### Appendix B. Policy on Practicability Analysis for Linear Transportation Projects

#### Introduction

The Clayton County Water Authority (CCWA) Policy on Practicability Analysis for Linear Transportation Projects (Linear Transportation Policy) sets reasonable criteria for determining when implementation of post-construction stormwater management standards is infeasible for linear transportation projects being constructed by Clayton County or the six Cities. Linear transportation projects are defined as construction projects on travel corridors including but not limited to roads, sidewalks, multi-use paths and trails, and airport runways and taxiways. The Linear Transportation Policy defines the conditions and documentation to support the determination that the post-construction stormwater management standards may be infeasible to apply for entirety or a portion of a linear transportation project. The Linear Transportation Policy does not address runoff reduction stormwater management standards infeasibility for non-linear projects; refer to the Clayton County Water Authority Policy on Practicability Analysis for Runoff Reduction for additional information.

The Linear Transportation Policy recognizes that linear developments differ from other land development applications and that it may be challenging to implement post-construction stormwater management standards on linear projects because linear developments may include several drainage areas and are often constructed in narrow travel corridors, inhibiting the use of land-intensive stormwater management practices.

The Linear Transportation Policy outlines a tiered screening process to determine the exclusion or infeasibility of stormwater management facilities. The linear development is first evaluated at the project scale to determine if a Project Level Exclusion (PLE), which exempts the entire project from complying with MS4-related post-construction stormwater requirements, is applicable to the linear development. If a PLE does not apply, the development may be investigated further at the outfall or drainage basin level to determine if Outfall Level Exclusions (OLEs) are applicable. OLEs exempt the outfall's drainage area from MS4-related post-construction stormwater requirements through separate application to each of the major post-construction stormwater management requirements: runoff reduction, water quality, channel protection volume, overbank flood protection, and extreme flood protection. If OLEs do not apply, the development may be investigated further at each outfall drainage basin individually to determine if implementation of post-construction stormwater management facilities would be infeasible due to site constraints and other factors. A determination of PLE, OLE, or infeasibility does not remove the requirement for a Downstream Analysis to check for adverse impacts downstream of the project.

The Linear Transportation Policy is based on the following principles:

- Designed to help CCWA implement a process for granting a Determination of Infeasibility that supports efficient review of linear transportation projects.
- Applies to new development and redevelopment linear transportation projects being constructed by Clayton County or the six Cities with post-construction stormwater management facilities.



- It is part of the Metro District's Model Ordinance for Post-Construction Stormwater Management for New Development and Redevelopment and is part of the Post-Construction Stormwater Management Ordinance adopted by Clayton County and six Cities.
- Aligns with requirements for stormwater management standards in the Georgia Environmental Protection Division's permit to discharge from the municipal separate storm sewer system (MS4) permit.
- Focused on the site conditions and regulatory environment in Clayton County.
- Requires ensuring all attempts to meet the stormwater management standards have been exhausted when pursuing any determination of PLE, OLE, or infeasibility.
- Applicants must request a pre-submittal consultation with CCWA or their designee when applying for a determination of PLE, OLE, or infeasibility through this policy.
- For any determination of PLE, OLE, or infeasibility to apply, an infeasibility report that is compliant with the required documentation per this policy and contains adequate documentation to support the evaluation shall first be submitted to CCWA.

## Conditions and Documentation for Project Level Exclusion

PLEs exempt the entire project from post-construction stormwater treatment requirements. The following conditions and documentation may warrant a PLE. PLEs will be documented in Attachment B-1 and include the following required documentation:

**1. Facility is not owned by or operated by Clayton County or the six Cities.**

*Required Documentation:*

- *Identify owner/operator of property.*
- *Provide location map with the beginning/end of project demonstrating that it is not a County or City roadway.*

**2. Project is not within MS4 boundaries.** This PLE should not be applied unless it is applicable for the entire project. If the CCWA municipal separate storm sewer system (MS4) Permit requirements apply to a portion of the project, a PLE is not applicable.

*Required Documentation:*

- *Document in Cover Letter and Introduction narrative in the Stormwater Management Plan (Plan).*
- *Provide location map with the beginning/end of project demonstrating project does not drain to CCWA's MS4 system.*

**3. Maintenance and Safety Improvement project (disturbing less than 1 acre).** This includes repaving, bridge maintenance, maintenance projects that do not add impervious surface area, driveway access paving, shoulder paving and building, fiber optic line installation, sign addition, safety barrier installation, and sound barrier installation. There can be multiple non-connected projects or sites in the same plan set that each disturb less than 1 acre.

*Required Documentation:*

- *Provide a brief narrative indicating the type of project and the proposed disturbed area.*
- *Provide project plan sheets with disturbed area clearly delineated and hatched when applicable.*

**4. Road project disturbing less than 1 acre or facility project adding less than 5,000 square feet impervious area.** PLE could apply to expansions of existing facilities. For multiple non-connected projects or sites in the same plan set that each disturb less than 1 acre, the project could still be eligible for a PLE.

*Required Documentation:*

- *Provide a brief narrative indicating the type of project and the proposed disturbed and impervious areas documented.*
- *Provide project plan sheets with disturbed and impervious areas clearly highlighted.*

## Conditions and Documentation for Outfall Level Exclusion

OLEs exempt the outfall's drainage area from MS4-related post-construction stormwater requirements through separate application to each of the major post-construction stormwater management requirements: runoff reduction, water quality, channel protection volume, overbank flood protection, and extreme flood protection. Project outfalls are defined as the point where concentrated flows from the road drainage system leaves the ROW. Each outfall drainage area should not be confused with each receiving water's drainage area. The following conditions and documentation may warrant an OLE. OLEs will be documented in Attachment B-2 and include the following required documentation:

**1. Installation of a stormwater management facility is the sole reason requiring a change to the existing roadway alignment that would create a safety concern.**

*Required Documentation:*

- Provide a written explanation detailing the OLE and demonstrate how the stormwater management facility necessitated the impact.
- Provide roadway exhibit that clearly shows stormwater management facility causing OLE.

**2. Installation of a stormwater management facility is the sole reason requiring realignment and/or piping of a stream.**

*Required Documentation:*

- Provide a written explanation detailing the OLE and demonstrate how the stormwater management facility necessitated the impact.
- Provide roadway exhibit that clearly shows stormwater management facility causing OLE.

**3. Installation of stormwater management facility is the sole reason requiring impacts to an existing vegetated stream buffer or wetland.**

*Required Documentation:*

- Provide the Natural Resource Inventory showing buffers and wetland areas.
- Provide exhibit showing roadway alignment with topography that clearly shows stormwater management facility and resulting impacts to environmentally sensitive areas.

**4. Stormwater discharges from the project site are designed to exit the ROW as sheet flow (non-point source discharges).** CCWA Administrator approval is required to claim this OLE where stormwater discharges leave the ROW as sheet flow but channelize prior to discharging to a receiving stream or waterbody. If a ditch is visible in the cross-section, it is likely that this outfall level exclusion is not applicable. The designer should assess (and will be responsible for) sheet flow design in relation to causing instability, erosion, and flooding by visiting the site prior to design, and provide a written explanation with supporting evidence for the exclusion.

*Required Documentation:*

- Provide calculations and exhibit showing drainage basin delineation and roadway alignment showing all topographic features demonstrating stormwater leaves ROW as sheet flow.
- Designer must prove that sheet flow will not cause instability, erosion or flooding downstream of the project. (Reference Volume 2 Section 5.4.3 of 2016 GSMM for velocity limitations of channel linings for justification. A separate analysis must be completed to prove no downstream flooding.)

5. **Stormwater flows originate outside the ROW for Clayton County or the six Cities or are diverted flows from undisturbed areas.** This outfall level exclusion is most applicable to projects that only have a portion of the project subject to CCWA's MS4 Permit. For example, if only a portion of a project is located on a ROW for Clayton County or the six Cities, then the drainage areas located outside a ROW for Clayton County or the six Cities could claim this OLE.

*Required Documentation:*

- *Provide exhibit showing drainage basin delineation and roadway alignment clearly indicating that flows originate off project ROW.*

6. **Net impervious surface area within the outfall's drainage area has been reduced or remains the same as pre-developed conditions.** Special consideration may be given to an outfall's drainage area with a minimal increase in impervious area. Each minimal increase in impervious area claim at each outfall basin should be supported by calculations illustrating a negligible increase in post-condition flow rates. "Negligible" increases must be supported by reasons why the designer makes this claim and must also be agreed upon by CCWA. As general guidance, increases over one tenth of an acre in impervious surface per basin are not considered negligible.

*Required Documentation:*

- *Provide pre-and post-development roadway plans showing project footprint with limits of impervious areas delineated and labeled.*
- *If claiming "negligible increase", designer must provide analysis comparing pre-and post-developed percent increases in discharge, velocity, and depth. No numeric standards exist for "negligible;" therefore, engineering judgement must be used to determine if it is applicable based on the analysis. (The CCWA Administrator will issue determination of acceptability based on the submitted analysis.)*

## Conditions and Documentation for Stormwater Management Standard Infeasibility

Infeasibility criteria make compliance with post-construction requirements for a specific outfall's drainage area infeasible. The following conditions and documentation may warrant outfall post-construction stormwater management standards infeasible. Infeasibilities will be documented in Attachment B-2 and include the following required documentation:

1. **Cost of stormwater management facilities equals or exceeds 10 percent of the project costs for the drainage basin.** stormwater management facility costs should only be compared to the portion of the project within the stormwater management facility's associated drainage basin. The stormwater management facility costs should include additional ROW requirements, stormwater management facility construction, and other related design elements. stormwater management facility construction costs include the stormwater management facility and all associated elements (for instance, the costs to construct a maintenance access drive to the stormwater management facility). Design and permitting costs should not be included in the estimate. The project cost should include: ROW acquisition, roadway construction, utility relocation, and mitigation costs. Do not include maintenance costs. The project cost should be a quantified estimate within the associated drainage basin. Cost per linear foot or percent estimates are not permitted for determining project costs; must be actual cost of project within the associated basin.

*Required Documentation:*

- *Provide a detailed cost comparison of proposed roadway costs to additional stormwater management facility cost within the associated basin. Include ROW cost (include actual cost of acquisition in both or exclude altogether), roadway construction (actual cost for specific project segment), utility relocation, additional ROW requirements (specific to the stormwater management facility), stormwater management facility construction, and all related design elements.*
- *Summarize the detailed cost estimates in a summary table with cost categories and showing the additional cost due to the stormwater management facility as a percent of the roadway cost.*
- *If stormwater management facility cost is slightly above 10% of roadway cost, consider cost saving measures to lower stormwater management facility cost to under 10% (e.g., use of retaining walls in areas with high ROW cost).*

2. **Implementation of the stormwater management facility(s) will cause 90 days or greater of delays to the project.**

*Required Documentation:*

- *Describe how the inclusion of the stormwater management facility would increase the schedule.*
- *Clearly indicate the delay is solely due to the stormwater management facility. Note: this does not apply to design delays, only exceptional impacts or new ROW phases.*

3. **Implementation of the stormwater management facility(s) will cause loss of habitat for endangered or threatened species.** For endangered or threatened bat areas, loss of habitat only applies inside the tree line.

*Required Documentation:*

- *Provide applicable sections of reports showing habitat/resource locations (Protected Species Survey Report, Historical and Archeological Resources Survey Report).*

- *When available, provide Environment Resource Impact Table (ERIT).*
- *Provide a basin exhibit or plan sheets with roadway alignment and habitat/resource delineations demonstrating how any stormwater management facility would impact these areas. Label the areas.*

**4. Implementation of the stormwater management facility(s) will cause significant damage to a cultural or community resource (historical and archaeological sites, cemeteries, parks, wildlife refuges, nature trails, or school facilities).**

*Required Documentation:*

- *Provide applicable sections of reports showing habitat/resource locations (Protected Species Survey Report, Historical and Archeological Resources Survey Report).*
- *When available, provide Environment Resource Impact Table (ERIT).*
- *Provide a basin exhibit or plan sheets with roadway alignment and habitat/resource delineations demonstrating how any stormwater management facility would impact these areas. Label the areas.*

**5. Implementation of the stormwater management facility(s) would result in the displacement of a residence or business.** Resource impacts must be from the stormwater management facility only and not the other project elements.

*Required Documentation:*

- *Provide exhibit showing roadway alignment and home/business locations demonstrating that any stormwater management facility would impact these locations.*
- *Include cross sections and construction limits from the construction of the stormwater management facility.*

**6. Implementation of the stormwater management facility(s) would result in a violation of county, state, or federal law/regulation.**

*Required Documentation:*

- *Provide the specific statute or regulation that would be violated in order to construct a stormwater management facility.*

**7. Site limitations.** This includes shallow bedrock, contaminated soils, high groundwater, potential utility conflicts, or other underground facilities if avoidance or relocation is infeasible (cost of the relocation equals or exceeds the cost of the stormwater management facility).

*Required Documentation:*

- *Only the documentation relevant to the specific site limitation is needed.*
- *Utilize the Web Soil Survey website to give approximate data for bedrock and groundwater depths (Pre-submittal Consultation phase).*
- *Provide applicable sections of geotechnical report to show bedrock and groundwater table data (Stormwater Management Plan phase).*
- *Provide Soil Quality and Contaminant Survey Report to establish quality of soils to determine stormwater management facility feasibility.*

- *Provide aboveground utility location survey data on roadway plans as part of the stormwater management facility infeasibility exhibit.*
- *Use GPR or other subsurface utility surveys to locate underground facilities to determine stormwater management facility feasibility.*
- *Provide the cost to relocate utilities and the estimated cost of the stormwater management facility.*

**8. Soil infiltration capacity is limited, where the soil hydraulic conductivity (K) is less than 0.5 inches per hour ( $3.5 \times 10^{-4}$  centimeters per second).**

*Required Documentation:*

- *Provide calculations and exhibits showing roadway alignment and surveyed features along with alternatives analysis demonstrating that only infiltrating stormwater management facilities would be feasible for this basin.*
- *Utilize the Web Soil Survey website to give approximate data for soil infiltration capacity (Pre-submittal Consultation phase).*
- *Provide applicable section of geotechnical report to show bedrock, soils, and groundwater depth data (Stormwater Management Plan phase).*

**9. Site is too small to infiltrate a significant volume.**

*Required Documentation:*

- *Provide calculations and exhibits showing roadway alignment and surveyed features along with alternatives analysis demonstrating that only infiltrating stormwater management facilities would be feasible for this basin.*
- *Utilize the Web Soil Survey website to give approximate data for soil infiltration capacity (Pre-submittal Consultation phase).*
- *Provide applicable section of geotechnical report to show bedrock, soils, and groundwater depth data (Stormwater Management Plan phase).*

**10. Site does not allow for gravity flow to the appropriate stormwater management facility.**

*Required Documentation:*

- *Provide exhibit showing roadway alignment, survey features and contours demonstrating that topography does not provide adequate fall for flow into or out of the stormwater management facility.*

**Appendix C**  
**Policy on Practicability Analysis for**  
**Runoff Reduction**



## Clayton County Water Authority

### Appendix C. Policy on Practicability Analysis for Runoff Reduction

#### Introduction

Runoff reduction practices are stormwater management facilities used to disconnect impervious and disturbed pervious surfaces from the storm drainage system. The purpose is to reduce post-construction stormwater runoff rates, volumes, and pollutant loads. Runoff reduction is more than simple infiltration. The Runoff Reduction Volume (RRV) is the retention volume calculated to infiltrate, evapotranspire, harvest and use, or otherwise remove runoff from a post-developed condition to mimic the natural hydrologic conditions more closely.

Certain conditions, such as soils with very low infiltration rates, high groundwater, or shallow bedrock, may lead CCWA to waive or reduce the runoff reduction requirement for proposed site development on a case-by-case basis. If any of the stormwater runoff volume generated by the first 1.0 inch of rainfall cannot be reduced or retained on the site, due to site characteristics or constraints, the remaining volume shall be increased by a multiplier of 1.2 and shall be intercepted and treated in one or more stormwater management facilities that provide at least an 80 percent reduction in total suspended solids.

The Clayton County Water Authority Policy on Practicability Analysis for Runoff Reduction (practicability policy) was developed to provide guidance about the site conditions and supporting documentation that could justify a "Determination of Infeasibility" for the runoff reduction stormwater management standard. This policy does not address stormwater management standards infeasibility for linear transportation projects; refer to the Clayton County Water Authority Policy on Practicability Analysis for Linear Transportation Projects for additional information.

The practicability policy is based on the following principles:

- Designed to help CCWA implement a process for granting a Determination of Infeasibility that supports review of land development applications.
- Applies to new development and redevelopment projects for public and private post-construction stormwater management facilities. It is referenced in the Post-Construction Stormwater Management Ordinance adopted by Clayton County and six Cities and the CCWA Stormwater Development Guidelines.
- Aligns with requirements for runoff reduction in the Georgia Environmental Protection Division's permit to discharge from the municipal separate storm sewer system (MS4) permit. The MS4 permit states that the stormwater management system shall be designed to retain the first 1.0 inch of rainfall on the site to the maximum extent practicable. Many Georgia Stormwater Management Manual (GSMM) stormwater management facilities include a runoff reduction component.
- Focused on the site conditions and regulatory environment in Clayton County.
- Requires ensuring all attempts to provide 100 percent RRV onsite have been exhausted when pursuing a Determination of Infeasibility.
- Applicants must request a pre-submittal consultation with CCWA or their designee when applying for a Determination of Infeasibility through the practicability policy.

## Conditions that may Warrant a Determination of Infeasibility

The GSMM and the CCWA Stormwater Development Guidelines provide broad guidance about conditions that may lead CCWA to waive or reduce the runoff reduction stormwater management standard. The following conditions may warrant a Determination of Infeasibility.

- **Soil Infiltration Rate:** The soil infiltration rate is less than 0.5 inch per hour as measured over a meaningful portion of the site. Consideration should be given to infiltration rates throughout the soil profile.
- **Water Table:** The water table seasonal high elevation is measured less than 2 feet from the subgrade of a proposed infiltration practice.
- **Shallow Bedrock:** Bedrock that cannot be excavated by mechanical means AND is less than 2 feet from the subgrade of an infiltration practice.
- **Extreme Topography:** Proposed conditions reflect surface grades steeper than 3:1 (H:V) slope for more than 50 percent of the contributing drainage area.
- **Karst Topography:** Any of the existing conditions onsite exhibit karst topography.
- **Hotspots/ Contamination:** Reasonable suspicion that previous land uses have resulted in soil contamination onsite.
- **Historic Resources:** Buildings, structures, or historic sites included in the Georgia Historic Preservation Division's Historic Resources Survey or listed in the National Register of Historic Places or that has been recommended as a historic resource by a Preservation Professional.
- **Site Constraints:** Sites where the density or nature of the proposed redevelopment would create irreconcilable conflicts for compliance between the runoff reduction stormwater management standard and other requirements such as zoning, floodplains, stream buffers, or septic fields.
- **Economic Hardship:** The cost of retaining the first 1.0 inch of rainfall onsite using runoff reduction practices is equal to or greater than three times the cost of providing water quality practices to meet the stormwater management standards. This condition must be present with at least one other condition to warrant a Determination of Infeasibility. Additionally, a Determination of Infeasibility for economic hardship is applicable to a maximum 50 percent of the volume required for meeting the runoff reduction stormwater management standard.

## Obtaining a Determination of Infeasibility

Determination of Infeasibility is not an all or nothing proposition. Design professionals must demonstrate that they have explored all avenues to meet the runoff reduction standard. If meeting the runoff reduction standard is determined to be infeasible, design professionals must attempt to provide the maximum percentage of RR<sub>v</sub> on site as feasible. Only after all attempts to provide any RR<sub>v</sub> on site are exhausted will CCWA consider a Determination of Infeasibility.

### ***Qualify for a Determination of Infeasibility?***

Answering “NO” to any of the following questions may indicate that the site qualifies for a Determination of Infeasibility:

1. Can GSMM runoff reduction stormwater management facilities fully meet the runoff reduction volume?
2. Does the site analysis show the conditions are supportive for managing the calculated runoff reduction volume needed for the site?
3. Can better site design practices (see GSMM, Volume 2, Section 2.3) be used to avoid challenging site conditions or constraints?
4. Can stormwater management facilities, such as green roofs and rainwater harvesting techniques, be used in ways that do not require infiltration into subsurface soils, but rather rely on evapotranspiration and reuse?
5. Can the installation of multiple runoff reduction stormwater management facilities, such as installing runoff reduction stormwater management facilities at higher elevations or in multiple subwatersheds, manage the calculated runoff reduction volume needed for the site?

### ***Prior to Construction***

1. Prior to submittal of the land development permit application, the design professional identifies conditions that limit using runoff reduction methods to retain 100 percent of the first 1.0 inch of rainfall onsite and must request a pre-submittal consultation with CCWA or their designee. CCWA will assess the need for a meeting with the design professional based on the project and site information provided with the Determination of Infeasibility application. If CCWA schedules a meeting with the applicant for the pre-submittal consultation, the following information will be reviewed during the meeting:
  - Runoff Reduction Infeasibility Form.
  - Supporting documentation submitted with the Determination of Infeasibility application.
    - Conceptual Stormwater Management Plan that has been developed based on site analysis and natural resources inventory (including impracticability) in accordance with GSMM, Volume 2, Section 2.4.2.5.
    - GSMM Stormwater Quality Site Development Review Tool for the Conceptual Stormwater Management Plan.
    - Written justification that the site cannot accommodate runoff reduction practices that rely on evapotranspiration and reuse such as rainwater harvesting or green roofs.
  - Documentation of pre-submittal consultation outcomes.
2. CCWA or their designee will evaluate the information provided by the design professional on a case-by-case basis; coordinate with the design professional to understand site-specific issues; and explore potential design strategies to achieve 100 percent RRV in compliance with the standards and specifications of the Post-Construction Stormwater Management Ordinance and GSMM.

3. Based on pre-submittal consultation meeting and information provided by the design professional, CCWA will provide one of the following determinations to the design professional:
  - Approval – preliminary Determination of Infeasibility issued
  - Approval with conditions – preliminary Determination of Infeasibility issued with conditions to incorporate CCWA comments into the Conceptual Stormwater Management Plan
  - Denial - revise the Conceptual Stormwater Management Plan to obtain 100 percent RR<sub>v</sub>
4. Design professional may either:
  - Submit the land development application with the Stormwater Management Plan and preliminary Determination of Infeasibility (as applicable).
  - Appeal the “denial” or “conditions” following the appeals process outlined in the CCWA ordinance (Ord. No. 2006-44, Pt. 1, 3-21-06).

### ***During Construction***

1. During the development process, the owner encounters a site condition that would prevent building stormwater management facilities as specified in the Stormwater Management Plan. The design professional will complete a Runoff Reduction Infeasibility Form and initiate a meeting with CCWA or their designee to discuss the findings. The design professional must evaluate modifications to the proposed stormwater management facilities or installation of alternative stormwater management facilities that will provide some or all RR<sub>v</sub> in an alternative method.
2. CCWA will evaluate the Runoff Reduction Infeasibility Form on a case-by-case basis; coordinate with the design professional to understand site-specific issues; and explore potential design strategies to keep the stormwater management facilities identified in the Stormwater Management Plan.
3. Based on the Runoff Reduction Infeasibility Form and meeting, CCWA will provide one of the following determinations to the design professional:
  - Approval – determination of Infeasibility is issued and attached to the land development permit
  - Approval with conditions – preliminary Determination of Infeasibility issued with conditions to either:
    - Revise the design of runoff reduction methods (e.g. adding soil amendments or an underdrain to maximize runoff reduction volume) to retain the first 1.0 inch of rainfall onsite.
    - Meet the stormwater runoff reduction standard through a combination of runoff reduction and water quality management.
4. Design professional may either:
  - Continue construction as outlined in the modified Stormwater Management Plan under the land development permit revision with an approved Determination of Infeasibility.
  - Appeal the “conditions” following the appeals process as outlined in the CCWA ordinance (Ord. No. 2006-44, Pt. 1, 3-21-06).

**Attachment C-1  
Runoff Reduction Infeasibility (RRI)  
Form for Determination of Infeasibility**

Date (submitted): \_\_\_\_\_

## Clayton County Water Authority

### Runoff Reduction Infeasibility (RRI) Form for Determination of Infeasibility

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#### DESIGN PROFESSIONAL CONTACT INFORMATION

Name: \_\_\_\_\_

Email: \_\_\_\_\_

Phone: \_\_\_\_\_

#### DESCRIPTION OF SITE

Land Development Application Number: \_\_\_\_\_

Site Address: \_\_\_\_\_

#### PROPOSED CONDITIONS OF SITE

Disturbed Area (acres): \_\_\_\_\_

Impervious Area (acres): \_\_\_\_\_

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#### RUNOFF REDUCTION AND WATER QUALITY VOLUME SUMMARY

Maximum Practicable Runoff Reduction Volume\* (cubic feet):

Volume for Water Quality Treatment\* (cubic feet):

*\*If any of the stormwater runoff volume generated by the first 1.0 inches of rainfall cannot be reduced or retained on the site, due to site characteristics or constraints, the remaining volume shall be increased by a multiplier of 1.2 and shall be intercepted and treated in one or more stormwater management facilities that provide at least an 80 percent reduction in total suspended solids.*

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#### GENERAL SUPPORTING DOCUMENTATION

All General Supporting Documentation must be included with this RRI Form for the submittal for a Determination of Infeasibility to be considered complete. Please check each item below to confirm it has been included in the submittal package.

- Conceptual Stormwater Management Plan (*prior to construction*) **OR** Stormwater Management Plan (*during construction*).
- GSMM Stormwater Quality Site Development Review Tool for the Conceptual Stormwater Management Plan (*prior to construction*) **OR** GSMM Stormwater Quality Site Development Review Tool for the Stormwater Management Plan (*during construction*).
- Written justification that the site cannot accommodate runoff reduction practices that rely on evapotranspiration and reuse such as rainwater harvesting or green roofs.

Attachment C-1 Runoff Reduction Infeasibility (RRI) Form for Determination of Infeasibility

**SITE CONDITION APPLICABILITY**

Site condition descriptions are in the Clayton County Water Authority Policy on Practicability Analysis for Runoff Reduction.

Please check each applicable item below and confirm the supporting documentation has been included in the submittal for a Determination of Infeasibility.

Site Condition	Supporting Documentation
<input type="checkbox"/> Soil Infiltration Rate	Infiltration test(s), soil boring log(s), and report of results as interpreted by a professional engineer, professional geologist, or soil scientist licensed in Georgia
<input type="checkbox"/> Water Table	Soil boring log(s) and report with results of the seasonal highwater table assessment as interpreted by a professional engineer, professional geologist, or soil scientist licensed in Georgia
<input type="checkbox"/> Bedrock	Soil boring log(s) and report with results of the shallow bedrock assessment as interpreted by a professional engineer, professional geologist, or soil scientist licensed in Georgia
<input type="checkbox"/> Extreme Topography	Site survey showing 50 percent of the contributing drainage area is steeper than 3:1 (H:V) slopes, as interpreted by a professional engineer or land surveyor licensed in Georgia. Conceptual Stormwater Management Plan ( <i>prior to construction</i> ) <b>OR</b> Stormwater Management Plan ( <i>during construction</i> ), showing the post-development surface grades will reflect the same condition as the site survey
<input type="checkbox"/> Karst Topography	Report developed by a professional engineer, professional geologist, or soil scientist licensed in Georgia
<input type="checkbox"/> Hotspots/ Contamination	Phase I Environmental Assessment Report
<input type="checkbox"/> Historic Resources	Documentation of the Georgia's Natural, Archaeological, and Historic Resources GIS listing  <b>OR</b> Report of assessment from a preservation professional (including archaeologist, architectural historian, historian, historic preservationist, or historic preservation planner)
<input type="checkbox"/> Site Constraints	Site plan identifying all development requirements (e.g., zoning side/front setbacks, build-to-lines, stream buffers, floodplains, septic fields) that are creating irreconcilable conflicts with onsite runoff reduction
<input type="checkbox"/> Economic Hardship*	An estimated construction cost comparison of proposed runoff reduction practices compared to proposed water quality practices must be included to show the cost of runoff reduction practices is equal to or greater than three times the cost of providing water quality practices

\* Note: Economic Hardship must be present with at least one other condition to warrant a Determination of Infeasibility. Additionally, a Determination of Infeasibility for economic hardship is applicable to a maximum 50 percent of the volume required for meeting the runoff reduction stormwater management standard.

Attachment C-1 Runoff Reduction Infeasibility (RRI) Form for  
Determination of Infeasibility

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**GEORGIA PROFESSIONAL ENGINEER CERTIFICATION**

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

---

**FOR CLAYTON COUNTY WATER AUTHORITY USE ONLY**

APPROVED

APPROVED with the following requirements:

DENIED

CCWA Administrator:

\_\_\_\_\_

(Printed Name)

\_\_\_\_\_

(Signature)

\_\_\_\_\_

(Date)



**Appendix D**  
**Detailed Components of a Stormwater**  
**Management Plan**

## Clayton County Water Authority

### Appendix D. Detailed Components for a Stormwater Management Plan

A comprehensive stormwater management plan is required for any applicable land disturbance as described in Section 1 of the Stormwater Development Guidelines. The Plan summarizes the technical information and analysis through a report, annotated copies of applicable checklists (see Appendices F, G, H and I), and associated construction drawings. The stormwater management plan must be prepared by a registered Professional Engineer licensed in the State of Georgia. A registered Professional Engineer licensed in the State of Georgia must seal and sign specific items 2 through 6 listed below. The construction drawings must be stamped by a design professional licensed in the State of Georgia. The landscaping plans must be stamped by a registered Professional Engineer or registered Landscape Architect licensed in the State of Georgia. The stormwater management plan must contain the following items:

1. Natural Resources Inventory
  - Meeting the requirements listed in Appendix E for the Natural Resources Inventory as part of the Pre-design Consultation.
  - Site visit performed under the supervision of a design professional licensed in the State of Georgia to confirm the data collected by desktop analysis.
2. Existing Conditions Hydrologic Analysis
  - A topographic map of existing site conditions (minimum of 2-foot contour interval) with the basin boundaries indicated.
  - Acreage, soil types, and land cover of areas for each sub-basin affected by the project.
  - All perennial and intermittent streams and other surface water features.
  - All existing stormwater conveyances and stormwater management facilities.
  - Direction of flow and exits from the site.
  - Analysis of runoff provided by off-site areas upstream of the project site.
  - Infiltration rates of existing soils.
  - Methodologies, assumptions, site parameters, and supporting design calculations used in analyzing the existing conditions and site hydrology.
3. Post-Development Hydrologic Analysis
  - A topographic map of developed site conditions (minimum 2-foot contour interval recommended) with the post-development basin boundaries indicated.
  - Total area of post-development impervious surfaces and other land cover areas for each sub-basin affected by the project.
  - Unified stormwater sizing criteria runoff calculations for runoff reduction, water quality, channel protection, overbank flood protection, and extreme flood protection for each sub-basin.

- Location and boundaries of proposed natural feature protection and conservation areas.
- Documentation and calculations for any applicable site design credits that are being utilized.
- Methodologies, assumptions, site parameters and supporting design calculations used in analyzing the existing conditions site hydrology.
- If the land development activity on a redevelopment site constitutes more than 50 percent of the site area for the entire site, then the performance criteria specified in the Georgia Stormwater Management Manual must be met for the stormwater runoff from the entire site.

#### 4. Stormwater Management System

- Narrative describing how the selected stormwater management facilities will be appropriate and effective.
- Supporting calculations showing the stormwater management facility is designed according to the applicable design criteria in the Georgia Stormwater Management Manual (GSMM).
- Hydrologic and hydraulic analysis of the stormwater management system for all applicable design storms (including stage-storage or outlet rating curves, and inflow and outflow hydrographs).
- Documentation and supporting calculations to show that the stormwater management system adequately meets the post-development stormwater management performance criteria specified in the GSMM. Including copy of completed GSMM Stormwater Quality Site Development Review Tool.
- Drawing or sketch of the stormwater management system including the location of nonstructural site design features, stormwater conveyance elements, and existing and proposed stormwater management facilities. This drawing should show design water surface elevations, storage volumes available from zero to maximum head, location of inlets and outlets, location of bypass and discharge systems, and all orifice/restrictor sizes.
- Cross-section and profile drawings and design details for each of the elements of the stormwater management system.
- Drawings, design calculations, dimensions, and elevations for all existing and proposed stormwater conveyance system elements including stormwater management facilities, stormwater drains, inlets, drainage ditches, outfall energy dissipation, and areas of overland flow.
- A narrative describing how the stormwater management system corresponds with any watershed protection plans and/or local greenspace protection plan.

For redevelopment sites, the following additional requirements apply for existing stormwater management facilities used to meet the stormwater management standards:

- As-built Drawings for existing stormwater management facilities, where available.
- Hydrology Reports / Stormwater Report / Stormwater Management Plans for existing stormwater management facilities, where available.
- Current inspection report with deficiencies noted.
- Landscaping and Open Space Plan.

For development sites, the following additional requirements apply for off-site stormwater management facilities used to meet the stormwater management standards:

- Must be preapproved by CCWA at the project's Pre-Design Consultation.
- Shown to cause no adverse impacts to upstream or downstream areas or structures.

For development sites, the following additional requirements apply for stormwater management facilities not included in the GSMM used to meet the stormwater management standards:

- Must be pre-approved by CCWA at the project's Pre-Design Consultation.
- Provide supporting documentation that demonstrates performance (effectiveness and pollutant removal rates through documentation of prior studies, literature reviews, or other means), maintenance, application requirements, and limitations.

5. Downstream Analysis

- Supporting assumptions, calculations, and results for a downstream peak flow analysis using the ten-percent rule, in accordance with the GSMM, necessary to show safe passage of post-development design flows downstream.
- The analysis of downstream conditions in the report shall address 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 channel or watercourse immediately downstream of the project. This area shall extend downstream from the project to a point in the drainage basin where the project area is a maximum of 10 percent of the total basin area.
- In calculating runoff volumes and discharge rates, consideration may need to be given to any planned future upstream land use changes.
- In some instances, the results from the downstream analysis may indicate a stormwater management facility has an adverse impact on the watershed. In such cases, CCWA may determine if the detention practice is not warranted.

6. Erosion and Sedimentation Control Plan (Construction Drawings)

- The Design Professional shall consult with the local jurisdiction regarding the information that needs to be included in the plan.
- This plan must contain all the elements specified in the Georgia Erosion and Sediment Control Act and local ordinances and regulations.
- Sequence/phasing of construction and temporary stabilization measures.
- Temporary structures that will be converted into permanent stormwater management facilities.
- The erosion and sedimentation control plan will be reviewed by the local jurisdiction; however, a copy of the plan shall be included in the stormwater management plan.

7. Landscaping and Open Space Plan (Construction Drawings)

- The Design Professional shall consult with the local jurisdiction regarding the information that needs to be included in the plan.
- This plan must contain the arrangement of planted areas, natural areas and other landscaped features on the site plan.
- Provide information necessary to construct the landscaping elements shown on the plan drawings.
- Descriptions and standards for the methods, materials and vegetation that are to be used for the landscaping elements.
- The landscaping and open space plan will be reviewed by the local jurisdiction; however, a copy of the plan shall be included in the stormwater management plan.

8. Inspections and Maintenance Plan

- For private stormwater management facilities, an inspection and maintenance plan shall be incorporated into the stormwater management plan, as detailed in Appendix K.
- The plan shall include a description of maintenance tasks, responsible parties for maintenance, funding, access, and safety issues.
- The plan shall show a minimum 20-foot-wide access easement on the stormwater management plan to ensure access from the public right-of-way to the stormwater management facilities and practices for maintenance and inspection purposes.
- The plan shall include an inspection and maintenance agreement and stormwater management facility maintenance checklist.
- The Design Professional preparing the stormwater management facility maintenance checklist shall review the GSMM maintenance recommendations. CCWA will perform post-construction inspections on the stormwater management facilities based on this plan.
- The agreement shall be binding on all subsequent owners. Any issues that may arise from these inspections will be directed to the owner.

9. Evidence of Acquisition of Applicable Land and Non-Local Permits

10. Waiver Request (if applicable)

11. Floodplain Management / Flood Damage Prevention Plan

i. Site Plan

Refer to County or applicable City floodplain ordinance from the Municode Library.

ii. Building and Foundation Design Detail

Refer to County or applicable City floodplain ordinance from the Municode Library.

iii. Extent of Alteration or Relocation of Watercourses

Description to the extent to which any watercourse will be altered or relocated as a result of the proposed development.

iv. Flood Study

Refer to Appendix 8, Floodplain Management Flood Damage Prevention Plan Checklist.

v. Permits

Copies of all applicable State and Federal permits necessary for proposed development.

vi. Certifications

All applicable certifications such as floor elevation or floodproofing, etc., as outlined in the County's or applicable City's floodplain ordinance.

vii. Engineering Study for Floodplain Encroachment

Refer to County or applicable City's floodplain ordinance from Municode Library.

**Appendix E**  
**Detailed Components of a**  
**Pre-submittal Consultation**

## Clayton County Water Authority

### Appendix E. Detailed Components for a Pre-submittal Consultation

Before a land development permit application is submitted, an applicant may request a pre-submittal consultation with CCWA. The pre-submittal consultation should take place based on an early step in the development process. The purpose of the pre-submittal consultation is to discuss opportunities, constraints, and ideas for the stormwater management system before formal site design engineering. Applicants may request a pre-submittal consultation with the CCWA or their designee when applying for a Determination of Infeasibility through the practicability policy. CCWA or their designee will assess the need for a meeting with the design professional based on the project and site information provided with the Determination of Infeasibility application.

The following list summarizes the site information recommended for the Pre-submittal Consultation:

1. Existing conditions plan (boundary information, topography, site features, etc.)
2. Proposed site plan (proposed site features)
3. Soil characteristics, infiltration rates, etc. (if available)
4. Natural resources inventory

Resources to be identified and mapped (as applicable) for the natural resources inventory:

- Topography and Steep Slopes (i.e., areas with slopes greater than 15%)
- Natural Drainage Divides and Patterns
- Natural Drainage Features (e.g., swales, basins, depressional areas)
- Wetlands
- Water bodies
- Floodplains
- Aquatic buffers
- Soils
- Erodible soils
- Groundwater recharge areas
- Wellhead protection areas
- Trees and other existing vegetation
- High quality habitat areas
- Protected river corridors

5. Conceptual stormwater management plans

- Common address and legal description of site
- Vicinity map
- Existing conditions and proposed site layout mapping and plans (recommended scale of 1" = 50'), which illustrate at a minimum:
  - Existing and proposed topography (minimum of 2-foot contour interval)
  - Perennial and intermittent streams
  - Mapping of predominant soils from USDA surveys
  - Boundaries of existing predominant vegetation and proposed limits of clearing and grading
  - Location and boundaries of 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.).
  - Location of existing proposed roads, building, parking areas and other impervious surfaces.
  - Existing and proposed utilities (i.e., water, sewer, gas, electric) and easements.
  - Preliminary estimates of unified stormwater sizing criteria requirements.
  - Identification and calculation of stormwater site design credits.
  - Preliminary selection and location, size, and limits of disturbance of proposed stormwater management facilities.
  - Location of existing and proposed conveyance systems such as grass channels, swales, and storm drains.
  - Flow paths.
  - Location of floodplain and floodway limits and relationship of site to upstream and downstream properties and drainages.
  - Preliminary location and dimensions of proposed channel modifications, such as bridge and culvert crossing.

6. Identification of preliminary waiver requests and application for Determination of Infeasibility, where applicable.



# **Appendix F**

## **Stormwater Technical Review Checklist**

## Clayton County Water Authority

### Appendix F. Stormwater Technical Review Checklist

#### A. STORMWATER MANAGEMENT PLAN REQUIREMENTS

##### A.1. General Information

1. Yes  No  NA : Project title shown.
2. Yes  No  NA : Developer/Owner name, legal address, email address, and telephone number shown.
3. Yes  No  NA : Surveyor name, address, email address, and telephone number shown.
4. Yes  No  NA : Design professional name, address, email address, and telephone number shown.
5. Yes  No  NA : 24-hour contact information shown.
6. Yes  No  NA : Detailed project site location map with street names, north arrow, common address, and legal description of site shown.
7. Yes  No  NA : Cover page is stamped and signed by a registered engineer/landscape architect.
8. Yes  No  NA : Total acreage, disturbed acreage, and impervious acreage of the site shown.
9. Yes  No  NA : Narrative describing the proposed project, conditions upstream and downstream of the project site, and the purpose of the post-construction stormwater management system.
10. Yes  No  NA : A statement indicating if any portion of the site is located within the base and/or future-conditions floodplains.
11. Yes  No  NA : A statement indicating if any development activity will occur within the floodplain.

## **A.2. Existing Conditions Hydrologic Analysis**

1. Yes  No  NA : Acreage, soil types, land cover, and impervious cover for each subbasin affected by the project shown.
2. Yes  No  NA : Analysis of runoff from offsite areas upstream of the project site shown.
3. Yes  No  NA : Time of concentration calculations shown.
4. Yes  No  NA : Curve number calculations shown.
5. Yes  No  NA : Methodologies, assumptions, site parameters, and supporting design calculations used in analyzing the existing conditions site hydrology provided.

## **A.3. Post-Development Hydrologic Analysis**

1. Yes  No  NA : A topographic map of developed site conditions provided (minimum 2-foot contour interval) showing post-development basin boundaries (on-site and offsite), drainage area for each basin and drainage paths for time of concentration calculations.
2. Yes  No  NA : Total area of post-development impervious surfaces and other land cover areas for each subbasin affected by the project shown.
3. Yes  No  NA : Location and boundaries of proposed natural feature protection and conservation areas shown.
4. Yes  No  NA : Time of concentration calculations shown.
5. Yes  No  NA : Curve number calculations shown.
6. Yes  No  NA : A summary of pre-developed flow, post-developed flow, routed flow to pond and flow bypasses the pond for 1- , 2- , 5- , 10- , 25- , 50- , and 100-year storm for each drainage basin provided.
7. Yes  No  NA : The post-developed flows are less than or equal to the predeveloped flows for all drainage basins.
8. Yes  No  NA : Methodologies, assumptions, site parameters and supporting design calculations used in analyzing the post-development conditions site hydrology provided.

#### **A.4. Stormwater Management System Design**

1. Yes  No  NA : A topographic map (minimum 2-foot contour interval) showing drainage area delineation for each BMP (structural stormwater control measure), including existing and proposed stormwater conveyance systems, longest flow paths, and post-developed land use.
2. Yes  No  NA : Unified stormwater sizing criteria runoff calculations for runoff reduction, water quality, channel protection, overbank flooding protection and extreme flood protection for each subbasin provided.
3. Yes  No  NA : Stage-storage or outlet rating curves shown.
4. Yes  No  NA : Inflow and outflow hydrographs shown.
5. Yes  No  NA : Channel protection orifice designed with a 24-hour drawdown.
6. Yes  No  NA : Design calculations and elevations of all existing and proposed stormwater conveyance elements shown and include storm drains, pipes, culverts, catch basins, channels, swales and areas of overland flow.
7. Yes  No  NA : Design calculations for structural controls' outlet orifices shown.
8. Yes  No  NA : Spillway design calculations shown.
9. Yes  No  NA : Narrative describing how the selected stormwater management facilities will be appropriate and effective.
10. Yes  No  NA : Georgia Stormwater Management Manual Stormwater Quality Site Development Review Tool (current version) is provided and correct.
11. Yes  No  NA : Total TSS removal is 80% or greater.

#### **A.5. Downstream Analysis**

1. Yes  No  NA : A narrative discussing the impact of the development to downstream property.
2. Yes  No  NA : A map showing any known drainage problems and existing stormwater system and drainage path between the point where stormwater leaves the site and the 10% point.
3. Yes  No  NA : Hydrograph for the 1, 2, 5, 10, 25, 50 and 100-year storms at the point where the stormwater leaves the site and the 10% point.

4. Yes  No  NA : Analysis of existing culverts or pipe systems located between the point where stormwater leaves the site to the 10% point showing they would handle the 100-year flow in the post-development condition.

#### **A.6. Stormwater Conveyance System**

1. Yes  No  NA : Stormwater drainage systems that are part of lateral closed systems (pipes and inlets) are designed to accommodate the peak discharge from the 25-year storm.
2. Yes  No  NA : Culverts are designed to accommodate the peak discharge from the 100-year storm.
3. Yes  No  NA : Sumped inlets are designed to accommodate the peak discharge from the 50-year storm.
4. Yes  No  NA : Open channels are designed to accommodate the peak discharge from the 25-year storm.
5. Yes  No  NA : Reinforced concrete pipe is used under public road.
6. Yes  No  NA : Reinforced concrete pipes, reinforced concrete box culverts or HDPE pipes are used to convey flowing streams.
7. Yes  No  NA : Culvert skews shall not exceed 45% as measured from a line perpendicular to the roadway.
8. Yes  No  NA : Maximum slope for concrete pipe culvert is 10%, if slope is greater than 10%, restraining method is used (i.e. anti-seep collar).
9. Yes  No  NA : Maximum slope for corrugated metal pipe culvert is 14%, if slope is greater than 14%, restraining method is used (anti-seep collar).
10. Yes  No  NA : Maximum drop in a drainage structure is 10 feet.
11. Yes  No  NA : Culverts are designed with a maximum of 18" of freeboard measured from the lowest point of the road.
12. Yes  No  NA : Velocity of pipe does not exceed 15 fps.
13. Yes  No  NA : Minimum velocity for 2-year flow is 2.5 fps.
14. Yes  No  NA : Pipes used in the public right-of-way and directly connected to the public right-of-way are approved by CCWA.
15. Yes  No  NA : Pipe size in the County ROW is at least 18 inches in diameter.

16. Yes  No  NA : Side slopes of drainage ditches are 4:1 or flatter.
17. Yes  No  NA : Riprap apron or riprap outlet basin is used for Froude Number less than or equal to 2.5.
18. Yes  No  NA : Baffled outlet is used for Froude Number between 1 and 9.
19. Yes  No  NA : Provide gutter spread calculations summary. Refer to GSMM Section 5.2.1.2 for flow spread limits.

#### **A.7. Inspections and Maintenance Plan**

1. Yes  No  NA : A maintenance agreement and an inspection and maintenance checklist (Appendices K and L) are attached to the stormwater management report.

#### **A.8. Evidence of Acquisition of Applicable Land and Non-Local Permits**

1. Yes  No  NA : For developments adjacent to or encroaching into wetland areas, documentation of contact with the U.S. Army Corps of Engineers regarding appropriate permits is provided.
2. Yes  No  NA : For developments encroaching into stream buffers, a copy of the Stream Buffer Variance (SBV) application with GAEPD is provided.
3. Yes  No  NA : For developments proposing to construct a dam greater than 25 feet in height or impounding more than 100 acre-feet, permit from the Georgia Safe Dams Program is provided.
4. Yes  No  NA : For developments located downstream of a Category 2 dam, documentation of contact with the Georgia Safe Dams Program is provided.
5. Yes  No  NA : Other applicable permits. \_\_\_\_\_

#### **A.9. Waiver Requests**

1. Yes  No  NA : Include a copy of approved waiver requests.

## **B. STORMWATER MANAGEMENT CONSTRUCTION DRAWINGS REQUIREMENTS**

### **B.1. General Information**

1. Yes  No  NA : Plan is sealed and signed by a professional engineer.
2. Yes  No  NA : Vicinity map showing location of proposed site.
3. Yes  No  NA : North arrow shown.
4. Yes  No  NA : Common address and legal description of site are provided.
5. Yes  No  NA : Name, address, email address, and telephone number of owner, developer, surveyor, and engineer shown.
6. Yes  No  NA : 24-hour contact information shown.
7. Yes  No  NA : The type of business that will ultimately occupy the site shown.
8. Yes  No  NA : Drawing scale shown.
9. Yes  No  NA : Drawing to scale shown.
10. Yes  No  NA : Total acreage of site shown.
11. Yes  No  NA : Total impervious acreage of site and of each parcel within the site shown.
12. Yes  No  NA : Building footprints within each parcel shown.
13. Yes  No  NA : Acreage of floodplain/wetlands shown.
14. Yes  No  NA : Acreage to be disturbed in floodplain/wetlands shown.

### **B.2. Natural Resource Inventory**

1. Yes  No  NA : Location and boundaries of natural feature protection and conservation areas such as wetlands, lakes, ponds, and other setbacks (e.g., stream buffers, groundwater recharge area setbacks, wellhead protection area setbacks, high quality habitat area setbacks, protected river corridor setbacks, septic setbacks, etc.).
2. Yes  No  NA : A 50-foot undisturbed buffer with additional 25-foot impervious setback is shown on both sides of stream located outside the areas zoned watershed protection district.

3. Yes  No  NA : A 150-foot protection buffer is provided on lots abutting the J.W. Smith Reservoir property.
4. Yes  No  NA : A 50-foot buffer is provided on both sides of stream located within the small drinking water supply watershed and outside the 7-mile radius. Septic tanks are located outside the 75-foot setback area on both sides of the stream.
5. Yes  No  NA : A 100-foot buffer is provided on both sides of stream located within the 7-mile radius of the drinking water intake. Septic tanks are located outside the 150-foot setback area on both sides of the stream.
6. Yes  No  NA : All perennial streams, intermittent streams, and other water bodies.
7. Yes  No  NA : Location of floodplain and floodway limits and relationship of site to upstream and downstream properties and drainage areas.
8. Yes  No  NA : Mapping of soils from USDA soil surveys, locations of any site-specific borehole investigations, and identifying erodible soils.
9. Yes  No  NA : Boundaries of existing vegetation (trees and other existing vegetation) and proposed limits of clearing and grading.

### **B.3. Existing Conditions Hydrology**

1. Yes  No  NA : A topographic map of existing site conditions provided (minimum 2-foot contour interval) and identifying steep slope areas.
2. Yes  No  NA : Existing conditions drainage divides (onsite and offsite), drainage areas, drainage patterns, flow paths for time of concentration, and flow exits from the site.
3. Yes  No  NA : Existing conditions drainage features (e.g., swales, basins, depressional areas).
4. Yes  No  NA : Location of existing conditions roads, buildings, parking lots and other impervious areas.
5. Yes  No  NA : Location of existing conditions utilities (e.g., water, sewer, gas, electric) and associated easements.



**B.4. Post-Development Hydrology**

1. Yes  No  NA : A topographic map of proposed post-development site conditions and existing site conditions shown in grayscale (minimum 2-foot contour interval).
2. Yes  No  NA : Proposed post-development conditions drainage divides (onsite and offsite), drainage areas, drainage patterns, flow paths for time of concentration, and flow exits from the site.
3. Yes  No  NA : Proposed post-development conditions drainage features (e.g., swales, basins, depressional areas).
4. Yes  No  NA : Location of proposed post-development conditions roads, buildings, parking lots and other impervious areas.
5. Yes  No  NA : Location of proposed post-development conditions utilities (e.g., water, sewer, gas, electric) and associated easements.

**B.5. Stormwater Management System**

1. Yes  No  NA : Estimates of unified stormwater sizing criteria requirements.
2. Yes  No  NA : Identification and calculation of stormwater site design credits.
3. Yes  No  NA : Existing and proposed stormwater management system shown.
4. Yes  No  NA : Location of existing and proposed stormwater management facilities shown.
5. Yes  No  NA : A Stormwater Management Facility chart is provided and include the following information:

BMP ID	Type	Dimensions			
		Maximum Height	Maximum Width	Maximum Depth	Maximum Side Slope

\* Enter NA if not applicable.

6. Yes  No  NA : Cross-section of stormwater management facility's embankment shown and include outlet pipe, emergency spillway, embankment slopes, minimum top width of embankment, outlet control structures, headwalls, and riprap.

7. Yes  No  NA : A minimum of 1 foot of freeboard above maximum water surface elevation is provided.
8. Yes  No  NA : Trash racks are provided for orifices less than 3 inches in diameter.
9. Yes  No  NA : Location of non-structural design features shown. Note that site design credits for non-structural stormwater control practices are not provided by CCWA.
10. Yes  No  NA : Design water surface elevations for stormwater management facilities shown.
11. Yes  No  NA : Available storage volumes (from zero to maximum head) for stormwater management facilities shown.
12. Yes  No  NA : Locations of inlets and outlets of stormwater management facilities shown.
13. Yes  No  NA : Locations of bypass and discharge systems shown.
14. Yes  No  NA : All orifice/restrictor sizes shown.
15. Yes  No  NA : Cross-section and profile drawings and design details for each of the stormwater management facilities shown.
16. Yes  No  NA : Side slopes of storage ponds are 3:1 or flatter.
17. Yes  No  NA : All ponds greater than 4 feet in depth are enclosed behind a 5-foot PVC-coated chain link fence.
18. Yes  No  NA : 20-foot access easement is provided to the stormwater management facilities from the public right-of-way.
19. Yes  No  NA : A minimum of 16-foot PVC-coated chain link double gate access to the pond.
20. Yes  No  NA : Detail of emergency spillway shown.
21. Yes  No  NA : Anti-seep collars shown for pond outlet pipe.
22. Yes  No  NA : Stormwater management facilities are located on separate individual platted lots.
23. Yes  No  NA : BMPs that provide infiltration must be included in the phased erosion and sedimentation control plan sheets.

24. Yes  No  NA : Include note: "Heavy construction equipment shall be restricted from the footprint of the infiltration area to prevent the compaction of native soils."
25. Yes  No  NA : Include note: "Upland drainage area shall be completely stabilized with a well-established layer of vegetation prior to commencing excavation for an infiltration practice."
26. Yes  No  NA : Include note: "Side slopes of infiltration practices shall be sodded immediately after installation to prevent the bare areas from erosion."

### B.6. Stormwater Conveyance System

1. Yes  No  NA : Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, drainage ditches, swales, and areas of overland flow.
2. Yes  No  NA : Location and dimensions of proposed channel modifications, such as bridge or culvert crossings.
3. Yes  No  NA : Location of drainage areas for pipe design is provided.
4. Yes  No  NA : The following statement is included on the plan: **"All stormwater structures located in the public right-of-way and directly connected to the public right-of-way must be on the Georgia Department of Transportation Qualified Products List."**
5. Yes  No  NA : All pipes are numbered.
6. Yes  No  NA : A pipe or culvert chart is shown and includes the following information:

Pipe ID	
Time of Concentration	
Drainage Area	
Rainfall Intensity	
Runoff Coefficient	
Design Discharge	
Manning's n	
Velocity	
Pipe Material	
Pipe Diameter	
Pipe Slope	
Pipe Length	

Appendix F. Stormwater Technical Review Checklist

Pipe Gage or Class	
Inlet Invert	
Outlet Invert	
Headwater Depth	
Pipe Coating	
Structure at Entrance of Pipe	i.e., headwall
Structure at Outlet of Pipe	i.e., flared end section, headwall, etc.

\*Enter NA if not applicable.

7. Yes  No  NA : All culverts are numbered and culvert chart is shown and includes the following information:

Culvert ID	
Type	i.e., box, pipe
Number of Barrels	
Culvert Material	
Class/Gage	
Design Discharge	
Drainage Area	
Manning's n	
Width	
Height	
Slope	
Velocity	
Inlet Invert	
Outlet Invert	
Headwater Depth	
Structure at Entrance of Culvert	i.e., headwall
Structure at Outlet of Culvert	i.e., flared end section, headwall, etc.

\* For circular culverts, width = length.

\*\*Enter NA if not applicable.

8. Yes  No  NA : All inlets are shown and inlet chart (for junction boxes, drop inlets with or without weirs and catch basins) includes the following information:

Inlet ID	Diameter of Inlet Pipe	GDOT/CCWA Standard Number	Invert of Inlet Pipe	Diameter of Outlet Pipe	Invert of Outlet Pipe	Precast or Built-in-Place	Material	Dimension		
								Width	Length	Depth

9. Yes  No  NA : All open channels are numbered and an open channel chart is provided and include the following information:

Open Channel ID	Lining	Manning's n	Design Storm	Velocity	Dimension			
					Length	Average Bottom Width	Average Top Width	Slope

10. Yes  No  NA : The following statement shown on the pipe bedding detail:  
**“Drainage pipes and culverts shall be backfilled with materials that meet the Georgia Department of Transportation Specification for Roadway Materials, Section 810, Roadway Materials, Class I or Class II soils. Backfills will be constructed in six to twelve-inch vertical layers and thoroughly compacted. The compacted dry weight per cubic foot for each layer of backfill will be at least ninety-five (95%) percent of the maximum laboratory dry weight per cubic foot.”**
11. Yes  No  NA : Drawings and elevations of all existing and proposed stormwater conveyance elements shown (including storm drains, pipes, culverts, catch basins, swales and areas of overland flow).
12. Yes  No  NA : All drainage easements (for pipes and ditches) shown.
13. Yes  No  NA : Location and dimension of energy dissipation/outlet protection shown.

### B.7. Landscaping Plan

1. Yes  No  NA : A description of woody and herbaceous vegetation that will be used within and adjacent to stormwater management facilities and practices shown.
2. Yes  No  NA : Arrangement of planted areas, natural and greenspace areas and other landscape features shown.
3. Yes  No  NA : Information necessary to construct landscaping elements shown.
4. Yes  No  NA : Descriptions and standards for the methods, materials and vegetation that will be used for construction shown.
5. Yes  No  NA : Density of plantings shown.
6. Yes  No  NA : Description of stabilization and management techniques used to establish vegetation shown.

# **Appendix G**

## **Preliminary Plat Review Checklist**

## Clayton County Water Authority

### Appendix G. Preliminary Plat Review Checklist

1. Yes  No  NA : A statement indicating whether any portion of the site lies within the floodplain and indicate source of floodplain information.
2. Yes  No  NA : Location of future-conditions floodplain boundaries and base flood boundaries shown.
3. Yes  No  NA : Location of water bodies, streams, wetlands, and other pertinent features such as stream buffers, on the site and within 200 feet of the site shown.
4. Yes  No  NA : Locations of stormwater management facilities shown.

# **Appendix H**

## **Final Plat Review Checklist**



## Clayton County Water Authority

### Appendix H. Final Plat Review Checklist

1. Yes  No  NA : All stormwater management system components located on the site and adjacent to the site shown.
2. Yes  No  NA : The location, length, diameter, and type of stormwater management system components shown.
3. Yes  No  NA : Location of permanent access easements to stormwater management facilities and width of access easements shown.
4. Yes  No  NA : Fencing around stormwater management facilities (greater than 4 feet depth) shown.
5. Yes  No  NA : Location and width of drainage and access easements shown.
6. Yes  No  NA : Location of water bodies, streams, wetlands, and other pertinent features, on the site and within 200 feet of the site shown.
7. Yes  No  NA : 50-foot stream buffer and 25-foot impervious setback shown.
8. Yes  No  NA : Location of future-conditions floodplain boundaries and base flood boundaries and elevations shown.
9. Yes  No  NA : Lowest floor elevations for each structure located adjacent to or in the future-conditions floodplain elevations shown. The elevation of the lowest floor, including basement and access to the building, shall be at least 3 feet above the base flood elevation or 1 foot above the future-conditions flood elevation, whichever is higher.
10. Yes  No  NA : The Engineer's Certificate of Construction Conformance for Green Infrastructure Stormwater Management Facility (Appendix M) is completed, stamped, and signed by a Professional Engineer.
11. The Stormwater Management Facility As-Built Certification Form (Appendix N) is completed, stamped, and signed by a Professional Engineer.
12. Yes  No  NA : Proposed deed restrictions provided are used.
13. Yes  No  NA : The following statement shown: **"The developer warrants all sanitary sewer system and water distribution system improvements donated to Clayton County Water Authority for ownership and maintenance, and stormwater management systems within the right-of-way and directly connected to the right-of-way to be free from defects in materials and workmanship for a period of 24 months from the date of acceptance of the improvements by Clayton County Water Authority."**

**Appendix I**  
**Floodplain Management/Flood**  
**Damage Prevention Plan Checklist**

## Clayton County Water Authority

### Appendix I. Floodplain Management Flood Damage Prevention Plan Checklist

#### I.1 General Submittal

1. Yes  No  NA : Engineering study is stamped and signed by a professional engineer.
  2. Yes  No  NA : Copies of all applicable State and Federal permits attached to the study (including the wetland permits and incidental take permits from the U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service).
  3. Yes  No  NA : Site Plan provided.
  4. Yes  No  NA : Building and Foundation details provided.
  5. Yes  No  NA : If floodproofing is permitted, details of floodproofing methods are provided.
  6. Yes  No  NA : If the development involves compensatory storage, the details of excavation activities are provided including the schedule of excavation activities.
  7. Yes  No  NA : Future-conditions floodplains and elevations are shown on the plan.
  8. Yes  No  NA : FEMA floodplain boundary, floodplain zones, and base flood elevations are shown on the plan.
  9. Yes  No  NA : Structures affected by the floodplain are shown on the plan.
  10. Yes  No  NA : Digital files of base and future-conditions floodplains are provided in GIS shapefile format.
  11. Yes  No  NA : Digital files of base and future-conditions floodway are provided in GIS shapefile format.
- a. **Note: Complete this section only when the stream on the development site has a drainage area greater than 100 acres and less than 1 square mile when the future-conditions floodplains are not available.**
1. Yes  No  NA : Methodology is approved by FEMA.
  2. Yes  No  NA : Q100 calculation based on existing and future-conditions hydrology (use County/City zoning map or comprehensive land use plan).

3. Yes  No  NA : Manning's n for left bank, right bank, and channel shown.
4. Yes  No  NA : 100-year elevation based on existing conditions hydrology shown.
5. Yes  No  NA : 100-year elevation based on future-conditions hydrology shown.
6. Yes  No  NA : The boundaries of the existing and future-conditions floodplains provided on the Site Plan.
7. Yes  No  NA : Calculation and location of floodway limits shown (only if the floodway width is not available from the Flood Insurance Study (FIS) or FEMA approved study).

**b. Note: Complete this section only when a development is proposed within the floodplain**

1. Yes  No  NA : A step-back water analysis provided using the original model used to obtain the results in the FIS.
2. Yes  No  NA : Q100 calculation based on existing and future-conditions hydrology (use County/City zoning map or comprehensive land use plan).
3. Yes  No  NA : Manning's n for left bank, right bank, and channel shown.
4. Yes  No  NA : 100-year elevation (base flood) based on existing conditions hydrology shown.
5. Yes  No  NA : 100-year elevation (future-conditions flood) based on future-conditions hydrology shown.
6. Yes  No  NA : Calculations of the pre-developed and post-developed depth and velocity of the waters of the base flood upstream and downstream of the development boundaries shown based on existing conditions hydrology.
7. Yes  No  NA : Calculations of the pre-developed and post-developed depth and velocity of the waters of the future-conditions flood upstream and downstream of the development boundaries shown based on future-conditions hydrology.
8. Yes  No  NA : No change in velocity of the waters of the base flood or future-conditions flood as they pass the upstream and downstream boundaries of the development area.
9. Yes  No  NA : Calculations of the base flood and future-conditions flood storage volumes shown based on cross-sections (at least one cross section is used every 100 feet).

10. Yes  No  NA : No change in the base flood and future-conditions flood storage volumes.

11. Yes  No  NA : Location, extent and nature of encroachment shown on the Site Plan.

**c. Note: Complete this section if the floodplain storage will be reduced.**

1. Yes  No  NA : Description of how the storage capacity will be compensated shown.

2. Yes  No  NA : Method of compensation shown.

3. Yes  No  NA : Slope of cut areas is shown and not less than 1.0 percent.

4. Yes  No  NA : A schedule showing the work to be performed shown. The schedule shall be developed such that the flow velocities upstream and downstream of the boundaries of the development area will not be increased or decreased.

**d. Note: Complete this section if changes are proposed to the base flood floodplain.**

1. Yes  No  NA : A Conditional Letter of Map Revision (CLOMR) from FEMA is provided.

**e. Note: Complete this section only when a development is proposed within the areas designated by FEMA as regulatory floodway.**

1. Yes  No  NA : The Conditional Letter of Map Revision from FEMA and the Engineering No-Rise Certification Form (Appendix J) are provided.

2. Yes  No  NA : Duplicate of the original FIS step-backwater model printout shown

3. Yes  No  NA : Revised existing conditions step-backwater model shown.

4. Yes  No  NA : Proposed conditions step-backwater model shown.

5. Yes  No  NA : FIRM and topographic map, showing floodplain and floodway, the additional cross-sections, the site location with the proposed topographic modification superimposed onto the maps, and a photocopy of the effective FIRM or BBFM showing the current regulatory floodway provided.

6. Yes  No  NA : Documentation clearly stating analysis procedures provided. All modification made to the original FIS model to represent revised existing conditions, as well as those made to the revised existing conditions model to represent proposed conditions, should be well documented and submitted with all supporting data.

7. Yes  No  NA : Copy of effective Floodway Data Table copied from the FIS report shown.
8. Yes  No  NA : Statement defining source of additional cross-section topographic data and supporting information shown.
9. Yes  No  NA : Cross-section plots, of the added cross sections, for revised existing and proposed conditions shown.
10. Yes  No  NA : Certified planimetric (boundary survey) information indicating the location of structures on the property shown.
11. Yes  No  NA : Copy of the microfiche, or other applicable source, from which input for original FIS HEC-2 model was taken, shown.
12. Yes  No  NA : Disk with all input files shown.
13. Yes  No  NA : Printout of output files from EDIT runs for all three floodway models shown.
14. Yes  No  NA : Result of the computer output indicates "NO IMPACT" on the 100-year flood elevations, floodway elevations, or floodway widths.

## I.2 Site Plan Requirements

1. Yes  No  NA : The following statement is shown: **"The developer or landowner certifies that all land development activities will be performed according to the approved floodplain management/flood damage prevention plan. The developer or landowner acknowledges that any and all development permits and/or use and occupancy certificates or permit may be revoked at any time if the construction and development activities are not in strict accordance with approved plans.**

**Signature of Developer/Land Owner: \_\_\_\_\_".**

2. Yes  No  NA : The following statement shown: "No excavation below the elevation of the top of the natural (pre-development) stream channel will be performed by the developer or landowner".
3. Yes  No  NA : Project Title shown.
4. Yes  No  NA : Scale shown.
5. Yes  No  NA : North arrow shown.
6. Yes  No  NA : Developer/Owner name, address, telephone, and fax number shown.

7. Yes  No  NA : Registered professional engineer or surveyor's name, address, telephone, and fax number shown.
8. Yes  No  NA : Detailed Project Site Location Map with street names and north arrow shown.
9. Yes  No  NA : Existing and proposed elevations of the area to be developed in the floodplain shown.
10. Yes  No  NA : Description of the nature of existing or proposed structures, earthen fill placement, amount and location of excavation material and storage materials or equipment provided.
11. Yes  No  NA : Location and dimensions of existing or proposed structures, earthen fill placement, amount and location of excavation material and storage materials or equipment shown.
12. Yes  No  NA : For all proposed structures, spot ground elevations at building corners and 20-foot or smaller intervals along the foundation footprint, or one-foot contour elevations throughout the building site shown.
13. Yes  No  NA : Proposed locations of water supply, sanitary sewer and utilities shown.
14. Yes  No  NA : Proposed locations of drainage and stormwater management facilities shown.
15. Yes  No  NA : Proposed grading plan shown.
16. Yes  No  NA : Base flood elevations and future-conditions flood elevations shown.
17. Yes  No  NA : Boundaries of the floodplain and future-conditions floodplain shown.
18. Yes  No  NA : Location of floodway shown based on the FIS. If floodway information is not available from the FIS, a copy of study delineating the floodway boundaries provided.
19. Yes  No  NA : A statement indicating if any portion of the site is located within the base and/or future-conditions floodplains.
20. Yes  No  NA : A statement indicating if any development activity will occur within the floodplain.
21. Yes  No  NA : A statement indicating if any development activity will occur in the areas designated by FEMA as regulatory floodway.
22. Yes  No  NA : The site plan containing all of the items above sealed, signed and dated by a registered professional engineer or surveyor.

### **I.3 Building and Foundation Design Detail Sheet Requirements**

1. Yes  No  NA : Registered professional engineer or surveyor's name, address, telephone, and fax number shown.
2. Yes  No  NA : Elevation in relation to mean sea level (or highest adjacent grade) of the lowest floor, including basement of all proposed structures shown.
3. Yes  No  NA : Elevation in relation to mean sea level to which any nonresidential structure will be floodproofed shown.
4. Yes  No  NA : For enclosures below the base flood elevation, location and total net area of foundation openings shown and meet the requirements of the Floodplain Management/Flood Damage Prevention Ordinance of the local jurisdiction where the development is located:
  - 4.1 Yes  No  NA : A minimum of 2 openings provided for every square foot of enclosed area.
  - 4.2 Yes  No  NA : Each opening has a total net area of equal to or greater than 1-in<sup>2</sup>.
  - 4.3 Yes  No  NA : The bottom of all openings is no higher than 1 foot above grade.
  - 4.4 Yes  No  NA : No partition is shown in the interior portion of the enclosed area.
  - 4.5 Yes  No  NA : The following statement shown: "The unfinished and flood resistant enclosure is only intended to be used for parking of vehicles, limited storage of maintenance equipment used in connection with the premises or entry to the elevated area."
5. Yes  No  NA : The following statement shown: "Proposed non-residential flood-proofed structure meets the criteria of the County/City Floodplain Management/Flood Damage Prevention Ordinance."
6. Yes  No  NA : No new construction of principal residential building is proposed within the floodplain.
7. Yes  No  NA : Substantial improvement of residential principal buildings, including manufactured homes located in and adjacent to the future-conditions floodplain meet the following requirements:
  - 7.1 Yes  No  NA : Lowest floor is at least 3 feet above the base flood elevation or at least as high as the future-conditions flood elevation.
  - 7.2 Yes  No  NA : Openings provided on solid foundation perimeter walls.



8. Yes  No  NA : No new construction of principal non-residential building is proposed within the floodplain.
9. Yes  No  NA : Substantial improvement of non-residential building has the lowest floor elevated to at least 3 feet above the base flood elevation or at least as high as the future-conditions flood elevation.
10. Yes  No  NA : Substantial improvement of non-residential principal structure (provided that it is not a critical facility, i.e., hospital, fire station, police station, schools, senior homes, child care facilities, etc.) located in A1-30, AE, or AH zones is allowed to be watertight to 1 foot above the base flood elevation, or at least as high as the future-conditions flood elevations with impermeable walls.
11. Yes  No  NA : Non-habitable structures located within the future-conditions floodplain are designed with flood-resistant materials and anchored.
12. Yes  No  NA : For residential buildings located in A-O zones, the lowest floor of all substantial improvements is elevated to the flood depth number (in feet) specified in the FIRM map above the highest adjacent grade. If no flood depth number is specified, the lowest floor is at least 3 feet above the highest adjacent grade.
13. Yes  No  NA : For non-residential buildings located in A-O zones, the building is allowed to be watertight to the specified FIRM flood level plus 1 foot above the highest adjacent grade with substantially impermeable walls.
14. Yes  No  NA : Design plans for all proposed structure(s) is sealed, signed, and dated by a registered professional engineer or architect.
15. Yes  No  NA : For any non-residential building that is proposed to be floodproofed, a statement from a registered professional engineer or architect is provided certifying the design and methods of construction are in accordance with accepted standards of practice and meet the requirements of the Floodplain Management/Flood Damage Prevention Ordinance of the local jurisdiction where the development is located.

**Appendix J**  
**FEMA Procedures for No-Rise**  
**Certification for Proposed**  
**Developments in Regulatory Floodway**

## Clayton County Water Authority

### Appendix J. FEMA Procedures for No-Rise Certification for Proposed Developments in Regulatory Floodway

Section 60.3 (d) (3) of the National Flood Insurance Program (NFIP) regulations states that a community shall *"prohibit encroachments, including fill, new construction, substantial improvements, and other developments within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base (100-year) flood discharge."*

Prior to issuing any building grading or development permits involving activities in a regulatory floodway, the community must obtain a certification stating the proposed development will not impact the pre-project base flood elevations, floodway elevations, or floodway data widths. The certification should be obtained from the permittee and signed and sealed by a professional engineer.

The engineering or "no-rise" certification must be supported by technical data. The supporting technical data should be based upon the standard step-backwater computer model utilized to develop the 100-year floodway shown on the community's effective

Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM) and the results tabulated in the community's Flood Insurance Study (FIS).

Although communities are required to review and approve the "no-rise" submittals, they may request technical assistance and review from the FEMA regional office. However, if this alternative is chosen, the community must review the technical submittal package and verify that all supporting data, listed in the following paragraphs, are included in the package before forwarding to FEMA.

To support a "no-rise" certification for proposed developments encroaching into the regulatory floodway, a community will require that the following procedures be followed:

#### Currently Effective Model

1. Furnish a written request for the step-backwater computer model for the specified stream and community, identifying the limits of the requested data. A fee will be assessed for providing the data. Send data requests to:

Federal Emergency Management Agency  
Region IV HIRA Branch  
3003 Chamblee-Tucker Road  
Atlanta, GA 30341

Or send to:

FIS Information Specialist  
Dewberry & Davis  
8401 Arlington Boulevard  
Fairfax, VA 22031-4666

## Duplicate Effective Model

2. Upon receipt of the step-backwater computer model, the engineer should run the original step-backwater model to duplicate the data in the effective FIS.

## Existing Conditions Model

3. Revise the original step-backwater model to reflect site specific existing conditions by adding new cross-sections (two or more) in the vicinity of the proposed development, without the proposed development in place. Floodway limits should be manually set at the new cross-section locations by measuring from the effective FIRM or FBFM. The cumulative reach lengths of the stream should also remain unchanged. The results of these analyses will indicate the 100-year floodway elevations for revised existing conditions at the proposed project site.

## Proposed Conditions Model

4. Modify the revised existing conditions model to reflect the proposed development at the new cross-sections, while retaining the currently adopted floodway widths. The over-bank roughness coefficients should remain the same unless a reasonable explanation of how the proposed development will impact Manning's "n" values should be included with the supporting data. The results of this floodway run will indicate the 100-year floodway elevations for proposed conditions at the project site. These results must indicate NO impact on the 100-year flood elevations, floodway elevations, or floodway widths shown in the Duplicate Effective Model or in the Existing Conditions Model.

The original FIS model, the duplicate effective FIS model, the revised existing conditions model, and the proposed conditions model should all produce the same exact results.

The "no-rise" supporting data and a copy of the engineering certification must be submitted to and reviewed by the appropriate community official prior to issuing a permit.

The "no-rise" supporting data should include, but may not be limited to:

1. Duplicate of the original FIS step-backwater model printout or floppy disk.
2. Revised existing conditions step-backwater model.
3. Proposed conditions step-backwater model.
4. FIRM and topographic map, showing floodplain and floodway, the additional cross-sections, the site location with the proposed topographic modification superimposed onto the maps, and a photocopy of the effective FIRM or FBFM showing the current regulatory floodway.
5. Documentation clearly stating analysis procedures. All modification made to the original FIS model to represent revised existing conditions, as well as those made to the revised existing conditions model to represent proposed conditions, should be well documented and submitted with all supporting data.
6. Copy of effective Floodway Data Table copied from the FIS report.
7. Statement defining source of additional cross-section topographic data and supporting information.
8. Cross-section plots, of the added cross-sections, for revised existing and proposed conditions.

9. Certified planimetric (boundary survey) information indicating the location of structures on the property.
10. Copy of the microfiche, or other applicable source, from which input for original FIS HEC-RAS model was taken.
11. Floppy disk with all input files.
12. Printout of output files from EDIT runs for all three floodway models.

The engineering "no-rise" certification and supporting technical data must stipulate NO IMPACT on the 100-year flood elevation, floodway elevations, or floodway widths at the new cross-sections and at all existing cross-sections anywhere in the model. Therefore, the revised computer model should be run for a sufficient distance (usually 1 mile, depending on hydraulic slope of the stream) upstream and downstream of the development site to ensure proper "no-rise" certification.

Attached is a sample "no-rise" certification form that can be completed by a registered professional engineer and supplied to the community along with the supporting technical data when applying for a development permit.

## ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the state of Georgia. It is to further certify that the attached technical data supports the fact that proposed \_\_\_\_\_

*(Name of Development)*

will not impact the Base Flood Elevations (100-year flood), floodway elevations and the floodway widths on \_\_\_\_\_

*(Name of Stream)*

at published sections in the Flood Insurance Study for \_\_\_\_\_

*(Name of Community & Community ID Number)*

dated \_\_\_\_\_ and will not impact the Base Flood Elevations (100-year flood), floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Signature \_\_\_\_\_

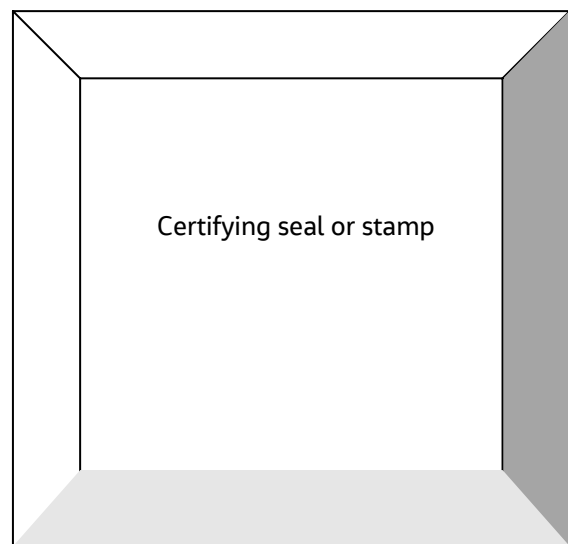
Phone Number \_\_\_\_\_ EMAIL \_\_\_\_\_

Representing \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

\_\_\_\_\_  
*(Date)*



**Appendix K  
Inspections and Maintenance  
Agreement**

# Inspections and Maintenance Agreement

*The Land Owner shall complete and sign the following agreement and record the following agreement in Clayton County Superior Court. Once recorded, return a copy of the recorded agreement to Clayton County Water Authority.*

THIS AGREEMENT, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_, by and between **(INSERT FULL NAME OF OWNER)** hereinafter called the "*Landowner*", and the Clayton County Water Authority, hereinafter called the "CCWA" WITNESSETH, that

WHEREAS, the Landowner is the owner of certain real property described as **(INSERT TAX MAP/PARCEL IDENTIFICATION NUMBER)** as recorded by deed in the land records of Clayton County, Georgia, Deed Book \_\_\_\_\_ Page \_\_\_\_\_, hereinafter called the "*Property*".

WHEREAS, the *Landowner* is proceeding to build on and develop the property; and

WHEREAS, the Site Plan/Subdivision Plan known as **(INSERT NAME OF PLAN/DEVELOPMENT PLAN/SUBDIVISION PLAN)** hereinafter called the "*Plan*", which is expressly made a part hereof, as approved or to be approved by the CCWA, provides for detention of stormwater within the confines of the property; and

WHEREAS, the CCWA and the *Landowner*, its successors and assigns, including any homeowners association, agree that the health, safety, and welfare of the residents of **(INSERT THE NAME OF LOCAL JURISDICTION)**, Georgia, require that on-site stormwater management facilities be constructed and maintained on the *Property*; and

WHEREAS, the **(INSERT THE NAME OF LOCAL JURISDICTION)** requires that on-site stormwater management facilities as shown on the *Plan* be constructed and adequately maintained by the *Landowner*, its successors and assigns, including any homeowners association.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the *Landowner*, its successors and assigns, in accordance with the plans and specifications identified in the *Plan*.
2. The *Landowner*, its successors and assigns, including any homeowners association, shall adequately maintain the stormwater management facilities. This includes all pipes, channels or other conveyances built to convey stormwater to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The Stormwater Management Facility Maintenance Checklist is to be used to establish what good working condition is acceptable to the CCWA.
3. The *Landowner*, its successors and assigns, shall inspect the stormwater management facility based on the Stormwater Management Facility Maintenance Checklist. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structure, pond areas, access roads, etc. The *Landowner*, its successors and assigns, shall maintain records of any deficiencies, maintenance and repairs made on the stormwater management facility.



4. The *Landowner*, its successors and assigns, hereby grant permission to the CCWA, its authorized agents and employees, to enter upon the *Property* and to inspect the stormwater management facilities whenever the *CCWA* deems necessary. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. The *CCWA* shall provide the *Landowner*, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.
5. In the event the *Landowner*, its successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the *CCWA*, the *CCWA* may enter upon the *Property* and take whatever steps necessary to correct deficiencies identified in the Inspection Report and to charge the costs of such repairs to the *Landowner*, its successors and assigns. This provision shall not be construed to allow the *CCWA* to erect any structure of permanent nature on the land of the *Landowner* outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the *CCWA* is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the *CCWA*.
6. The *Landowner*, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the stormwater management facilities (including sediment removal) is outlined on the approved plans, the schedule will be followed.
7. In the event the *CCWA* pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the *Landowner*, its successors and assigns, shall reimburse the *CCWA* upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the *CCWA* hereunder.
8. This Agreement imposes no liability of any kind whatsoever on the *CCWA* and the *Landowner* agrees to hold the *CCWA* harmless from any liability in the event the stormwater management facilities fail to operate properly.
9. This Agreement shall be recorded among the land records of Clayton County, Georgia, and shall constitute a covenant running with the land, and shall be binding on the *Landowner*, its administrators, executors, assigns, heirs and any other successors in interests, including any homeowners association.

WITNESS the following signatures and seals:

\_\_\_\_\_  
 Company/Corporation/Partnership Name (Seal)

By: **(INSERT NAME AND TITLE)**

The foregoing Agreement was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, by \_\_\_\_\_.

\_\_\_\_\_  
 NOTARY PUBLIC

My Commission Expires: \_\_\_\_\_

COUNTY OF \_\_\_\_\_, GEORGIA

## Attachment A Responsible Person

The Landowner hereby identifies the responsible person or position responsible for ensuring that the inspection and maintenance of the Stormwater Management Facilities and Improvements is accomplished according to the inspection and maintenance schedule prepared by the engineer of record for this Property

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(Address or Name of the Property) as

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(Name and Title of person so identified).

Results of the inspections shall be submitted annually to Clayton County Water Authority. Inspection reports shall be submitted to:

Clayton County Water Authority  
1600 Battle Creek Road  
Morrow, Georgia 30260

If the responsible entity or contact person changes Clayton County Water Authority shall be notified in writing of the change not later than thirty (30) days from the effective date of such change.

---

Responsible Entity

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Contact Person's Name

---

Signature

---

Address

---

City, State, Zip Code

---

Phone Number

## Attachment B

Provide a required *Inspection and Maintenance Schedule* labeled as "Attachment B"

*Refer to the Georgia Stormwater Management Manual, Appendix E, Best Management Practice Operations & Maintenance Guidance Document, for minimum recommended inspection and maintenance requirements for the applicable stormwater management structure.*

**ALSO INCLUDE AN 8 ½" X 11" SIZE COPY OF THE SITE PLAN NOTING THE LOCATION OF THE APPLICABLE STORMWATER STRUCTURES INCLUDED IN THE INSPECTION AND MAINTENANCE SCHEDULE.**

**Appendix L**  
**Inspection Form – Pipes and Structures**

## Clayton County Water Authority

### Appendix L. Inspection Form – Pipes and Structures

Date: \_\_\_\_\_ Inspector: \_\_\_\_\_

Project Name: \_\_\_\_\_ Permit Number: \_\_\_\_\_

#### Stormwater Structures (Junction Box, Catch Basin, Inlet)

1. Yes  No  NA : Drainage structures are installed at the proper location per approved plans.
2. Yes  No  NA : Drainage structures are installed at the proper grade and slope.
3. Yes  No  NA : Steps are provided according to CCWA standard.
4. Yes  No  NA : Access covers are provided.
5. Yes  No  NA : For depth exceeding 3 feet, access cover is located over the steps.
6. Yes  No  NA : Drainage structures are constructed of materials shown on the approved plans.
7. Yes  No  NA : Structure inverts are shaped to prevent ponding water and accumulation of debris.
8. Yes  No  NA : Pipes are properly grouted and fitted into each drainage structure.
9. Yes  No  NA : Junction box is used to connect pipes of different materials, sizes, inverts, slope, and directions.
10. Yes  No  NA : Inlets used are on Georgia Department of Transportation (GDOT) Qualified Products List.

**Stormwater Pipes**

1. Yes  No  NA : Proper backfill materials are used (Class I or Class II).
2. Yes  No  NA : Backfills are thoroughly compacted.
3. Yes  No  NA : HDPE pipe bedding agrees with CCWA standard. Bedding for other type of pipe agrees with GDOT standard.
4. Yes  No  NA : Pipe size and materials are consistent with the approved plans.
5. Yes  No  NA : Location and slope of pipe are consistent with the approved plans.
6. Yes  No  NA : Pipe sections are joined correctly (coupling bands are used for corrugated metal pipes, joints, gaskets, etc.).
7. Yes  No  NA : Pipes are in good condition and not damaged.
8. Yes  No  NA : Proper outlet structures (headwalls) are in place.
9. Yes  No  NA : Pipe class agrees with CCWA standard.
10. Yes  No  NA : Pipes used are on GDOT Qualified Products List.

**Appendix M**  
**Engineer's Certificate of Construction**  
**Conformance for Green Infrastructure**  
**Stormwater Management Facility**

## Clayton County Water Authority

### Appendix M. Engineer's Certificate of Construction Conformance for Green Infrastructure Stormwater Management Facility

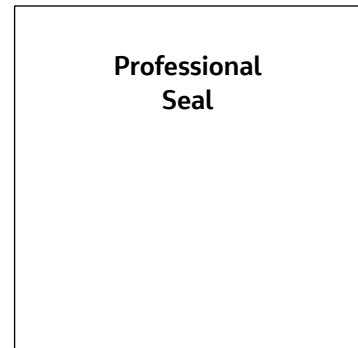
I, \_\_\_\_\_, a registered professional engineer in the State of Georgia, hereby  
certify with my signature and seal, that the Green Infrastructure (Runoff Reduction) stormwater  
management facility located at the following address, \_\_\_\_\_,  
as permitted under Land Development Permit # \_\_\_\_\_,  
have been constructed in conformance with the approved plans and specifications.

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

Developer Name: \_\_\_\_\_

Facility ID #: \_\_\_\_\_

Facility Type \_\_\_\_\_



\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Note: One Engineer's Certificate of Construction Conformance for Green Infrastructure Stormwater  
Management Facility



**Appendix N**  
**Stormwater Management Facility**  
**As-Built Certification Form**

## Clayton County Water Authority

### Appendix N. Stormwater Management Facility As-Built Certification Form

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Project Name: \_\_\_\_\_ Date: \_\_\_\_\_

Project Address: \_\_\_\_\_

Developer Name: \_\_\_\_\_

Land Development Permit #: \_\_\_\_\_ Facility ID#: \_\_\_\_\_

Facility Type: \_\_\_\_\_

Volume Type	Approved Design	Certified As-Built Field Surveyed Volumes
Total Permanent Pool Volume (cubic feet)		
Total Runoff Reduction Volume (cubic feet)		
Total Water Quality Volume (cubic feet)		
Total Channel Protection Volume (cubic feet)		
Total Facility Volume (cubic feet)		

Appendix N. Stormwater Management Facility As-Built Certification Form

Outlet Controls	Approved Design	Certified As-Built Field Surveyed Conditions
Water Quality Orifice Dimensions (inches)		
Invert Elevation (feet)		
Channel Protection Orifice Dimensions (inches)		
Invert Elevation (feet)		
Flood protection Outlet(s) Dimensions (inches)		
Invert Elevation (feet)		
Spillway Dimensions (inches)		
Invert Elevation (feet)		
100-year Peak Stage Freeboard (feet)		

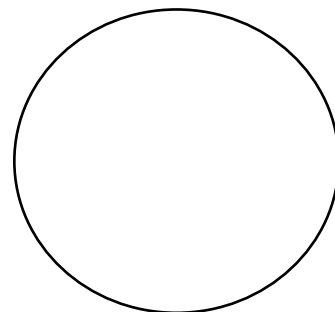
As-Built field survey was conducted on \_\_\_\_\_ (date) by \_\_\_\_\_ (company)

I hereby certify any changes that may have occurred to the Facility, which would affect either the volume or the outlet control structure since the As-Built Stormwater Management Report was approved by CCWA, have been evaluated. We conclude that the Facility's volumes and outflow rates are in accordance with the requirements of Clayton County's stormwater regulations.

**GEORGIA PROFESSIONAL ENGINEER CERTIFICATION**

**Certifying Seal or Stamp:**

Name: \_\_\_\_\_ Date: \_\_\_\_\_



Attached to this form is the as-built field survey including site topography, all stormwater management system components associated with the facility, and details for each stormwater management system component. Also attach the pre-development and post-development flow report and stage-storage for facility. Include the results of stormwater management system component performance tests required in the Stormwater Management Plan. Variances from the approved Stormwater Management Plan are to be clearly noted and documentation provided to demonstrate all required stormwater management performance standards are met.

Note: One Stormwater Management Facility As-Built Certification Form per facility.

**Appendix O**  
**Clayton County Water Authority**  
**Stormwater Standards and**  
**Specifications**

## Clayton County Water Authority

### Appendix O. Clayton County Water Authority Stormwater Standards and Specifications

#### 1. Specifications for HDPE Pipe

##### i. HDPE Pipe Materials

Pipe Sizes      12 inches through 48 inches nominal diameter shall be in conformance with AASHTO M294.

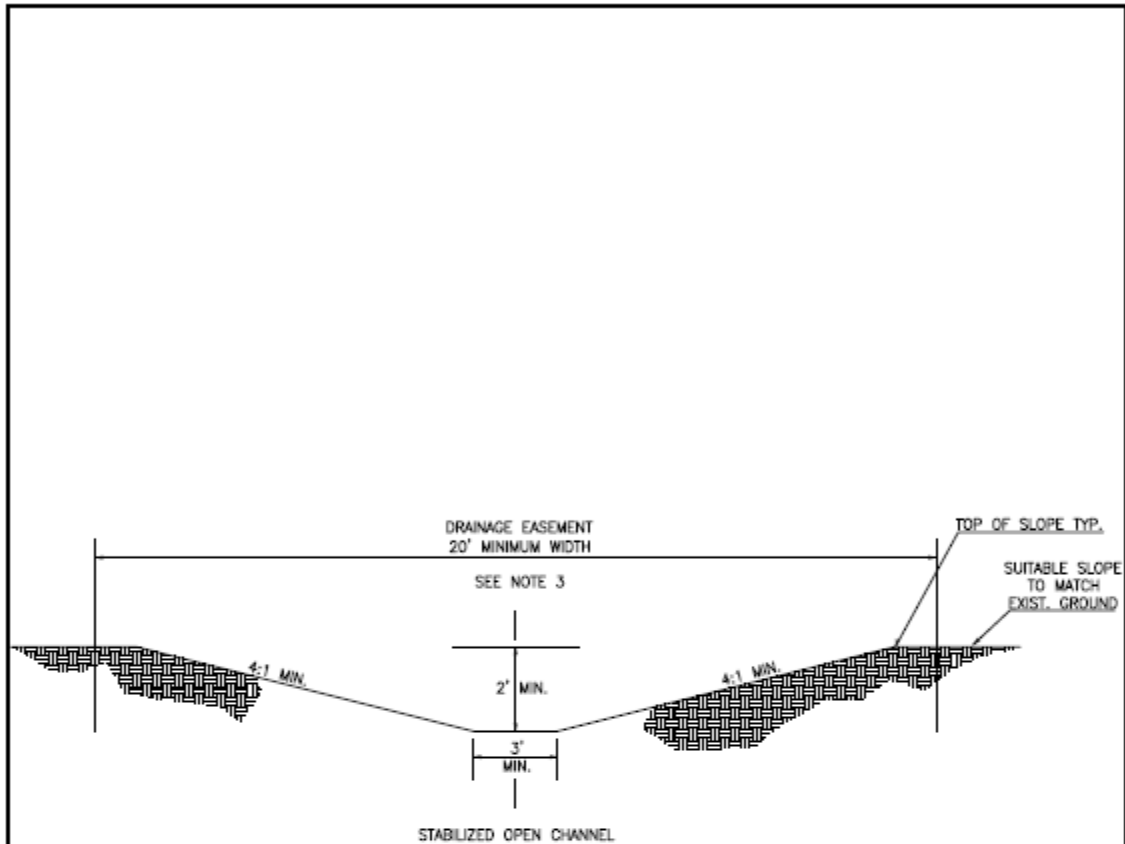
Note: corrugations may be annular configuration only.

Pipe Joints      Pipe joints are to be constructed to meet silt-tight standards as specified in AASHTO PP 63-09.

Resins            Extruded pipe and blow molded fittings – Extruded pipe and blow molded fittings shall be made of virgin PE compounds which conform with the requirements of cell class 335420C as defined and described in ASTM D3350, except that the carbon black content shall not exceed 5 percent. Compounds that have higher cell classifications in one or more properties are acceptable provided product requirements are met.

##### ii. Pipe Installation

- A. Installation shall be in accordance with ASTM D2321 and manufacturer's recommendations. Where applicable, Contractor shall adhere to more stringent requirements within these specifications.
- B. Minimum pipe cover: Provide a minimum of 36 inches of cover over pipe in non-traffic applications and in H-20 applications. Allowable minimum cover is measured from top of pipe to bottom of flexible pavement or top of pipe to top of rigid pavement. Minimum cover in unpaved areas must be maintained.



**NOTES:**

1. REFER TO THE GEORGIA STORMWATER MANAGEMENT MANUAL SECTION 5.4 FOR GUIDANCE ON DETERMINING OPEN CHANNEL DIMENSION AND STABILIZATION METHODS.
2. STABILIZE CHANNEL WITH APPROPRIATE VEGETATIVE COVER TO HANDLE THE MAXIMUM PERMISSIBLE VELOCITY. REFER TO TABLE 6-39.1, MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA, 2016 EDITION.
3. THE ENTIRE WIDTH OF THE OPEN CHANNEL IS TO BE CENTERED WITHIN THE DRAINAGE EASEMENT (TOP OF SLOPE TO TOP OF SLOPE).
4. THIS DETAIL IS NOT APPLICABLE TO NATURAL STORMWATER CONVEYANCES (JURISDICTIONAL STREAMS).
5. REFER TO SECTION 2.2.4., C.3 FOR PERMANENT DRAINAGE EASEMENT REQUIREMENTS.

**CLAYTON COUNTY WATER AUTHORITY**

DATE:	19 APRIL 2023	DETAIL TITLE:	DETAIL No.
SCALE:	N.T.S.	<b>TYPICAL OPEN CHANNEL</b>	100.1
DRAWN BY:	JEG		

