CHARLES COUNTY
MARYLAND
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STORM DRAINAGE ORDINANCE

Department of Planning & Growth Management

August 1, 2010

STORM DRAINAGE ORDINANCE

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1.0 PURPOSE AND SCOPE

A. This purpose of this ordinance is to protect the public health, safety and welfare on all existing properties by establishing minimum requirements and standards for adequate stormwater conveyance and drainage and providing for administration, enforcement, and penalties.

B. *Intent*. This ordinance shall be liberally construed to secure its expressed intent, which is to ensure the health, safety and welfare of the public and to ensure the preservation of the land and water resources of the County.

C. *Liability*. Nothing in this ordinance shall create any liability for loss or damage resulting from the failure of the County to perform any responsibility set forth in this ordinance or obligate the County to make any appropriation or expend any money not appropriated for any purpose set forth in this ordinance.

D. *Existing remedies.* The provisions in this ordinance shall not be construed to abolish or impair existing remedies of the County or its officers or agencies relating to the remediation of any dangerous, unsafe or unsanitary condition.

1.1 Validity

A. *Validity.* If any section, subsection, paragraph, sentence, clause, or phrase of this ordinance shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining portions of this ordinance which shall continue in full force and effect.

B. *Savings Clause*. This ordinance shall not affect violations of any other ordinance, code, or regulation existing prior to the effective date hereof, and any such violation shall be governed and shall continue to be punishable to the full extent of the law under the provisions of those ordinances, codes, or regulations in effect at the time the violation was committed or detected.

1.2 Other Publications Incorporated by Reference

A. The Charles County Drainage Manual

B. The MDSHA Drainage Manual

C. The Plan Preparation Package

D. The County Detail Manual

E. The County Standards and Specifications for Construction Manual

F. The Maryland Department of Transportation Book of Standards

2.0 DEFINITIONS

For the purpose of this ordinance, the following words and phrases shall have the meanings indicated.

Adequate outfall - A point of investigation as determined by calculations or other means approved by the County Engineer, at which stormwater can be released from the site without causing scouring, erosion, flooding, sedimentation or produce an adverse impacts to the receiving point.

Adequate Outfall study - A study prepared to support the existence of an adequate outfall.

Adverse impact - A deleterious effect on land, waters or wetlands, including their quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses which are or may potentially be harmful to human health, welfare, safety or property, to biological productivity, diversity, or stability or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.

Adverse impact study - A study performed by the developer to support a design or a waiver request to show that no downstream adverse impacts will occur due to the proposed development.

Agricultural land management practices - Those methods and procedures utilized in the cultivation of land in order to further crop and livestock production and conservation of related soil and water resources.

Applicant - Any person, firm, or governmental agency who executes the necessary forms to procure official approval of a project or of a permit to carry out construction of a project.

Backwater - Water backed up in its course by an obstruction such as a pipe, bridge or other structure.

Check storm - An alternate frequency storm event used to assess the hydraulic grade line, pavement spread, flood routing, hazard analysis, and critical locations where water can pond to appreciable depths.

Chief - The Chief of the division of Charles County responsible for the storm drainage plan approvals and/or inspections.

Clearing - The removal of trees and brush or anything from the land that does not disturb the soil.

Construction engineer - The engineer in responsible for inspections of a development.

County - the County Commissioners of Charles County, Maryland and their employees.

County Engineer - The engineer employed by the County who is in responsible for and supervises storm drainage engineering.

Department - Means the Department of Planning and Growth Management or any department of the County responsible for storm drainage approvals.

Design Engineer - The engineer responsible for the project design.

Design storm - A storm whose magnitude, rate, and intensity do not exceed the design load for a natural or manmade stormwater conveyance system.

Develop land - To change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.

Developer - A person, partnership, corporation, firm or governmental agency undertaking or proposing the construction of a building, a project consisting of interrelated buildings, or other construction, and who is primarily financially responsible for the proposed work.

Development - See develop land.

Direct runoff - The flow of rainwater, snowmelt, or spring flow over the land surface toward stream channels. Direct runoff may be in the form of overland flow, sheet flow, shallow concentrated flow or concentrated flow.

Director - The Director of the Department of the County responsible for implementation of the storm drainage program.

Discharge - The direct runoff of stormwater.

District - The Charles Soil Conservation District.

Drainage area - That area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line.

Drainage Manual - The Maryland State Highway Administration (MDSHA) Drainage Manual or any Drainage Manual adopted by Charles County to replace the MDSHA Drainage Manual for use in the County.

Easement - A grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.

Engineer - See Professional Engineer

Erosion - The process by which the land surface is worn away by the action of wind, water, ice or gravity.

Excavating - Any act by which soil, earth, sand, gravel, rock or any similar material is cut into, dug, quarried, uncovered, removed, displaced, relocated or bulldozed, and includes the conditions resulting from such actions.

Fee-in-lieu - A fee which may be collected by the County when waivers or variances are granted. The fee is used to offset the cost of planning, design, permitting, construction and inspection of storm drainage systems.

Fill - Any act by which soil, earth, sand, gravel, rock or any similar material is deposited, placed, pushed, pulled or transported and shall include the conditions resulting from such actions.

Final completion acceptance - The final approval from the County when all construction has been completed and inspected and when necessary papers have been submitted and approved.

Final inspections - Inspections performed with County Inspections Engineer and the Developer after the Pre-final Inspections when the project is considered complete.

Finished grade - The final grade or elevation of the ground surface which conforms to the approved grading plan.

Floodplain - That land typically adjacent to a body of water with ground surface elevations that are inundated by the base flood, excepting the land adjoining the banks of ponds, lakes or storm drainage detention and retention facilities when the banks of such water bodies provide containment of the base flood.

Floodplain, one-hundred year - The area inundated by a flood whose probability of occurrence is 1% in any given year.

Floodplain management - A program of identifying areas prone to flooding and providing regulation for the use of those areas by a number of possible alternatives including building codes, land use regulations and/or public acquisition.

Grading - Any act by which soil is cleared, stripped, stockpiled, excavated, scarified, filled or any combination thereof.

Groundwater - Underground water in a zone of saturation or water contained or moving among soils and sands or held within geologic formations under the ground surface.

Illicit discharge - Means any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater runoff except discharges from common residential outdoor uses, firefighting activities or from any legally permitted discharge.

Impervious area - Any surface that does not allow stormwater to infiltrate into the ground.

Land disturbance activity - Any fill, grading, stripping, excavation or removal of or placement of anything on land which may result in soil exposure and/or erosion or the covering of land surfaces.

Land Surveyor - A professional land surveyor duly licensed by the State of Maryland to practice professional land surveying in accordance with the provisions of the Annotated Code of Maryland.

Licensed Professional - An individual licensed in the State of Maryland involved with the consultation; design; evaluation; inspection of construction to ensure compliance with specifications and drawings; investigation; and planning of the storm drainage design or project.

Major stormwater conveyance system - Any manmade open or closed system designed specifically to convey concentrated runoff through a residential development across more than two properties to an acceptable outfall.

MDSHA - The Maryland State Highway Administration.

Natural ground surface - The ground surface excluding man-made surfaces, before grading, stripping, excavating or filling.

NRCS - United States Department of Agriculture, Natural Resources Conservation Service that is represented locally by the Charles Soil Conservation District.

Off-site storm drainage - The design and construction of a facility necessary to control stormwater from more than one development designed under separate permit applications which are owned by the same developer. The facility may or may not be located within the same property boundaries.

On-site storm drainage - The design and construction of systems necessary to control stormwater within an immediate development subject to a permit application.

Outfall - The discharge of water from development.

Owner - A person or entity with legal right of possession or lawful title to a parcel of real property.

Person - Any person, corporation, partnership, joint venture, agency, unincorporated association or any combination thereof. Includes the Federal Government, the State, the County, Municipal Corporation, or other political subdivision of the State, or any of their units, or an individual, receiver, trustee, guardian, executor, administrator, fiduciary, or representative of any kind, or partnership, firm, association, public or private corporation, or any of their affiliates, or any other entity.

Plan of compliance action - A plan submitted to the County by a person who causes or permits a violation of the water quality standards, water quality control or water quality goals of the County. The plan shall establish remedial actions to be taken as established by the County. Each action must be completed to abate or mitigate the impacts of the violation.

Plan Preparation Package - The document which outlines the policies and procedures for submitting information to the Department relative to permitting a development.

Point of investigation - The point where concentrated discharge leaves a defined site or drainage area boundary.

Point source - Discernable confined or discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which any pollutant is or may be discharged.

Pollutant - Any liquid, gaseous, solid, radioactive, hazardous or other substance which, when discharged directly or indirectly into the waters of the state as a point source or nonpoint source, or when applied to or stored on natural or man-made land surfaces, subsurfaces, or other surfaces connected to these surfaces in a manner other than authorized by applicable permits, regulations, or manufacturer's instructions, has a potential to or does:

1. Interfere with State or County designated water uses;

2. Obstruct or cause damage in any manner to surface or subsurface waters in the State or in the County;

3. Change water color, odor, or usability as a drinking water source through causes not attributable to natural stream processes affecting surface water or subsurface processes affecting Groundwater;

4. Add an unnatural surface film on the water;

5. Adversely change other chemical, biological, thermal, or physical conditions in any surface water or stream channel;

6. Degrade the quality of Groundwater; or

7. Harm human life, aquatic life, or terrestrial plant and wildlife.

Pollutant includes but is not limited to significant materials, dredged soil, solid waste, incinerator residue, sewage, garbage, wastewater, wastewater sludge, chemical waste, biological materials, radioactive material, rock, sand, dust, industrial waste, medical waste, sediment, nutrient, toxic substance, pesticide, herbicide, trace metal, automotive fluid, petroleum based substance and oxygen-demanding material.

Pollute - To discharge pollutants into any waters of the State, watercourse or drainageway.

Pollution - The direct or indirect distribution of pollutants into any waters of the state.

Prefinal inspections - Inspections performed with County and the Developer when the project is substantially complete.

Private drainage easement - An easement which is privately maintained under which the County has the right, but not the obligation, to inspect and maintain any storm drainage system located within the easement if the owner fails to maintain the storm drainage systems.

Private maintenance - Refers to maintenance of storm drainage facilities by private property owners and not by the County.

Professional Engineer - An individual duly licensed as an engineer by the State of Maryland to practice professional engineering under the requirements of Title 14, Business Occupations and Professions, Annotated Code of Maryland

Public drainage easement - An easement dedicated to and accepted by the County which allows the County to maintain any storm drainage system located within the easement.

Public Facilities - The Department in the County responsible for the maintenance and repair of public properties and public drainage easements.

Public maintenance - Refers to County maintenance of storm drainage facilities or stormwater conveyance systems.

Qualified individual - A person working under the responsible charge and direct supervision of a licensed professional.

Receiving bodies of water - Any waterbodies, watercourses or wetlands into which surface waters flow either naturally, in manmade ditches, or in a closed conduit systems.

Report - A report prepared to address the storm drainage design, construction, or inspection requirements.

Right-to-Discharge - The permission gained to discharge water onto adjacent off-site properties.

Sediment - Soils or other materials transported or deposited by the action of wind, water, ice, or gravity as a product of erosion.

Sedimentation - The action or process of forming or depositing Sediment in a manner which adversely impacts, or has the potential to adversely impact the physical and biological diversity of wetlands and waters of the state.

Significant materials - materials that include, but is not limited to: raw materials; petroleum derivative products; any controlled hazardous substances as described in COMAR 26.13; industrial waste (COMAR 26.08.01.01); infectious waste (COMAR 26.04.07.02); materials such as solvents or detergents; finished materials such as metallic products; raw material used in food processing or production; fertilizers; pesticides; waste products such as ashes, slag and sludge or any other material that could result in pollution of waters of the state as a constituent in stormwater discharge.

Site - Any combination or single tract, lot, or parcel of land in one ownership, or is contiguous and in diverse ownership, where development is to be performed as part of a unit, subdivision, or project.

Site drainage plan - The drainage plan submitted with the permit application showing the stormwater conveyance layout in plan view.

Slope - The inclined surface of placed fill, excavation or natural terrain.

Soil - Any earth, sand, gravel, rock or any other similar material.

Soil Conservation and Water Quality Plan - Means a land use plan for a farm approved by the District in accordance with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service Standards and Specifications to make the best possible use of soil and water resources in carrying out agriculture while minimizing the movement of sediment, animal wastes, nutrients, or agricultural chemicals into waters of the state.

Spread - The width of water on a pavement surface for a design storm. The width is measured from the face of the curb to the outermost limits of the water.

Stabilization - The prevention of soil movement by any of various vegetative and/or structural means.

Standard details - The State of Maryland Book of Standards for Highway and Incidental Structures and/or any detail or Detail Manual adopted to replace the book of Standards for Highway and Incidental Structures for use in Charles County.

State designated water uses - Uses specified in State Water Quality Standards.

Storm - An atmospheric disturbance accompanied by rain, snow, or other precipitation and sometimes accompanied by thunder, lightning and winds. For design purposes a storm is defined by its, rainfall, intensity, duration and frequency.

Stormwater - Water that originates from a precipitation event.

Storm drainage construction costs - Expenses incurred in constructing storm drainage systems.

Storm drainage plan - A set of drawings or other documents submitted by a person as a prerequisite to obtaining a storm drainage approval, which contain all of the information and specifications required by the County.

Storm drainage system - A system of natural or manmade streams, pipes, drainage structures (inlets, manholes, junction boxes, etc.) ditches, lows or any storm drainage measures through which stormwater flows, infiltrates, or discharges from a site.

Stream channel - Any part of a water course either naturally or artificially created which contains an intermittent or perennial base flow of groundwater origin.

Stripping - Any activity which removes the vegetative surface cover including tree removal, clearing, grubbing and storage or removal of topsoil.

Surface waters - All waters of the state other than groundwaters, which include public or private ponds, lakes, rivers, streams, tidal and nontidal wetlands, public ditches, private ditches, and public or private drainage systems except those used to collect, convey, or dispose of sanitary sewage.

Toxic substance - Any liquid, gaseous, or solid substance in a concentration which, when applied to, discharged to, or deposited in waters of the state, may, in the judgment of the Department, exert a detrimental effect on humans or on the propagation, cultivation, or conservation of terrestrial or aquatic life.

Variance - The relinquishment of the minimum storm drainage requirements for specific circumstances not self-created, where strict adherence to the requirements would result in unnecessary hardship and would not fulfill the intent of the ordinance.

Waiver - The modification from storm drainage requirements by the Department for a specific development on a case by case review basis.

Watercourse or drainageway - Any natural or artificial stream, river, creek, ditch, channel, canal, conduit, culvert, drain, waterway, gully, ravine or wash, in which water flows in a definite direction or course, either continuously or intermittently; and including any area adjacent thereto which is subject to inundation by a reason of overflow or floodwater.

Waters of the state - Both surface waters and groundwaters within the boundaries of the State of Maryland and subject to its jurisdiction and for the purpose of this ordinance within the boundaries of Charles County.

Watershed - The total drainage area contributing runoff to a single point.

Wetlands - Any land that is:

1. Considered private wetland or State wetland pursuant to Title 5, Nontidal Wetlands and to Title 16, Wetland and Riparian Rights, Environmental Article, Annotated Code of Maryland; or

2. Defined as wetland under the procedures described in the federally accepted "Federal Manual for Identifying and Delineating Jurisdictional Wetlands."

3.0 APPLICABILITY: WHEN A STORM DRAINAGE PLAN IS REQUIRED

Unless the particular activity is exempted by this regulation, a person may not construct a stormwater conveyance system consisting of pipes, inlets, gutters, ditches, swales, manholes, junction boxes, or perform any grading which would change the runoff characteristics from a property without first obtaining a permit from the Department. Prior to issuance of any permit, the County Engineer shall review and approve all information related to storm drainage as may required of a developer under the terms of this ordinance. The County Engineer may at any phase of the process request any additional information needed to support the design which may include but not be limited to, plans, calculations, notes, studies details, tables, reports, professional certifications, etc. The Director shall have final authority of all engineering/technical interpretations of the storm drainage requirements set forth herein.

3.1 Storm Drainage Plan Applicability

A permit may not be issued to construct any stormwater conveyance system or change the runoff characteristics from a property unless a storm drainage plan has been approved that is consistent with:

A. This ordinance,

B. Policies, procedures or any other requirement established by the Department,

C. Permit requirements, and

D. Building permit requirements.

4.0 EXEMPTIONS

The following categories of development are exempted from the requirements of providing a storm drainage plan.

A. Agricultural land management practices.

B. Land disturbance activities which the Department determines will be regulated under specific State and or Federal laws that provide for the adequate drainage within and from a site.

5.0 WAIVERS

The County Engineer may approve a storm drainage waiver (full or partial) on a case-by-case basis. Requests for storm drainage waivers must be submitted prior to the submission of a permit application. All waiver requests shall include all necessary supporting documentation. The County Engineer is not obligated in any way to approve any waiver if it is determined that the approval of any waiver may result in adverse impacts to any adjacent property. Appeals to the County Engineer's decision shall be submitted to the Chief. Decisions made by the Chief may be appealed to the Director and shall be the final step in any appeal for a waiver.

6.0 ADMINISTRATIVE VARIANCES

The Director may grant a written variance from any requirement of this ordinance and/or any decision by the County Engineer if there are exceptional circumstances applicable to the site such that strict

adherence to the provisions of this ordinance will result in unnecessary hardship and not fulfill the intent of the ordinance. A written request for a variance will set forth each variance sought and the corresponding justification. .

7.0 GENERAL DESIGN CRITERIA

A. Stormwater conveyance systems shall be designed utilizing the procedures and methods established in the latest edition of the:

1. Drainage Manual:

2. Urban Hydrology for Small Watersheds, TR-55 (Technical Release 55);

3. Computer Program for Project Formulation, TR-20 (Technical Release 20);

4. The County Standards and Specifications for Construction Manual,

5. County Standard Detail Manual; and

6. Other design criteria, specifications, and standard details adopted and approved by the Department.

8.0 BASIC DESIGN CRITERIA AND CONSTRUCTION SPECIFICATIONS

Basic design criteria and construction specifications for stormwater conveyance shall conform to the criteria set forth in this subsection.

8.1 Conveyance

A. Objectives for Conveyance of Runoff

Effective conveyance of stormwater runoff shall accomplish the following:

1. Protect life, property and structures from harm by safely conveying surface or subsurface runoff water from its origin to destination for any and all storm events up to the 100-year storm event.

2. Minimize the maintenance burden on property owners, the County or Homeowner's Associations by designing and constructing, inspecting and maintaining adequate stormwater conveyance systems and establishing easements, right-to-discharge points, open spaces or other specific designated area for the conveyance of all stormwater runoff.

B. General Conveyance Requirements

1. A designed conveyance system shall be required for all man-made surface water runoff in a development where the concentrated runoff is conveyed through and off the site as determined by the County Engineer. Incidental lot drainage conveying runoff from an individual lot is not included in this requirement if so determined by the County Engineer.

2. Any person who is required to submit a storm drainage plan shall provide adequately sized

conveyance systems to convey all runoff created on-site and all runoff originating off-site that is conveyed through the site.

3. All conveyance systems shall discharge to an existing manmade or natural conveyance system that has adequate capacity to accommodate the peak rate and velocity of stormwater flow for the maximum design storm of the drainage area, or discharge to a stormwater facility that contains adequate capacity to accommodate the peak rate and volume of stormwater flow for the maximum design storm of the drainage area without causing any adverse impact to the receiving system, facility or downstream property. If the existing conveyance system cannot meet this requirement then the downstream system shall be improved to a point agreed upon by the County Engineer.

4. All conveyance systems shall be designed and located in a way that ensures that no structures will be flooded by a 100-year storm event and that all runoff designed to drain to a specific destination shall reach that destination, even in the event that the runoff rate exceeds the capacity of the conveyance system or the conveyance system fails.

5. All conveyance systems shall be designed so as not to impede drainage or increase the water surface elevation upstream of the parcel being developed.

6. All conveyance systems shall be designed to function and discharge in a non-erosive manner.

C. Specific Conveyance Requirements

1. Design Storm - Stormwater Conveyance Systems

   a. Public cross culverts specified to convey runoff under public roads shall be designed based on public road classifications as follows:

	Classification	Design Storm
1)	Local Roads	10-year storm
2)	Collector Roads	25-year storm
3)	Arterial Roads	50-year storm

   All cross culverts for public roads shall be designed to accommodate the 100-year storm and, unless approved by the County Engineer, shall contain the 100-year storm within the right-of way or public drainage easement and be no higher than the edge of the pavement.

   b. Public storm drain systems specified to convey runoff along or under public roads shall be designed such that the full flow capacity is equal to or greater than the discharge for the for the 10-year storm. The hydraulic gradeline in the public storm drain system shall be below the surcharge elevation of the system for the applicable check storms based on the road classifications as follows:

	Classification	Design Storm	Check Storm
1)	Local Roads	10-year storm	10-year storm
2)	Collector Roads	10-year storm	25-year storm
3)	Arterial Roads	10-year storm	50-year storm

All storm drain systems shall be designed to accommodate the 100-year storm and, unless approved by the County Engineer, shall contain the 100-year storm below the curb.

c. Entrance Driveway Culverts (located within the County right-of-way) used in open section roads shall be designed as follows:

   1) All roads 10-year storm (HW/D=1)

d. Interior Driveway Culverts (located outside of the County right-of-way) shall be designed as follows:

   1) All 10-year storm

   Limit the 100-year surcharge over the driveway to 6-inches or less.

e. Private Commercial, Industrial, Institutional, etc.

   1) Recommended 10-year storm
   2) Require sufficient size as to not flood parking or structures as determined by the County Engineer

f. Open Channels

   1) All 10-year storm (capacity and velocity)

2. Ditches and Open Section Roads

   a. Unless approved by the County Engineer, drainage ditches for public roads and residential construction shall not be designed on slopes less than 1.5% (one and one-half percent).

   b. Where necessary, grass lined brow ditches may be allowed in fill sections of roads if the vertical distance from the flow line of the ditch to the natural ground surface does not exceed 4-feet. If the vertical distance of 4-feet is exceeded, the County Engineer may consider the use of brow ditches if concrete lining is used.

   c. Riprap shall not be specified for ditch lining within the public right-of-way or in public drainage easements unless approved by the County Engineer.

   d. The roadside ditches shall be designed to accommodate the placement of lot entrance culverts. The ditches shall not be less than 18-inches deep measured from the road shoulder.

   e. Check dams and or riprap lining shall not be located within public roadside ditches or public drainage easements unless allowed by the County Engineer.

   f. Ditches shall not be designed below the seasonal high water table.

g. For maintenance purposes open channels shall be trapezoidal with a minimum 2-foot base width.

h. Side slopes for all open channels shall be no steeper than 3:1 (h:v), unless approved by the County Engineer. Roadside ditches used for stormwater management purposes should not exceed a bottom width of 6-feet unless approved by the County Engineer.

i. All open drainage channels shall be designed to have vegetated bottoms and side slopes and function in a non-erosive condition unless approved by the County Engineer. The maximum permissible velocities and maximum tractive forces shall be those established in the Plan Preparation Package.

j. Unless approved by the County Engineer the maximum flow depth for the design storm event in an open channel on a residential lot and/or the right-of-way adjacent to a residential lot shall be 1-foot for the design storm. The maximum channel depth shall be 2-feet.

3. Culverts

a. Unless approved by the County Engineer, culverts shall not be placed in fill.

b. End sections shall not be substituted for endwalls where multiple culverts are specified or where culverts are placed in a stream.

c. Corrugated metal bottomless pipe arches are not allowed within public right-of-ways or public easements.

d. Scour Analysis shall be required as determined by the County Engineer.

e. Unless approved by the County Engineer, cross pipes and cross culverts shall cross public roads at 90^{o} to the road.

f. Culverts and storm drain systems that receive 50 acres or less drainage may be designed utilizing the rational method for determining runoff. Those systems receiving drainage greater 50 acres defined shall utilize the NRCS TR-55 or TR-20 methods for determining runoff.

g. The minimum size of culverts shall be 15-inches or a hydraulically equivalent elliptical size.

h. Unless otherwise approved by the County Engineer, the maximum allowable headwater above the crown of a cross culvert shall be 5-feet. The design headwater elevation shall be confined within a drainage easement (backwater easement).

i. The computed design headwater elevation (100-year) for culvert must not cause damage to existing properties and must be at least at the edge of the pavement (open section roads) or 1-foot below the top of curb elevation (closed section roads).

4. Inlets

   a. Closed section public roads shall be designed utilizing standard curb inlets. Grate inlets and curb cut openings are not allowed without approval from the County Engineer.

   b. Curb inlets near intersections should not be placed between the PC and PT of curb. Inlets shall not be designed within the curb fillet.

   c. Drop inlets, drop manholes or drop junction boxes shall be specified if the vertical depth from a pipe invert and the flow line of the inlet of 4-feet or greater.

   d. Curb inlets must be placed such that the transition from the mountable curb to the inlet does not fall within the limits of any entrance driveway.

   e. Time of concentration (T_c) calculations are not required for inlet designs if an assumed Tc of 7 (seven) minutes is utilized. If calculated Tcs are used in the design of inlet throat openings then the Tc for an inlet shall not exceed 15 (fifteen) minutes. These times do not apply to storm drain systems or culverts which will require Tc calculations.

   f. In public storm drain systems or public drainage easements no material changes will be allowed between inlets, manholes, junction boxes or other structures.

   g. Residential yard inlets shall be designed to accept no more than 2 (two) acres of drainage. The inlet shall include an examination of the 100-year storm which should not pond more than 12-inches at the inlet. A minimum of a 5-feet concrete gutter will be utilized in the design of all yard inlets. Grate yard inlets are not allowed for use as residential yard inlets.

   h. The design and evaluation of standard curb opening inlets will be made using a value for the local depression of 1.5-inches unless.

   i. Inlets shall be designed based on the standards for a 2-year storm. Inlets on grade shall be spaced to pick up at least 85% of the total gutter flow and 100 % of the flow must be intercepted at the next downstream inlet. Sump inlets must be designed to pick up 100% of the flow for the 10-year storm.

   j. In locations such as sag vertical curves in depressed sections, where significant ponding can occur, flanking inlets shall be placed on each side of the inlet at the low point in the sag. The flanking inlets should be placed so that they will limit spread on low gradient approaches to the level point and act in relief of the inlet at the low point if it should become clogged. Flanking inlets are not considered as intercepting flow in design computations.

   k. Inlets should be located just upgrade of pedestrian crossings if required near the crossing.

5. Curbs

    a. For mountable or rolled face curbs the face of curb shall be defined as ½ (one half) the distance from the flow-line to the back of the curb.

    b. Maximum allowable flow in standard curb and gutter streets shall be 5.0 cfs.

    c. Maximum allowable flow along curb fillets shall be 2.5 cfs.

6. Storm Drains

    a. Storm drains shall not be designed on slopes of less than 0.5% or greater than 20% unless approved by the County Engineer. Storm drain anchors will be required for storm drain systems on slopes of 15% or greater.

    b. Storm drains shall not be designed nor constructed less than the friction slope.

    c. Unless approved otherwise by the County Engineer, the minimum full velocity of a storm drain shall be 3 fps and the maximum full flow velocity shall be 25 fps.

    d. Bend structures or field connections will not be allowed in any public storm drain system or public drainage easement.

    e. Unless approved by the County Engineer, the storm drain systems shall discharge above the normal pool from any downstream source (swm ponds, etc.).

    f. A minimum vertical clearance of 12-inches and a minimum horizontal clearance of 5-feet, wall to wall, shall be provided between any other utility (water line, sewer lines, electric, gas, cable, etc.) and storm drains and culverts.

    h. When the hydraulic gradient in a storm drain system exceeds 1-foot above the crown of the pipe for the design storm, special treatment of pipe joints (i.e. rubber gaskets or concrete collars) shall be required.

    i. The hydraulic gradient for the design flows in a storm drain system shall not be above the elevation of 1-foot below the proposed ground elevation. For curb opening inlets, the gutter flow line is considered the proposed ground elevation.

7. Closed Section Roadways

    a. Discharge across intersections is not allowed unless approved by the County Engineer.

    b. If overflow from closed systems located in sump areas is allowed by the County Engineer then the design shall include overflow paths to safely pass surcharge from the systems.

    c. Maximum allowable concentrated flow from any development to the County streets shall be 2.0 cfs.

    d. All closed section roads and pavement areas for townhomes shall be provided with

under-drains that discharge to an adequate stormwater conveyance system unless not required by a geotechnical engineer.

8. Spread on Pavement (Closed Section)

    a. For private commercial, industrial, or institutional developments, maximum depth of water ponding (for the 100-year storm) in a parking lot or drive aisle shall be limited to 4-inches in sump areas and 2-inches elsewhere, with a maximum spread of 10-feet from any inlet structure, curb or barrier.

    b. Spread on local public streets shall be limited to the width of one-half of the travel lane from the face of curb in each direction or 8-feet from the face of curb, whichever is less for runoff generated from the 2-year storm.

    c. Spread on public collector streets shall be limited to the width of one-half of the travel lane from the face of curb in each direction or eight feet (8') from the face of curb, whichever is less for runoff generated from the 10-year storm.

    d. Spread on public arterial streets shall be limited to the width of one-fourth of the travel lane (one lane) from the face of curb in each direction or four feet (4') from the face of curb, whichever is less for runoff generated from the 25-year storm.

9. Miscellaneous

    a. Unless approved by the County Engineer, designed stormwater conveyances systems (open or closed) shall be located outside the limits of a small residential lot (1 acre or less).

    b. Manholes shall be specified at changes in pipe size, changes of materials, in grade or alignment, at the junction of two or more pipes, changes in maintenance responsibilities and at intervals where storm drain lengths exceed four hundred feet (400') on continuous runs.

    c. All roads to be dedicated for public use shall be designed with open (roadside ditches) or closed (storm drain, inlets, etc.) stormwater conveyance systems to discharge runoff from the roads to an adequate outfall or a stormwater management facility.

    d. All major stormwater conveyance systems with the associated easements shall be located outside the limits of residential lots of one (1) acre or less.

    e. In the design of a stormwater conveyance system, the runoff curve number or the rational coefficient for the offsite contributing drainage areas shall be determined on the basis of the ultimate development of the drainage area in accordance with current zoning for the area.

    f. All stormwater conveyance systems shall be designed by a professional duly licensed in the State of Maryland as allowed by State law.

    g. A geotechnical Report shall be provided for every residential (including townhomes) project to identify areas of poor soils or high groundwater. The design of all stormwater

conveyance systems shall accommodate discharge from sump pumps and under-drains unless determined otherwise by the geotechnical engineer.

h. Unless approved otherwise, all calculations shall be submitted on Charles County Forms as found in the Charles County Drainage Manual.

i. Pipes shall be designed such that the minimum cover shall be 0.75-feet below the pavement section as measured from the subgrade to the top of the pipe or the manufacturer's requirements, whichever is greater.

j. All plans shall be submitted with all information as outlined in the Plan Preparation Package.

k. All fees, bonds etc. shall be based on Charles County Fee Schedules, Unit Price List, etc. as appropriate.

l. To provide adequate drainage in sag vertical curves, a minimum slope of 0.3% should be maintained within 50-feet of the low point of the curve. This is accomplished where the length of the curve divided by the algebraic difference in grades in percent (K) is equal to or less than 167.

m. For maintenance purposes, in addition to frame and covers all inlets and junctions boxes (precast or cast-in-place) shall be constructed with removable top lids.

n. Storm drain covers shall be the standard Charles County cover or approved by the County Engineer. All covers shall contain the words "storm drain" and "public" or "private".

o. Flow arrows shall be shown in plan view on all storm drains.

p. When using the rational formula, the runoff coefficient "C" must be calculated for each drainage area. "C" values shall not be assumed.

q. Hydrodynamic and other structural stormwater management devices shall only limited to those areas inside of the right-of-way where necessary with approval of the County Engineer.

8.2 Utilizing Existing Conveyance Systems

A. The use or connection to an existing conveyance system shall require that the existing system can provide adequate conveyance for the total amount of drainage being conveyed by the existing system based on the ultimate development for the design storm event.

B. Adequate Outfall Study - The discharge to or the use or connection to an existing stormwater conveyance system shall require an analysis of the existing conveyance system to verify that the system provides adequate conveyance. Hydraulically critical points shall be investigated to assure that there are no adverse impacts to downstream properties which must be avoided or mitigated. The adequate outfall study must include the following information:

1. Storm Drains:

a. A survey or depiction in plan and profile of the existing storm drain system to a point of adequate outfall as determined by calculations and/or agreed upon by the County Engineer;

b. Inlet capacity calculations based on current design standards;

c. Hydrology calculations based on current design standards;

d. Storm drain calculations based on current design standards;

e. Hydraulic gradeline calculations based on current design standards; and

f. Any other information required by the County Engineer

2. Culverts

a. A survey or depiction in plan and profile of the existing culvert under investigation;

b. Hydrology calculations based on current design standards;

c. Culvert calculations based on current design standards; and

d. Any other information required by the County Engineer.

3. Manmade Open Channels

a. A survey or depiction in plan and profile of the existing manmade open channel culvert under investigation;

b. Hydrology calculations based on current design standards;

c. Open channel calculations based on current design standards; and

d. Any other information required by the County Engineer.

4. Natural Channels

a. A survey or depiction in plan and profile of the existing natural channel showing cross sections at critical section to point of adequate outfall as determined by calculations and/or agreed upon by the County Engineer;

b. Hydrology calculations based on current design standards;

c. Open channel calculations based on current design standards;

d. Mannings “N” value calculations;

e. Tractive Force calculations;

f. Maximum permissible velocities and tractive forces shall not exceed those listed in Plan Preparation Package; and

g. Any other information required by the County Engineer

5. Combination Systems

a. A survey or depiction in plan and profile of the existing stormwater conveyance system at hydraulically critical points to an adequate outfall as determined by calculations and/or agreed upon by the County Engineer;

b. Hydrology and hydraulic calculations as required by 1.-4. above; and

c. Any other information required by the County Engineer.

C. The County may, but is not obligated to, accept a "Fee-in-Lieu" for any offset to making downstream improvements. Fees accepted to offset downstream improvements will be placed in a dedicated fund for drainage improvements as determined by the County.

8.3 Design For Maintenance

New or improved drainage conveyance systems shall be designed and constructed to require economical maintenance. Adequate rights-of-way must be provided for access for construction and continued maintenance

8.4 Project Reports

A. Project Report Contents

Project design shall include a Project Report outlining the scope, the methodologies, and assumptions utilized in the design. The Project Report should include:

1. A table of contents;

2. Numbered sheets;

3. A narrative that supports the design and describes the project and describes how adequate drainage is provided for the project.

4. All nomographs, charts, forms, computer generated output, etc. to support the design;

5. All calculations shall be provided using the Drainage Manual methods, format and forms. The County Engineer may approve computer programs provided the programs provide input and output in the same format as required in the Drainage Manual;

6. If the Report includes computer generated output (ex. TR - 20), then a compact disc must be submitted with all input and output; and

7. Upon request of the County, copies of the licensed software necessary to duplicate computer generated output.

B. Drainage Area Maps

All drainage area maps used in the design must be included as part of the plan assembly. At a minimum the drainage plan shall include the following information:

1. A delineation of the entire drainage area (in acres), including all off-site area, contributing flow to the study point. Drainage areas contributing to a specific point of interest shall be indicated by existing contours, proposed on-site grading and street grades;

2. Topography of the drainage area;

3. Soil types based on the NRCS Soil Survey (supplemented by site soil inspection, if necessary);

4. A description of the corresponding land cover within the associated drainage area including the runoff coefficient value (i.e., the 'CN' value) and the Time of Concentration path (i.e. Tc);

5. All existing and proposed conveyance systems (open channel or closed conveyance) in the drainage area. The plan information shall be based on field verified topography whenever possible. The plan information shall include all pipe sizes; slopes; pipe material including Manning's roughness coefficient; all inlets; open channel contours; one cross section of each open channel at two hundred foot (200') intervals including the beginning and end of the open channel but not less than three (3) cross sections; the surface lining type; the allowable shear stress of the lining type; channel geometry including side slopes, top and bottom width and depth;

6. The water surface elevations in the open channel for the Design Storm and the 100-year storm event;

7. The location and elevation of the tailwater affecting the open channel system, if tailwater is present; and

8. Watercourse information: flood profiles.

C. Reports submitted for Final Storm Drainage Plan Approval

Reports submitted for final storm drainage plan approval shall include:

1. Geotechnical investigations including soil maps, borings, site-specific recommendations, and any additional information necessary for the final storm drainage design;

2. Drainage area maps depicting predevelopment and post-development runoff flow path segmentation and land use;

3. Hydrologic computations for all elements of the drainage plan;

4. Hydraulic and structural computations for structural elements designed as part of the storm drainage system used;

5. A narrative that supports the final storm drainage design; and

6. Any other information established in the Plan Preparation Package or required by the County Engineer.

D. Construction Drawings submitted for Final Storm Drainage Plan Approval

Construction drawings submitted for final storm drainage plan approval shall include the following minimum information:

1. A vicinity map;

2. Existing and proposed topography and proposed drainage areas, including areas necessary to determine downstream analysis for the proposed storm drainage facilities;

3. Any proposed improvements including the location of buildings or other structures, impervious surfaces, storm drainage facilities, and all grading;

4. The location of existing and proposed structures;

5. Any easements and rights-of-way;

6. The delineation, if applicable, of the 100-year floodplain and any on-site wetlands;

7. Structural and construction details including representative cross sections for all components of the proposed storm drainage facilities;

8. All necessary construction specifications;

9. A sequence of construction;

10. Data for total site area, disturbed area, new impervious area, and total impervious area;

11. A table of materials to be used for storm drainage facility planting;

12. All soil boring logs and locations;

13. An inspection and maintenance schedule;

14. Certification by the owner/developer that all storm drainage construction will be done according to this plan;

15. An as-built certification signature block to be executed after project completion; and

16. Any other information required by the County Engineer.

8.5 Additional Plan and Report Information

Construction drawings and storm drainage reports submitted for final storm drainage plan approval shall include the following minimum information unless approved otherwise by the County Engineer:

A. Topographic survey including the area necessary to determine the downstream effect from any proposed storm drainage structure.

B. Topographical information of the contributing watershed based upon USGS topographic quadrangles with a field verified drainage area and acreage noted on the plan or County topographic maps at 1" = 200'.

C. Geotechnical investigations, including soils maps, borings, site specific recommendations, and any additional information necessary for the proposed storm drainage plan design.

D. Descriptions of all water courses, impoundments, and wetlands on or adjacent to the site or into which stormwater directly flows.

E. Computations:

1. Hydrology;

2. Hydraulic;

3. Structural;

F. Storm drainage Design Plans:

1. Location map;

2. Vicinity map;

3. Topography survey as indicated in this section;

4. Any proposed improvements including the location of buildings or other structures, impervious surfaces, storm drainage facilities, and all grading;

5. The location of existing and proposed structures and utilities;

6. Any easements and rights-of-way;

7. The delineation, if applicable, of the 100-year floodplain and any on-site wetlands;

8. Structural and construction details for all components of the proposed stormwater facilities;

9. A sequence of construction;

10. Data for total site area, disturbed area, new impervious area, and total impervious area;

11. All soil boring logs and locations;

14. Pre and post-development watershed maps and design drainage area maps for stormwater conveyance shall be part of the plan assembly;

15. Location of utilities in the construction area;

16. Structural details for proposed facilities;

17. Notes on drawings shall specify materials to be used;

18. Construction specifications; and

G. Construction Cost Estimate

H. If the plans include precast structures, then the design engineer shall be responsible to submit approved shop drawings to the County prior to the placement of the precast structure. The information required on the shop drawing is as outlined in the Plan Preparation Package.

I. Adequate Outfall Study

The developer's study of the downstream conditions shall extend to the point where an adequate outfall exists as determined by calculations or to the point as determined by the County Engineer.

J. Standards and Specifications

Storm drainage reports and/or storm drainage plans must be prepared in sufficient detail, with reference to appropriate standards and specifications, to ensure understanding by those responsible for review, installation, and inspection.

K. The Developer shall retain a Licensed Professional to inspect the construction of all storm drainage construction. The Licensed Professional shall submit routine inspection reports with test results at time intervals established by the County Engineer. The Licensed Professional shall not accept any work not in compliance with State or County requirements and shall notify the County immediately when work in not in compliance.

L. The design plans shall indicate the 100-year floodplains, backwaters, ponding for streams, culverts, storm drain systems, and the maximum impounded water surface elevation of the Storm drainage structure during ultimate emergency spillway operation. The resultant inundated area such at this elevation shall be accurately delineated and recorded on the site plan or plat as a perpetual storm drainage, floodplain, backwater, or drainage easement, as applicable. Additional buffer easements may be necessary or required for maintenance, access, and/or safety purposes. No existing or proposed building structures shall be allowed within these easements without prior approval of the Department. Peripheral construction may be granted provided that all floor elevations are at least 1-foot higher than the maximum water surface elevation.

M. Concentrated discharge from a storm drain and/or stormwater management systems onto residential lots from a land disturbance activity or development shall be avoided. Where a proposed stormwater management system is designed to outfall concentrated discharge to any offsite residential lot and that discharge is greater than the discharge of a 15" (fifteen inch) pipe with a manning's roughness coefficient of 0.24 at full flow conditions when laid on natural grade, then a storm drain system or principal spillway shall be designed to discharge from the

facility through the use of a subsurface structure and be continued thru the off-site residential lot.

1. All necessary off-site easements shall be obtained by the developer and will be required prior to plan approval. If the developer demonstrates that off-site easements and improvements cannot be obtained, then the developer may offset these requirements by providing one or a combination of the following with approval from the Department:

    a. Watershed or stream restoration plan;

    b. Retrofitting of an existing structure;

    c. Drainage improvements;

    d. A Fee-in-Lieu of as established in the County Fee Schedule or

    e. Any other measure approved by the Department.

N. Other information as required by the County Engineer.

9.0 QUALIFICATIONS

A. As required by Title 14 of the Business Occupations & Professional Article of the Annotated Code of Maryland, only Licensed Professionals may be involved with the consultation; design; evaluation; investigation; and planning, construction stakeout, as-built plan preparation and inspection of construction to ensure compliance with specifications and drawings of the storm drainage project.

B. The storm drainage plan and all supporting documents shall be signed and sealed by a Professional Engineer or other Licensed Professional as allowed under the Maryland State law.

C. All storm drainage construction shall be only be inspected by a Licensed Professional as required by Title 14 of the Business Occupations & Professional Article of the Annotated Code of Maryland. The Director may require certifications for testing laboratories and/or inspection personnel who work under the direct supervision and responsible charge of a Licensed Professional.

D. The Licensed Professional responsible for the inspection of all storm drainage construction shall certify the inspections through reports, test results, letters or other documents as required by the County Engineer.

10.0 AS-BUILT PLANS

A. As-Built plans shall include both line and grade.

B. As-Built plans of any underground structure shall be performed prior to the placement of any backfill. Deviations from the approved plans must be corrected prior to backfilling operations. Construction of all stormwater conveyance systems per the approved plan shall be the responsibility of the developer.

C. Full or partial as-built plans may be requested at any time during the construction phase of the project if the County determines that there may be deviations from the approved plan. Normally as-built plans shall be submitted to the Department prior to requesting final inspections of the project. As-Built plans shall be submitted following procedures established in the Plan Preparation Package.

D. As-Built plans shall be prepared by a Licensed Professional.

E. As-Built Plans shall include certifications as indicated in the Plan Preparation Package.

11.0 PRIVATE DEVELOPMENTS (COMMERCIAL, INDUSTRIAL, etc.)

Private stormwater conveyance designs for private commercial or industrial developments are not subject to the specific design requirements established in this ordinance. The onsite stormwater conveyance designs shall be consistent with acceptable engineering practices. The County will review plans for all private stormwater conveyance designs to assure that acceptable engineering practices are being followed and may make suggestions or comments accordingly. The County may require any design or improvement if there is a potential public health, safety and welfare issue. Bonding of private developments will only be those subject to structures in easements. Onsite site construction and stormwater conveyance work must be substantially complete prior to the Department recommending that a Use and Occupancy permit be issued.

12.0 FINAL COMPLETION ACCEPTANCE CERTIFICATIONS

A. The developer shall have the construction engineer or other licensed professional submit a letter certifying to the County that all work performed under their supervision has been completed per the approved plans, per the Charles County Standards and Specifications for Construction Manual, per the County ordinances and per any County direction.

B. The developer shall have a Registered Landscape Architect (RLA) or other licensed professional submit a letter to the County certifying that all plantings have been completed and are surviving per the approved plans and/or specifications.

13.0 EASEMENTS AND MAINTENANCE AGREEMENTS

Where storm drainage is provided on-site, storm drainage easements and/or maintenance agreements as approved by the Department shall be recorded by the developer for the location and use of such facility. Easement documents shall be submitted to the County for review and approval prior to recording of the plat. The plats and easement documents shall include all necessary information as required by the County. Such easements shall be adequate to provide access for maintenance from a public right-of-way and shall include any downstream improvements from the storm drainage structure and/or the downstream danger reach of the structure.

13.1 Easements

A. Legal record. All drainage easements shall be shown, labeled, dimensioned on the plans.

B. Required easements. All conveyance systems conveying discharge from a public right-of-way or property shall be located within a drainage easement of the appropriate width and length.

Drainage easements shall be designated as public or private easements as determined by the County.

C. Structures in easements. No structure (sheds, fences, etc.) shall be located or constructed within a drainage easement without prior written permission from the County Engineer.

E. Easement widths are outlined in the Plan Preparation Package.

F. Off-site drainage easements shall be recorded prior to permit issuance.

G. Inlets and sumps. A drainage easement around the area of inundation shall be provided for all catch basin sumps, inlets and areas considered by the Department to be hydraulically critical areas. A minimum twenty foot (20') separation distance between the easement and any occupied existing or proposed structure shall be required unless approved otherwise by the County Engineer.

13.2 Location of Easements – Residential Developments

A. In residential developments, the storm drainage and access easements shall be located on properties of persons responsible for maintenance of such easements and facilities and shall be located outside the limits of residential lots unless approved by the County Engineer.

B. In the case of publically maintained facilities, the easements shall be located in open space or public use lots or other areas as allowed by the County.

13.3 Easements – Commercial, Industrial, Institutional Developments

A. Drainage easement areas shall be shown, labeled and dimensioned on the storm drainage plans.

B. Adequate access to all stormwater conveyance systems shall be provided from a public right-of-way.

14.0 OWNERSHIP OF STORM DRAINAGE SYSTEMS

Unless approved otherwise by the County Engineer, storm drainage systems for private developments shall be located outside of County owned right-of-ways and properties.

A. Residential Subdivisions – Private storm drainage systems for residential developments shall be maintained by a Homeowner's Association.

B. Nonresidential Development - Storm drainage systems located in nonresidential areas such as commercial, industrial and institutional development shall be located on the developer's property and shall be maintained by the owner of the property. Systems conveying stormwater that is generated from or through County right-of-ways or County properties shall be enclosed in private drainage easements.

C. Public Development & Maintenance – The County will maintain any stormwater conveyance system conveying stormwater that is generated from or through County right-of-ways or County owned properties as determined by the County Engineer and/or the Director. Such systems shall be enclosed in public drainage easements.

15.0 DISCHARGE OF STORMWATER (POINT OR LINEAR)

If a project involves the discharge of some or all of the stormwater runoff from the site in a manner that alters the water quality or the flow characteristics of depth, velocity, width, rate, or volume from that which exists in the pre-developed condition, the developer shall obtain from abutting property owner(s) any necessary easement, right-to-discharge, or other property interest concerning flow of water prior to the issuance of the permit. Approval of a stormwater drainage plan does not create or affect any right to direct runoff onto adjacent property without that property owner's permission.

16.0 AGREEMENTS / BONDS / FEES

16.1 Permits

A permit and/or agreement shall be required for construction projects and shall specify the developer's responsibilities during the project.

16.2 Bonds

The County Commissioners shall require a surety bond, letter of credit, cash guarantee or other means of security acceptable to the County Commissioners from the Developer prior to issuance of the permit. Such bond, letter of credit or cash guarantee shall be in an amount established by the County. The County reserves the right to require a post development guarantee bond after the final completion acceptance of the project.

16.3 Conditions of Bond

Bonds shall include provisions relative to forfeiture for failure to complete work specified, compliance with all provisions of this ordinance and other applicable laws and regulations, and any time limitations. The bond shall remain in full force and effect until completion of work to specifications required, submission and approval of the as-built plans by the Department, certification of completion by the developer, and recordation of easements, dedications, maintenance agreement and other appropriate documents as required.

16.4 Fees

Unless otherwise provided herein, a non-refundable fee will accompany plans to provide for the cost of plan review, administration and inspection for all projects subject to this ordinance. The amount of this fee will be established by the Department via the County Fee Schedule.

17.0 CONSTRUCTION INSPECTION AND ENFORCEMENT

17.1 Construction Layout

Construction layout for stormwater construction shall only performed by a licensed professional.

17.2 Inspections

All inspections shall be performed by qualified individuals. The County and/or the construction engineer responsible for the inspections will approve and certify all inspections and inspection reports.

Routine inspections shall be performed as required by this ordinance. A policy and procedure for public and private inspections shall be established and maintained by the County. Upon final completion acceptance the Developer will certify to the County that all construction, testing and inspections were completed per the approved plans, the County Standards and Specification Manual, this ordinance and any directive issued by the County.

17.3 Laboratory, Testing and Individual Certifications

The Director may establish minimum certification requirements for qualified individuals or material testing laboratories performing work in the County.

17.4 Notifications and Requirements

It shall be the responsibility of the developer or his representative to notify the Department forty eight (48) hours prior to commencement of any work and forty-eight (48) hours prior to work at the specified stages of construction for storm drainage systems. The Department has the right to enter any project at any phase to monitor and/or inspect the construction of storm drainage systems.

The developer will make all necessary arrangements for providing to the Department a certification, letter, or report documenting the required stages of construction established in this ordinance and all test results from a Professional Engineer.

17.5 Inspection Reports and Records

A. Detailed written or electronic reports shall be prepared for each inspection and shall be maintained by the County. The minimum information required on each inspection report shall include:

1. The project name and number;
2. The person performing the inspection;
3. The date and time of the inspection;
4. An estimate of weather and temperature;
5. Contractor performing the work;
6. A detailed description of what was constructed and inspected to include materials, dimensions, quantities, etc;
7. Tests performed and results of tests;
8. Whether construction was in compliance with the approved storm drainage plan;
9. Any variations from the approved construction specifications; and
10. Any violations that exist.

B. The owner/developer and on-site personnel shall be notified in writing when violations are observed. Written notification shall describe the nature of the violation and the required corrective action.

C. Work may not proceed until the work previously completed is approved by the appropriate inspection authority.

17.6 Enforcement

The Department may use the following enforcement actions or a combination thereof:

A. A notice of violation may be issued specifying the need for the violation to be corrected if storm drainage plan noncompliance is identified;

B. A stop work order may be issued for the site by the County if a violation persists;

C. Bonds or securities may be withheld or the case may be referred to the County Attorney's Office for legal action if reasonable efforts to correct the violation have not been undertaken; and/or

D. In addition to any other sanctions, a civil action or criminal prosecution may be brought against any person in violation of this ordinance.

Any step in the enforcement process may be taken at any time, depending on the severity of the violation.

17.7 Developers Responsibilities

The developer or his representative shall assure that inspections are made and approvals are given and certifications are submitted to the County for all work and specifically at the following specified stages of construction:

A. Storm Drain System:

1. At beginning of excavation;

2. During pipe laying and backfill;

3. During placement of precast or construction of cast in-place structures (inlets, manholes, junction boxes, etc.);

4. During placement of outlet protection; and

5. At the completion of final grading and establishment of permanent stabilization.

B. Open channel systems:

1. During the excavation to grade;

2. During the placement of any lining; and

3. At the completion of final grading and establishment of permanent stabilization.

C. Other conveyance systems:

1. At steps established by the County.

The developer or his representative shall provide additional inspection, testing and/or Reports as field conditions may warrant and as determined by the construction engineer and/or the County.

17.8 Notification of Non-Compliance

If at any stage during construction the work does not conform to the approved plans and specifications, or to any instructions of the Department, a written notice to comply may be given to the developer. Such notice shall set forth the nature of corrections required and the time within which corrections will be made. Upon failure to comply within the time specified, the developer will be considered in violation of this ordinance, in which the County may impose penalties as establish in this ordinance.

17.9 Testing

A. The developer shall be responsible for making all necessary arrangements for the testing of materials required at specific stages of construction of the stormwater conveyance systems and the storm drainage systems.

B. Testing requirements are those established on the plans and in County's Standards and Specification for Construction Manual.

C. All concrete, soil and other material testing shall be performed by qualified individuals. The results of all material testing shall be clearly documented in a report and certified by a Licensed Professional. All testing shall be performed per applicable ASTM, AASHTO, MDSHA or County standards.

D. The developer shall notify the Department for pre-final and final inspections after the project is completed. Prior to the final inspections the following information must be submitted:

1. Red-lined as-built plans and surveys by a Licensed Professional at the same scale as the original plan showing all storm drainage facility improvements. The minimum information and formatting required for the As-Built plans shall be established in the Plan Preparation Package.

2. Certification by the developer that all grading, drainage, erosion control measures, and permanent systems and vegetative measures have been completed in conformance with the approved plans and specifications.

3. Certification from the Construction Engineer that all of the work related to construction of the storm drainage has been inspected and completed per the approved plans.

4. A final testing & inspections report summarizing all testing and inspections performed during the construction of all stormwater conveyance systems and storm drainage systems.

17.10 Final Completion Acceptance for Storm Drainage

After all stormwater conveyance work and final inspections have been completed and the required documents have been submitted and approved the Department will issue a Certificate of Final Completion Acceptance to the Developer.

18.0 MAINTENANCE

A. If any maintenance required by this ordinance is not done, the person responsible shall be notified of the deficiency and a time frame in which the repairs must be completed will be specified. A subsequent inspection shall be made to ensure completion of repairs. The required work shall be performed within a given specified time. In the event of an immediate danger to the public health or welfare of the community, nuisance and/or safety, notice shall be given by the most expeditious means and the hazard shall be eliminated immediately. In the event that the person responsible fails to take corrective action, the Department shall complete the required work. The cost of such work by the Department shall be paid to the County by the person who failed to take corrective action and shall be a debt due to the County.

B. The County reserves the right of entry and the right to operate and maintain all private storm drainage for which the Owners have failed to perform under the conditions of their Stormwater Maintenance and Inspection Agreement and/or Private Drainage Easement Agreement. All costs incurred by the County for operation and maintenance shall be charged to the Owners of the systems and such costs shall constitute a lien against all property subject to and benefitted by the original agreement. Such costs shall also be personal obligations of the property Owners at the time they are incurred, and shall be assessed, levied, collected and enforced as County real estate taxes are now, or may hereafter be, by law levied and collected, and shall have the same priority rights, bear the same interest and penalties, constitute a lien upon the real property so assessed and in every respect be treated the same as County real estate taxes.

19.0 PROHIBITIONS, ENFORCEMENT AND PENALTIES

19.1 Unlawful Acts

A. General: It shall be unlawful for any person to violate any provision of this ordinance or cause a violation to occur, fail to comply with any of the requirements hereof, violate or fail to comply with an approved plan or directive of any County Official, or fail to comply with the provisions of a permit or a certificate issued under this ordinance, or cause the same to be done.

B. Specific prohibitions. It shall be a violation of this ordinance to:

1. Discharge, or cause to allow to be discharged, sewage, industrial wastes, or other wastes into the stormwater conveyance system, or any component thereof, or onto driveways, sidewalks, parking lots, or other areas draining to the stormwater conveyance system;

2. Connect, cause, or to allow to be connected, any storm drain system without proper permits;

3. Discharge, or cause, to allow to be discharged, stormwater associated with industrial activity into the storm sewer system, or any component thereof, without State or County approval;

4. Submit inaccurate site inspection reports to the County;

5. Block natural or manmade conveyance systems by filling, building diversions, building walls or fences, placing trash or debris, planting plants or trees or any activity which would block, slow, or impede any natural drainage or manmade drainage system; or

6. Change runoff characteristics or runoff patterns by cutting, filling, grading, removing land cover, paving, constructing pipes, building ditches or any other activity that would change or modify the existing site without first obtaining a permit.

C. The following activities shall not be in violation of this ordinance if the activities are conducted in such a manner as to avoid the discharge of sewage, industrial wastes, or other wastes into the storm sewer system. In the event any of these activities are found to cause sewage, industrial wastes or other wastes to be discharged into the storm sewer system, the County shall notify the person performing such activities and shall order such activities be stopped or conducted in such a manner as to avoid the discharge of sewage, industrial wastes, or other wastes into the storm sewer system

1. Water line flushing;

2. Landscape irrigation;

3. Pumping of uncontaminated groundwater from potable water sources, foundation drains, irrigation waters, springs, or water from crawlspaces or footing drains;

4. Lawn watering;

5. Individual car washing on residential properties;

6. De-chlorinated swimming pool discharges; or

7. Street washing.

19.2 ILLICIT DISCHARGE

A. Legislative Intent

In addition to the general purposes section 1.0, *Purpose and Scope*, this section is further intended to:

1. Implement federal regulations promulgated by the Environmental Protection Agency pursuant to the Clean Water Act of 1977 (P.L. 95-217), as amended.

2. Comply with the conditions of the County's National Pollutant Discharge Elimination System (NPDES) permit for discharges from the municipal separate storm sewer system.

B. Prohibited Actions

1. No person shall:

a. Discharge any significant materials or pollutant into any component of any municipal separate storm sewer system that would constitute an illicit discharge;

b. Create any condition that results in the potential for an illicit discharge that could result in the pollution of stormwater conveyed and discharged from any outfall of those systems; or

c. In any way cause or contribute to any type of illicit discharge into those systems that could result in a potential for adverse impacts.

2. No person shall alter or in any way create an obstruction to flow, or alter the flow regime within a County or municipal separate storm sewer system or any natural or man-made stormwater conveyance system so that it reduces its intended design capacity or that results in the system being unable to provide its intended function.

3. No person shall create any new connection that is intended to introduce new or increased stormwater flow into any County or municipal separate storm sewer system unless reviewed and approved by the County.

4. No person shall create any new connection or maintain any that currently exist that can introduce any discharge other than stormwater into any County or municipal separate storm sewer system.

5. No person shall obstruct any outfall of any County or municipal separate storm sewer system that impedes the system design discharge.

C. Control of Illicit Discharge

1. The Director may order:

a. The abatement of any illicit discharge and correction of any pollution of the waters of the state including the abatement and correction of any degradation of aquatic and riparian habitat attributed to such pollution; and

b. The abatement and correction of any degradation of riparian habitat and aquatic life, caused by a failure to design, install, operate, or maintain sediment and erosion control, stormwater management, or agricultural best management practices in accordance with an approved sediment and erosion control plan or permit, a stormwater management plan or permit, a soil conservation and water quality plan or plan of compliance action.

2. If illegal pollutant discharges from properties engaged in agriculture impair aquatic life or public health, cause stream habitat degradation, or result in water quality standards or criteria violations, the Department will pursue correction of these violations in conjunction with the District and if necessary, the Administration. Abatement of any violations will be handled in accordance with a memorandum of understanding between the Department and the District regarding the specific notification and enforcement procedures to be followed in cases of water pollution caused by agriculture.

3. The Best Management Practices ("BMP") used to comply with this ordinance will be designed, installed, operated and maintained in accordance with the approved sediment and

erosion control plans and permits and the approved stormwater management plan. Agricultural BMPs must be designed, installed, operated and maintained in accordance with the soil conservation and water quality plans approved by the District.

D. Liability for Expenses Caused by a Violation

1. In an immediate danger to the public health, safety or welfare, the Director will notify the responsible party by the most expeditious means, and the party who was notified must remove the illicit discharge or pollutant by the time stated in the notice. If not so removed, the County may remove, mitigate, and clean up any illicit discharge or pollutant. The cost of that clean-up must be paid to the County by the party causing the illicit discharge. The debt associated for the illicit discharge borne by the County is due to the County. This section does not restrict the County from proceeding directly with alternative enforcement procedures as allowed by law.

2. If, after an inspection by the County, the Director finds that a pollutant discharge poses an immediate hazard to the public health, safety or welfare or to the waters of the state, the Director must take action necessary to abate the pollutant discharge, protect the public, and mitigate any damage that the pollutant discharge has caused to the affected waters. Any cost incurred in carrying out actions under this subsection must be paid by the owner under subsection A.

3. The Director may establish fees and charges necessary to cover the expenses caused by any violation

19.3 Enforcement and Compliance

A. The Department may enter a site at any time during normal business hours, and at other times the Department deems as reasonable, to inspect, investigate, or monitor activities subject to this ordinance. If the person in charge does not consent to entry by the Department, the Director may obtain an administrative search warrant.

B. Upon finding a violation of this ordinance, the Director may issue a notice of violation, stop work order, or corrective order to any person causing or permitting a violation.

C. The Director may issue a stop work order to any person who violates this ordinance when performing activities authorized by any permit issued by the County.

D. When the Department determines that a violation has occurred, the Department shall notify the onsite personnel and person or permittee committing the violation in writing of the violation, describe the required corrective action, and specify the time period in which to have the violation corrected.

E. If the violation persists after the time and date specified for corrective action of violation, the Department shall stop work on the site. The Department shall determine the extent to which work must be stopped, which may include all work on the site except that work necessary to correct the violation.

F. If a discharge is observed that represents an immediate hazard or potential hazard to public health or safety or welfare, or to aquatic life, the Director or employees of the sheriff's office,

emergency services, and any other agent of the County designated by the Commissioners, may enter any property or structure, except a dwelling, as necessary to prevent or stop the hazard.

G. A person shall not hinder, prevent, or unreasonably refuse to permit any inspection, investigation, or monitoring under this ordinance.

H. Any person who causes or permits a violation of this ordinance to occur shall apply for a Post Activity Permit and submit a plan and any other document required by the County. This Post Activity Permit Application must be approved by the Director prior to implementation. Any person submitting the post activity permit application must also obtain any required federal, state, County or local permits.

1. The Director may require the owner or operator, in compliance with the plan to:

a. Maintain records to demonstrate compliance;

b. Prepare and file reports to demonstrate compliance; and

c. Sample any soil, air, or water as necessary by using:

1) State certified laboratory;
2) Sampling methods where, when and how the Department requires; and
3) Licensed Professionals.

I. Upon request of the Department, the owner or operator shall provide any records, manifests, and invoices for review. If the documents are not available at the time of the request, the owner or operator shall produce records within the designated time allowed by the Director.

J. A person who has submitted a post activity permit application that has been approved by the Director and any other permitting agency is not in violation of this ordinance provided all requirements are implemented in time frames required by the Department.

K. Any violation of this ordinance is a single violation. Each day a violation continues is a separate violation.

L. In addition to any other remedy allowed by law, the Department may seek injunctive or other appropriate judicial relief to prevent or stop violations of this ordinance.

19.4 Liability for Expenses Caused By a Violation

A. If a drainage violation occurs and is creating an immediate danger to the public health, safety or welfare, the Director shall notify the responsible party by the most expeditious means, and the party notified must respond to correct the drainage violation by the time stated in the notice. If not so corrected, the County may make the necessary corrections. The cost of the corrections must be paid to the County by the person causing the drainage violation. The debt associated for the drainage violation borne by the County is owed to the County. This section does not restrict the County from proceeding directly with alternative enforcement procedures as allowed by law.

19.5 Penalties

A. Civil Action - The County may bring a civil action against any person for any violation of the provisions of this ordinance or adopted or approved storm drainage plan. The action may seek the imposition of a civil penalty of not more than $10,000 against the person, an injunction to prohibit the person from continuing the violation or both.

B. Criminal Action - Any person convicted of violating the provisions of this ordinance shall be guilty of a misdemeanor, and upon conviction thereof, shall be subject to a fine of not more than Five Thousand Dollars ($5,000.00) or imprisonment not exceeding 1 year or both for each and every violation with costs imposed in the discretion of the court. Each day that the violation continues shall be a separate offense. In addition thereof, the Department may institute injunctive or other appropriate action or proceedings at law or equity for the enforcement of this ordinance or to correct violations of this ordinance, and any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions or other appropriate forms of remedy or relief.

20.0 FEES

The County may charge fees for all types of storm drainage related permits, plan reviews, plan review services performed by contractors, other reviews, inspections, waivers, variances, administration costs, re-inspection fees, minimum inspection fees, additional inspection fees due to permit extensions, fees in lieu, or for any cost incurred by the County relative to the permit. Fee amounts shall be as established in the County's Fees & Charges Schedule as amended from time to time.

The County shall also have the authority to charge for reimbursement if the County or their agent has had to respond to a permitted site for safety issues related to drainage. Reimbursements will be based on actual costs incurred by the county, including any administrative costs and/or penalties.

21.0 SEVERABILITY

If any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provisions and such holding shall not affect the validity of the remaining portion of this ordinance; it being the intent of the County Commissioners of Charles County that this ordinance shall stand, notwithstanding the invalidity of any section, subsection, sentence, clause, phrase, or portion hereof.

22.0 EFFECTIVE DATE

And be it further enacted, that this ordinance, as revised, shall take effect August 1, 2010.

23.0 TRANSITION PROVISIONS

The requirements established in this ordinance shall not apply to any permit applications received prior to August 1, 2010 provided those permits are issued and construction begins by May 4, 2012.