

Article 6: Stormwater Regulations

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City of Southport
Unified Development Ordinance (UDO)

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6.1 GENERAL PROVISIONS

A. TITLE, PURPOSE

1. This article shall constitute and be known, and may be cited as the “Stormwater Discharge Control Regulations of the City of Southport, North Carolina.”
2. The purpose of this article is to protect, maintain, and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased stormwater associated with future land development within the City of Southport. Proper management of stormwater runoff will include the following beneficial effects: (a) will minimize damage to public and private property; (b) ensure a functional drainage system; (c) reduce the effects of development on land and stream channel erosion; (d) assist in the attainment and maintenance of water quality standards; (e) reduce local flooding and drainage problems; (f) maintain as nearly as possible the pre- developed runoff characteristics of the area; and (g) facilitate economic development by mitigating associated flooding and drainage impacts.
3. The application of this article and the provisions expressed herein shall be the minimum stormwater discharge control requirements and shall not be deemed a limitation or repeal of any other obligations imposed by state statute or judicial decisions. The City Public Services Director or designee shall be responsible for the coordination and enforcement of the provisions of this article.

B. SCOPE OF ARTICLE

1. No person shall develop any land without having provided for appropriate stormwater discharge control measures to control or manage stormwater runoff, in compliance with this ordinance and North Carolina Department of Environmental Quality (NCDEQ) requirements, unless included in the exemptions of Section C below.
2. No land owner or land operator shall receive any of the building, grading, or other land development permits required for land disturbance activities without first meeting the requirements of this ordinance prior to commencing the proposed activity.

C. EXEMPTIONS FROM REQUIREMENTS

The following activities shall be exempt from these stormwater performance criteria:

1. Any logging and bona fide farm activity which is consistent with an approved soil conservation plan or timber management plan approved by the City, as applicable.
2. Additions or modifications to existing single-family or duplex structures that cumulatively propose to add less than 10,000 square feet of impervious surfaces.
3. Residential development of a single-family dwelling or a duplex on a single existing lot, provided the issuance of a state stormwater permit is not required (i.e. less than 10,000 square feet of impervious surfaces or not more than one (1) acre of land disturbance).

4. Repairs to any stormwater treatment practice deemed necessary by the City of Southport.

D. PERMITS

1. Except where provided elsewhere, development shall not commence without obtaining a Stormwater Permit pursuant to the provisions of this article.
2. The Stormwater Permit Application shall be made by, or on behalf of, the owner(s) or developer(s) of the site for which the permit is sought. The application shall be filed with the City on a form supplied by the City and shall be accompanied with the information identified in the Stormwater Technical Manual.
3. A Stormwater Permit shall not be issued until the following conditions are met:
 - a) Approval by the UDO Administrator of the supporting information.
 - b) Submission and approval of any required easements.
 - c) Submission and approval of any required inspection and maintenance agreements.
 - d) Payment of all fees.
4. If the development requires a Sediment and Erosion Control Permit, the Stormwater Permit will be conditional upon the owner receiving such sediment and erosion permit and upon the filing of a copy of the approved Sediment and Erosion Control Plan and associated Permit to the UDO Administrator.
5. The Stormwater Permit will be valid for one (1) year from the date of issuance or if significant changes in the development are made that change the intent of the permit. Significant changes shall be determined by the UDO Administrator. If significant changes are made, the original Stormwater Permit shall not be valid and a new permit shall be required.

E. REGULATORY CONSISTENCY

This article shall be construed to assure consistency with the requirements of the Clean Water Act and acts amendatory thereof or supplementary thereto, or any applicable implementing regulations.

F. ILLEGAL DISCHARGES

No person shall cause or allow the discharge, emission, disposal, pouring or pumping directly or indirectly to any stormwater conveyance, the waters of the State or upon the land in manner and amount that the substance is likely to reach a stormwater conveyance or the waters of the State or, any liquid, solid, gas, or other substance, other than stormwater; provided that non-stormwater discharges associated with the following activities are allowed on the condition that they do not contain potential pollutants, create erosion, cause sedimentation or impact the existing water quality of the conveyance or of the waters of the State:

1. Potable water line flushing;
2. Landscape irrigation and lawn watering;
3. Uncontaminated pumped groundwater (not including construction dewatering);
4. Diverted stream flows;

5. Naturally rising groundwater and springs;
6. Discharges from potable water sources;
7. Air conditioning condensation;
8. Uncontaminated foundation and footing drains;
9. Uncontaminated water from crawl space pumps;
10. Flows from riparian habitats and wetlands;
11. Dechlorinated (less than 1 ppm total chlorine) swimming pool discharges;
12. Street wash waters;
13. Flows from fire-fighting;
14. Other non-stormwater discharges for which a valid NPDES discharge permit has been approved and issued by the State of North Carolina, provided that any such discharges to the municipal waste water system shall be authorized by the City of Southport.
15. Discharges of hazardous materials released, or having the potential to reach a stormwater conveyance system, shall be contained, controlled, collected and properly disposed. All affected areas shall be restored to their condition pre-existing the discharge event.
16. Persons in control of the hazardous materials immediately prior to their release or discharge, and persons owning the property on which the materials were released or discharged, shall immediately notify the City Fire Chief of the release or discharge, as well as making any required notifications under State and federal law. Notification shall not relieve any person of any expenses related to the restoration, loss, damage, or any other liability which may be incurred as a result of said release, nor shall such notification relieve any person from other liability which may be imposed by State or federal law.

G. ILLICIT CONNECTIONS

1. Any drain or conveyance, whether surface or subsurface, which allows an illegal discharge to enter the storm water conveyance system, is unlawful. Prohibited connections include, but are not limited to, any conveyances which allow any storm water discharge containing sewage, process waste water, commercial washing machine wastewater including commercial vehicle washing, to enter the storm water conveyance system. Any connection thereto from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by a governmental agency is prohibited. Any drain or conveyance from a commercial, residential or industrial land use to the storm water conveyance system which has not been documented in plans, maps or equivalent records and approved by the City is prohibited. The construction, use, maintenance or continued existence of illicit connections to the storm water conveyance system is prohibited.
2. Where such connections exist in violation of this section and said connections were made prior to the adoption of this provision or any other ordinance prohibiting such connections, the property owner or the person using said connection shall remove the connection within one (1) year following the

effective date of this ordinance. However, the one (1) year grace period shall not apply to connections which may result in the discharge of hazardous materials or other discharges which may pose an immediate threat to health and safety, or are likely to result in an immediate injury and harm to real or personal property, natural resources, wildlife, or habitat.

3. Where it is determined that said connection:
 - a) May result in the discharge of hazardous materials, or may pose an immediate threat to health and safety, or is likely to result in immediate injury and harm to real and personal property, natural resources, wildlife, or habitat, or
 - b) Was made in violation of any applicable regulation or ordinance other than this article, the Public Services Director shall designate the time within which the connection shall be removed. In setting the time limit for compliance, the
 - i) The quantity and complexity of the work,
 - ii) The consequences of delay,
 - iii) The potential harm to the environment, to the public health, and to public and private property, and
 - iv) The cost of remedying the damage.

6.2 STORMWATER DISCHARGE CONTROL PRELIMINARY AND DESIGN PLANS

A. STORMWATER DISCHARGE CONTROL PRELIMINARY AND DESIGN PLANS

1. A permit application on the form provided in the Technical Manual accompanied by a Preliminary Stormwater Discharge Control Plan, a maintenance agreement, and a non-refundable permit review fee for each development shall be submitted to the Public Services Director and the UDO Administrator for review and approval by the City of Southport prior to preliminary plan or subdivision approval, unless exempted by Section 6.1.C above. The preliminary stormwater discharge control plan shall contain information as required by the City of Southport Stormwater Management Plan Technical Manual (see Appendix II). Where applicable, the plan must also be submitted to NCDEQ prior to submission to the City.
2. The purpose of the preliminary stormwater discharge control plan is to provide enough information, including engineering calculations, to determine if stormwater discharge control facilities will be needed to control runoff from the proposed development.
3. The City of Southport shall review the preliminary stormwater discharge plan within 45 days after receipt of the plan, and shall recommend:
 - a) Approval of the preliminary stormwater discharge control plan as submitted which calls for construction of stormwater discharge control facilities that comply with this ordinance, or
 - b) Disapproval of the preliminary stormwater discharge control plan.

4. If the preliminary stormwater discharge control plan is disapproved, the City of Southport shall instruct the applicant on the resubmission of a revised plan, and the applicant may make such changes and resubmit same for reconsideration. The City shall review the revised plan within 30 days after receipt of the plan and recommend approval of the changes in the plan or maintenance agreement.
5. Upon approval of the preliminary stormwater discharge control plan, the applicant shall submit a final stormwater discharge control plan (as part of the construction plans) to the City of Southport for review and approval, if stormwater discharge control facilities will be required. If the stormwater discharge control preliminary plan is submitted in sufficient detail and identifies the location and type of facilities needed, the City of Southport can accept the preliminary plan as the final stormwater discharge control design plan.

B. MINIMUM RUNOFF CONTROL REQUIREMENTS AND WAIVER OF REQUIREMENTS

1. The minimum stormwater control requirements shall provide measures necessary to control velocities of flow from stormwater discharge control facilities to a level which will comply with both the North Carolina Soil Erosion Act and North Carolina Administrative Code Section 15A NCAC 2H.1000, Stormwater Management.
2. In addition, stormwater discharge control measures shall be provided to limit the 25-year developed peak discharge rates to existing peak discharge rates for unimproved land (land not having been improved) such as pasture, grassland, meadow, brush, secondary (old field) growth or forest.
3. Improved property (property that has the soil surface exposed or a disturbance to the vegetative cover or topography) that is proposed for redevelopment, whether or not to be paved, containing or to contain structures, or be regraded, shall include stormwater discharge control measures to limit the two-year, ten-year and 25-year design storm discharge rates from exceeding that amount discharged in an unimproved state.
4. For the purposes of this ordinance, the design storm is the storm of 3-hour duration as shown on Chart E-6 in the City of Southport Stormwater Management Plan Technical Manual. The design of these facilities shall be based on procedures contained in the City of Southport Stormwater Management Technical Manual or procedures approved by the City of Southport. The Stormwater Best Management Practices by the NC Department of Environmental Quality (NCDEQ) should also be complied with where applicable.

C. STORMWATER DISCHARGE CONTROL FACILITIES

1. Stormwater discharge control facilities may include both structural and nonstructural elements. Natural swales and other natural runoff conduits shall be retained where practicable.
2. Where additional stormwater discharge control facilities are required to satisfy the minimum control requirements, the following measures are examples of what may be used:

- a) Stormwater detention structures (dry ponds).
 - b) Facilities designed to encourage overland flow, slow velocities of flow, and flow through buffer zones.
 - c) On-site infiltration practices used to control runoff from small areas.
 - d) Reduction of impervious surfaces directly connected to the drainage system.
 - e) Off-site channel improvements designed to contain a 25-year design storm under developed land use conditions (the analysis for the channel improvement shall extend downstream to where the proposed development represents 10 % of the total watershed).
 - f) Other methods acceptable to the City of Southport which assure no harm to downstream properties.
3. Where detention and retention structures are used, designs which consolidate these facilities into a limited number of large structures will be preferred over designs which utilize a large number of small structures.
 4. The stormwater discharge control facilities within the City (including both public and private facilities) will be designed to the same engineering and technical criteria and standards. The City's review will be the same whether the facilities will be under public or private control or ownership.
 5. All stormwater discharge control facilities shall be designed using the Stormwater Best Management Practices developed by the NC Department of Environment and Natural Resources, and in accordance with the design criteria contained in the City of Southport Stormwater Management Technical Manual, or other procedures approved by the City of Southport.
 6. The post-development discharge for the two-year, ten-year and 25-year design storm shall not exceed pre-development discharge including runoff from all upstream flows entering the site under existing conditions.

D. STORMWATER DISCHARGE CONTROL DESIGN PLAN REQUIREMENTS

Stormwater discharge control design plans shall include the following:

1. A determination that no proposed stormwater discharge control facility will create flooding or drainage problems for the 25- and 100-year flood events.
2. Stormwater discharge control design plans shall include designation of all easements needed for inspection and maintenance of the stormwater discharge control facilities. The location of all stormwater management facilities shall be specified prior to recording of easements.
3. A plan for maintenance of all stormwater discharge control facilities shall be included as part of the stormwater discharge control design plan. Maintenance must be the responsibility of the developer, and ultimately, the development owners or homeowners' association. The maintenance plan should be signed and notarized by the developer and/or owner, and a copy provided to the City Public Services Director and UDO Administrator. This agreement will include any and all maintenance easements required to access and inspect the stormwater

discharge practices, and to perform routine maintenance as necessary to ensure proper functioning of the stormwater discharge practice.

4. In determining downstream effects from stormwater discharge control structures and the development, hydrologic-hydraulic engineering studies using the 25-year design storm shall extend downstream to a point where the proposed development represents 10 % of the total watershed. If the discharge calculations indicate that adjacent properties, between the exit of the proposed development and the "10 % downstream point," might be adversely impacted by the proposed development, then the City will require backwater calculations and the determination of flood elevations for the areas impacted.

E. PLAN CRITERIA FOR THE STORMWATER DISCHARGE CONTROL PRELIMINARY PLAN AND THE STORMWATER DISCHARGE CONTROL DESIGN PLAN

The hydrologic criteria to be used for the stormwater discharge control preliminary and stormwater discharge control design plans shall be as follows:

1. 25-year design storms for all detention and retention basins, and
2. All stormwater discharge control designs shall be checked to ensure that no increase in local flooding and flood hazards to adjacent structures and/or property occurs, using the 100-year storm.

F. CITY PARTICIPATION

When the City of Southport determines that additional storage capacity beyond that required by the applicant for on-site stormwater discharge control is desirable to correct unacceptable or undesirable existing conditions or to provide protection in a more desirable fashion for future development, the City, with approval from Board of Aldermen, may:

1. Develop an agreement with the applicant to enlarge the required stormwater discharge control facility, and
2. Participate financially in the construction of such a facility to the extent that such a facility exceeds the required on-site stormwater discharge control required of this ordinance.

G. PERMIT REQUIREMENTS

No building or zoning permits for improvements or plat recordation for a subdivision, for which a stormwater discharge control plan is required, shall be approved or modified by the City without the approval of the following discharge control regulatory items.

1. Right of entry for emergency maintenance.
2. Any recorded off-site easements needed.
3. An approved stormwater discharge control design plan.
4. A maintenance agreement.
5. Recorded easements for stormwater discharge control facilities.

H. PERMIT SUSPENSION AND REVOCATION

1. Notice of Violation. When the City determines that an activity is not being carried out in accordance with the requirements of this ordinance, it shall issue a written notice of violation to the owner of the property. The notice of violation shall contain:
 - a) The name and address of the owner or applicant.
 - b) The address when available or a description of the building, structure, or land upon which the violation is occurring.
 - c) A statement specifying the nature of the violation.
 - d) A description of the remedial measures necessary to bring the development activity into compliance with this ordinance and a time schedule for the completion of such remedial action.
 - e) A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed.
2. Stop Work Orders. Persons receiving a notice of violation will be required to halt all construction activities. This “stop work order” will be in effect until the City confirms that the development activity is in compliance and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner can result in civil, criminal, or monetary penalties in accordance with the enforcement measures authorized in this ordinance.
3. Restoration of Lands. Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the City may take necessary corrective action, the cost of which shall become a lien upon the property until paid.

I. PROFESSIONAL REGISTRATION REQUIREMENTS

1. Stormwater discharge control preliminary and discharge control design plans that are incidental to the design of a residential subdivision shall be prepared by a qualified registered North Carolina Professional Engineer, Surveyor, or Landscape Architect, using acceptable engineering standards and practices. All other stormwater discharge control preliminary and design plans shall be prepared by a qualified registered North Carolina Professional Engineer, using acceptable engineering standards and practices.
2. The engineer, surveyor, or landscape architect shall perform services only in areas of his/her competence, shall undertake to perform engineering, landscape architecture, or land surveying assignments only when qualified by education and/or experience in the specific technical field.

6.3 OWNERSHIP, INSPECTION, AND MAINTENANCE

A. OWNERSHIP AND MAINTENANCE OF STORMWATER DISCHARGE CONTROL FACILITIES

1. Any stormwater discharge control facility required by this article shall be privately-owned and maintained; provided, however, the owner thereof shall grant to the City, a perpetual, nonexclusive easement which allows for public

inspection and emergency repair, in accordance with the terms of the maintenance agreement set forth in Section 6.3.C.

2. Stormwater discharge control facilities shall be publicly owned and/or maintained only if accepted for maintenance by the City. If a stormwater discharge control facility is not accepted by the City, the property owner has the maintenance responsibility for this facility.
3. Private maintenance requirements shall be a part of the deed to the affected property.
4. Should be in compliance with Section K of the City of Southport Stormwater Management Technical Manual.

B. INSPECTION SCHEDULE

1. Prior to the approval of the stormwater discharge control design plan, the applicant shall submit a proposed inspection schedule. The stormwater discharge control design plan shall indicate a phase line for approval otherwise the inspection schedule will be for the entire development. The City may make additional inspections during and after construction if deemed necessary by the City.
2. If a responsible party fails or refuses to meet the requirements of the maintenance covenant, the City, after reasonable notice, may correct a violation of the design standards or the maintenance needs by performing all necessary work to place the facility in proper working condition. If, after an inspection, the condition of a facility presents an immediate danger to the public health, safety, or general welfare due to unsafe conditions or improper maintenance, the City shall have the right, but not the duty, to take such action as may be necessary to protect the public and make the facility safe. Any cost incurred by the City shall be paid by the owner. In addition, the City shall notify the owner(s) in writing of the facility of any violation, deficiency, or failure to comply with this article within 10 days of the discovery of the violation. Upon a failure to correct violations requiring maintenance work within 10 days after, notice thereof, the City may provide for all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the costs of the work performed by the City.
3. The permittee shall provide the City of Southport actual "as-built" plans for any stormwater management practice or facility located on the site after final construction certified by a professional engineer (as outlined in Section 6.3.I).
4. The professional engineer shall certify to the City that:
 - a) The facility has been constructed as shown on the as-built plan, and
 - b) The facility meets the approved stormwater discharge control design plan and specifications or achieves the function for which it was designed.

C. MAINTENANCE AGREEMENT (PRIVATELY-OWNED FACILITIES ONLY)

1. A proposed maintenance agreement shall be submitted to the City for all private on-site stormwater discharge control facilities prior to the approval of the stormwater discharge control design plan and recordation of lots in a subdivision to be served by the discharge control facility. Such agreement shall be in a form and content acceptable to the City and shall be the responsibility of the private owner. The agreement shall identify who will have the maintenance responsibility and shall be recorded by the landowner in the Brunswick County Register of Deeds prior to subdivision recording and/or building permit, and shall be binding on all subsequent owners of land served by the discharge control facility.
2. The maintenance agreement shall specify how proper maintenance of the facilities will be accomplished, and identify a financial arrangement which will assure the long-term financial capability to implement perpetual maintenance procedures. The agreement shall specify the type of security that will be used within the financial arrangement (escrow, letter of credit, etc.).
3. The maintenance agreement shall provide for access to the facility by virtue of a non-exclusive perpetual easement in favor of the City, at reasonable times for inspection by the City to ensure that the discharge control facilities are maintained in proper design working condition.

D. ACCEPTANCE OF CERTIFICATION IN LIEU OF INSPECTIONS

The City of Southport, at its sole discretion, may accept the certification of a registered engineer in lieu of any inspection required by this article.

E. MAINTENANCE RECORDS

The parties responsible for the operation and maintenance of the stormwater facilities should make records of the installation and of all maintenance and repairs of the facility. Such records shall be maintained for a period of five (5) years and shall be made available to the City during inspection of the facilities and upon request at other times.

6.4 MISCELLANEOUS PROVISIONS

A. STORMWATER MANAGEMENT VARIANCE

1. Every applicant shall provide for stormwater management, unless they file a written request to waive this requirement through a formal variance procedure. Request to for a variance from the stormwater management plan requirements shall be submitted to the UDO Administrator for consideration by the Board of Adjustment in accordance with Section 2.7.D.
2. The minimum requirements for stormwater management may be waived in whole or in part upon written request of the applicant, provided that the applicant must demonstrate through a sealed certification by a professional engineer that the immediately downstream waterways will not be subject to: deterioration of existing culverts, bridges, dams, and other structures; deterioration of biological functions or habitat; accelerated streambank or

streambed erosion or siltation; or increased threat of flood damage to public health, life, and property and a finding that at least one (1) of the following conditions applies after satisfaction of the minimum criteria for issuance of a variance as provided in Section 2.7.D.3:

- a) It can be demonstrated that the proposed development is not likely to impair attainment of the objectives of this ordinance.
- b) Alternative minimum requirements for on-site management of stormwater discharges have been established in a stormwater management plan that has been approved by the City of Southport and that is required to be implemented by local ordinance.
- c) Provisions are made to manage stormwater by an off-site facility. The off-site facility is required to be in place, to be designed, and adequately sized to provide a level of stormwater control that is equal to or greater than that which would be afforded by on-site practices and has a legally obligated entity responsible for long- term operation and maintenance of the stormwater practice.
- d) It can be demonstrated that meeting the minimum on-site management requirements is not feasible due to the natural or existing physical characteristics of a site.
- e) Non-structural practices are provided that reduce the generation of stormwater from the site, the size and cost of stormwater storage and provide partial removal of many pollutants are to be used at the site.

3. .

B. FEE IN LIEU OF STORMWATER MANAGEMENT PRACTICES

1. The City may waive all or part of the minimum stormwater management requirements, in lieu of receipt of a fee in an amount as determined by the City. When an applicant obtains a waiver of the required stormwater management, the monetary contribution required shall be in accordance with a fee schedule (unless the developer and the City agree on a greater alternate contribution) established by the City, and based on the cubic feet of storage required for stormwater management of the development in question. All of the monetary contributions shall be credited to an appropriate capital improvements program project and shall be made by the developer prior to the issuance of any building permit for the development.

C. DEDICATION OF LAND

1. In lieu of a monetary contribution, an applicant may obtain a waiver of the required stormwater management by entering into an agreement with the City for the granting of an easement or the dedication of land by the applicant, to be used for the construction of an off-site stormwater management facility. The agreement shall be entered into by the applicant and the City prior to the recording of plats or, if no record plat is required, prior to the issuance of the building permit.

D. APPEALS

The disapproval or required modification of any proposed preliminary stormwater discharge control plans or design plans or the determination of noncompliance or failure to maintain by the City shall entitle the aggrieved person to appeal this decision or lack of action to the Board of Adjustment in accordance with Section 2.7.E. Such appeal must be made in writing to the city clerk and the UDO Administrator within 30 days of written notice of disapproval, or modification of a preliminary or design stormwater discharge control plan, or determination of noncompliance or failure to maintain.

E. PENALTIES

Civil penalties imposed for illegal discharge shall be as follows:

1. First time offenders will be assessed a civil penalty of \$100 per violation or per day for a continuing violation if the quantity of the discharge is less than or equal to five (5) gallons and consists of domestic or household products. If the quantity of the discharge is greater than five (5) gallons or contains non-domestic substances, the offending party shall be assessed a civil penalty of \$1,000 per violation or per day for a continuing violation.
2. Penalties imposed upon repeat offenders willfully committing violations which are identical or substantially similar to previous violations shall be double the amount assessed for the prior violation or per day for a continuing violation, but shall in no event exceed \$10,000 per violation or per day for a continuing violation.
3. All other acts or conditions constituting a violation of this article shall subject the offender to a civil penalty of \$500 per violation or per day for any continuing violation.

6.5 STORMWATER DRAINAGE

Applicants for a major subdivision shall provide an adequate drainage system for the proper drainage of all surface water. The design of such a system shall be subject to the approval of the proposed subdivision in accordance with the procedures outlined in Article 2 in addition to the following:

- A. No surface water shall be channeled or directed into a sanitary sewer.
- B. Where feasible, the subdivider shall connect to an existing storm drainage system.
- C. Where an existing storm drainage system cannot feasibly be extended to the subdivision, a surface drainage system shall be designed to protect the proposed development from water damage.
- D. Surface drainage courses shall have side slopes of at least three (3) feet of horizontal distance for each one (1) foot of vertical distance, and courses shall be of sufficient size to accommodate the drainage area without flooding, and designed to comply with the current State of North Carolina standards and specifications for erosion control, and any locally adopted erosion and sedimentation control ordinances.
- E. Unless necessitated by exceptional topography, and subject to the approval of the Planning Board, street grades shall be not more than 8% nor less than 0.5 %. Grades

approaching intersections shall not exceed 5% for a distance of not less than 100 feet from the centerline of said intersection.

- F. Stream banks and channels downstream from any land disturbing activity shall be protected from increased degradation by accelerated erosion caused by increased velocity of runoff from the land disturbing activity in accordance with current State of North Carolina sedimentation pollution control requirements.
- G. Anyone constructing a dam or impoundment within the subdivision must comply with current State of North Carolina dam construction standards.
- H. In all areas of special flood hazards, all subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.

6.6 RETENTION POND OR SUBSURFACE FACILITY REQUIREMENTS

Within areas zoned for commercial, industrial, or multi-family uses (CBD, BD, HC, LI, HI, MF, PUD, and O/I), retention pond facilities or subsurface drainage facilities shall be required as follows:

- A. For all development which exceeds 40% impervious surface coverage on a parcel or tract of land whose land area is less than one (1) acre in size.
- B. For all development which exceeds 25% impervious surface coverage on parcels or tracts of land whose land area is one (1) acre or more in size.

NOTE: The designer should refer to the NCDEQ, "Erosion and Sediment Control Planning and Design Manual" for supplemental information.

6.7 DETENTION AND WET RETENTION FACILITIES

The City encourages the use of innovative techniques and designs which will provide the necessary protection for the receiving watercourse. These facilities shall be designed for the run-off produced by the 25-year storm and checked for the 100-year storm. The 100-year storm check is to verify that no structures become flooded. Detailed drawings, substantiating data, calculations, and specifications shall be submitted for designs of this nature. The use of open ponds has been utilized most frequently for stormwater control and, therefore, design standards and procedures for this approach have been included in this design guide. However, the City suggests that the developer or owner incorporate stormwater controls into the overall site as an amenity and/or visual enhancement. The following are minimum requirements for detention/retention facilities:

A. MINIMUM SLOPES

Side slopes where vegetation is used for stabilization shall be 2.5 (horizontal) to 1 (vertical) or flatter. The side slopes should be a minimum of 3 to 1 where mowing will be necessary. Where the side slopes are protected with riprap, fabric form, or other approved armoring, side slopes of 2 to 1 will be permitted. Steeper slopes may be approved by the City on a case-by-case basis.

B. VEGETATION

- 1. Vegetation for stabilization of side slopes shall be a hearty ground cover such as the following, listed in order of best overall suitability:

- a) Tall Fescue
 - b) Bermuda Grass
 - c) Pensacola Bahia grass
 - d) Reed Canary Grass
2. All of these are well suited for flooding tolerance and waterways and channels. The bahia grass is excellent for sandy sites. The others spread by rootstocks, making a well anchored and stable ground covering.
 3. The designer shall consult with the Public Services Department regarding landscape standards such as selection, spacing, location, and planting requirements of all grasses and plants which are to be incorporated in the system. Approval of a landscaping plan by the Public Services Department will be required prior to issuance of a construction permit.

C. RISERS

Risers shall be a minimum of 12 inches in diameter and pipes shall be a minimum of 12 inches in diameter to reduce the potential for clogging the outlet system. A trash rack with 4-inch maximum openings shall be provided to avoid pipe clogging. The design shall include consideration of anti-vortex measures were deemed necessary for stability of the outlet structure.

D. DRAIN

The design of the pond should incorporate a method of draining all water by use of a valve assembly. Where this is determined not possible by the reviewing engineer, a well-defined low point shall be constructed to allow for pumping out the facility.

E. OVERFLOW

An emergency outlet or overflow designed for the 100-year storm shall be provided for all detention/retention facilities. This overflow should be designed assuming the principal spillway is obstructed and cannot convey any water.

F. OTHER UTILITIES

No other utilities shall be constructed within five (5) feet of the stormwater detention/retention pond unless specifically approved by the City.

G. LANDSCAPING

Open basins shall be provided with a minimum 5-foot landscaped zone around the periphery of the ponds which have a surface area up to 0.5 acres as measured at the top bank. A minimum 10-foot landscaped zone as measured outward from the top of the bank shall be provided for ponds larger than 0.5 acres.

H. ACCESS

A stable access and maintenance shoulder with a minimum width of 10 feet measured from the top of bank shall be provided, sufficient to allow the periodic removal of sediment from the system. This access shall be coordinated with the landscaping zone around the basin. The landscaping zone shall not be incorporated into the access/maintenance way.

I. FENCING

Fencing for private facilities shall be at the option of the developer.