

PART 4: SPECIFICATION FOR APPLICATION OF THE COLUMBIA DRAINAGE  
ORDINANCE, STORM SEWER DESIGN  
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CITY OF COLUMBIA REGULATIONS  
PART 4

APPLICATION OF THE COLUMBIA DRAINAGE ORDINANCE, STORM SEWER DESIGN

- 4.1            GENERAL – All drainage computations and storm sewer improvements shall be in accordance with the Columbia Drainage Ordinance and the Flood Plain Insurance Program. Flooding from major streams as well as local flash flooding will be considered in design.
- 4.1.1        The Engineering Report and plans shall conform to specifications of Part 1.
- 4.1.2        On small projects, such as a single building, or buildings on one lot, computations need not be submitted with plans. The engineer or architect must state over his signature that the proposed plan meets the Columbia Drainage Ordinance and/or the Flood Damage Prevention Ordinance requirements. For certain projects as defined in state law the certification may be signed by a duly registered landscape architect.
- 4.1.3        On small projects, engineer’s certification may be waived when the project is located in an existing subdivision and when the owner will sign a “hold harmless” statement. (See Item 4.3.1.)
- 4.2            DESIGN PROCEDURES – In determining the required capacities of storm sewers, the following factors are to be considered:
- 4.2.1        Imperviousness of the soil, selection of runoff coefficient.
- 4.2.2        Time of concentration from the upper reaches of the drainage area to the several design points.
- 4.2.3        Area of the drainage area.
- 4.2.4        Flow to be expected for the 10, 25, 50 and 100 year return frequency storm.
- 4.2.5        Water surface elevation of storm water thus calculated.
- 4.3            DESIGN BASIS
- 4.3.1        Flow
- 4.3.1.1      Major and minor streams, as defined in the Columbia Drainage Ordinance, shall be designed to carry the 25 year storm within the improved section of the channel, the 50 year storm within the dedicated drainage easement and the 100 year storm must be contained one foot below the low point of the structure.
- 4.3.1.2      Flow in channels shall be determined by Manning’s equation or Kutter’s formula.
- 4.3.1.3      Runoff may be determined by the “Rational Method.” Other “accepted practice” methods will be approved provided such method produces similar results with regard to runoff.

- 4.3.1.4 Time of concentration shall be determined using the longest path “L” from the upper reaches of the drainage area of the design point. Care should be exercised when determining the average slope over the distance “L”.
- 4.3.1.5 Runoff coefficients used shall be in accordance with the Columbia Drainage Ordinance.
- 4.3.1.6 Nomographs for solution of t and I, such as those published in Seelye’s DATA BOOK FOR CIVIL ENGINEERS, are acceptable.
- 4.3.2 Drainage Materials
- 4.3.2.1 Structures of reinforced concrete, HDPE (corrugated outside, smooth inside), are acceptable provided trench loads and superimposed loads are considered and the proper “n” value applied in accordance with good practice. All types of pipe must be installed according to manufacturer’s guidelines.
- 4.3.2.2 Junction boxes may require sweeps for direction of flow if deemed necessary based on conditions. This is most likely to be required in cases of 48” or larger pipe or 90 degree turn.
- 4.3.2.3 Grades will be such as to produce minimum velocities of 2 f.p.s. Velocities up to 20 f.p.s. are acceptable provided adequate blocking is provided and that this velocity is reduced so as to prevent erosion at the outlet end of the structure.
- 4.3.2.4 Depth of Cover
- 4.3.2.5 Structures shall have adequate cover to prevent damage from traffic and from other structures. All structures and pipe must be installed according to manufacturer’s guidelines.
- 4.3.2.5.1 Depth at inlets shall be such that the distance from the water surface above the inlet to the water surface in the pipe will be equal to or exceed the velocity head ( $v^2/2g$ ) of water in the pipe.
- 4.3.2.6 The street paving and curb and gutter may be utilized to carry a part of the 25 year return frequency rain. Flow allowed in the curb and gutter is the difference between the 10 and 25 year return frequency storm.
- 4.3.2.7 Easement
- 4.3.2.8 All storm drain pipes proposed to be owned and maintained by the City of Columbia shall have a minimum easement width of 20’, of which 15’ shall be continuous on one side of the pipe. Larger easements may be required based on pipe size, location and access feasibility. Additional ingress/egress easements may be required if necessary for maintenance purposes.
- 4.4 FORMS



4.4.1 Form 4A

Engineering Division  
City of Columbia  
Columbia, S.C.

\_\_\_\_\_ 19 \_\_\_\_\_

Property owner and Address:

Property Location: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby request that the storm drainage for the proposed \_\_\_\_\_  
be approved and I understand and agree that:

- a. It shall be incumbent upon the property owner to determine if existing drainage meets the requirements of the proposed use of the property.
- b. The property owner shall hold the City harmless from any or all claims or damages should flooding occur.
- c. Changes in the Columbia Code of Ordinances may void this agreement prior to the issuance of a building permit.

I hereby acknowledge and agree to the conditions stated above.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Property Owner

Approval: \_\_\_\_\_

Date \_\_\_\_\_

City Engineer

PR-41B



4.4.2 Form 4B

Engineering Division \_\_\_\_\_, 19\_\_\_\_  
City of Columbia  
Columbia, S.C.

Property owner and Address: \_\_\_\_\_ Location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby request that the storm drainage for the proposed \_\_\_\_\_  
be approved and I understand and agree that:

- a. The property is below the 100 year flood plain elevation as shown on the Army Corps of Engineers Flood Boundary and Floodway Maps. The 100 year frequency flood elevation in this area, as determined from these maps, is approximately \_\_\_\_\_ feet mean sea level. The City of Columbia Code of Ordinances, Chapter 3, Section 6-3127, requires that the floor elevation of all structures erected within areas designated as flood plain areas shall be protected from flood hazards by filling the building site to an elevation of not less than two (2) feet above the regulatory flood level with such elevations extending not less than twenty-five (25) feet outward from the base of the structure. In the event this cannot be accomplished, the Code of Ordinances provides that service facilities such as electrical, heating and cooling equipment shall not be less than two (2) feet above the regulatory flood level and the floor elevation must be not less than two (2) feet above the regulatory flood level. Therefore the minimum floor elevation must be \_\_\_\_\_MSL and the service facilities such as electrical, heating and cooling equipment must be above elevation \_\_\_\_\_MSL.
- b. Prior to storm drainage approval, the property owner shall provide the City with a property plat showing mean sea level elevations at all property irons, midway of property lines and midway of property. In addition, the property owner shall provide certification by a registered land surveyor that states the first floor was constructed at or above \_\_\_\_\_MSL.
- c. It shall be incumbent upon the property owner to determine if existing drainage meets the requirements of the proposed use of the property and does not result in a negative impact to the operation of the system upstream or downstream of the property

- d. The property owner shall hold the City harmless from any or all claims or damages should flooding occur.
- e. Changes in the Columbia Code of Ordinances may void this agreement prior to the issuance of a building permit.
- f. It is understood that this agreement has no effect on flood insurance rates.

I hereby acknowledge and agree to the conditions stated above.

Date \_\_\_\_\_ Signature \_\_\_\_\_  
Property Owner

Approval: \_\_\_\_\_ Date \_\_\_\_\_  
City Engineer

PR-41C

4.4.3 Form 4C

Engineering Division \_\_\_\_\_, 19\_\_\_\_  
City of Columbia  
Columbia, S.C.

Property owner and Address: \_\_\_\_\_ Location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby request that the storm drainage for the proposed \_\_\_\_\_  
be approved and I understand and agree:

The property is within the regulatory flood area. It is estimated that the ground surface in  
my yard will be inundated by the regulatory flood to a depth of approximately \_\_\_\_\_ feet.

My signature below indicates that I understand that the temporary structure will be  
inundated to some extent from time to time and will hold the City harmless from any and all  
claims should flooding occur.

I hereby acknowledge and agree to the conditions stated above.

Date \_\_\_\_\_ Signature \_\_\_\_\_  
Property Owner

Approval: \_\_\_\_\_ Date \_\_\_\_\_  
City Engineer

PR41D

4.4.4 Form 4D

Engineering Division \_\_\_\_\_, 19\_\_\_\_  
City of Columbia  
Columbia, S.C.

Property owner and Address: \_\_\_\_\_ Location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby request that the storm drainage for the proposed \_\_\_\_\_  
be approved and I understand and agree:

- a. The property may be within the regulatory flood area as indicated on  
\_\_\_\_\_ maps (copy attached).

My signature below indicates that I understand that the temporary structure may be  
inundated to some extent from time to time and will hold the City harmless from any and all  
claims should flooding occur.

I hereby acknowledge and agree to the conditions stated above.

Date \_\_\_\_\_ Signature \_\_\_\_\_  
Property Owner

Approval: \_\_\_\_\_ Date \_\_\_\_\_  
City Engineer

PR-41E

## ORDINANCE

Amending 1979 Code of Ordinances of The City of Columbia, South Carolina, Part 6, Chapter 5  
Storm Drainage

BE IT ORDAINED by the Mayor and Council this 14<sup>th</sup> day of November, 1990, that the 1979  
Code of Ordinances of The City of Columbia, South Carolina, Party 6, Chapter 5 Storm  
Drainage, is amended as follows:

Sec. 6-5001. Purpose and Scope

It is the intent of this ordinance to protect the general health, safety and welfare of the public from hazards and damages of flooding from the various drainage areas in the City, to provide clean and sanitary channels for runoff; to prevent pollution of watersheds, streams and natural drainage channels, to prevent the encroachment of buildings or improvements on natural drainage channels; to protect natural scenic areas; and to provide for the conservation of the natural resources of the area. All subdivisions of land and all developments or improvements of any character which affect drainage in any portion of the City shall be subject to the provisions of these regulations.

1. The title of the chapter is amended to read: Sediment and Erosion Control and Storm Drainage.

2. Sec. 6-5002. Definitions is amended to read as follows:

The following definitions apply to words and terms used in this chapter. All other words shall have their customary meanings.

(1) City Engineer: Means the City of Columbia Engineer

(2) Construction: Any building or erection of a structure or any preparation for same.

(3) Developer: The owner of property or his agent engaged in the subdivision or improvement of land or the construction of structures upon the land within the City, or who makes application for plan approval and a grading permit under the provisions of this ordinance.

(4) Drainage: A general term applied to the removal of surface or subsurface water from a given area either by gravity via natural means or by systems constructed to so remove water, commonly applied herein to surface water.

(5) Drainage system: The surface and subsurface system for removal of water from the land, including both the natural elements of streams, marshes, swales, and ponds, whether of an intermittent or continuous nature, and the man-made elements such as improved open channels, ditches, culverts, retention facilities, and enclosed storm sewers.

(6) Embankment or fill: A deposit of soil, rock or other material placed by man.

- (7) Erosion: The general process by which soil and rock fragments are detached and moved by the action of wind, water, ice, and gravity, either naturally or induced.
- (8) Erosion and sediment control plan: A plan which adequately describes necessary land management practices and control measures, including a timetable or schedule for their implementation, which is necessary to effectively minimize soil erosion and sedimentation, prepared and approved as provided herein for application to a particular land area.
- (9) Flood: A temporary rise in the level of water which results in inundation of areas not ordinarily covered by water.
- (10) Grading: Any displacement or re-arrangement of soil by stripping, excavating, filling, stockpiling, or any combination thereof and including the land in its excavated or filled state.
- (11) Grading permit: A certificate issued to allow performance of work pursuant to an approved erosion and sediment control plan prepared under the provisions of this ordinance.
- (12) Land: Any ground, soil or earth including marshes, swamps, drainage ways, and areas not permanently covered by water.
- (13) Land distribution: Any activity involving the clearing, grading, transporting, filling, and any other activity which causes the land to be exposed to the danger of erosion.
- (14) Primary and secondary drainage channels:
  - a. Primary drainage channel: A drainage channel, stream or creek which drains an area of five hundred (500) acres or more.
  - b. Secondary drainage channel: A drainage channel, stream or creek which drains an area of less than five hundred (500) acres.
- (15) Run-off: The portion of the precipitation on the land which reaches the drainage system.
- (16) Sedimentation: The process which operates at or near the surface of the ground, the deposit of soil, debris, and other materials from either water or land on other ground surfaces or in water channels.
- (17) Structure: Anything constructed or erected, the use of which requires a location on the ground, or attached to something having a location on the ground including, but not limited to, tennis courts, swimming pools, fences, buildings, parking areas, and roads.
- (18) Vegetation: All plant growth, including trees, shrubs, grasses and mosses.

Sec. 6-5003. Responsibility for Improvements – Storm Drain.

- a. Primary Drainage Channels: The improvements of Primary drainage channels shall be the long-range responsibility of the developer and the City. The developer of land or improvements within an area containing a primary drainage channel shall design, plan and carry out his developments in a manner that will not interfere with or restrict the natural flow of water materially change the condition of runoff within the calculated area below the one hundred (100) year maximum flood elevation. Increased runoff and change in primary channels which are created by such developments within primary drainage areas shall be the planning responsibility of the developer and shall be made in accordance with the provisions of this ordinance. The developer may construct the primary channel improvements. If the developer chooses not to construct the necessary primary channel improvements then the City may make these improvements but is not obligated to construct the improvements within any specific time period.
- b. Secondary Drainage Channels: The improvement of secondary drainage areas and its channels shall be the responsibility of the developer.

Sec. 6-5004. Method of Calculating Stream Flow and Runoff – Storm Drain.

The following formula and values shall be used for calculating all stream flow and runoff for the regulations established herein:

- a. The following rainfall frequencies shall be used in the calculations for storm water runoff and facility design depending upon the size of the watershed.

Size-Acres	Frequency-Years
500 - +	50
40 - 500	25
0 - 40	10

- b. Runoff from primary areas greater than five hundred (500) acres may be computed by accepted engineering principles (such as the Kravens Modified Method) as approved by the City Engineer.
- c. Runoff from secondary drainage areas of five hundred (500) acres or less shall be determined by the Rational Formula:

$$Q = (A) (I) (R)$$

Q equals flow in cubic feet per second

A equals area to be drained in acres, determined by field surveys for areas less than one hundred (100) acres, and by latest government quadrangle maps for larger areas.

I equals percent of imperviousness of the area; may vary between seventy to ninety percent (70 to 90%). Coefficients lower than these indicated values may be used; however, in such instances individual block calculations will be submitted with plans.

R equals rate of rainfall over entire drainage area in inches per hour, based on time for concentration and latest government records for area.

- d. The size of closed storm sewers, open channels, culverts, and bridges shall be determined by using the Manning Formula which may be modified for use with runoff determined by the Rational Formula to:

$$Q = 1.486 R^{\frac{2}{3}} S^{\frac{1}{2}} \frac{A}{N}$$

- Q equals discharge in cubic feet per second.  
 A equals cross-sectional area of water in conduit in square feet.  
 R equals hydraulic radius of water in conduit.  
 S equals mean slope of hydraulic gradient in feet of vertical rise per foot of horizontal distance.  
 N equals roughness coefficient.

Note: The City will not accept drainage pipes less than 18” in diameter.

Sec. 6-5005. Primary Drainage Channel Requirements – Storm Drain.

All primary drainage channels which are located within or immediately adjacent to an improvement, development or subdivision shall be protected and improved by the developer as follows:

- a. Drainage easement of satisfactory width to provide working room for construction and maintenance shall be deeded to the City/County. All storm drain pipes proposed to be owned and maintained by the City of Columbia shall have a minimum easement width of 20’, of which 15’ shall be continuous on one side of the pipe. Larger easements may be required based on pipe size, location and access feasibility. Additional ingress/egress easements may be required if necessary for maintenance purposes. All land having an elevation below the 50 year flood elevation for the final improved channel and not protected by levees or dikes or fill shall be dedicated for the purpose of providing drainage and/or utility easement use. Levees, dikes and other fill materials shall not be allowed within the flood plain unless by specific approval of the City Engineer.
- b. The existing channel lying within or immediately adjacent to the subdivision or parcel of land proposed for development or redevelopment shall be cleaned to provide for the free flow of water, and the channel shall be straightened, widened and improved to the extent required to prevent overflow, resulting from a fifty (50) year frequency rainfall, beyond the limits of the dedicated drainage easement provided herein. Proper stabilization methods shall be used, as approved by the City Engineer, to ensure the integrity of the side slopes.
- c. Site improvements shall provide for the grading of all building pads (footing elevation) to an elevation one (1) foot above the one hundred (100) year frequency flood and for a distance of twenty-five (25) feet from the building pad to the one hundred (100) year level or the property line. Certain type structures are permitted within the flood plain if properly “floodproofed” in compliance with the zoning ordinance and building code.

- d. Whenever channel improvements are carried out, sodding, backsloping, cribbing, and other bank protection shall be designed and constructed to control erosion for the anticipated conditions and flow resulting from a fifty (50) year frequency rainfall.
- e. Drainage channels located within street easements shall be placed in an enclosed storm sewer except under the following conditions:
  - 1. Where a paved street surface at least two (2) lanes wide is provided on both sides of an improved channel so as to provide access to abutting properties, or
  - 2. For lots with a double-street-frontage, an open drainage channel is permitted between the rear lot line and the paved street; provided that access from the street to the lot is prohibited both at the time of construction and in the future.
  - 3. When a condition outlined in either above is present, adequate space shall be dedicated as Right-of-Way to provide for maintenance of an improved drainage channel and its bank.
- f. Culverts, bridges, and other drainage structures shall be constructed in accordance with the specifications and design criteria of the City when the City shall have present or future maintenance responsibility.

Sec. Section 6-5006. Secondary Drainage Channels and Surface Requirements – Storm Drain.

Drainage easements of satisfactory width to provide working room for construction and maintenance as determined by the City Engineer shall be deeded to the City for all drainage improvements. Easements shall be a minimum width of 20', of which 15' shall be continuous on one side of the pipe. Larger easements may be required based on pipe size, location and access feasibility. Additional ingress/egress easements may be required if necessary for maintenance purposes.

- a. Secondary drainage channels which have a primary function of collecting surface water from adjacent properties or intercepting and diverting side hill drainage shall be improved open channels.
- b. Secondary drainage channels which have a primary function of transporting water through the block or collecting water from cross channels and which have a drainage area of less than forty (40) acres shall be improved with closed storm sewers; and where the secondary drainage channel has a drainage area of greater than forty (40) acres, an improved open channel or closed storm sewer shall be provided. When the unit area to be drained is less than four (4) acres, the City Engineer may modify the requirements of the first part of this provision to permit a paved open channel, designed for use as a sidewalk, having a minimum width of five (5) feet or meeting current ADA standards and provided with six (6) inch curbs.
- c. Site improvements shall provide for the grading of all building pads (footing elevation) to an elevation one (1) foot above the one hundred (100) year frequency flood and for a distance of twenty-five (25) feet from the building pad to the one hundred (100) year level or to the property line. Certain type structures are permitted

within the flood plain if properly “floodproofed” in conformance with the zoning ordinance and building code.

- d. Drainage channels located within street easements shall be placed in an enclosed storm sewer except under the following conditions.
  - 1. Where a paved street surface at least two (2) lanes is provided for both sides of an improved channel so as to provide access to abutting properties, or
  - 2. For lots with a double-street-frontage, an open drainage channel is permitted between the rear lot line and the paved street; provided that access from the street to the lot is prohibited at the time of construction and in the future.
  - 3. When a condition in either above is present, adequate width shall be dedicated as street right-of-way to provide for the improved drainage channel and its bank.
  
- e. Developments:
  - 1. Single-family residential, duplex or mobile home development: Site grading shall be carried out in such a manner that surface water from each dwelling lot will flow directly to a storm sewer, improved channel, sodded swale, or paved street without running more than two hundred (200) feet.
  - 2. Commercial, industrial, multi-family and institutional development: Roofs, paved areas, yards, courts, courtyards and other impervious surfaces shall be drained into a storm sewer system. Exception: Such drainage may flow directly into a street, curb and gutter system or improved channel when of small area and approved by the City Engineer.
  
- f. Surface water collected on streets shall be diverted to storm drains at satisfactory intervals to prevent overflow of the street. Six (6) inch high curbs and gutters are permitted to carry surface drainage during a twenty-five (25) year frequency rain for the area and grades involved. Drainage area allowed for surface flow on streets at a point of diversion shall not exceed twenty (20) acres, regardless of flow.
  
- g. Open Channels:
  - 1. Open channels shall be provided with an improved sanction that will carry the runoff from a rain of fifty (50) year frequency with protection against channel erosion.
  - 2. Whenever an improved open channel is required or authorized for a secondary drainage channel under the provisions of this ordinance and the channel crosses residential lots which were developed under a Planned Unit Development or where the channel improvement will be designed as an area that will be maintained by a property owner’s association, the Planning Commission staff may recommend a modification of the requirements of the first part of this provisions to permit a channel designed in keeping with landscaping architectural plans, providing all hydraulic requirements to support the overflow resulting from a one hundred (100) year frequency rainfall are met in such a manner as to

prevent flooding of all building pads and the modifications are approved by the City Engineer.

Sec. 6-5007. Design Criteria for Improvements – Storm Drain.

- a. Bridge and Culvert Requirements: All flow of water across continuous streets or alleys shall be through culverts or bridges. Bridges and culverts shall be sized to accommodate a fifty (50) year frequency rain, without increasing the depth of flow in the channel. Design of bridges and culverts shall conform to the current South Carolina State Highway Department construction specifications.
- b. Closed Storm Sewers: Closed storm sewers shall be constructed of precast or prefabricated pipe or built in place of closed box design to conform with City construction specifications. Sizing shall be calculated by the Manning Formula; provided that storm sewers carrying runoff from streets may be designed to serve a ten (10) year frequency rain for the drainage area involved, provided that overflow from a one hundred (100) year frequency rain can reach a suitable outlet without inundating any building pad.
- c. Open Paved Storm Drainage: Open paved storm drainage channels shall be constructed in accordance with City specifications. Side slopes above the paved section shall be shaped and sodded on a slope of three horizontal to one vertical (3:1) or flatter. Fences shall not be erected closer than one (1) foot (measured horizontally) to the edge of the paved section.

Sec. 6-5008. Drainage Areas Outside of Channel Easement – Storm Drain.

The City Engineer shall require improvements to preclude any backup of tail water inundating any areas outside of the dedicated drainage easement in the subdivision or development as a result of a fifty (50) year frequency flood or which might inundate a building pad which is one (1) foot above the one hundred (100) year frequency flood elevation.

Sec. 6-5009. Administration – Storm Drain.

Prior to authorization of any building permit by the Building Official, the City Engineer shall review and approve all such stream flow and storm runoff calculations as he may require of a developer under the terms of this ordinance; and the City Engineer shall have authority to resolve differences in engineering interpretations of all required fifty (50) and one hundred (100) year flood elevations necessary to this ordinance.

Sec. 6-5010. Violation – Storm Drain.

The violation of this ordinance shall be a misdemeanor.

Sec. 6-5011. Conflict with Other Laws – Storm Drain.

Whenever the provision of this Article imposes more restrictive standards than required under any other ordinance, the standards herein contained shall prevail. Whenever the

provisions of any other ordinance require more restrictive standards than are required herein, the requirements of such other ordinance shall prevail.

Sec. 6-5012. Flood Plan Exemption – Storm Drain.

The provisions of this chapter shall not apply within the established regulatory flood plain as shown on the flood boundary and floodway maps filed with the City Engineer by the Federal Insurance Administration of the Federal Emergency Management Agency on March 6, 1981. (Ord. No. 81-11, 3/25/81).

Sec. 6-5013. APPROVED PLAN AND PERMIT REQUIRED FOR LAND DISTURBANCE – SEDIMENT AND EROSION CONTROL

Unless otherwise provided in this ordinance, the surface of land in Columbia shall not be disturbed or changed for any purposes whatsoever, but not including those exemptions outlined in Section 6-5014, except in accordance with an erosion and sedimentation control plan approved by the City Engineer prior to any grading, construction or land disturbance of any nature. The permit shall be valid for a period of two years.

Sec. 6-5014 EXEMPTIONS – SEDIMENT AND EROSION CONTROL

The provisions of this ordinance shall not apply to:

- (1) Agricultural and silvicultural land management and cultural practices, or to the construction of on-farm buildings and structures used in a farming operation.
- (2) Construction or land improvement of a single family residence or its accessory buildings. A single family residence property owner may make land improvements on his single lot without an approved erosion and sediment control plan and without obtaining a grading permit.
- (3) Mining and mineral resource extraction operations conducted in accordance with a valid mining permit issued by the Mining and Reclamation Division of the South Carolina Land Resources Commission.
- (4) Emergency repairs or maintenance of existing structures and facilities which requires ground to be broken. The responsible person shall notify the City Engineer in writing within five working days of such emergency repairs and maintenance actions.
- (5) Construction or land improvement by a state or federal agency conducted in accordance with a state or federal land management program.
- (6) Construction of transmission lines for electricity, water, telephone, gas, sanitary sewers, storm sewers, and other utilities which require disturbance of less than two (2) acres of natural ground surface.
- (7) Construction by public service districts, utility companies, Lexington or Richland County, and the City of Columbia when plans for such construction or improvements include a sedimentation control plan which is certified by a

registered professional engineer or architect to be in conformity with this ordinance. Plans may be certified by a registered landscape architect or Tier B land surveyor as empowered by State law.

**Sec. 6-5015. APPLICATION FOR PLAN APPROVAL AND PERMIT – SEDIMENT AND EROSION CONTROL**

The developer or his representative must submit seven (7) copies of an erosion and sediment control plan prepared in accordance with Section 6-5-23 – Section 6-5025 of this ordinance to the staff of the Columbia Planning Commission. The plan shall be certified to be in conformity with the ordinance by the applicant and by a registered professional engineer or architect. A registered landscape architect or Tier B land surveyor may certify plans as empowered by State Law. The plans must be accompanied by application in writing to the City Engineer for a grading permit to disturb or change land in Columbia.

**Sec. 6-5016. APPLICATION FEE – SEDIMENT AND EROSION CONTROL**

Applications for plan approval and a grading permit shall be accompanied by a non-refundable fee, payable to the City of Columbia. The amount of the application fee shall be determined according to an established schedule. Please see the land disturbance fee schedule on the updated amendment..

**Sec. 6-5017. APPROVAL OR DISAPPROVAL OF APPLICATION – SEDIMENT AND EROSION CONTROL**

(a) The Columbia Planning commission shall forward two copies of the erosion and sediment control plan to the City Engineer. If the plan conforms with the requirements of this ordinance, the City Engineer shall issue the grading permit to the applicant.

(b) If the erosion and sediment control plan does not conform with the requirements of this ordinance, the plan shall be disapproved and the City Engineer shall not issue the grading permit. Written notice of denial of the permit, indicating the reason or reasons for plan disapproval, shall be forwarded to the applicant.

(c) Review of erosion and sediment control plan shall be completed within thirty (30) days or less from the date of submittal until the time a decision is rendered, either approving or disapproving the plan. If, at the end of the thirty (30) day period, a decision has not been rendered, the plan shall be deemed approved and a grading permit issued on demand.

(d) If an erosion and sediment control plan is disapproved and the grading permit denied, the applicant may elect to revise the plan to conform with the provisions of this ordinance and resubmit the application and plan. No additional application fee shall be required for such resubmissions.

(e) The start of actual construction must be schedule with the City Engineer.

**Sec. 6-5018. VARIANCES AND EXCEPTIONS – SEDIMENT AND EROSION CONTROL**

(a) The City Engineer shall have the authority to grant variances and exceptions to any of the provisions of this ordinance in response to application to him showing undue

hardship. Such variance or exception must be in harmony with the general purpose and intent of this ordinance.

- (b) The City Engineer may waive the requirements of Section 6-5015 if he determines that the square footage of the area to be disturbed is negligible and the nature of the disturbing activity is inconsequential. Such waiver shall not waive compliance with the other provisions of this ordinance.

#### Sec. 6-5019. APPEALS – SEDIMENT AND EROSION CONTROL

- (a) Any person aggrieved by any decision of the City Engineer under this Ordinance may appeal to the Planning Commission within sixty (60) days upon written notice to the Secretary of the Planning Commission.
- (b) Any person aggrieved by the decision on an appeal to the Planning Commission may appeal to the court of competent jurisdiction, which shall hear the same. Such appeal shall be filed within thirty (30) days after the Planning Commission decision.

#### Sec. 6-5020. OTHER AUTHORIZATIONS OR REQUIREMENTS – SEDIMENT AND EROSION CONTROL

Where any other authorization, bonds or other sureties are required by applicable laws, regulations, ordinances or decisions of the City Engineer pertaining to any part of the proposed work to be done under the erosion and sediment control plan, the applicant shall, upon request, furnish the City Engineer with satisfactory evidence that such requirements have been met before the commencement of work under an approved plan and grading permit.

#### Sec. 6-5021. EXTENSION OF TIME – SEDIMENT AND EROSION CONTROL

If the applicant is unable to complete the work within the time specified in the approved plan and grading permit, he may, prior to the expiration of such time, present in writing a request to the City Engineer for an extension of time, setting forth the reasons for the requested extension. The City Engineer shall approve or deny the request for an extension of time and may make approval subject to such additional erosion and sediment control measures as may be reasonably required.

#### Sec. 6-5022. RESPONSIBILITY OF APPLICANT – SEDIMENT AND EROSION CONTROL

The applicant shall be responsible for carrying out the prepared work in accordance with the approved erosion and sediment control plan and grading permit, and in compliance with the requirements of this ordinance.

#### Sec. 6-5023. GUIDELINES FOR PREPARATION OF SEDIMENT AND EROSION CONTROL PLANS

Sediment and erosion control plans shall be prepared according to the following guidelines, as applicable, prior to submission to the City Engineer. Plans shall include appropriate measures and practices for erosion and sediment control, installed in a timely sequence during the development process, and maintained to insure their proper functioning.

- (1) Tracts of land vary in suitability for development based on drainage patterns, topography, and soils. Consider the major characteristics of the land area and the kinds of soil in selecting appropriate control measures and practices.
- (2) Expose the smallest practical area of land for the least possible time during development.
- (3) When feasible, retain and protect natural vegetation. Save topsoil, where practical, for replacing on graded areas.
- (4) Use temporary plant cover, mulching, and/or structures to control runoff and protect areas subject to erosion during construction.
- (5) Provide for handling the increased runoff caused by changed soil and surface conditions. Emphasis shall be placed on conservation of existing on-site soil. Effective means include the use of diversion ditches, grasses or surfaced waterways and outlets, enlarged and protected drainage channels, grade control structures, and effective use of street gutters and storm sewers.
- (6) Use sediment basins or other forms of silt traps, where practical, to remove heavy sediment loads from runoff waters leaving the disturbed area.
- (7) Install the permanent vegetative cover and the long-term erosion protection measures or structures as soon as practical in the development process. (See Section 6-5024).

Section 6-5024. CONTENTS OF PLAN AND APPLICATION – SEDIMENT AND EROSION CONTROL

The sediment and erosion control plan and application for grading permit shall include, but not be limited to, the following data as applicable:

- (1) A vicinity map at a scale of 1" = 1,000' sufficient to locate the site and to show the relationship of the site to its general surroundings.
- (2) A site plan, drawn to a scale of not less than 1" = 100' on 24" x 36" sheets and supporting specifications and schedules showing:
  - (a) The boundary lines of the site on which the work is to be performed including the approximate acreage of the site.
  - (b) Existing contours with intervals of not more than five (5) feet. Contours shall extend 100 feet outside the side boundary lines unless waived by the City Engineer.
  - (c) Proposed physical improvements on the site including present development and future utilization, if known.
  - (d) All drainage provisions, flood protection provisions, erosion and sediment control measures, vegetative practices, or other protective devices to be utilized in connection with, or as a part of, the proposed work.

- (e) Provisions for erosion control during construction (temporary) and during the life of the facility (permanent). Such provisions shall include a timing schedule and sequence of operations indicating the anticipated starting and completion dates of the particular development sequence, and the estimated time of exposure of each disturbed area prior to completion of effective erosion and sediment control measures. Specifications accompanying the plan shall include, as appropriate, seeding mixes and application rates, type of sod, seedbed preparation, lime and fertilizer application, mulching, and other related data.
- (f) A complete and adequate grading plan for on-site borrow pits and material processing facilities, where applicable, including provisions for adequate drainage in such areas.
- (g) A general description of the predominant soil types on the site.
- (h) The name and address of the owner, developer, and petitioner, and the individual responsible for satisfactory completion of the work described in the plan, if different from the above.
- (i) Title, scale, north arrow, date and signature of the individual or organization preparing the plan, with seal when applicable.
- (j) The plan and application shall be supported by such supplemental reports, specifications, data, and additional information as the City Engineer may reasonably require, including but not limited to finished contours, elevations, dimensions, locations, slopes, storm drainage computations, and field investigation reports on soils, drainage, and flooding.

(3) Applicant’s Certification Statement

“I (We) hereby certify that all clearing, grading, construction and/or development will be done pursuant to this plan.”

\_\_\_\_\_

Date
Permit Applicant

(4) Design Certification Statement (Amended by Ordinance dated 4/1/92)

I hereby certify that this plan is designed to meet storm drainage requirements and to contain silt on the property concerned to the maximum extent feasible. Provisions for erosion and sediment control and storm drainage are in accordance with the Columbia Sediment and Erosion Control and Storm Drainage Ordinance.

\_\_\_\_\_

Date
Permit Applicant

**Sec. 6-5025. PLAN SPECIFICATIONS AND REQUIREMENTS – SEDIMENT AND EROSION CONTROL**

- (a) All runoff water must be diverted away from all fill slopes or conveyed down the slope in a pipe or hard surface flume. Water and discharge is to be in a protected channel or

waterway. Pipe outlets must be protected to reduce velocity of water. Adjacent landowners must be protected from damage by discharge of storm water.

Sample criteria for the above is found in Soil Conservation Service (SCS) Handbook, Erosion and Sediment Control in Developing Areas, SCLRC.

(b) All diversions, waterways, dikes, dams, etc. in fact any structures installed must meet standards and specifications set forth in SCS Handbook, Erosion and Sediment Control in Developing Areas.

(c) Vegetation Plan for Disturbed Area

(1) Plantings or seedings as contained in the critical area Stabilization Section of SCS Handbook, Erosion and Sediment Control in Developing Areas, must be used.

Sec. 6-5026. ADMINISTRATION AND ENFORCEMENT – SEDIMENT AND EROSION CONTROL

(a) Inspection

The City Engineer or his authorized representative shall periodically inspect the work done under the approved plan and grading permit, as deemed advisable. Upon completion of such work, he shall make a final inspection to determine if the work has been completed in accordance with the plan and permit.

(b) Enforcement

When the City Engineer or his authorized representative finds that the work done or not done under any grading permit issued under the provisions of this ordinance fails to conform to the approved plan, he may, as he deems necessary, by written order direct conformance to the plan, to include the issuance of a written order to comply, to suspend work, or to revoke the permit issued, or seek redress through legal action, or to withhold the release of permanent electric power to the site.

(c) Violations and Penalties

- (1) any person who willfully violates the provisions of Section 6-5013 through Section 6-5026 of this ordinance shall be deemed guilty of a misdemeanor, and upon conviction, shall be imprisoned for not more than six (6) months or fined not more than one thousand dollars (\$1,000.00) or both.
- (2) The governing body of the City of Columbia or its appointed agent may obtain injunctive relief to enjoin violations of the provisions of this ordinance and any person damaged as a result of such violations may, upon a proper showing of such damages, obtain payment therefore by a civil action.

Sec. 6-5027. RELATIONSHIP WITH OTHER LAWS, REGULATIONS, AND ORDINANCES – SEDIMENT AND EROSION CONTROL

Whenever the provisions of this ordinance impose more restrictive standards than are required in or under any other law, regulation, or ordinance, the requirements herein contained shall prevail. Whenever the provisions of any law, regulation, or ordinance require more restrictive standards than are required herein, the requirements of such law, regulation, or ordinance shall prevail.

The effective date of this ordinance is November 14, 1990.

Requested by:

\_\_\_\_\_ s/ \_\_\_\_\_

Approved by:

\_\_\_\_\_

City Manager

ATTEST:

Approved as to form:

\_\_\_\_\_

City Attorney

\_\_\_\_\_ s/ \_\_\_\_\_

City Clerk

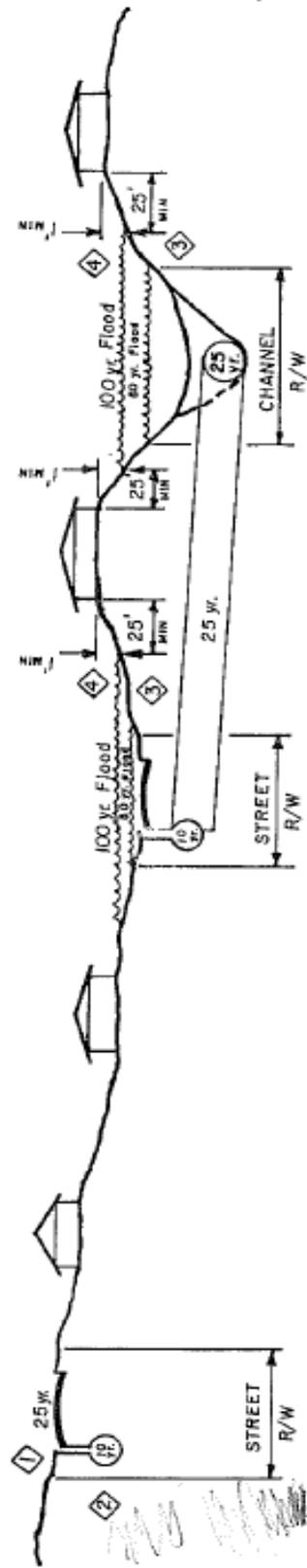
Introduced \_\_\_\_\_

\_\_\_\_\_

Final Reading \_\_\_\_\_

SKETCH ILLUSTRATING STORM DRAINAGE ORDINANCE

- ① FIRST INLET (UPSTREAM) IS PLACED AT THE POINT WHERE THE 25-YEAR FREQUENCY RAIN FILLS THE CURB AND GUTTER SECTION.
- ② AT THAT POINT, THE 10-YEAR FREQUENCY RAIN IS TAKEN INTO PIPED STORM SEWER. ADEQUATE INLETS ARE PROVIDED DOWNSTREAM TO INSURE THAT THE 25-YEAR FREQUENCY RAIN DOES NOT OVER FLOW THE CURB AND GUTTER. THUS THE CURB AND GUTTER PLUS THE STORM SEWER AND INLET SYSTEM CARRIES THE 25-YEAR FREQUENCY RAIN.
- ③ 50-YEAR FREQUENCY STORM CONTAINED IN STREET RIGHT-OF-WAY OR CHANNEL EASEMENT.
- ④ 100-YEAR FREQUENCY FLOOD 1 FOOT BELOW AND 25 FEET FROM HOUSE PAD ELEVATION.



REPRODUCED FROM "MODEL ORDINANCE FOR STORM DRAINAGE SYSTEMS AND IMPROVEMENTS" PREPARED BY CENTRAL MIDLANDS REGIONAL PLANNING COUNCIL.