ORDINANCE NO. 2-92

CITY OF CENTERVILLE, OHIO

SPONSORED BY COUNCILMEMBER James Siegen ON THE 17th DAY OF February, 1992.

AN ORDINANCE AMENDING ORDINANCE NUMBER 14-85, AN ORDINANCE TO ESTABLISH STANDARDS, PRINCIPLES AND PROCEDURES TO REGULATE STORMWATER RUNOFF FROM EARTH DISTURBING ACTIVITIES WHICH CAUSE OR MAY CAUSE ADVERSE IMPACTS OF ACCELERATED SURFACE WATER RUNOFF, SOIL EROSION, OR SEDIMENT DEPOSITION.

WHEREAS, the Council finds that the lands and waters of the City of Centerville are limited resources and that their natural quality is of primary significance in promoting and maintaining the health, safety, and general well-being of all life and inhabitants within its jurisdictional boundaries; and

WHEREAS, the Council finds that lands may become flooded and despoiled or that such waters may become polluted with sediment caused by accelerated storm water runoff and soil erosion resulting from the disruption and alteration of the natural surface character and subsurface composition of land site development and construction activities;

NOW, THEREFORE, THE MUNICIPALITY OF CENTERVILLE HEREBY ORDAINS:

SECTION 1. That Ordinance Number 14-85 is hereby amended as follows with the underlined portions added and the bracketed portions deleted.

SECTION 1. Definitions

1. Approving Agent: means the City Department of Development.

2. Basin: An area which, by virtue of a dam, berm or excavation, is capable of temporarily and/or permanently holding stormwater and/or sediment carried by stormwater runoff.

[2]3. Channel: a natural stream that conveys water; a ditch or channel excavated for the flow of water.

[3]4. Clearing: the clearing, grubbing, scalping, removal of trees and stumps, and removing and

disposing of all vegetation and debris within the site, and shall include the conditions resulting therefrom.

[4]5. Construction: the erection, alteration, repair, renovation, demolition or removal of any building or structure; and the clearing, stripping, excavating, filling, grading, and regulation of sites with connection therewith.

[5]6. Cut: an excavation. The difference between a point on the original ground and a designated point of lower elevation on the final grade. Also, the material removed in excavation.

[6]7. Debris: loose refuse or earth material not suitable for use as presently situated or constituted as determined by the Approving Agent.

[7]8. Developer: any individual, subdivider, firm, association, syndicate, partnership, corporation, trust, or any other legal entity commencing proceedings under this ordinance to effect the development of land for himself or for another.

[8]9. Development: any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

[9]10. Development Area: any contiguous area owned by one person or developed as a single phase or multiple phases [unit] included within the scope of these regulations, upon which earth-disturbing activities are planned or underway.

[10]11. Ditch: an open channel with intermittent flow, either dug or natural, for the purpose of drainage or irrigation. (See stream, drainageway, and grassed waterway).

[11]12. Drainageway: an area of concentrated stormwater [water] flow, other than those defined as a river, stream, ditch or grassed waterway.

13. Dry Detention: The capture and subsequent slow release of stormwater runoff. Capture facilities drain completely between storms.

[12]14. Dumping: the grading, pushing, piling, throwing, unloading, or placing of earth material.

[13]15. Earth-Disturbing Activity: any grading, excavation, filling, or other alteration of the earth's surface where natural or man-made ground cover is destroyed and which may result in or contribute to erosion and sediment pollution.

[14]16. Earth Material: soil, sediment, rock, sand, gravel, and organic material or residue associated with or attached to the soil.

17. Engineer: A professional engineer registered in the State of Ohio.

[15]18. Erosion: (1) the wearing away of the land surface by running water, wind, ice or other geological agents, including such processes as gravitational creep; (2) detachment and movement of soil or rock fragments by wind, water, ice or gravity.

a. Accelerated Erosion - erosion much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of the activities of man.

b. Gully Erosion - a type of erosion caused by water accumulating in narrow channels and over short periods during and immediately after rainfall or snow or ice melt activity which removes soil such that channels become considerably deeper than what would otherwise result by normal smoothing or tilling operations.

c. Natural Erosion (Geological Erosion) - the wearing away of the earth's surface by water, ice, or other natural agents under natural environmental conditions of climate, vegetation, etc., undisturbed by man.

d. Normal Erosion - the gradual erosion of land used by man which does not greatly exceed natural erosion.

e. Rill Erosion - an erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently disturbed soils.

f. Sheet Erosion - the removal of a fairly uniform layer of soil from the land surface by wind or runoff water.

g. Stream bank erosion - the erosion of the stream bank and channel bottom due to high velocity of the flow within the stream.

[16]19. Excavation: any act by which earth, sand, gravel, rock or any other similar material is dug into, cut, quarried, uncovered, removed, displaced, relocated or bulldozed and shall include the conditions resulting therefrom.

[17]20. Fill: (1) any act by which earth, sand, gravel, rock or any other material is placed, pushed, dumped, pulled, transported or moved to a new location above the natural surface of the ground or on top of the stripped surface and shall include the conditions resulting therefrom; (2) the difference in elevation between a point on the original ground and a designated point of higher elevation on the final grade; (3) the material used to make a fill.

[18]21. Finished Grade: the final grade or elevation of the ground surface conforming to the approved grading plan.

[19]22. Floodplain Scour: the abrading and wearing away of the nearly level land situated on either side of a channel due to overflow flooding.

[20]23. Grading: the stripping, cutting, filling, stockpiling, or any combination thereof of earth disturbing activity, including land in its cut or filled conditions.

[21]24. Grassed Waterway: a broad and shallow natural course or constructed channel with erosion resistant grasses or similar herbaceous cover which is used to conduct surface water drainage runoff at non-erosive velocities.

[22]25. Hazard: any danger to public health, welfare and safety including exposure to risk or damage to property or liability for personal injury; or risk of harm to land, air or water resulting in environmental degradation. Hazards can include flooding and ponding, compaction and settling, landslides, earthquakes, toxic chemicals, radiation, fire and disease.

[23]26. Mulching: the application of suitable materials on the soil surface to conserve moisture, hold soil in

place, and aid in establishing plant cover.

[24]27. Natural vegetation: any ground cover in its original state before commencement of earth disturbing activities.

[25]28. Nuisance: a public nuisance as known by common law or in equity jurisprudence.

29. One Hundred-year Floodplain: Any land which is subject to one (1) per cent or greater chance of flooding in any given year, whether or not such land is designated as a flood hazard area by the Federal Insurance Administration or the Federal Emergency Management Agency.

[26]30. Permanent vegetation: producing long term vegetative cover, e.g. bluegrass, tail fescue, crown vetch, etc.

[27]31. Permittee: any person to whom approval of a site plan according and pursuant to this standard is granted, or who is subject to inspection under it.

[28]32. Person: any individual, corporation, partnership, joint venture, agency, unincorporated association, municipal corporation, county, or state agency within Ohio, the federal government, or any combination thereof.

[29]33. Plan: as used in this [standard] Ordinance, "Plan" shall mean the Runoff Control and Sediment Abatement Plan.

[30]34. Plans: profiles, typical cross sections, working drawings and supplemental drawings of site, grading, drainage, and runoff and sedimentation control plans, vicinity map, soil map, and other plan as approved, or exact reproductions thereof, which show the location, character, dimensions, and details of the work.

[31]35. Pollution: the man-induced alteration of the chemical, physical, and biological integrity of air and water resources.

[32]36. Public Waters: those waters within lakes (except private ponds and lakes on single properties), rivers, streams, ditches, and/or waters leaving property on which surface water originates.

37. Retention: The collection and storage of

stormwater runoff without subsequent discharge other than through infiltration into the ground, or evapotranspiration.

[33]38. Runoff: the portion of rainfall, melted snow or irrigation water that flows across the ground surface and eventually is returned to streams.

a. Accelerated Runoff - increased rate and volume of runoff due to less permeable surface or reduced time of concentration primarily caused by urbanization.

b. Peak Rate of Runoff - the maximum rate of runoff for any 24 hour storm of a given frequency.

[34]39. Sediment: solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site or origin by air, water, gravity, or ice, and has come to rest on the earth's surface either above or below water.

[35]40. Sediment Basin: a facility such as a barrier, dam, or other suitable detention facility built across an area of waterflow to settle and retain sediment carried by surface drainage runoff water.

[36]41. Sediment Pollution: failure to use management or conservation practices to abate wind or water erosion of the soil or to abate the degradation of waters by soil sediment in conjunction with land grading, excavating, filling, or other soil disturbing activities.

[37]42. Site: any lot or parcel of land or a series of lots or parcels of land adjoining or contiguous or joined together under one ownership where clearing, stripping, grading or excavating is performed.

[38]43. Slope: [the face of an embankment or cut section; any ground whose surface makes an] rate at which the elevation of the ground changes expressed as the angle the ground makes with the plane of the horizon. Slopes are usually expressed in a percentage based upon vertical difference in feet per 100 feet of horizontal distance.

[39]44. Sloughing: a downward movement of an extended layer of soil over a slope frequently resulting from the undermining action of surface water runoff

or the earth-disturbing activity of man.

[40]45. Soil: all earth material of whatever origin that overlies bedrock, and may include the decomposed zone of bedrock which can be readily excavated by mechanical equipment.

[41]46. Soil loss: soil moved from a given site by the forces of erosion, and redeposited at another location.

[42]47. Steep Slope: a slope over fifteen percent (15%) grade, which is characterized by increased run-off, erosion and sediment hazards.

[43]48. Storm [Frequency] Return Interval: the average period of time in years within which a storm of a given duration and intensity can be expected to be equaled or exceeded.

[44]49. Stream: a body of water running or flowing on the earth's surface or channel in which such flow occurs. Flow is continuous or seasonally intermittent.

[45]50. Stripping: any activity which removes or significantly disturbs the vegetative surface cover.

[46]51. Subdivision: (1) The division of any parcel of land shown as a unit or as contiguous units on the last preceding tax roll, into two or more parcels, sites or lots, any one of which is less than five acres for the purpose, whether immediate or future, or transfer of ownership provided, however, that the division or partition of land into parcels of more than five acres not involving any new streets or easements of access, and the sale or exchange of parcels between adjoining lot owners, where such sale or exchange does not create additional building sites, shall be excepted; or (2) The improvement of one or more parcels of land for residential, commercial or industrial structures or groups of structures involving the division or allocation of land for the opening, widening or extension of any street or streets, except private streets serving industrial structures; the division or allocation of land as open spaces for the common use by owners, occupants or lease holders or as easements for the extension and maintenance of public sewer, water, storm drainage or other public facilities.

[47]52. Subsoil: that part of the soil below the surface soil or plow layer.

[48]53. Surface Soil: the uppermost part (5 to 8 inches) of the soil commonly stirred by tillage implements, or its equivalent in uncultivated soils.

[49]54. Swale: a [low lying stretch of vegetated land] mildly sloped channel or ditch with side slopes less than 4 to 1 which gathers and carries surface water runoff at a reduced rate of flow and conveys it downstream at less erosive velocities.

[50]55. Temporary vegetation: short term vegetative cover used to stabilize the soil surface until final grading and installation of permanent vegetation (i.e., oats, rye or wheat).

[51]56. Topsoil: surface and upper surface soils which presumably are darker colored, fertile soil materials, ordinarily rich in organic matter or humus debris.

[52]57. Watercourse: any natural or artificial waterway (including, but not limited to, streams, rivers, creeks, ditches, channels, canals, conduits, culverts, drains, drainageways, waterways, gullies, ravines, or washes) in which waters flow in a definite direction or course, either continuously or intermittently; and including any area adjacent thereto which is subject to inundation by reason of overflow of flood water.

58. Wet Detention: The capture and subsequent slow release of stormwater runoff. The capture facility has a permanent pool of water in the facility.

SECTION 2. Scope and Intent

1. Any person or persons proposing to develop or redevelop land [for any of the uses listed above] as defined under Section 1, paragraphs 9 and 51 shall design and implement a site grading and drainage development plan which will:

   a. yield quantities of surfacewater runoff from the development site at rates which are the same as or less than those before development occurred and result in rates of gross erosion as specified by Section 3.

b. not result in increasing current potentials for sedimentation of lands, siltation of waters, and flooding of watercourses that are at lower elevations off-site.

2. No changes subject to regulation under this section shall be made in the existing natural surface composition or subsurface configuration of any land proposed for development or redevelopment within the City [for land uses specified under Section 3 (1)] <u>without prior written approval of a site development plan by the approving agent</u>. Approval of a site development plan required according to Section 5 shall not be given:

   a. unless a determination is made by the approving agent that implementation of an approved site grading and drainage development plan would not cause runoff, erosion, and sediment impacts that would be harmful or damaging to the lands and waters off-site, or,

   b. until a plan for minimizing the harmful and damaging potentials of runoff, erosion and sediment impacts anticipated to result from implementation of a proposed site grading and drainage development plan has been approved by the approving agent.

3. Development situations may exist such that the development will have none of the harmful effects associated with increased runoff rates and volumes, or sediment disposition. Such developments are eligible for a waiver from these standards; however, the waiver applies only to the following requirements and may have specific conditions attached by the Approving Agent, including but not limited to:

   a. The preparation of plans, maps and/or information specified in Section 5.

   b. The installation of sediment abatement control devices until such time as site inspection indicates they may be necessary.

   c. Controlling runoff to predevelopment conditions as specified in Section 3, except that stormwater runoff must be controlled to the maximum volume and minimum rate feasible for the site as determined by the approving

agent.

4. The request for a waiver shall be in writing and shall include sufficient detail to determine that granting a waiver will not be detrimental to abutting properties or to the drainage system. However, the waiver does not in any way imply a relaxation of any of the other standards in this regulation including the requirement for adequate on-site drainage, the ability to accept runoff from land tributary to the development or reasonable control of soil erosion and sediment.

   Development activities for which waivers may be considered include the following:

   a. Single family residential developments involving improvement of an individual lot in a previously approved subdivision.

   b. Multi-family residential, commercial or industrial developments which total two (2) acres or less.

   c. Modifications to, or redevelopment of, an existing development which will not result in additional impervious areas.

   [d. Additions of 250 sq. ft. or more to existing property, such as driveways, sidewalks, patios, etc.]

5. Development activities that are exempt from this Ordinance include the following:

   a. Additions of less than 250 sq. ft. to existing property such as driveways, sidewalks, patios, etc.

   b. Regular farming procedures on land designed for such use.

SECTION 3. Stormwater Runoff Control Standards

1. In general, drainage systems shall be designed according to locally accepted design practice, sound engineering judgment and conform to the following:

   a. Storm sewer design shall be sufficient to convey the design storm discharge (Q) with an

average recurrence interval of 10 years so that the pipe flowing full condition (hydraulic grade line at top of pipe) is not extended.

b. Lot grading, in-tract drainage, and street improvements for all subdivisions should be designed so that floods having an average recurrence interval of 100 years or less will not cause inundation or damage to any dwellings. A grading plan for each subdivision will be required to define the lot grading and in-tract drainage. All developments within areas of special flood hazard or delineated on the official National Flood Insurance Program Flood Insurance Rate maps, or as determined by the City, shall comply with FEMA design requirements.

c. All drainage channels, conduits, and other structures located outside the road right-of-way designed to convey public storm runoff (off-site runoff) should be contained in suitable public easements. Easements for open channels should include sufficient area along the channel banks to permit access for maintenance equipment. Open channels may be fenced along both sides through urban areas where necessary to protect the public as well as preventing encroachment upon needed access area.

2. Areas adjacent to open drainageways and ponds shall be graded to preclude the entrance of stormwater except at planned locations. Where retention/detention areas are located on the project periphery, the developer may be required to provide additional landscaping or screening to adequately protect abutting properties.

[1]3. Each development shall provide for the on-site or off-site detention of excess stormwater runoff resulting from that development. For the purpose of this standard, "excess stormwater runoff" shall include all increases in stormwater peak flows and volume resulting from: an increase in the impervious surface of the site, including all additions of buildings, roads, and parking lots; changes in soil absorption caused by compaction during development; modifications in contours, including the filling or draining of small depressional areas, alterations of drainageways, or regrading of slopes; destruction of forest;

alteration of drainageways or installation of collection systems to intercept street flows or to replace swales or other drainageways; or the alteration of subsurface flows, including any groundwater dewatering or diversion practices such as curtain drains, compared with the site in its natural state.

[2]4. Any forseeable increase in rates and volume of site surface drainage water runoff caused by site development shall be controlled so the post-development peak rate of runoff does not exceed that of the predevelopment one-year frequency storm for all 24 hour storms between a one year frequency and the critical storm frequency as determined below. A recommended method which may be used to determine changes in rates and volumes of runoff is presented in the U.S. Department of Agriculture, Engineering Division of the Soil Conservation Service (SCS), Urban Hydrology for Small Watersheds, Technical Release No. 55, (Washington, D.C.: USDA, [January, 1975)] June, 1986 and the Ohio Supplement (April, 1981). To find the critical storm frequency for which additional control will be needed:

a. determine the percent increase in runoff volume for a one year frequency, 24 hour storm, and

b. determine the critical storm frequency for which additional control is needed by using the percent increase in runoff volume, derived in (a), in the table below:

Percent Increase in Runoff Volume from a 1 year Frequency, 24 hour Storm		Critical Storm Frequency
Equal to or Greater Than	Less Than	
%	%	Years
-	10	1
10	20	2
20	50	5
50	100	10
100	250	25
250	500	50
500	-	100

[3]5. [The peak rate of runoff from the critical storm occurring over the development shall not exceed the peak rate of runoff from a 1-year frequency storm occurring over the same area under predevelopment conditions.] Storms of less frequent occurrence (longer return period) than the critical storm, shall have peak rate of runoff not greater than for the same storm under predevelopment conditions. As an example, if the total volume is shown to be increased by 35%, the critical storm is a 5-year storm. The peak rate of runoff for all storms up to this intensity shall be controlled so as not to exceed the peak rate of runoff from a 1-year frequency storm under predevelopment conditions in the area. The runoff from a more intense storm need only be controlled so as not to exceed the predevelopment peak rate from the same frequency of storm.

6. The intent of paragraphs 4 and 5 will be met if the criteria are fulfilled for the 1-, 2-, 5-, 25-, 50- and 100-year storm.

[4]7. Design regulations. All detention facilities and improvements required by this section shall comply with the following regulations.

a. An access easement shall be provided to all detention facilities from the nearest public road so that these facilities are accessible in case emergency maintenance work is required. The minimum easement width will be 10 feet.

[a]b. Storage volumes. Storage may be provided by [set] wet or dry bottom basins or reservoirs [or rooftop storage facilities].

[b]c. Maximum depth. The maximum planned depth of stormwater [stored] detained should be five (5) feet unless site conditions lend themselves to greater depths.

[c]d. Outlet control structures. Outlet control structures shall be designed as simply as possible and shall operate automatically. They will be designed to limit discharges into existing or planned downstream channels or conduits so as not to exceed the existing flow from the site in its natural condition or as further controlled in Section 3(4).

[d]e. Spillway. Emergency overflow facilities shall be provided unless inflow is controlled to divert flows when the basin is at capacity. The spillway shall safely discharge the detention basin overflow without damage to the detention basin. A minimum of one (1) foot freeboard shall be provided for the 100 year 24-hour storm event.

[e]f. Dry bottom basin. For basins designed without permanent pools;

(1) Interior drainage. Provisions must be made to facilitate interior drainage, to include the provision of natural grades to outlet structures, longitudinal and transverse grades to perimeter drainage facilities, or the installation of subsurface drains.

(2) Multipurpose features. These may be designed to serve secondary purposes for recreation, open space, or other types of use which will not be adversely affected by occasional or intermittent flooding.

(3) Cleaning. The basins shall be designed for periodic cleaning and removal of sediments, which shall be removed from the site or otherwise disposed of in an appropriate manner.

[f]g. Wet basins. For basins designed with permanent pools:

(1) Depth for fish. If fish are used to help keep the basin clean, at least one-quarter (25%) of the area of the permanent pool must have a minimum depth of ten (10) feet.

(2) Facilities for emptying. For emergency purposes, cleaning, or shoreline maintenance, facilities shall be provided or plans prepared for the use of auxiliary equipment to permit emptying and drainage.

(3) Pollution abatement. Aeration facilities may be required when the quality of the influent and detention time would result in a lowering of dissolved oxygen content

in the basin.

(4) Slopes. Approach slopes shall be at lease 6:1 but not more than 3:1 and shall be at least four (4) to six (6) feet wide and slope gently toward the basin. The side slopes shall be of nonerosive material with a slope of 1:1 or flatter. The ledge shall be four (4) to six (6) feet wide and slope gently toward the shore to prevent people or objects from sliding into deep water. There shall be a freeboard of twelve (12) to eighteen (18) inches above the high-water elevation on all retention basins. Alternate designs for side slopes may be considered under special circumstances where good engineering practice is demonstrated.

(5) Cleaning. The basins shall be designed to include sediment traps in all inlets. Sediment traps shall be designed to permit periodic cleaning and maintenance. A basin maintenance plan shall be developed to insure that the design depths of the basin will remain over time.

[g]h. Building regulations.

[(1) Rooftop storage. The depth and volume of storage, design of outlet devices and downdrains, elevations of overflow scuppers, design loadings for the roof structure, and emergency overflow provisions. Rooftop storage shall not be permitted to drain directly into sanitary sewers or streets.]

[2](1) Parking lot storage. Paved parking lots may be designed to provide temporary detention storage of stormwater on a portion of their surfaces. Outlets shall be designed to empty the stored waters slowly, and depths of storage must be limited so as to prevent damage to parked vehicles, and storage areas shall be posted with warning signs.

[3](2) Detention storage. All or a portion of the detention storage may also be

provided in underground detention facilities, provided they meet the design regulations of Section 3(7) - (b), (c), and g(3).

(3) Off-site easements for stormwater management facilities will be required when either of the following conditions exist:

a. The discharge is into any man made facility for which the City does not have either a drainage easement or right-of-way.

b. The discharge is into a natural system such that the rate or character (i.e., sheetflow vs. concentrated flow) of the flow at the property line has been changed. The easement will be required to a point at which natural conditions are duplicated.

(4) Design Criteria for Off-site Drainage

Off-site areas which drain to or across a site proposed for development must be accommodated in the stormwater management plans for the development. The stormwater management system for the development must be capable of transporting existing off-site flows through or around the development without increasing stages or flows upstream or downstream of the development. The estimation of the off-site flows must be done separately from the estimation of on-site pre and post-development flows (i.e., separate off-site and on-site hydrographs must be computed due to the typically significant differences in land use characteristics).

(5) For sites containing less than ten thousand (10,000) square feet of total impervious surface, alternatives to detention or retention ponds that utilize landscaped buffers and swale drainage as a means of attenuating rate of runoff are encouraged, provided it can be shown that applicable design and performance

criteria are met.

(6) Measures shall be taken to protect the embankment of detention and retention facilities from erosion and provide a definitive protective flow path downstream of the facility.

SECTION 4. Off-site Drainage Facilities

1. The City may allow or require surface water runoff to be discharged into drainage facilities off the site of development if each of the following conditions are met:

   a. The drainage facilities are constructed and maintained in accordance with the requirements of this article.

   b. Adequate provision is made for acquisition, construction and operating costs of the off-site drainage facilities.

   c. A request to use these drainage facilities and all information related to these proposed drainage facilities should be made a part of the developer's application.

2. The City may allow or require payment of a fee for redevelopment activities in lieu of constructing a detention or retention facility as specified in Section 3. Payment received in lieu of redevelopment detention or retention shall be used for stormwater improvement projects, including the establishment of regional detention systems. The fee shall be based on an amount per square foot of impervious surface (on-site).

3. Whenever deemed practical, necessary and in the public interest, the City may acquire land and construct these drainage facilities, and to the greatest extent possible, the fees and charges for such facilities be sufficient to cover all costs associated therewith, and that such facilities be self-supporting.

SECTION [4]5. Soil Erosion and Sedimentation Control Standards

1. In order to prevent both soil erosion and

sedimentation, a soil erosion and sedimentation control plan shall be required whenever a development will involve any clearing, grading, transporting, or other form of disturbing land by the movement of earth.

2. Sediment deposition caused by accelerated stormwater runoff over a development site or by accelerated erosion due to the sloughing or sliding of surface soil that has been exposed by grading, dumping, stockpiling or any other excavation-related earth disturbances shall be retarded [whenever possible] and confined to within the boundaries of the development site.

3. The accumulative monthly predicted amounts of gross soil loss anticipated from sheet and rill erosion shall be abated to within an average annual rate of fifteen (15) tons per acre during the first year, ten (10) tons per acre for any year thereafter of site development activities and to within five (5) tons per acre per year after site development is completed. The Universal Soil Loss Equation as referenced within the U.S. Department of Agriculture, Soil Conservation Service (SCS), Water Management and Sediment Control for Urbanizing Areas, (Washington, D.C.; U.S. Government Printing Office, June, 1978) or other approved methods shall be used to predict average annual rates of gross soil loss by month from a development site.

4. Specifically, the following protection shall be provided for all disturbed areas: minimize velocities of water runoff, maximize protection of disturbed areas from stormwater runoff, and retain sedimentation within the development site as early as possible following disturbances. A list of major problem areas for erosion and sedimentation control follows. For each one, the purpose(s) of requiring control is described. Soil erosion and sedimentation control measures for all such areas shall be provided with a view toward achieving the specific purpose listed below for which a control plan is required:

   a. Erodable slopes: prevent detachment and transportation of soil particles from slope.

   b. Streams, streambeds, streambanks, bodies of water, lake shorelines: prevent detachment and transportation of soil particles.

c. Drainageways: prevent detachment and transportation of soil particles (which would otherwise deposit in streams, bodies of water, or wetlands); promote deposit of sediment loads (traversing these areas) before these reach bodies of water.

d. Land adjacent to streams, ponds, lakes, and wetlands: prevent detachment and transportation of soil particles.

e. Enclosed drainage structure: prevent sedimentation in structure, erosion at outfall of system, and deposit of sediment loads within system or beyond it.

f. Large flat surface areas (unpaved): prevent detachment of soil particles and their off-site transportation.

g. [Impervious] Pervious surfaces: prevent the detachment and transportation of soil (in response to an increase in the rate and/or volume of runoff of the site or its concentration caused by impervious surfaces).

h. Borrow and stockpile areas: divert runoff from the face of slopes which are exposed in the excavation process; convey runoff in stabilized channels to stable disposal points; leave borrow areas and stockpiles in stable condition.

i. Adjacent properties: prevent their erosion and/or being deposited with sediment.

[5. The Appendix presents graphic examples of erosion and sedimentation control measures and indicates, by asterisk, when any such measure may effectively control the problem area. One or more of each such asterisked measure shall suffice to comply with the requirements of this section.]

SECTION [5]6. Runoff Control and Sediment Abatement Plan Requirements

1. Any person seeking approval of a development proposal shall:

a. provide mapped information about the location and vicinity of the area proposed for

development, and

b. furnish three types of information and maps about the proposed land development and site location: (1) an existing characteristics inventory; (2) a predevelopment conditions assessment; and (3) an abatement control plan.

Minor additions to existing facilities may be exempted from this requirement by the approving agent.

2. Specifically, all proposed land developments shall have plans or maps of an appropriate scale that depict existing and proposed improvements, including, but not limited to;

a. Structures, streets, sidewalks, driveways, parking lots, storm drainage systems and appurtenances, utilities, poles, etc., and

b. Elevations, contour lines, inverts of sewers and drainage facilities etc.

c. Location of the boundary of the 100 year floodplain.

3. Abatement Control Plan Content Requirements.

a. A Runoff Control and Sediment Abatement Plan shall identify how accelerated surface water runoff, increased erosion and sediment deposition induced by site development are to be controlled to within the abatement standards of Sections 3 and [4]5. The developer's engineer shall include in the construction plans a master drainage map showing all existing and proposed features. The map is to be prepared on a 24-inch by 36-inch sheet on a scale not to exceed 1" = 100'. Listed below are the features that are to be included on the drainage map.

1. Drainage boundaries, including all areas draining to the proposed subdivision or development.

2. Sufficient topographical information with elevations to verify the location of all ridges, streams, etc.

3. Highwater data on existing structures

upstream and downstream for the subdivision.

4. Notes indicating sources of highwater data.

5. Notes pertaining to existing standing water, areas of heavy seepage, springs, wetlands, streams, etc.

6. Existing drainage features (ditches, roadways, ponds, etc.). Existing drainage features are to be shown a minimum of 1,000 feet downstream of the proposed development unless the ultimate outfall system is a lesser distance.

7. Subdivision layouts with horizontal and vertical controls, show proposed structures with minimum pad elevations.

8. Proposed drainage features, including locations of inlets, swales, open drainageways, ponding areas, storm sewer, culverts, etc.

9. Delineation of drainage sub-areas.

10. Retention/detention areas shown and ingress/egress areas for retention/ detention facilities.

11. General type of soils (obtain from soil survey of Montgomery County).

12. 10-, 25- and 100-year flood elevations for any areas in or within 100 feet of the property. The source of these elevations shall also be shown on the plans.

13. Description of current ground cover and/or land use.

b. All proposed drainage features and runoff controls are to be designed in accordance with methods and techniques set forth [in the SCS texts cited in Sections 3 and 4 or others approved by the City] in the City's Design Manual.

c. A Runoff Control and Sediment Abatement Plan

shall be comprised of, but not limited to, the following information:

(1) a map rendered on the base which indicates the number, types, dimensions, and locations of all runoff, erosion or sediment control devices to be utilized either temporarily or permanently on a development site,

(2) all pertinent computations made to arrive at the final dimensions of each control device shall be presented along with plan and section view drawings of the same rendered at an appropriate design scale to be agreed upon between the applicant and the approving agent, and

(3) schedules detailing the timing for the installation and maintenance of each control device.

4. Plan Preparation by Professional Engineer

The Drainage and Runoff Control Plan shall be prepared by or under the direct supervision of a Registered Civil Engineer.

SECTION [6]7. Administration and Appeals

1. A developer shall apply and receive the approval of the approving agent prior to the development or redevelopment of land in the City.

2. The approving agent shall review all applications and shall approve those applications determined to be in full compliance with all the requirements of this ordinance.

3. A developer may submit his application seeking approval under the terms of this ordinance in conjunction with an application seeking approval

under the terms of the City Zoning or Subdivision Ordinances. The City Council or the City Planning Commission may act as the approving agent in such cases.

4. The provisions of this ordinance may be varied as follows:

   a. Certain requirements as specified in Sections 3 and [4]5 may be waived administratively by the [Department of Development] approving agent.

   b. The City Council or the City Planning Commission shall have the authority to vary the provisions of this ordinance, when a developer submits his application seeking approval under the terms of this ordinance in conjunction with an application seeking approval under the terms of the City Zoning or Subdivision Ordinances.

   c. All other requests for variances from the provisions of this ordinance may be granted by the City Planning Commission.

5. Variances may be issued by the [Department of Development] approving agent, City Council or the City Planning Commission only if it finds all of the following conditions to exist:

   a. The variance is the minimum necessary to afford relief;

   b. There are exceptional or extraordinary circumstances or exceptional conditions applying to the property in general that do not apply to other properties in the vicinity;

   c. Failure to grant the variance would result in exceptional hardship to the applicant; and,

   d. The authorizing of such variance will not be of substantial detriment to adjacent property or the public interest.

6. Appeal of decisions under the terms of this Ordinance shall be as follows:

   a. A decision by the [Department of Development] approving agent may be appealed in writing to the City Planning Commission within 30 days of

the decision being rendered.

b. A decision by the Planning Commission may be appealed to the City Council within 30 days of a decision being rendered by the Commission.

SECTION [7]8. Compliance Responsibility

1. Performance Liability

No provision of this standard shall limit, increase or otherwise affect the liabilities of the permittee nor impose any liability upon the City not otherwise imposed by law.

2. Operations and Management

During site development, a permittee is responsible for:

a. carrying out all provisions as approved in plan and required by this standard,

b. promptly removing all soil, miscellaneous debris or other materials that may become spilled, dumped or otherwise deposited on any public thoroughfares during transport to and from the development site, and

c. taking precautions to inhibit the deposition of sediment into any sewer system or natural watercourse.

3. Enforcement

a. The developer's engineer shall be required to inspect all drainage facilities under construction and certify their compliance with approved plans and in addition, the City may inspect all drainage facilities while under construction. When facilities are not constructed according to approved plans, the City has the explicit authority to compel compliance and require correction of any situations which are not according to the approved plans.

b. Site development operations shall be subject to inspections by the City to determine whether a site development plan is being implemented in compliance with provisions of

this standard and any plan approval conditions. The applicant shall arrange with the City Inspection Department for scheduling of inspections to ensure effective control of erosion and sedimentation and that all drainage facilities are being completed in accordance to the approved Stormwater Management Plan. Prior to final inspection, the developer's engineer shall provide as-built plans of the detention facilities and outlet control structures documenting facilities are constructed substantially in accordance with approved plans.

c. After each inspection the inspector shall complete a site development status report. If the inspector finds that operations are being conducted by a permittee in violation of an approved plan or provisions of this standard, a stop-work order may be issued at that time.

4. Ownership and Maintenance

Permanent runoff control and sediment abatement installation which are to be privately owned and maintained by an individual or group of property owner(s) shall be:

a. designed and constructed by the permittee with easements sufficient to allow adequate access for inspections, maintenance and corrective actions, if necessary, by the City;

b. inspected as needed by the City to ensure privately owned installations are being properly maintained and, if not, the City may compel the owners to make the necessary repairs at the expense of the owner.

c. maintained as installed by the permittee according to the approved design and not be altered unless approved by the City.

d. Legal/Operation Entity Requirements

1. Acceptable Entities - The City considers the following entities acceptable to operate and maintain runoff and sediment control facilities:

(a) The City;

(b) Non-profit corporations including

homeowners associations, property owners associations, condominium owners associations or master associations;

(c) The property owner or developer is normally not acceptable as a responsible entity especially when the property is to be sold to various third parties. However, the property owner or developer may be acceptable under one of the following circumstances:

(1) The property is wholly owned by said property owner or developer and is intended to be so retained. This would apply to a farm, corporate office or single industrial facility for example.

(2) The ownership of the property is retained by the owner or developer and is either leased to third parties such as in some shopping centers or rented to third parties such as in some mobile home parks for example. To satisfy the requirement, the owner or developer must provide written documentation.

2. Association Requirements

(a) If a Homeowners or Property Owners Association or Master Application is proposed, the developer must submit the Articles of Incorporation for the Association, and Declaration of Protective Covenants or Deed Restrictions, as well as a reference map if referred to in documents. After these are approved, the developer must furnish the Certificate of Incorporation and the recording information (Official Book and page number) for the Declaration.

(b) If a condominium association is

proposed, the developer must supply the Articles of Incorporation for the Condominium Association, and Declaration of Condominium. After the documents are approved, it will be necessary for the developer to forward a copy of the letter from the Montgomery County Recorder's Office stating that the documents are proper for filing.

The Association, be it either a non-profit association or a condominium association, must comply with the applicable provisions of Ohio laws.

(c) The Association must have the following general powers which are reflected in the Articles of Incorporation:

(1) Own and convey property.

(2) Operate and maintain common property specifically the surface water management system as permitted by the City including all lakes, retention areas, culverts and related appurtenances.

(3) Establish rules and regulations.

(4) Assess members and enforce said assessments.

(5) Sue and be sued.

(6) Contract for services (if the Association contemplates employing a maintenance company) to provide the services for operation and maintenance.

(7) The Association must have as members all the homeowners, lot owners, property owners or unit owners.

(8) The Association shall exist in perpetuity; however, if the Association is dissolved, the Articles of Incorporation must provide that the property consisting of the surface water management system shall be conveyed to an appropriate agency of local government. If it is not accepted, then the surface water management system must be dedicated to a similar non-profit corporation.

(9) All other powers necessary for the purposes for which the Association is organized.

(d) The Declaration of Protective Covenants, Deed Restrictions or Declaration of Condominium must set forth the following:

(1) That it is the responsibility of the Association to operate and maintain the surface water management system.

(2) The surface water management system is owned by the association or described therein as common property.

(3) That there be a method of assessing and collecting the assessment for operation and maintenance of the surface water management system.

(4) That any amendment which would affect the surface water management system, including the water management portions of the common areas, must have the prior approval of the City.

(5) That the Declaration of Covenants be in effect for at least 25 years with automatic renewal periods thereafter.

(e) If the documents are not submitted

with the original application, they must be submitted and approved prior to construction. It is advised that the documents be submitted prior to recording to allow comment by the City Solicitor. Modification of these requirements can only be based upon:

(1) Intervening local government requirements of a more stringent nature such as the requirement of a maintenance agreement and posting of bond by the developer.

(2) The uniqueness of the project requiring an alternative entity. Such alternative entity must be evaluated upon an individual basis with any and all necessary agreements or easements in effect before approval will be given.

SECTION [8]9. Penalty

1. Violation of the provisions of this ordinance or failure to comply with any of its requirements shall constitute a misdemeanor of the fourth (4th) degree. Each day such violation continues shall be considered a separate offence. Nothing herein contained shall prevent the City of Centerville from taking such other lawful action as necessary to prevent or remedy any violation.

2. In case any violation order is not promptly complied with, the Approving Agent may request the jurisdiction's legal representative to institute an appropriate action or proceeding at law to exact the penalty provided in this code. Also, the Approving Agent may ask the legal representative to proceed at law or in equity against the person responsible for the violation for the purpose of ordering that person to desist from and correct any action that has impacted or may impact the lands and waters of the City of Centerville and/or surrounding areas.

SECTION 2. This Ordinance shall become effective on the earliest date allowed by law.

Passed this 17th day of February, 1992.

Shirley F. Hunt
Mayor of the City of Centerville, Ohio

ATTEST:

Marie McLaughlin
Clerk of the Council of the City of Centerville, Ohio

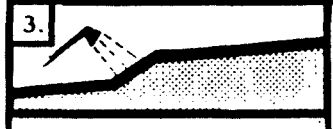
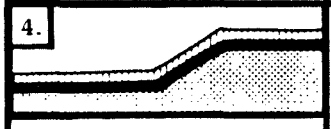
CERTIFICATE

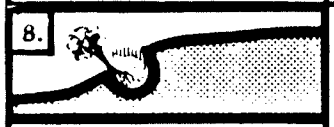
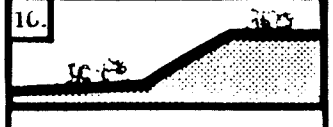
The undersigned, Clerk of the Council of the City of Centerville, Ohio, hereby certifies that the foregoing is a true and correct copy of Ordinance Number 2-92, passed by the Council of the City of Centerville, Ohio on the 17th day of February, 1992.

Marie McLaughlin
Clerk of Council

Approved as to form, consistency with the Charter and Constitutional provisions.
Department of Law
Robert N. Farquhar
Municipal Attorney

APPENDIX

MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
1.  Seeding	Inexpensive and effective, but may require supplemental measures. Stabilizes soil, thus minimizing erosion. Permits runoff to infiltrate soil, reducing runoff volume. Should include prepared topsoil bed.	*	*	*			*		*	*	
2.  Seeding with Mulch	Facilitates establishment of vegetative cover. Effective for drainageways with low velocity. Should include prepared topsoil bed.	*	*	*	*				*	*	
3.  Hydro Seeding	Effective on large areas. Mulch tacking agent used to provide immediate protection until grass is rooted. Should include prepared topsoil bed and supplemental measures, when necessary.	*		*			*		*	*	
4.  Sodding	Provides immediate protection. Can be used on steep slopes where seed may be difficult to establish. Watering until sod is established is desirable. Should include prepared topsoil bed.	*	*	*	*		*		*	*	
5.  Mulching	Used alone to protect exposed areas for short periods. Protects soil from impact of rain. Preserves soil moisture and protects germinating seed.	*		*			*		*		
6.  Sod Retaining Wall	Protects erodable slopes from sheet erosion. Maximum slope is 1:2. Sod, usually 18"×72" is piled, tilting slightly toward the slope.	*									

MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
7.  Willow Webs	Protects slopes that are highly susceptible to erosion. Mulch will improve establishment of plant material.	*	*	*	*						
8.  Brush and Sod	More expensive than other slope stabilization techniques. Provides a high-quality landscape.	*		*	*						
9.  Willow Revetment	Stabilizes cutbanks adjacent to deep water. Aesthetic and wildlife benefits.		*	*	*						
10.  Vegetative Buffer	Use grass, prairie or forest. Slows runoff velocity. Filters sediment from runoff. Reduces volume or runoff on slopes.	*		*	*		*		*	*	
11.  Reed Banks	Stabilizes streambanks. Provides more visually attractive results than purely structural techniques.		*								
12.  Reed Berms	Reduces flow velocity and stabilizes. Breaks wave action. Slightly higher initial costs, but requires little maintenance.		*								

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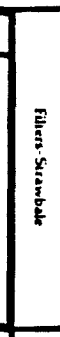
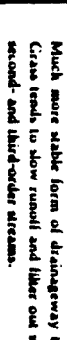
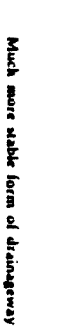
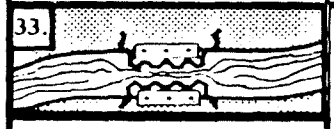
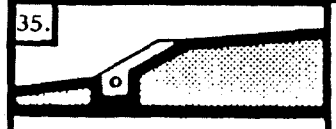
13.  Planter Strips	Traps sediments. Reduces velocity.							*			
14.  Reforestation	Intercepts precipitation and reduces runoff. Aesthetic and wildlife benefits.	*		*	*		*			*	
15.  Native Prairie	Effective in reducing runoff and capturing sediment. Requires maintenance to continue prairie character.			*	*		*			*	
16.  Filters-Strawbale	Filters sediment from runoff. Temporary use for seeded and/or mulched slopes. Staked along contour where slope exceeds 100'	*		*	*				*	*	
17.  Grassed Swale or Waterway	Much more stable form of drainageway than bare channel. Grass tends to slow runoff and filter out sediment. Serves as second- and third-order streams.		*	*	*		*	*			
18.  Wetland Swale	Lowers runoff velocities. Effectively removes sediment from small- and medium-sized storms. Requires careful design and good maintenance. First-order components of drainage system.		*	*	*		*	*			

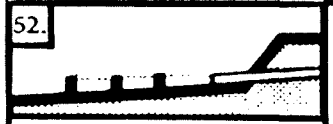
MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
19.  Woodland Swale	Canopy intercepts precipitation and roots slow rate of runoff. Greater installation costs, but lower maintenance costs.		*	*	*		*	*			
20.  Grading and Shaping	Minimizes exposed areas, thus reducing erosion. Water can be diverted to minimize erosion. Flatter slopes ease erosion problems.	*		*	*		*		*	*	
21.  Grubbing Omitted	Saves cost of grubbing. Provides new sprouts. Retains existing root mat system.	*		*	*		*			*	
22.  Compaction	Helps hold soil in place, making exposed areas less vulnerable to erosion.										*
23.  Rip Rap Slope	Used where vegetation is not easily established. Effective for high velocities or high concentration. Permits runoff to infiltrate soil. Dissipates energy flow.		*			*					
24.  Gravel Base	Stabilizes soil surface, thus minimizing erosion. Permits construction traffic in adverse weather. May be used as part of permanent base construction of paved areas.										*

MEASURE	CHARACTERISTICS	EROD. SLOPES	WATER BODIES	LAND ADJ. TO WATER	DRAINAGEWAYS	ENCL. DRAINAGE	LARGE FLAT SURF.	IMPERV. SURF.	BORROW/STOCKPILE	ADJ. PROPERTIES	INTERIM ROADS/PARKING
25. Paving	Provides weather resistant traffic surface, but increases runoff volume and velocity.										*
26. Benches	Reduces runoff velocity by reducing effective slope length. Collects sediment. Provides access to slopes for seeding, mulching, and maintenance.	*									
27. Diversion Berm	Diverts water from vulnerable areas. Collects and directs water to prepared drainageways. May be placed as part of normal construction operation.	*							*	*	
28. Diversion Ditch	Collects and diverts water to reduce erosion potential. May be incorporated in permanent project drainage systems.	*							*	*	
29. Dechannelization	Reduces runoff velocities. Increases sediment deposition in floodplain areas.		*		*						
30. Roughen Surface	Reduces velocity and increases infiltration rates. Collects sediment. Holds water, seed, and mulch better than smooth surfaces.	*					*				

MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
31.  Stockpiling	Topsoil may be stockpiled above borrow areas to act as a diversion. Stockpile should be temporarily seeded.	*					*		*		
32.  Pervious Pavement	Permits greater infiltration and reduces runoff. Expensive to install, but can be a permanent site improvement. Lattice concrete pavers permit grass surface where traffic is not excessive.							*			*
33.  Protect Work Area	Protects erodible bank areas from stream currents during construction. Minimal disruption when removed.		*								*
34.  Retaining Wall	Reduces gradient where slopes are extremely steep. Permits retention of existing vegetation, keeping soil stable in critical areas. Minimizes maintenance.	*									
35.  Seepage Control	Prevents piping and soil slippage on cut slopes.	*									
36.  Curb	Keeps high velocity runoff on paved areas from leaving paved surface. Collects and conducts runoff to enclosed drainage system or prepared drainageway.	*									

MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
37.  Sediment Trap	May be constructed of a variety of materials. Traps sediment and reduces velocity of flow. Can be cleaned and expanded as needed.		*	*	*						
38.  Sediment Basin	Traps sediment. Releases runoff at nonerosive rates. Controls runoff at system outlets. Can be visual amenities.		*	*	*	*					
39.  Sod Filter	Inexpensive and easy to construct. Provides immediate protection. Protects areas around inlets from erosion.					*		*			
40.  Straw or Rock Filter	Can utilize material found on site. Easy to construct. Filters sediment from runoff.					*					*
41.  Inlet Sediment Trap	Easy to shape. Collects sediment. May be cleaned and expanded as needed.					*		*			
42.  Culvert Sediment Trap	Easy to install at inlet. Keeps culvert clean and free flowing. May be constructed of lumber or logs.		*								*

MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
43.  Check Dams	Reduces flow velocity. Catches sediment. Can be constructed of logs, straw, hay, rock, lumber, masonry, or sandbags.		*	*	*						
44.  Weir	Controls sedimentation in large streams. Causes minimal turbidity.		*	*	*						
45.  Windbreak	Minimizes wind erosion. May be snow fence.						*				
46.  Stream Pooling	Reduces scoring and dissipates excess energy. "Dams" need not be impermeable. Catches sediment. Provides aquatic habitats.		*	*	*						
47.  Slope Drain (chute)	Prevents erosion on slopes when runoff cannot be diverted to edges of slope area. Can be temporary or permanent. Slows velocity of runoff.	*									
48.  Slope Drain (pipe)	Prevents erosion on slopes when runoff cannot be diverted to edge of slope area. Usually permanent. Can be constructed as grading progresses.	*									

MEASURE	CHARACTERISTICS	ERODABLE SLOPES	WATER BODIES	LAND ADJACENT TO WATER BODIES	DRAINAGEWAYS	ENCLOSED DRAINAGE STRUCTURES	LARGE FLAT SURFACE AREAS	IMPERVIOUS SURFACES	BORROW AND STOCKPILE AREAS	ADJACENT PROPERTIES	INTERIM ROADS AND PARKING AREAS
49.  Drop Spillway	Slows velocity of flow, reducing erosive capacity.		*	*	*						
50.  Storm Sewer	System removes collected runoff from site, particularly from paved areas. Can accept large concentrations of runoff. Conducts runoff to municipal sewer system or stabilized outfall location. Use catch basins to collect sediment.							*		*	
51.  Catch Basin	Collects high-velocity concentrated runoff. May use filter cloth over inlet.							*		*	
52.  Energy Dissipator	Slows runoff velocity to nonerosive level. Permits sediment collection from runoff.	*		*	*	*					
53.  Level Spreader	Converts collected channel or pipe flow back to sheet flow. Avoids channel easements and construction off project site. Simple to construct.			*	*						
54.  Temporary Crossing	Eliminates stream turbulence and turbidity. Provides unobstructed passage for fish and other water life. Capacity for normal flow can be provided with storm water flowing over roadway.		*								*