MANOR TOWNSHIP

STORM WATER MANAGEMENT ORDINANCE

Adopted May 5, 2014

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ARTICLE I

GENERAL PROVISIONS

SECTION 100 FINDINGS

The governing body of the municipality finds that:

1. Inadequate management of accelerated runoff of storm water resulting from development throughout a watershed increases flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control storm water, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases nonpoint source pollution of water resources.

2. A comprehensive program of storm water management, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, and welfare and the protection of people of the Commonwealth, their resources, and the environment.

(1) Storm water is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

4. Federal and state regulations require certain municipalities to implement a program of storm water controls. These municipalities are required to obtain a permit for storm water discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES).

SECTION 101 PURPOSE

The purpose of this Ordinance is to:

1. Promote the general health, welfare and safety of the community.

2. Regulate the modification of the natural terrain and alteration of existing drainage from land disturbances, new subdivisions and developments in order to control erosion and sedimentation of soils and preserve stream channels.

3. Provide design, construction and maintenance criteria for permanent on-site storm water management and storm drainage facilities for the purpose of controlling storm water, erosion and sedimentation.

4. In the enactment of this Ordinance, it is the intent of the Board of Supervisors to minimize impacts from storm water discharge by requiring the pre-treatment of storm water from large paved areas and related activities.

5. In the enactment of this Ordinance, it is the further intent of the Board of Supervisors to: ensure consistency and compliance with the recommendations for quantity and quality controls, within the Little Conestoga Creek Watershed and the Conestoga River Watershed, that are found in the Little Conestoga Creek Watershed Act 167 Stormwater Management Plan, approved by the Lancaster County Commissioners on April 29, 1998 and by the DEP on June 28, 1998, and the Conestoga River Watershed Act 167 Stormwater Management Plan, approved by the Lancaster County Commissioners on June 8, 2005 and by the DEP on August 29, 2005; to encourage the recharge of groundwater, where appropriate, within the Township; to preserve and restore the flood carrying capacity of streams within the Township; and to maintain existing flows and quality of streams within the Township.

6. Provide standards to meet NPDES MS4 permit requirements.

7. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code 93 to protect, maintain, reclaim, and restore the existing and designated uses of the waters of this Commonwealth.

8. Provide proper operation and maintenance of all facilities and all Storm Water Management BMPs that are implemented within the municipality.

SECTION 102 AUTHORITY

The Board of Supervisors of Manor Township are empowered to regulate these activities by authority of the Act of October 4, 1978, P.L. 864, No. 167, known as the "Storm Water Management Act" and pursuant to the express and implied powers granted to the Board of Supervisors under the Second Class Township Code, Act of May 1, 1933, P.L. 103, No. 69), reenacted and amended July 10, 1947, P.L. 1481, No. 567, as amended hereby enacts and ordains this ordinance as the Manor Township Storm Water Management Ordinance.

SECTION 103 APPLICABILITY

It shall be unlawful for any persons, partnership, business or corporation to undertake any of the following activities without the prior approval from Manor Township:

1. Diversion or piping of any natural or man-made stream channel.

2. Installation of storm water system or appurtenances thereto.

3. Placement of fill, structures or pipes in the floodplain or natural drainage ways.

4. Installation of any impervious cover unless specifically exempted by Section 302 of this Ordinance.

5. Removal of ground cover, grading, filling or excavating when such activity creates a diversion of storm water which increases the quantity, velocity or rate of flow at any point on any adjoining property or otherwise adversely redirects flow of storm water.

6. All activities related to proper operation and maintenance of approved storm water management BMPs and all activities that discharge to a regulated small MS4 are subject to regulation by this Ordinance.

7. Major or Minor Land Disturbances.

SECTION 104 ABROGATION AND GREATER RESTRICTIONS

Approvals issued pursuant to this Ordinance do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act or ordinance. Whenever there is a difference between the minimal applicable standards specified herein and those included in other applicable Township regulations, the regulations of this Ordinance shall apply.

SECTION 105 MUNICIPAL LIABILITY

Except as specifically provided by the Pennsylvania Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. § 608.1 et seq., the making of any administrative decision by the Township or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind of the Township of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, storm water runoff, flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the Township and its officials and employees. The Township Supervisors, by enacting and amending this Ordinance, does not waive or limit any immunity granted to the Township and its officials and employees by the Governmental Immunity Act, 42 Pa. C.S. § 8541 et seq., and does not assume any liabilities or obligations.

SECTION 106 ERRONEOUS PERMIT

Any permit or authorization issued or approved based on false, misleading or erroneous information provided by an applicant is void without the necessity of any proceedings for revocation. Any work undertaken or use established pursuant to such permit or other authorization is unlawful. No action may be taken by a board, agency or employee of the Municipality purporting to validate such a violation.

ARTICLE II

DEFINITIONS

SECTION 201

Unless otherwise stated the following words shall for the purpose of this Ordinance, have the meaning herein indicated. Words in the present tense include the future tense. Words in the singular include the plural and words in the plural include the singular.

1. ACCELERATED EROSION: The removal of the surface of land through the combined action of man's activities and the natural processes at a rate greater than would occur because of the natural process alone.

2. ACT 167 PLAN: A reference to the Little Conestoga Creek Watershed Act 167 Stormwater Management Plan, approved by the Lancaster County Commissioners on April 29, 1998 and by the DEP on June 28, 1998, and the Conestoga River Watershed Act 167 Stormwater Management Plan, approved by the Lancaster County Commissioners on June 8, 2005 and by the DEP on August 29, 2005.

3. AGRICULTURAL ACTIVITY: Activities associated with agriculture such as agricultural cultivation, agricultural operation, and animal heavy use areas. This includes the work of producing crops including tillage, land clearing, plowing, disking, harrowing, planting, harvesting crops or pasturing and raising of livestock and installation of conservation measures. Construction of new buildings or impervious area is not considered an agricultural activity.

4. AGRICULTURAL USE OF LAND: The use of land exclusively for the cultivation of soil, the production of crops or livestock or the science of forestry; also land which has been diverted from agricultural use by an active federal farm program, provided the land has a conservation cover of grass, legume, trees or wildlife shrubs.

5. APPLICANT: A landowner, as herein defined, or agent of the landowner, who has filed an application for a storm water management permit.

6. BEST MANAGEMENT PRACTICE (BMP): Activities, facilities, designs, measures, or procedures used to manage storm water impacts from regulated activities, to meet state water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Storm Water BMPs are commonly grouped into one of two broad categories or measures: “structural” or “nonstructural.” In this Ordinance, nonstructural BMPs or measures refer to operational and/or behavior-related practices that attempt to minimize the contact of pollutants with storm water runoff whereas structural BMPs or measures are those that consist of a physical device or practice that is installed to capture and treat storm water runoff. Structural BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural storm water BMPs are permanent appurtenances to the project site.

7. BMP MANUAL: The Pennsylvania Stormwater Best Management Practices Manual of December 2006, or most recent version thereof.

8. CONSERVATION DISTRICT: A conservation district, as defined in Section 3(c) of the Conservation District Law (3 P. S. § 851(c)) that has the authority under a delegation agreement executed with DEP to administer and enforce all or a portion of the regulations promulgated under 25 Pa. Code 102.

9. CULVERT: A structure with appurtenant works which carries a watercourse under or through an embankment or fill.

10. DEDICATION: The deliberate appropriation of property by its owner for general public use.

11. DEP: also PA DEP or PADEP: The Pennsylvania Department of Environmental Protection or any agency successor to the Pennsylvania Department of Environmental Protection.

12. DESIGN STORM: The magnitude of precipitation from a storm event measured in probability of occurrence (e.g. 10-year storm) and duration (e.g., 24-hour), and used in computing storm water management control systems.

13. DETENTION BASIN: A vegetated basin designed to drain completely after storing runoff only for a given storm event and release it at a pre-determined rate. Also known as a dry pond.

14. DETENTION VOLUME: The volume of runoff that is captured and released into the waters of this Commonwealth at a controlled rate.

15. 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.

16. DEVELOPER: Any landowner, agent of such landowner or tenant with the permission of such landowner, who makes or causes to be made a subdivision of land or a land development, or other activities covered by this Ordinance.

17. DRAINAGE EASEMENT: A right granted by a landowner to a grantee, allowing the use of private land for storm water management purposes.

18. EARTH DISTURBANCE ACTIVITY: A construction or other human activity which disturbs the surface of the land, including, but not limited to: clearing and grubbing; grading; excavations; embankments; land development; agricultural plowing or tilling; operation of animal heavy use areas; timber harvesting activities; road maintenance activities; oil and gas activities; well drilling; mineral extraction; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials. Earth disturbance activity is subject to regulation under 25 Pa. Code 92, 25 Pa. Code 102, or the Clean Streams Law.

19. ENERGY DISSIPATER: A device used to slow the velocity of storm water particularly at points of concentrated discharge such as pipe outlets.

20. FOREST MANAGEMENT/TIMBER OPERATIONS: Planning and activities necessary for the management of forestland. These include conducting a timber inventory, preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation, and reforestation.

21. EROSION: The removal of soil particles by the action of water, wind, ice, or other geological agents.

22. FACILITY DEPTH: For above ground detention/retention/BMP facilities, the facility depth is defined to be the depth between the bottom invert of the lowest orifice and the invert of the spillway. If there is no spillway, the top of the berm shall be used. For basins with no orifices or outlet structure, the bottom elevation of the basin shall be used.

23. GRASSED WATERWAY: A man-made drainage way of parabolic or trapezoidal cross-section shaped to required dimensions and vegetated for safe disposal of runoff. (Also known as a swale.)

24. HOLDING POND: A retention or detention pond.

25. HYDROLOGIC SOIL GROUP (HSG): Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The NRCS defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less pervious as the HSG varies from A to D.

26. IMPERVIOUS SURFACE: A surface which prevents the percolation of water into the ground. Impervious surfaces (or areas) shall include, but not be limited to: roofs; additional indoor living spaces, patios, garages, storage sheds and similar structures; and any new streets or sidewalks. Decks, parking areas, and driveway areas are not counted as impervious areas if they do not prevent infiltration.

27. KARST: A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

28. LAND DEVELOPMENT: The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving: (a) a group of two or more buildings, or (b) the division or allocation of land or space between or among two or more existing or prospective occupants by means of, or for the purpose of, streets, common areas, leaseholds, condominiums, building groups or other features. Also any subdivision of land and development in accordance with Section 503(1.1) of the PA Municipalities Planning Code.

29. LANDOWNER: The legal or beneficial owner or owners of land including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if he is authorized under the lease to exercise the rights of the landowner, or other person having a proprietary interest in land, shall be deemed to be a landowner for the purposes of this Ordinance.

30. LAND DISTURBANCE: Any activity involving grading, tilling, digging or filling of ground, or stripping of vegetation, or any other activity which causes land to be exposed to the danger of erosion.

Land Disturbance Activities shall be classified as follows:

A. Major Land Disturbance Activity:

(1) Any use requiring the submission of a subdivision or land development plan as herein defined;

(2) Any land disturbance not defined as a minor land disturbance activity or deemed to qualify as a minor land disturbance activity by the Township.

(3) Any use involving the diversion or piping of any natural or man-made watercourse or existing drainage pattern;

(4) Any use involving the installation of ground cover, grading, filing, excavation, or disturbance of woodland in excess of one (1) acre except for the use of land for agricultural plowing and tilling and the science of forestry when operated in accordance with approved conservation and erosion control practices;

B. Minor Land Disturbance Activity:

(1) The use of land on an existing lot of record, including subdivided lots or land developments approved under a Major Land Disturbance Activity, provided that:

(a) The use is not within a floodplain area;

(b) No diversion or piping of any natural or man-made water course or existing drainage pattern is involved;

(c) The use creates impervious areas of more than 1,000 sq. ft. and less than 5,000 sq. ft. or involves the removal of ground cover, grading, filling, or excavation of an area less than 5,000 sq. ft.;

(d) The use does not require the submission of a subdivision or land development plan as herein defined.

(2) Any use of the land, which in the opinion of the Township, represents minimal ground disturbance or impact to the environment.

31. MUNICIPALITY: The Township of Manor, Lancaster County, Pennsylvania.

32. NATURAL WATERCOURSE: A natural watercourse or channel (not man-made) with a definite bed and banks which confine and conduct continuously or periodically flowing water.

33. NRCS: USDA Natural Resources Conservation Service previously SCS.

34. ON-SITE STORM WATER MANAGEMENT: The control of runoff to allow water falling on a given site to be absorbed or retained on-site to the extent that after development the peak rate of discharge leaving the site is not significantly greater than if the site had remained undeveloped.

35. PEAK DISCHARGE: The maximum rate of flow of water at a given point and time resulting from a specified storm event.

36. PERSON: An individual, partnership, association, corporation, or other legally recognized entity, and the members of such partnership or association, and the officers of such corporation.

37. PROJECT SITE: The specific area of land where any regulated activities in the municipality are planned, conducted, or maintained.

38. QUALIFIED PROFESSIONAL/PERSON: Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

39. RATE CONTROL: Storm water management controls used to manage the peak flows for the purposes of channel protection and flood mitigation.

40. RATIONAL FORMULA (RATIONAL METHOD): A rainfall-runoff relation used to estimate peak flow.

41. RECORD DRAWINGS: Where a regulated activity constitutes a subdivision or land development, the Final Subdivision or Land Development plan which contains the information the Ordinance requires. Where a regulated activity does not constitute a subdivision or land development, a Storm Water Management Site Plan containing all required information and prepared in a form acceptable to the Office of the Recorder of Deeds for recording.

42. REDEVELOPMENT: Any physical improvement to a previously developed lot that involves earthmoving, removal, or addition of impervious surfaces.

43. REGULATED ACTIVITY: Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect storm water runoff.

44. REGULATED EARTH DISTURBANCE ACTIVITY: Activity involving earth disturbance subject to regulation under 25 Pa. Code 92, 25 Pa. Code 102, or the Clean Streams Law.

45. RETENTION POND: A pond containing a permanent pool of water designed to store runoff for a given storm event and release it at a predetermined rate.

46. RETENTION VOLUME/REMOVED RUNOFF: The volume of runoff that is captured and not released directly into the surface waters of this Commonwealth during or after a storm event.

47. RETURN PERIOD: The average interval, in years, within which a storm event of a given magnitude can be expected to occur one time. For example, the 25-year return period rainfall would be expected to occur on average once every 25 years; or stated in another way, the probability of a 25-year storm occurring in any one year is 0.04 (i.e., a 4% chance).

48. UNOFF: Any part of precipitation that flows over the land.

49. SEDIMENT BASIN: A temporary dam or barrier constructed across a waterway or at other suitable locations to intercept the runoff and to trap and retain the sediment.

50. SMALL PROJECT: Regulated activities that, measured on a cumulative basis from (the date of enactment of this Ordinance or other date as determined by the municipality), create additional impervious areas of 1,000 sq. ft. or less or involve removal of ground cover, grading, filling or excavation of an area less than 5,000 sq. ft. and do not involve the alteration of storm water facilities or watercourses.

51. STATE WATER QUALITY REQUIREMENTS: The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code and the Clean Streams Law.

52. STORM SEWER: A system of pipes, conduits, swales or other similar structures including appurtenant works which carries intercepted runoff, and other drainage, but excludes domestic sewage and industrial wastes.

53. STORM WATER: Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

54. STORM WATER MANAGEMENT: A program of controls and measures designed to regulate the quantity and quality of storm water runoff from a development while promoting the protection and conservation of groundwaters and groundwater recharge.

55. STORM WATER MANAGEMENT BEST MANAGEMENT PRACTICES (SWM BMP) – See BMPs.

56. STORM WATER MANAGEMENT FACILITIES: Those controls and measures used to effect a storm water management program, including BMPs.

57. STORM WATER MANAGEMENT PLAN: The Lancaster County Act 167 Watershed Stormwater Management Plan, “Blueprints”, for managing storm water runoff adopted by the county of Lancaster as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the “Storm Water Management Act.” Also, by reference, the Little Conestoga Creek Watershed Act 167 Storm Water Management Plan and the Conestoga River Watershed Act 167 Storm Water Management Plan.

58. STORM WATER MANAGEMENT SITE PLAN: The plan prepared by the developer or his representative indicating how storm water runoff will be managed at the development site in accordance with this Ordinance.

59. SUFFICIENTLY TREATED: Water treated by storm water management facilities designed to incorporate BMPs sufficient to achieve the performance criteria specified in Section 407 of this Ordinance.

60. SUBDIVISION: The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, transfer of ownership or building or lot development.

61. TOTAL SUSPENDED SOLIDS: The total amount of soils or other particulate matter which is suspended in the water column.

62. TOWNSHIP: The Township of Manor, Lancaster County, Pennsylvania.

63. USDA: United States Department of Agriculture.

64. WATER QUALITY VOLUME: The storage capacity required to treat storm water runoff equivalent to the first 1.2" of runoff from the developed areas of the site.

65. WATERS OF THIS COMMONWEALTH: Any and all rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

66. WATERSHED: Region or area drained by a river, watercourse, or other surface water of this Commonwealth.

ARTICLE III

STORM WATER MANAGEMENT SITE PLAN REQUIREMENTS

SECTION 301 GENERAL REQUIREMENTS

1. Prior to the final approval of any subdivision or land development plan, or the issuance of any permit, or the commencement of any regulated activity, the developer shall submit a Storm Water Management Site Plan to the Township for approval unless this Ordinance provides an exemption in Section 302.

2. Modifications of the provisions of this Ordinance shall be as specified in Section 709.

3. Impervious areas:

   A. The measurement of impervious areas shall include all of the impervious areas in the total proposed development even if development is to take place in stages.

   B. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.

   C. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Ordinance; except that the volume controls in Section 408 and the peak rate controls of Section 405 do not need to be retrofitted to existing impervious areas that are not being altered by the proposed regulated activity.

4. The design of all facilities over karst shall include an evaluation of measures to minimize adverse effects.

5. Infiltration BMPs, to the extent practicable, should be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance.

6. Normally dry, open top, storage facilities shall completely drain the volume control storage over a period of time not less than 24 and not more than 72 hours from the end of the design storm. Any designed infiltration at such facilities is exempt from the minimum 24 hour standard, i.e. may infiltrate in a shorter period of time, provided that none of this water will be discharged into Waters of this Commonwealth. Rate control storage shall drain as required in Section 405.

7. The design storm volumes to be used in the analysis of peak rates of discharge shall be as specified in Section 403..

8. To the maximum extent practicable, incorporate the techniques for Low Impact Development Practices described in the BMP Manual and in the Appendix.

9. Various BMPs and their design standards are listed in the BMP Manual.

10. For all regulated earth disturbance activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained during the regulated earth disturbance activities (e.g., during construction) to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual* (E&S Manual)2, No. 363-2134-008 (April 15, 2000), as amended and updated.

11. For all regulated activities, Storm Water Management BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Storm Water Management Act.

12. All regulated activities shall include such measures as necessary to:

    A. Protect health, safety, and property;

    B. Meet the water quality goals of this Ordinance by implementing measures to:

        (1) Minimize disturbance to floodplains, wetlands, and wooded areas.

        (2) Maintain or extend riparian buffers.

        (3) Avoid erosive flow conditions in natural flow pathways.

        (4) Minimize thermal impacts to waters of this Commonwealth.

        (5) Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.

SECTION 302 EXEMPTIONS

1. Activities on lands which have an approved Storm Water Management Site Plan, which was approved prior to the adoption of this Ordinance and which, in the opinion of the Township, adequately manage storm water flows resulting from the proposed activities, are exempt from the requirements of this Ordinance.

2. The following activities are exempt from the requirements of this Ordinance except for Sections 302.3 and 302.4.

    A. Regulated activities that create additional impervious areas less than or equal to 1,000 sq. ft., or disturbed areas less than or equal to 5,000 square feet on existing lots of record, and which are improved with an existing principal building, are exempt from the requirements of this Ordinance except for Section 302.6. This exemption will be applied on a cumulative basis for the subject property. A completed copy of the form in the Appendix is required to obtain this exemption.

    B. Deminimus activities, such as gardening less than 5000 square feet, lawn mowing, snow removal and the like.

C. Agricultural activity, when operated in accordance with a conservation plan, nutrient management plan, or erosion and sedimentation control plan approved by the County Conservation District.

D. Forest management and timber operations provided the activities are performed according to the requirements of Chapter 102.

3. PennDOT construction and road maintenance activities are regulated under 25 Pa Code Chapter 102. Design policy pertaining to storm water management facilities for PennDOT roadways and associated facilities are provided in Sections 13.7 (Antidegradation and Post Construction Storm Water Management Policy) of PennDOT Publication No. 13M, Design Manual Part 2 (August 2009), as developed, updated, and amended in consultation with PA DEP.

4. The municipality may deny or revoke any exemption pursuant to this Section at any time for any project that the municipality believes may pose a threat to public health, safety, property or the environment.

SECTION 303 MINOR LAND DISTURBANCE/SMALL PROJECT

1. The Minor Land Disturbance Plan shall include a general plan of the lot configuration, existing and proposed building locations, location and square footage of proposed impervious area or land disturbance, grading, storm water management facilities, and erosion and sedimentation control facilities.

2. The Plan need not demonstrate literal compliance with all the provisions of this Ordinance, however the plan shall demonstrate that the proposed activity will comply with the intent of this Ordinance as provided for in Section 103.

3. The Minor Land Disturbance Plan shall provide for volume control but shall not be required to provide for rate control.

4. The Township may require additional information, or invoke any section of this Ordinance, as deemed necessary to adequately demonstrate compliance with the intent of this Ordinance. These requirements may be appealed to the Township Supervisors.

SECTION 304 MAJOR LAND DISTURBANCE STORM WATER MANAGEMENT SITE PLAN CONTENTS

All activities regulated by Section 103 of this Ordinance, and not exempted by Section 302, shall prepare a Storm Water Management Site Plan. The Storm Water Management Site Plan shall consist of all applicable calculations, maps and plans, including all plans, reports, and correspondence with the Lancaster County Conservation District. All Storm Water Management Site Plan materials shall be submitted to the Municipality in a format that is clear, concise, legible, neat and well organized.

1. <u>The Following General Information:</u>

A. Proposed name or identifying title of project.

B. Name and address of the landowner and developer of the project site.

C. Total acreage of the project site and the tract of land on which the project site is located.

D. A location map, for the purpose of locating the project site to be developed, at a minimum scale of two thousand (2,000) feet to the inch, showing the relation of the tract to adjoining property and to all streets and Township boundaries existing within one thousand (1,000) feet of any part of the tract of land on which the project site is proposed to be developed.

E. Certificate for Approval by the Township's Authorized Staff Representative. See form of certificate in the Appendix.

F. A modification to a submitted Storm Water Management Site Plan that involves a change in Storm Water Management BMPs or techniques, or that involves the relocation or redesign of Storm Water Management BMPs, or that is necessary because soil or other conditions are not as stated on the Storm Water Management Site Plan as determined by the municipality shall require a resubmission of the modified Storm Water Management Site Plan in accordance with this Article.

2. <u>The Following Existing Features</u>

A. Tract boundaries showing distances, bearings and curve data, as located by field survey or by deed plotting.

B. Existing contours at vertical intervals of one (1) foot for land with an average slope of 0 to 3 percent, two (2) feet for land with an average natural slope of 4 to 20 percent and at vertical intervals of five (5) feet for land with an average slope of 21 percent and greater; except that for residential and agricultural uses where a preliminary subdivision or land development plan is not required by the controlling Subdivision and Land Development Ordinance, no contours shall be required; however, the plan should indicate the natural drainage patterns of the site along with the approximate grades of all slopes. Where contours are shown, the location of the benchmark and the datum used shall also be indicated.

C. The names of all owners of all immediately adjacent unplatted land, the names of all proposed or existing developments immediately adjacent, and the locations and dimensions of any streets or easements shown thereon.

D. The names, locations and dimensions of all existing streets, railroads, watercourses, drainage facilities, floodplains, and other significant features within two hundred (200) feet of any part of the tract proposed to be developed and the location of all buildings and approximate location of all tree masses within the tract.

E. Soil types as designated by the USDA SCS Soil Survey of Lancaster County.

F. The locations of all existing utilities (including on lot disposal systems and wells), sanitary sewers, and water lines and associated easements.

3. The Following Proposed Features:

A. The proposed land use, the number of lots and dwelling units and the extent of commercial, industrial or other nonresidential uses.

B. The locations and dimensions of all proposed streets, parks, playgrounds, and other public areas; sewer and water facilities; lot lines and building locations, and parking compounds and other impervious and semi-pervious surfaces.

C. The proposed changes to land surface and vegetative cover including areas to be cut or filled.

D. Final contours at vertical intervals of one foot for land with an average slope of 0 to 3 percent, two (2) feet for land with an average natural slope of 4 to 20 percent and at vertical intervals of five (5) feet for land with an average slope of 21 percent and greater.

E. Where existing contours are not shown or where proposed contour lines cannot be accurately located (i.e., as in a single family detached residential development when the building has not been deter-mined), arrows indicating general surface runoff flow patterns shall be shown.

4. The Following Storm Water Management Facilities and Information:

A. All storm sewers along with any proposed connections to existing facilities.

B. Groundwater recharge methods such as seepage pits, beds or trenches. When these structures are used, the locations of septic tank infiltration areas and wells must be shown.

C. Other control devices or methods such as roof-top storage, grass swales, parking lot ponding, vegetated strips, and detention or retention basins.

D. Plans and profiles of all proposed storm water management facilities including vertical and horizontal alignment, size and type of material. This information shall be of the quality required for the construction of all facilities.

E. When plan applications, whether preliminary or final, are submitted in sections, a generalized Storm Water Management Site Plan for the entire project site shall be submitted in addition to the detailed Storm Water Management Site Plan for the proposed section. This generalized plan shall demonstrate how the storm water of the proposed section will relate to the entire development. The amount and velocity at the discharge point of the section shall be included in the data submitted. If temporary facilities are required for construction of a section, such facilities shall be included in the submitted plans.

F. A note on the plan indicating any area that is not to be offered for dedication along with a statement that the Township is not responsible for maintenance of any area not dedicated to and accepted for public use, and that no alteration to swales, or basins, or placement of structures shall be permitted within easements

G. A certificate, signed and sealed by an individual registered in the Commonwealth of Pennsylvania and qualified under all applicable local and State laws to perform such duties, indicating the compliance of the design of the storm water management facilities with the provisions of this Ordinance.

H. A Declaration of Adequacy/Highway Occupancy Permit from the Penn DOT District Office when utilization of a Penn DOT storm water facility is proposed.

I. For any activities that require a DEP Joint Permit Application and are regulated under Chapter 105 or Chapter 106, require a Penn DOT Highway Occupancy Permit, or require any other permit under applicable state or federal regulations, the permit(s) shall be part of the Storm Water Management Site Plan and must be obtained prior to final plan approval.

5. Erosion and Sedimentation Controls

The type, location and extent of all erosion and sedimentation control measures shall be shown on an erosion and sedimentation control plan that conforms to the requirements of the Soil Erosion and Sedimentation Control Manual of the Pennsylvania Department of Environmental Protection and the Design Standards of Section 406 of this Ordinance.

A. Written Report, including the following information.

(1) Storm water runoff calculations for both pre-development and post-development conditions.

(2) An erosion and sedimentation control plan narrative that conforms to the requirements of the Soil Erosion and Sedimentation Control Manual of the Pennsylvania Department of Environmental Protection and provides a description of all erosion and sedimentation control measures, temporary as well as permanent, including the staging of earth moving activities, sufficient in detail to clearly indicate their function.

(3) An ownership and maintenance program, in recordable form, that clearly sets forth the ownership and maintenance responsibility of all temporary and permanent storm water management facilities, BMPs and erosion and sedimentation control facilities, including:

(a) Description of temporary and permanent maintenance requirements.

(b) Identification of a responsible individual, corporation, association or other entity for ownership and maintenance of both temporary and permanent storm water management and erosion and sedimentation control facilities.

(c) Establishment of suitable easements, a minimum of twenty (20) feet wide for access to all facilities.

(d) The intent of these regulations is to provide private ownership and maintenance of storm water management and erosion and

sedimentation control facilities. Where the Township Supervisors accepts dedication of storm water management facilities, the Township Supervisors may require the developer to establish, at the time of dedication, a maintenance fund, in an amount determined by the Township, adequate for the perpetual care of such facilities, including detention basins.

(e) For all proposed detention basins and retention basins, except temporary sedimentation basins, the documentation shall include a plotting or tabulations of storage volumes with corresponding water surface elevations and the outflow rates for those water surfaces.

(f) For all proposed detention basins and retention basins, except temporary sediment basins, documentation shall set forth the design hydrograph, the shortcut routing method or a method of equal caliber acceptable to the Township Engineer, utilized to determine the function of the basin.

(g) A Pennsylvania Department of Transportation Highway Occupancy Permit for any storm water management facility proposed within the right of way of a State road.

B. A note on the maps shall refer to the associated computations and E&S Pollution Control Plan by title and date. The cover sheet of the computations and E&S Pollution Control Plan shall refer to the associated maps by title and date.

SECTION 305 PLAN SUBMISSION AND REVIEW PROCEDURE

1. An application for a Storm Water Management Site Plan Review and four (4) copies of the Storm Water Management Site Plan, calculations and report shall be submitted to the Township. See the Appendix.

2. The Applicant shall submit a copy of the complete plan submission to the Township, the Township Engineer and the Lancaster County Conservation District for their respective reviews and approval.

3. All applications for approval of a plan shall be acted upon by the Township's Authorized Staff Representative(s) which shall render their decision and communicate it to the developer not later than ninety (90) days following the date the application is filed.

A. The decision of the Township's Authorized Staff Representative(s) shall be in writing and shall be communicated to the developer personally or mailed to him at his last known address not later than fifteen (15) days following the decision;

B. When the application is not approved in terms as filed, the decision shall specify the defects found in the application and describe the requirements which have not been met and shall, in each case, cite the provisions of the Ordinance relied upon;

C. Failure of the Township's Authorized Staff Representative(s) to render a decision and communicate it to the developer within the time and in the manner required herein shall be deemed an approval of the application in terms as presented, unless the developer has

agreed in writing to an extension of time or change in the prescribed manner of presentation or communication of the decision; in which case, failure to meet the extended time or change in manner of presentation or communication shall have like effect.

D. Approval of a Storm Water Management Site Plan by the Township shall not be construed as an indication that the plan complies with the standards of any agency of the Commonwealth.

E. Approval of a Storm Water Management Site Plan by the Township shall be obtained by the applicant/developer prior to the issuance of a zoning permit by the Township. No construction of storm water management facilities may begin until a zoning permit is obtained by the developer in accordance with the Township Zoning Ordinance.

F. Where literal compliance with the design criteria herein specified is clearly impractical, the Municipality on the recommendations of the municipal engineer or Lancaster County Conservation District, may modify or adjust the standards to permit reasonable utilization of property while securing substantial conformance with the objectives of these regulations.

4. Manor Township shall not approve any Storm Water Management Site Plan that is deficient in meeting the requirements of this Ordinance. At its sole discretion and in accordance with this Article, when a Storm Water Management Site Plan is found to be deficient, Manor Township may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, Manor Township may accept submission of revisions.

5. The Municipality, in conformance with Section 703.1, shall inspect all phases of the installation of any temporary or permanent Storm Water Management facilities, including BMPs.

6. During any stage of the work, if the Municipality determines that any temporary or permanent Storm Water Management facilities are not being installed in accordance with the approved Storm Water Management Site Plan, the Municipality shall revoke any existing permits until a revised Storm Water Management Site Plan is submitted and approved, or the situation is corrected, as specified in this Ordinance.

SECTION 306 AS-BUILT PLAN

Prior to the final release of the financial security, the developer shall provide the Township with one (1) Mylar and two (2) prints of the final as-built plan showing the following:

1. Actual location of all concrete monuments which were set at all angle breaks, points of curvature and tangents around the perimeter of the total tract. When the outside perimeter of a tract falls within or along an existing road right-of-way, then the right-of-way of that roadway shall be monumented at the above referenced points.

2. Actual location of all iron pins or drill holes in curbs for all individual lot lines.

3. Actual cul-de-sac radius.

4. Actual horizontal and vertical location of cartway centerline versus right-of-way centerline.

5. Actual location of floodplain by elevation and dimension from property line.

6. Actual location and cross section of swales and accompanying easements.

7. Actual horizontal and vertical location of storm water management facilities including type and size of storm drainage pipes.

8. Detention basin:

   A. Actual contours of the detention basin.

   B. Actual outlet structure details including type, size and inverts of outlet pipes.

   C. Actual elevation of the embankment and emergency spillway.

   D. A table showing the stage/storage/discharge curve for the constructed conditions.

   E. A table providing a comparison of the approved design vs. the as-built discharge rates from all detention facilities.

9. When a digital submission of an As-Built Plan is required, all coordinates as depicted on the plan shall be based on the PA South Zone State Plane Coordinate System (NAD83 for horizontal and NAVD88 for vertical).

10. The As-Built Record Plan submission shall include a certification of completion signed by the Owner's qualified professional verifying that all permanent Storm Water Management BMPs have been constructed according to the approved plans and specifications. If any qualified licensed professionals contributed to the construction plans, then a qualified licensed professional must sign the completion certificate.

ARTICLE IV

DESIGN STANDARDS

SECTION 401 GENERAL REQUIREMENTS

1. All Storm Water Management Site Plans shall be designed and certified by individuals registered in the Commonwealth of Pennsylvania and qualified to perform such duties.

2. Where applicable, storm water management facilities shall comply with the requirements of Chapter 105 (Water Obstructions and Encroachments) of Title 25, Rules and Regulations, as amended, of the Pennsylvania Department of Environmental Protection.

3. Storm water management facilities which involve a State Highway shall also be subject to the approval of the Pennsylvania Department of Transportation.

4. Storm water management facilities located within or affecting the floodplain of any watercourse shall also be subject to the requirements of the Manor Township Flood Plain Regulations, as amended, or any future Ordinances, regulating construction and development within areas of the Township subject to flooding.

5. Storm water discharge points onto an adjacent property shall comply with the following:

   A. Storm water runoff from a project site shall flow directly into a natural watercourse or into an existing storm sewer system. If neither of these is available, the applicant shall obtain an easement from the downstream landowner to allow the runoff discharge from the 10-year storm to be piped to a natural watercourse or existing storm sewer system.

   B. Where the downstream land owner will not grant such an easement, the plan shall be designed so that the discharge from the applicant's site shall be in a non-erosive, sheet flow condition. The use of a level spreader, concrete or otherwise, is expressly prohibited. Runoff from the applicant's site shall flow onto the adjacent property in a manner similar to the runoff characteristics of the pre-development flow. Where an easement is not granted the 10- through 100-year discharge from the basin shall flow onto the adjacent property in a manner similar to the runoff characteristics of the pre-development flow.

6. Storm water runoff shall not be transferred from one watershed to another unless the watersheds are sub-watersheds of a common watershed which join together within the perimeter of the property, or the effect of the transfer does not alter the peak discharge onto adjacent lands, or drainage easements from the affected landowners are provided.

7. All storm water runoff flowing over the project site shall be considered in the design of the storm water management facilities.

8. The calculated peak rates of runoff for storm water originating on the project site must meet the following conditions, for all watersheds flowing from the project site:

   A. Post-development runoff from any regulated activity shall not exceed 50% of the peak rates of runoff prior to development for all design storms (2, 5, 10, 25, 50, and 100-year

storm events) unless the predevelopment hydrograph is not exceeded at all points. To match the pre-development hydrograph, the post development peak rate must be less than or equal to the pre-development peak rate, and the post development runoff volume must be less than or equal to the pre-development volume for the same storm event. A shift in hydrograph peak time of up to five minutes and a rate variation of up to 5% at a given time may be allowable to account for the timing affect of BMPs used to manage the peak rate and runoff volume. "Volume Control" volumes as required in Section 408 above may be used as part of this option.

9. Innovative methods for the detention and control of storm water runoff may be used when approved by the Township. Various combinations of methods should be tailored to suit the particular requirements of the type of development and the topographic features of the project site. The following is a partial listing of detention and control methods which can be utilized in storm water management systems where appropriate:

   A. Detention basins and retention basins.

   B. Roof-top storage

   C. Parking lot ponding

   D. Seepage pits, seepage trenches or other infiltration structures

   E. Concrete lattice block surfaces

   F. Grassed channels and vegetated strips

   G. Cisterns and underground reservoirs

   H. Routed flow over grass

   I. Decreased impervious surface coverage

10. Runoff can be managed regionally, by one or more developers, either on-site or off-site. The design and release rate shall be consistent with the Act 167 Plan. Groundwater recharge and water quality must be addressed in this option.

11. Unless an alternate design is submitted to the Township for review, and said design is prepared by a geologist or geotechnical engineer licensed in the Commonwealth of Pennsylvania:

   A. No storm water facilities shall be placed in, over or within a distance that will impact the following features:

      1. Sinkholes

      2. Closed depressions

      3. Lineaments in carbonate areas

      4. Fracture traces

5. Caverns

6. Intermittent Streams

7. Ephemeral streams

8. Bedrock pinnacles (surface or subsurface)

B. The minimum isolation distance from storm water management basins to the listed geologic features shall be as follows:

1. One hundred (100) feet from the rim of sinkholes or closed depressions;

2. One hundred (100) feet from disappearing streams;

3. Fifty (50) feet from lineaments or fracture traces;

4. Twenty-five (25) feet from surface or identified subsurface pinnacles.

C. Storm water runoff from any subdivision or land development activities shall not be discharged into sinkholes.

D. It shall be the developer's responsibility to verify if the development is underlain by carbonate geology. The certificate in the Appendix shall be attached to all Storm Water Management Site Plans and signed and sealed by the developer's qualified professional.

E. Whenever a storm water facility will be located in an area underlain by carbonate geology, a geological evaluation of the proposed location by a Registered Professional Geologist shall be conducted to determine susceptibility to sinkhole formation. The evaluation may include the use of impermeable liners to reduce or eliminate the separation distances listed in Section 401.11.B.

SECTION 402 STORM WATER MANAGEMENT DISTRICTS

The Township shall comply with the applicable provisions of the Little Conestoga Creek Watershed Act 167 Stormwater Management Plan, approved by the Lancaster County Commissioners on April 29, 1998 and by the DEP on June 28, 1998, and the Conestoga River Watershed Act 167 Stormwater Management Plan, approved by the Lancaster County Commissioners on June 8, 2005 and by the DEP on August 29, 2005. In Manor Township, all lands within the Township are required to comply with the provisions of these plans, unless there is a subsequent plan adopted with more restrictive provisions. In that case, the more restrictive provisions will apply within the applicable watershed(s).

SECTION 403 METHODS OF CALCULATION OF RUNOFF

1. The methods of computation used to determine peak discharge and runoff shall be:

   A. All storm water management pre-development versus post-development calculations shall use one of the following:

      (1) The Soil-Cover-Complex Method (as set forth in the latest edition of Urban Hydrology for Small Watersheds, Technical Release No. 55 as published by SCS) is the recommended and preferred method for all facilities with a drainage area greater than or equal to one hundred (100) acres or a time of concentration greater than 60 minutes.

      (2) The Rational Method is the recommended and preferred method for all facilities with drainage areas less than one hundred (100) acres:

      (3) The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland. NOAA's Atlas 145 can be accessed at: http://hdsc.nws.noaa.gov/hdsc/pfds/.

      If the Rational Method is used, the NOAA Atlas 14 data (see item "B" above) shall be used to determine the rainfall intensity in inches per hour based on the information for the 5 through 60 minute duration storm events.

      (4) Runoff Coefficients "C" and Curve Numbers "CN" shall be based on the charts contained in the Appendix.

      (5) For the purpose of calculating peak discharges, all agricultural lands that contribute storm drainage to or from the project site shall be considered cultivated lands with conservation measures in good hydrologic condition.

      (6) Hydrographs may be obtained from NRCS methods such as TR-55, TR20, or from use of the "modified" or "unit hydrograph" rational methods. If "modified" or "unit hydrograph" rational methods are used, the ascending leg of the hydrograph shall have a time of three times the time of concentration (3xTc) and the descending leg shall have a time of 7 times the time of concentration (7xTc) to approximate an SCS type II hydrograph.

   B. Design of on-site conveyance systems calculations may use the Rational Method of Q=CIA where Q is the peak discharge of the watershed in cubic feet per second, C is the coefficient of runoff, I is the intensity of rainfall in inches per hour, and A is the area of the watershed in acres; or any other method approved by the Township.

      When the Rational Method is used, the NOAA Atlas 14 data (see item "B" above) shall be used to determine the rainfall intensity in inches per hour based on the information for the 5 through 60 minute duration storm events.

C. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediment basins, retention and detention structures and sufficient design information to construct such facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of storm water runoff from the project site.

D. Flow calculations for water carrying structures shall be presented in tabular form using the flow tabulation form attached (or equal) hereto. See the Appendix.

E. Permanent detention basins shall be designed with a primary outlet discharge that is less than or equal to the requirements for post-development peak rate of runoff established by Section 401.8 of this Ordinance.

F. Runoff calculations will also be made to ensure that the runoff from the upstream watershed area can be accommodated by the pipes, drainage easements, watercourses, etc., on the site.

G. For the NOAA Atlas 14 rainfall, provide the following;

(1) Provide the rainfall used for the 2, 10, 25, 50, and 100-year 24-hour storm events. Rainfall values vary throughout the county depending on location.

(2) Provide the location (longitude and latitude) or a description of the location for which the rainfall applies.

(3) If rainfalls from more than one (1) location are used, provide the methodology by which the design rainfall was calculated.

H. Sheet flow may be determined using the nomograph found in the Appendix, or the TR-55 Manning's kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in the Appendix.

SECTION 404 WATER CARRYING FACILITIES

1. Storm sewer pipes and culverts shall be reinforced concrete pipe (RCP) or smooth lined corrugated polyethylene pipe (SLCPP), shall have a minimum diameter of fifteen (15) inches, and shall be installed on a sufficient slope to provide a minimum velocity of three (3) feet per second when flowing full. Pipes and culverts located outside of public street rights of way and not subject to vehicular loading shall have a minimum diameter of eight (8) inches.

2. Inlets or manholes shall be placed at all points of changes in the horizontal or vertical directions of conveyance pipes. Curved pipe sections are prohibited.

3. The roughness coefficient (Manning "n" values) used for conveyance pipe capacity calculations should be determined in accordance with PennDOT Publication 584, PennDOT Drainage Manual, or per the manufacturer's specifications.

4. Within the public street right-of-way, the gutter spread based on the 25-year storm shall be no greater than one half of the travel lane and have a maximum depth of three inches (3 inches) at

the curb line. A parking lane shall not be considered as part of the travel lane. In the absence of pavement markings separating a travel lane from the parking lane, the parking lane shall be assumed to be seven feet (7 feet) wide if parking is permitted on the street.

5. All inlets placed in paved areas shall have heavy duty bicycle-safe grating consistent with PennDOT Publication 72M, latest edition. A note to this effect shall be added to the Storm Water Management Site Plan or inlet details therein.

6. Inlets, junction boxes, or manholes greater than five feet (5 feet) in depth shall be equipped with non-aluminum ladder rungs and shall be detailed on the Storm Water Management Site Plan.

7. The "n" factors to be used for paved or riprap swales or gutters shall be based upon accepted engineering design practices, as approved by the Municipal Engineer and as follows:

   A. For vegetated swales, the first condition shall consider swale stability based upon a low degree of retardance ("n" = 0.03);

   B. For vegetated swales, the second condition shall consider swale capacity based upon a higher degree of retardance ("n" = 0.05); and

   C. All vegetated swales shall have a minimum slope of 2% unless otherwise approved by the Municipal Engineer.

8. All swales shall be designed to maximize infiltration and concentrate low flows to minimize siltation and meandering, unless geotechnical conditions do not permit infiltration.

9. Where the connecting pipe has a diameter 18 inches or greater, headwalls and endwalls shall be provided with a protective barrier device to prevent entry of the storm sewer pipe by unauthorized persons. Such protection devices shall be designed to be removable for cleaning.

10. All storm sewer pipes, grass waterways, open channels, swales and other water carrying facilities shall be designed for a twenty-five (25) year storm event unless in the opinion of the Township or Township Engineer the character of development and potential for damage warrant design for the 50- or 100-year storm.

11. All storm sewer pipes, culverts, manholes, inlets, endwalls and endsections shall be constructed in accordance with Pennsylvania Department of Transportation, Form 408, as amended.

12. Storm sewer pipes, culverts, manholes, inlets, endwalls, and endsections proposed for dedication or located along streets shall conform to the requirements of the Pennsylvania Department of Transportation, Bureau of Design, Standards for Roadway Construction, Publication No. 72, in effect at the time the design is submitted, as modified by the Township.

13. Storm sewer pipes and culverts shall be reinforced concrete pipe (RCP) or smooth lined corrugate polyethylene (SLCPP), shall have a minimum diameter of eighteen (18) inches, and shall be installed on a sufficient slope to provide a minimum velocity of three (3) feet per second when flowing full.

14. All storm sewer pipe shall be laid to a minimum depth of one (1) foot from subgrade to the crown of pipe.

15. Endwalls and endsections shall be used where storm water runoff enters or leaves the storm sewer horizontally from a natural or manmade channel.

16. Inlets shall be placed on both sides of the street at low spots, at a maximum of six hundred (600) feet apart along a storm sewer pipe, at points of abrupt changes in the horizontal or vertical directions of storm sewers, and at points where the flow in gutters exceeds three (3) inches. Inlets shall normally be along the curb line at or beyond the curb radius points. For the purpose of inlet location at corners, the depth of flow shall be considered for each gutter. At intersections, the depth of flow across the through streets shall not exceed one (1) inch. Manholes may be substituted for inlets at locations where inlets are not required to collect surface runoff.

17. Storm water roof drains and pipes, wherever possible shall discharge water into a storm water runoff dispersion and infiltration control device and not into storm sewers or street gutters.

18. All existing and natural watercourses, channels, drainage systems and areas of surface water concentration shall be maintained in their existing condition unless an alteration is approved by the Township.

19. Flow velocities from any storm sewer shall not result in a degradation of the receiving channel.

20. Energy dissipaters shall be placed at the outlets of all storm sewer pipes where flow velocities exceed maximum permitted channel velocities.

21. The capacities of grassed waterways shall be computed from the Manning Equation. Permissible open channel velocities and design standards shall be in accordance with good engineering practice as documented in the Engineering Field Manual for Conservation Practices, U.S.D.A., S.C.S., or in Design Charts for Open-Channel Flow, Hydraulic Design Series No. 3, U.S. Department of Transportation.

22. Grassed waterways may be utilized in place of conduit piping in those areas where soil conditions allow recharge of groundwater. All newly installed grassed waterways must be well established sod of good quality or matted with an approved stabilizing material. The usage of grassed waterways is not recommended in areas of year round or seasonally high ground water table unless provisions are made to handle long duration flows, for example by means of subsurface drainage of stone centered waterways.

    The shape of the waterway shall permit hydraulic efficiency and ease of maintenance. Allowable velocities within the waterway shall be limited to those values which would not cause erosion of the soil or cover material. Vegetation or durable materials shall be established on all channels where design velocities exceed the maximum values for base earth channels. Permanent channels should be designed using grass or other suitable material.

    The following information should be utilized in selecting adequately sized channels that do not exceed maximum velocities. The maximum permissible velocity shall be selected as the lowest value from Sections 404.13A and 404.13B which follow:

    A. Guidelines for maximum permissible velocities relevant to individual site conditions:

        (1) 3.0 feet per second where only sparse vegetation can be established and maintained because of shade or soil conditions:

(2) 3.0 - 4.0 feet per second should be used under normal conditions where the vegetation is to be established by seeding;

(3) 4.0 - 5.0 feet per second should be used only in areas where a dense vigorous sod is obtained quickly or where water can be diverted out of the waterway during establishment of vegetation. (Use where netting and mulch or other special methods of establishing vegetation are used).

(4) 5.0 - 6.0 feet per second may be used on well-established sod of good quality (use where establishment of vegetation is by sodding or water is introduced to a previously sodded channel).

B. Soil characteristics, design velocities and the level of desired maintenance should be considered in determining seed mixtures and methods of establishment of vegetation. Soils information for various soil types is contained in the "Lancaster County Soil Survey." Maximum permissible velocities in feet per second based on vegetation, slope of waterway and soil erodibility are as follows:

*****For seeding with Kentucky Bluegrass, Kentucky 31 Tall Fescue, smooth brome grass or a mixture of Kentucky 31 Tall Fescue and Birdsfoot Trefoil. (Mow occasionally).

Channel Grade (percent)	0 – 5	5 – 10	Greater Than 10
Easily eroded soils (******k less than .37)	5fps	4fps	3fps Recommended only with special engineering
Erosion resistant soils	6fps	6fps	5fps consideration (k=.7 or greater)

*****For seeding with Red Fescue or similar lawn mixtures (mow frequently)

Channel Grade (percent)	0 – 5	5 – 10	Greater than 10
Easily eroded soils	2.5	K<.37	NOT RECOMMENDED OVER 5%
Erosion resistant soils	3.5	K≥.37	NOT RECOMMENDED OVER 5%

*****Redtop is recommended for use as a companion seeding.

******K is the erosion factor found in Table 16 of the "Soil Survey of Lancaster County, PA". Issued May 1985

Velocities for other channels are as follows:

Channel Lining	Maximum Permissible Velocity (feet/second)
6" rip-rap	4
9" rip-rap	8
Durable Bedrock	8
Asphalt	7
12" rip-rap	9
Concrete or steel	12

SECTION 405 RATE CONTROL FACILITIES

For above ground facilities which include rate control and have a facility depth less than 2 feet, the standards in Section 409 may be used. All other facilities that include rate control shall meet the standards in this section. Facilities that include volume control shall also meet the requirements of Section 408.

1. An impervious core/key trench, when required, shall consist of a cutoff trench (below existing grade) and a core trench (above existing grade). A key trench may not be required wherever it can be shown that another design feature, such as the use of an impermeable liner, accomplishes the same purpose.

2. The core should extend up both abutments to the 10-year water surface elevation or six (6) inches below the emergency spillway elevation, whichever is lower.

3. All pipe collars (anti-seep collars), shall be designed in accordance with Chapter 7 of the DEP E&S Manual. The material shall consist of concrete or otherwise non-degradable material around the outfall barrel and shall be watertight.

4. Embankment fill material. The embankment fill material shall be taken from an appropriate borrow area which shall be free of roots, stumps, wood, rubbish, stones greater than 6 inches, frozen or other objectionable materials.

5. Bottom slope. The minimum bottom slope of facilities not designed for infiltration shall be one percent (1%). A flatter slope may be used if an equivalent dewatering mechanism is provided.

6. Pretreatment elements. When required, pretreatment elements shall consist of forebays, or alternate approved by the Municipal Engineer, to keep silt to a smaller portion of the facility for ease of maintenance.

7. Infiltration basins. Within basins designed for infiltration, existing native vegetation shall be preserved, if possible. For existing unvegetated areas or for infiltration basins that require excavation, a planting plan shall be prepared in accordance with Section 301 and the BMP Manual which is designed to promote infiltration.

8. All discharge control devices with appurtenances shall be made of reinforced concrete and stainless steel. Bolts/fasteners shall be stainless steel.

9. Use of the spillway to convey flows greater than the 50-year design storm is permitted.

10. Emergency use. The spillway shall be designed to convey the 100-year peak inflow.

11. When required, freeboard shall be measured from the top of the water surface elevation for emergency use.

12. All basins shall be structurally sound and shall be constructed of sound and durable materials. The completed structure and the foundation of all basins shall be stable under all probable conditions of operation and shall be capable of discharging the peak discharge of a post-development 100-year storm event through the primary emergency and/or spillway facilities, in a condition that assumes the primary outlet(s) are blocked, which will not damage the integrity of the facility or the downstream drainage areas.

13. The effect on downstream areas if the basin embankment fails shall be considered in the design of all basins. Where possible, the basin shall be designed to minimize the potential damage caused by such failure of the embankment.

14. All detention basins shall include an outlet structure to permit draining the rate control volume in the basin to the level of a two year storm within twenty-four (24) hours. (Exclusive of BMP or Volume Control storage).

15. All outlet structures and emergency spillways shall include a satisfactory means of dissipating the energy of flow at its outlet to assure conveyance of flow without endangering the safety and integrity of the basin and the downstream drainage area.

16. A cutoff trench of relatively impervious clay material shall be provided within all basin embankments, except for those embankments with side slope ratios of three (3) horizontal to one (1) vertical or flatter. Embankments with flatter side slopes shall have a key trench.

17. All culverts through basin embankments shall have properly spaced concrete cutoff collars or welded anti-seep collars.

18. A minimum one (1) foot freeboard above the design elevation of the water surface at the emergency spillway shall be provided.

19. No outlet structure from a detention basin or swale shall discharge directly onto a Township road but shall discharge into a culvert under a Township road.

20. The minimum top width of dams up to ten (10) feet in height shall be equal to two-thirds (⅔) of the dam height, but in no case shall the top width be less than five (5) feet.

SECTION 406 EROSION AND SEDIMENT CONTROL FACILITIES

1. All earth disturbance activities shall be conducted in such a way as to minimize accelerated erosion and resulting sedimentation. Measures to control erosion and sedimentation shall, at a minimum, meet the standards of the Lancaster County Conservation District and all requirements of Title 25, Rules and Regulations of the Pennsylvania Department of Environmental Protection.

2. The Erosion and Sedimentation Control Plan must be available at all times at the project site. When required, a permit allowing earthmoving activity shall be obtained by the developer before any construction on the project site shall begin.

3. Approval of an Erosion and Sedimentation Control Plan by the Township shall not be construed as an indication that the plan complies with the standards of any agency of the Commonwealth.

4. The Erosion and Sedimentation Control Plan shall be submitted to the Lancaster County Conservation District for its review and recommendations.

5. The following principles shall be applied to the design plan and construction schedule to minimize soil erosion and sedimentation.

   A. Stripping of vegetation, grading or other soil disturbance shall be done in a manner which will minimize soil erosion.

   B. Whenever feasible, natural vegetation shall be retained and protected.

   C. The extent of the disturbed area and the duration of its exposure shall be kept to a minimum, within practical limits.

   D. Either temporary seeding, mulching or other suitable stabilization measures shall be used to protect exposed critical areas during construction.

   E. Drainage provisions shall accommodate the storm water runoff both during and after construction.

   F. Soil erosion and sedimentation facilities shall be installed prior to any on-site grading.

SECTION 407 LARGE IMPERVIOUS AREAS FACILITIES

1. All large impervious surface areas, excluding buildings, but including paved areas that are constructed with bituminous, concrete or other impervious or semi-impervious surfaces which are in excess of one hundred fifty thousand (150,000) square feet, either initially or cumulatively as of May 19, 2004, or any activity which when conducted on the same tract of land or on adjacent tracts of land results in an aggregate paved area constructed with bituminous, concrete or other impervious or semi-impervious surface that exceeds one hundred fifty thousand (150,000) square feet, either initially or cumulatively as of May 19, 2004, whether or not the paved areas are contiguous, shall be subject to the provisions of this Section.

2. The expansion of any existing site or the redevelopment of previously developed sites that include facilities or activities defined by 407.1 shall meet the standards of this section.

3. Any storm water that comes into contact with the facilities or activities defined by 407.1 is considered to be contaminated by pollutants and in need of subsequent pretreatment. All storm water shall be directed to a minimum of two (2) separate BMPs for pretreatment prior to discharge from the site.

4. Within the areas and activities that are the subject of this Section the following additional storm water management requirements must be met:

   A. Source reduction practices must be used which are intended to minimize the contact between rainfall and the area/activity in order to minimize the amount of storm water that must be treated.

   B. Pre-treatment must be accomplished by the use of water quality inlets, water quality swales, wet ponds, constructed storm water wetlands, bioretention, and extended detention basins. Other innovative methods will be considered on an individual site basis.

   C. Storm water runoff shall be treated to provide hydro-carbon removal and a reduction of thermal pollution.

   D. The use of infiltration practices without pre-treatment for total suspended solids or hydrocarbons is prohibited.

5. BMP systems required by this Section shall incorporate designs which allow for the shutdown, containment and isolation of storm water from the site in the event of an emergency spill or other unexpected contamination. BMPs with inlets and outlets can be designed with a shutoff and containment mechanism, using available storage in the BMP. Generally a shut-off valve or gate valve should be installed at the lowest invert point.

6. Water Quality Design Storm

   A. The runoff volume to be treated by BMPs (prescribed runoff) is to be calculated based upon the two (2) year twenty-four (24) hour storm event for all impervious areas of the post-development project site.

7. Storm water management BMP systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS) after construction is complete and the site is stabilized. It is presumed this standard is met when:

   A. Water quality inlets shall be utilized for treatment of all runoff prior to discharge to other BMPs.

   B. Runoff from all impervious areas are directed to BMPs for pretreatment prior to discharge from the site; and,

   C. Storm water management BMPs are sized to capture the prescribed runoff volume; and,

   D. Suitable nonstructural practices for source control and pollution prevention are implemented including, but not limited to sweeping and vacuuming of paved areas, litter control and spill containment; and,

   E. Storm water BMPs are maintained in a first class design condition.

8. Design Standards and Specifications for Water Quality BMPs

A. Extended Detention Basin

1. The minimum contributing watershed shall be ten (10) acres;

2. Provide a minimum 48-hour detention time for the prescribed runoff;

3. Provide a sediment forebay at the inlet;

4. Provide a micropool located near the outlet structure to reduce resuspension of sediments;

5. A minimum length to width ratio of 3:1 needs to be provided with the inlet structure(s) placed at the maximum distance from the outlet structure; and,

6. Establish and maintain water tolerant or wetland vegetation on the basin bottom.

B. Wet Extended Detention Basin

1. The minimum contributing watershed shall be twenty-five (25) acres or provide other measures to maintain a permanent pool of water;

2. A permanent pool with a volume equal to 40% of the prescribed runoff needs to be provided;

3. A sediment forebay with a minimum volume of 13% of the prescribed runoff needs to be provided;

4. The extended detention storage volume shall be a minimum of 47% of the prescribed runoff;

5. Provide a maximum depth of 2.5 feet;

6. Wetland vegetation needs to be established along the basin edges; and,

7. A minimum length to width ratio of 3:1 needs to be provided with the inlet structure(s) placed at the maximum distance from the outlet structure.

C. Bioretention

1. Can be designed on-line or off-line of the storm water facilities;

2. Bioretention components shall include grass buffer strips, sand bed, ponding area, organic or mulch layer, planting soil and plants;

3. The facility shall be lined and treated runoff shall be drained to downslope facilities;

4. Minimum contributing watershed of one-half (½) acre;

5. Maximum contributing watershed of five (5) acres;

6. Shall be designed to carry and filter the runoff from the two (2) year twenty-four (24) hour storm event. Additional flows must be conveyed in safe and non-erosive manner to additional facilities;

7. The minimum surface area shall be equal to seven (7) percent of the product of the drainage area multiplied by the rational method runoff coefficient "c" determined for the site;

8. Provide a minimum width of fifteen (15) feet, minimum length of forty (40) feet;

9. The maximum ponding depth shall not exceed six (6) inches;

10. The planting soil shall be a sandy loam with a clay content ranging from 10 to 25 percent;

11. The area shall be planted in understory trees and shrub with a shrub to tree ratio of 3:1; and,

12. The area shall be fully stabilized to a non-erosive condition with a dense vegetative cover prior to accepting any storm water runoff.

D. Water quality inlets (WQI)

1. Shall be utilized for treatment of all runoff prior to discharge to other BMPs;

2. The inlets must utilize three chambers (sediment, oil separation, and discharge);

3. A separate manhole shall be provided for access to each chamber;

4. Shall utilize a screen between the 1st and 2nd chamber, and a pipe designed to pass along the design storm;

5. An inverted elbow shall be utilized between the 2nd and 3rd chamber;

6. A coalescing unit designed to maximize oil/water separation is required for each WQI;

7. The maximum contributing watershed to a WQI shall be one (1) acre;

8. Diffusion baffles shall be utilized to reduce turbulent flow and the resuspension of settled pollutants;

9. WQIs shall be reinforced concrete and watertight;

10. WQIs shall maintain permanent pools to maximize pollutant retainage; and,

11. The WQIs shall be cleaned at the beginning of each season (Summer, Fall, Winter, Spring). Each WQI shall be inspected twice during each season for proper operation. In the event that the WQI is not operating effectively, it shall be repaired/cleaned immediately.

E. Water Quality Swales

1. Provide maximum side slopes of 4:1;

2. The longitudinal slope shall range from 0.5 to 4 percent; and,

3. Velocity checks shall be provided at maximum one hundred (100) foot intervals. Longer spacing may be permitted provided calculations are provided that document flow velocities for the two (2) year twenty-four (24) hour storm event do not exceed two (2) feet per second.

F. Constructed Storm Water Wetlands

1. Constructed storm water wetlands shall be designed, constructed, operated and maintained in accordance with the USEPA Storm Water Technology Fact Sheet No, EPA 832-F-99-025, Storm Water Wetlands, as amended, updated or rewritten from time to time.

9. An operation and maintenance plan for the proposed BMPs is required which at a minimum includes:

A. Storm water management system owner(s) and address; and,

B. The party or parties responsible for operation and maintenance; and,

C. A detailed schedule for the inspection and maintenance of all BMPs which shall include the routine maintenance and non-routine maintenance tasks to be undertaken; and,

D. A detailed cost estimate for the operation, inspection and maintenance of the storm water management BMPs; and,

E. In addition to any other financial security required by this Ordinance, financial security, in amount equal to one hundred ten (110) percent of the approved inspection, operation and maintenance cost estimate, and a financial security agreement shall be provided.

(1) For the purposes of this subsection, the financial security shall be provided in accordance with Article V of the Pennsylvania Municipalities Planning Code. The Township may annually readjust the amount of the financial security by re-determining the costs of the inspection, operation, and maintenance of the storm water management BMPs to maintain financial security in an amount equal to amount equal to one hundred ten (110) percent of the re-determined inspection operation and maintenance cost estimate; and,

F. The operation and maintenance plan is to be updated annually and a revised version forwarded to the Township.

G. Where the NPDES permit for the project requires that BMPs be installed, annual written reporting of the inspection and maintenance of those BMPs shall be required by the operation and maintenance plan.

SECTION 408 VOLUME CONTROL FACILITIES

1. For those project sites that do not meet the applicability criteria of Section 407, storm water management facilities shall be supplemented by BMPs as outlined in this section. Required storage volume shall be provided to minimize impacts to water quality of receiving waters.

2. Water volume controls shall be implemented using the *Design Storm Method* described in Subsection 408.3 below.

3. The *Design Storm Method* is applicable to any size of regulated activity not already exempted in Section 302. This method requires detailed modeling based on site conditions.

   A. Do not increase the post development total runoff volume for all storms equal to or less than the 2-year 24-hour storm event.

   B. For modeling purposes:

      1. Existing (pre-development) non-forested pervious areas must be considered meadow in good condition.

      2. Twenty percent (20%) of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions, subject to the limit stated in Section 408.4.

      3. The maximum loading ratio for volume control facilities in Karst areas shall be 3:1 impervious drainage area to infiltration area and 5:1 total drainage area to infiltration area. The maximum loading ratio for volume control facilities in non-Karst areas shall be 5:1 impervious drainage area to infiltration area and 8:1 total drainage area to infiltration area. A higher ratio may be approved by the municipality if justification is provided.

4. For projects that add impervious area to a parcel, an amount of existing impervious area not to exceed 20% of the proposed impervious area is subject to the volume control requirements of this Ordinance.

5. Any portion of the volume control storage that meets the following criteria may also be used as rate control storage;

   A. Volume control storage that depends on infiltration is designed according to the infiltration standards in Section 411.

   B. The volume control storage is located within a rate control facility

C. The volume control storage which will be used for rate control is that storage which is available within 24 hours based on the stabilized infiltration rate and/or the evapo-transpiration rate.

6. A detailed geologic evaluation of the Development Site shall be performed in areas of carbonate geology to determine the design parameters of recharge facilities. The evaluation shall be performed by a state licensed/certified Professional Geologist (PG), and shall, at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability.

SECTION 409 SMALL ABOVE GROUND FACILITIES LESS THAN 2 FEET DEEP

1. Discharge pipes, where used, shall be reinforced concrete pipe (RCP) or smooth lined corrugate polyethylene pipe (SLCPP), or PVC pipe, and shall have a minimum diameter of six (6) inches.

2. Facilities shall have impoundment areas with side slopes no greater than two (2) horizontal to one (1) vertical.

3. All facilities shall drain any Rate Control Volume within twenty-four (24) hours. All other storage shall meet the drainage time requirements of Section 401.

4. The minimum top width of shall be two (2) feet.

SECTION 410 SUBSURFACE STORAGE FACILITIES

1. The maximum depth from the surface shall be two (2) feet less than the limiting zone.

2. The maximum loading ratio shall be as specified in the BMP manual unless otherwise determined by professional geologic evaluation.

3. Pretreatment requirements. The facility shall be designed to provide a method to eliminate solids, sediment, and other debris from entering the subsurface facility.

4. Stone for infiltration beds. The stone used for infiltration beds shall be clean washed, uniformly graded coarse aggregate (AASHTO No. 3 or equivalent approved by the municipality). The void ratio for design shall be assumed to be 0.4.

5. Backfill material. Material consistency and placement depths for backfill shall be (at a minimum) per all applicable pipe manufacturer's recommendations, further providing it should be free of large (not exceeding 6 inches in any dimension) objectionable or detritus material. Select non-aggregate material should be indigenous to the surrounding soil material for non-vehicular areas. Backfill within vehicular areas shall comply with this section unless otherwise specified in governing municipal road/street or subdivision and land development ordinances. Furthermore, if the design concept includes the migration of runoff through the backfill to reach the infiltration facility, the material shall be well drained, free of excess clay or clay like materials and generally uniform in gradation.

6. Lining material. Non-woven geotextiles shall be placed on the sides and top of subsurface infiltration facilities. No geotextiles shall be placed on the bottom of subsurface infiltration facilities.

7. When located under pavement, the top of the subsurface facility shall be a minimum of three (3) inches below the bottom of pavement subbase.

8. Where located under vegetative cover, the top of the subsurface facility shall be a minimum of 12 inches below the surface elevation or as required to establish vegetation.

SECTION 411 INFILTRATION FACILITIES

1. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on the suitability of the soils and site conditions and shall be constructed on soils that have the following characteristics:

   A. A minimum depth of twenty-four (24) inches between the bottom of the facility and the seasonal high water table and/or bedrock (limiting zones).

   B. An infiltration and/or percolation rate sufficient to accept the additional storm water load and drain completely as determined by field tests conducted by the Owner's design professional.

2. Extreme caution shall be exercised (1) where infiltration is proposed in geologically susceptible areas such as carbonate or limestone areas, and (2) where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate groundwater. A detailed geologic investigation may be required to determine the suitability of recharge facilities and to specifically address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability.

3. For single-family residential subdivisions with on-lot BMPs, one probe test pit per lot is required, within twenty-five (25) feet of the proposed BMP area. Verification testing shall take place when BMPs are sited at greater distances.

4. For multi-family and high density residential developments, one test pit per BMP area or acre is required.

5. For large infiltration areas (basins, commercial, institutional, industrial, and other proposed land uses), multiple test pits shall be evenly distributed at the rate of four (4) to six (6) tests per acre of BMP area.

6. Additional tests shall be conducted if local conditions indicate significant variability in soil types, geology, water table levels, bedrock, topography, etc. Similarly, uniform site conditions may indicate that fewer test pits are required. Excessive testing and disturbance of the site prior to construction is not recommended.

7. At least one percolation/infiltration test shall be conducted at the proposed bottom elevation of an infiltration BMP, and a minimum of two tests per probe test pit is required. More tests may be warranted if the results for first two tests are substantially different.

8. The highest rate (inches/hour) for test results shall be discarded when more than two are employed for design purposes. The geometric mean shall be used to determine the average rate following multiple tests.

9. Percolation/infiltration testing shall be done using a double ring infiltrometer or an equal method.

ARTICLE V

MAINTENANCE

SECTION 501 MAINTENANCE OF STORM WATER MANAGEMENT FACILITIES

Maintenance is an essential part of the successful functioning of a storm water management system.

1. Maintenance during development of a project shall be the responsibility of the developer and/or landowner and shall usually include but not be limited to:

   A. Removal of silt from all debris basins, traps or other structures or measures when 60% of capacity is filled with silt;

   B. Periodic maintenance of temporary control facilities such as replacement of straw bale dikes, straw filters or similar measures;

   C. Establishment or reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not successfully been established;

   D. Installation of necessary controls to correct unforeseen problems caused by storm events within design frequencies;

   E. The contractor or developer shall be responsible for removal of all temporary measures and installation of permanent measures upon completion of the project.

2. Maintenance of project after physical completion:

   A. The applicant or his agent shall demonstrate that any facilities intended to be installed and located on an individual or group of individual lots can be adequately maintained by the homeowner(s) and/or lot owner(s).

   B. It is the purpose of this Ordinance that Manor Township shall not become responsible for maintenance and supervision of developed areas. Such responsibility falls upon the party responsible for land development who shall remain personally responsible for those areas of the development which are subject to the requirements of this Ordinance. This responsibility may be retained or assigned to third persons as is deemed most acceptable to the party responsible for land development. In the event that any portion of land development would, but for the existence of areas requiring maintenance subject to this Ordinance, be dedicated to the Municipality, the contractor or developer may make application to the Municipality for acceptance by the Municipality of such portions of the land development. In the event that the Municipality, by formal action, accepts such portions of land development, maintenance and responsibility for such portions shall fall upon the Municipality.

   C. It is the intent of this Ordinance that the purposes of the Ordinance shall be carried out through the exercise of responsibility by private parties, and, therefore, it is anticipated that control plans shall be developed with the view towards projects which can effectively be contained within the tracts to be owned and maintained by private parties. To foster

this purpose, with respect to portions or parts of a project as shown on a plan of a developer or contractor, which portions will not otherwise become part of municipal property, such portions shall become the responsibility of the individual property owners on whose property such portions of a project lie including but not limited to retention ponds, detention ponds, sediment basins, BMPs, energy dissipaters or grassed water-ways. Persons including contractors and developers conveying property of a development to another party, which property contains any portions of a Storm Water Management Site Plan, after that plan has been established, shall include a specific deed reference to such grantee's responsibility for the maintenance and care of the portions of such project as are included within said grantee's conveyed property. The deed reference to such portions shall be in the form of a deed restriction imposing responsibilities upon said property owner for the maintenance of the portions of the project, including BMPs, within the boundary lines of said property as may be necessary for proper maintenance of the project in accordance with the terms of this Ordinance. Such maintenance shall include the following:

(1) Liming and fertilizing vegetated channels and other areas according to specifications in "Erosion and Sedimentation Control Handbook of Lancaster County."

(2) Reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not been successfully established.

(3) Mowing as necessary to maintain adequate strands of grass and to control weeds. Chemical weed control may be used if state and local regulations are met. Selection of seed mixtures acceptable to the Municipality in accordance with regulations to be established.

(4) Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways and thus reducing their capacity.

(5) Regular inspection of the areas in questions to assure proper maintenance and care. Storm Water Management BMPs should be inspected by the landowner, or the owner’s designee (including the municipality for dedicated and owned facilities), according to the following list of minimum frequencies:

(a) Annually for the first five (5) years.

(b) Once every three (3) years thereafter.

(c) During or immediately after the cessation of a 10-year or greater storm.

D. The deed restrictions hereinabove mentioned shall also include notice that in the event the individual property owners should fail to comply with the terms of this Ordinance for the maintenance and care of the land in question, the Township of Manor shall have the authority to carry out those duties hereby imposed upon individual property owners. The Municipality may, after giving notice to an individual property owner that he is not properly maintaining the areas subject to this Ordinance, and by making demand that such compliance shall be made within thirty (30) days, enter upon said private property

and take such actions as may be required to bring the area into compliance with this Ordinance. The property owner shall be responsible for reimbursing the Township for any and all costs incurred by the Township in its actions required to bring the area into compliance with this Ordinance. Should the property owner fail to reimburse the Township, the Township shall further have the right to file a municipal lien against such property for the cost of maintenance work carried out under this section. The Municipality shall in addition to the filing of a municipal lien have any other remedies provided by law against any property owner who should fail to comply with the terms of this Ordinance.

E. Where the Township accepts dedication of all or some of the required storm water management facilities following completion, the Township may require the posting of financial security to secure structural integrity of said facilities as well as the functioning of said facilities in accordance with the design and specifications as depicted on the approved Storm Water Management Site Plan for a term not to exceed eighteen (18) months from the date of acceptance of dedication. Said financial security shall be the same type as required with regard to installation of such facilities, and the amount of the financial security shall not exceed fifteen (15) percent of the actual cost of installation of said facilities.

F. In the case Condominium and Planned Committees, separate agreements will be entered and be in legal form capable of being enforced against the common elements and the ownership interests of the individual units or properties, as the case may be, so that the Municipality has the ability to force compliance with the provisions of such agreements and to assess the cost (as set forth in Section 506.A) against all owners so that the municipality does not incur out of pocket expenses.

G. Storm Water Management facilities existing on the effective date of this Ordinance, which have not been accepted by the Municipality or for which maintenance responsibility has not been assumed by a private entity such as a homeowners' association shall be maintained by the individual Landowners. Such maintenance shall include at a minimum those items set forth in Section 501.C above. If the Municipality determines at any time that any permanent Storm Water Management facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials, or improperly maintained, the condition constitutes a nuisance and the Municipality shall notify the Landowner of corrective measures that are required, and provide for a reasonable period of time, not to exceed thirty (30) days, within which the property owner shall take such corrective action. If the Landowner does not take the required corrective action, the Municipality may either perform the work or contract for the performance of the work and bill the Landowner for the cost of the work plus a penalty of ten percent (10%) of the cost of the work. If such bill is not paid by the property owner within thirty (30) days, the Municipality may file a municipal claim against the property upon which the work was performed in accordance with the applicable laws. The municipality shall have the right to choose among the remedies and may use one or more remedies concurrently.

H. No person shall place any structure, fill landscaping or vegetation into a Storm Water Management facility or within a drainage easement that will limit or alter the functioning of the facility or easement in any manner.

ARTICLE VI

PROHIBITION AGAINST NON-STORM WATER DISCHARGES

SECTION 601 PROHIBITED DISCHARGES

1. No person in the Municipality shall allow, or cause to allow, storm water discharges into the Municipality's storm sewer system or into waters of this Commonwealth which are not composed entirely of storm water, except (1) as provided in Section 601.2 below, and (2) discharges allowed under a state or federal permit.

2. Discharges which may be allowed, based on a finding by the Municipality that the discharge(s) do not significantly contribute to pollution to surface waters of the Commonwealth, are:

   A. Discharges from firefighting activities.

   B. Potable water sources including dechlorinated water line and fire hydrant flushing.

   C. Irrigation drainage.

   D. Routine external building washdown (which does not use detergents or other compounds).

   E. Air conditioning condensate.

   F. Water from individual residential car washing.

   G. Springs.

   H. Water from crawl space pumps.

   I. Uncontaminated water from foundation or from footing drains.

   J. Flows from riparian habitats and wetlands.

   K. Lawn watering.

   L. Pavement washwaters where spills and leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and were detergents are not used.

   M. Dechlorinated swimming pool discharges.

   N. Uncontaminated groundwater.

   O. Diverted stream flows

   P. Rising ground waters

   Q. Uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20)).

3. In the event that the Municipality determines that any of the discharges identified in Section 601.2 significantly contribute to pollution of waters of the Commonwealth, or is so notified by DEP, the Municipality will notify the responsible person to cease the discharge.

4. Upon notice provided by the Township under Section 601.3, the discharger will have a reasonable time, as determined by the Municipality, to cease the discharge consistent with the degree of pollution caused by the discharge.

5. Nothing in this Article shall affect a discharger's responsibilities under state law.

SECTION 602 PROHIBITED CONNECTIONS

The following connections are prohibited, except as provided in Section 601.2:

1. Any drain or conveyance, whether on the surface or subsurface, which allows any non-storm water discharge including sewage, process wastewater, and wash water, to enter the separate storm sewer system, and any connections to the storm drain system from indoor drains and sinks; and,

2. Any drain or conveyance connected from a commercial or industrial land use to the storm sewer system which has not been documented in plans, maps, or equivalent records, and approved by the Municipality.

ARTICLE VII

ADMINISTRATION

SECTION 701 PLAN SUBMISSION AND APPROVAL

1. A Storm Water Management Site Plan for any activity described in Section 103 shall be submitted to the Township for approval.

2. In the case of subdivision and land development activities, the submission requirements and procedures of the Storm Water Management Site Plan shall be in accordance with this Ordinance.

3. The Storm Water Management Site Plan will be submitted to the Township with the subdivision or land development plan to allow for timely review and inclusion in the final subdivision or land development plan of any revision(s) which may result from the review(s). It shall be the responsibility of the Applicant to make distribution of the Storm Water Management Site Plan to the Township Engineer, and the Lancaster County Conservation District for review and comment and to any other agencies such as PA DOT, DEP, etc. when permits from these agencies are required.

4. The final Storm Water Management Site Plan approved by the Township shall become a supplement to the final subdivision or land development plan and be subject to all rules, regulations and procedures pertaining thereto, as well as the following requirement:

    A. Prior to the final approval of the improvement guarantee for any subdivision or land development plan by the Township, the developer must do one of the following:

        (1) Provide the Township with an improvement guarantee or other guarantee in an amount equal to 110% of the construction costs of the storm water management facilities as estimated by a qualified engineer acceptable to the Township. The amount may be included in the letter of credit or escrow account, required for other development requirements such as roads, curbs, sidewalks, etc. The Township may waive the financial guarantee requirement for plans which do not require dedication of additional rights-of-way.

        (2) Implement the control facilities outlined in the Storm Water Management Site Plan.

5. A disapproved Storm Water Management Site Plan may be resubmitted, with the revisions addressing the municipality's concerns, to the municipality in accordance with this Article. The applicable review fee must accompany a resubmission of a disapproved Storm Water Management Site Plan.

6. The municipality's approval of an Storm Water Management Site Plan authorizes the regulated activities contained in the Storm Water Management Site Plan for a maximum term of validity of five (5) years following the date of approval. The municipality may specify a term of validity shorter than five (5) years in the approval for any specific Storm Water Management Site Plan. Terms of validity shall commence on the date the municipality signs the approval for an Storm Water Management Site Plan. If an approved Storm Water Management Site Plan is not

completed according to Section 407 within the term of validity, then the municipality may consider the Storm Water Management Site Plan disapproved and may revoke any and all permits. Storm Water Management Site Plans that are considered disapproved by the municipality shall be resubmitted in accordance with Section 405 of this Ordinance.

SECTION 702 ADHERENCE TO APPROVED PLAN

It shall be unlawful for any person, firm or corporation to undertake any earth disturbing activity on any property except as provided for in the Storm Water Management Site Plan approved pursuant to this Ordinance. It shall also be unlawful to alter or remove any control structure required by the Storm Water Management Site Plan pursuant to this Ordinance or to allow the property to remain in a condition which does not conform to the approved Storm Water Management Site Plan.

SECTION 703 ENFORCEMENT

The Municipality is hereby authorized and directed to enforce all of the provisions of this Ordinance. It shall be unlawful for a person to undertake any regulated activity except as provided in an approved Storm Water Management Site Plan, unless specifically exempted in Section 302.

1. All inspections regarding compliance with the Storm Water Management Site Plan shall be the responsibility of the Township, its municipal engineer or other person designated by the Municipality.

   A. A set of design plans approved by the Municipality shall be on file at the site throughout the duration of the construction activity.

   B. During the construction of the development, the Township Engineer or other authorized Township official may inspect the premises to determine that the work is progressing in compliance with the information provided on the approved Storm Water Management Site Plan and with all applicable Township laws and ordinances.

   C. The cost for the conducting of plan reviews, inspections, and other costs associated with the enforcement and administration of this Ordinance by the Township Engineer or other authorized Township official shall be borne by the applicant/developer in accordance with the schedule of fees adopted by resolution of the Township Supervisors.

   D. In the event the Township's Authorized Staff Representative(s) or other authorized official discovers that the work does not comply with the approved plan or any applicable laws and ordinances, the Township shall suspend existing permits related to the development until the required corrections have been made. Any portion of the work which does not comply with the approved plan must be corrected by the developer within ten (10) days. No work may proceed on any subsequent phase of the Storm Water Management Site Plan, the subdivision or land development, or the building construction, until the related zoning permits have been reinstated.

E. A suspended approval may be reinstated by the municipality when:

(1) The municipality has inspected and approved the corrections to the violations that caused the suspension.

(2) The municipality is satisfied that the violation has been corrected.

F. If at any stage of the work, the Township's Authorized Staff Representative(s) or authorized official determines that the site conditions are not as stated or shown in the approved application, or that there has been a false statement or misrepresentation by the developer, the Township's Authorized Staff Representative(s) or authorized official may refuse to approve further work and the Township may revoke existing permits until a revised plan is submitted and approved, as required by this Ordinance.

G. An approval that has been revoked by the municipality cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.

H. At the completion of the project, and as a prerequisite for the release of the guarantee, the owner or his representative shall:

(1) Provide a certificate of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.

(2) Provide a set of record drawings.

(3) In the case of a Storm Water Management Site Plan that requires an NPDES permit, evidence of the NPDES permit's executed "Notice of Termination" shall be provided prior to final release of the financial security.

I. After receipt of the certification of completion by the Township, a final inspection shall be conducted by the Township's Authorized Staff Representative(s) or other person designated by the Township to certify compliance with this Ordinance.

J. If a violation causes no immediate danger to life, public health, or property, at its sole discretion, the municipality may provide a limited time period for the owner to correct the violation. In these cases, the municipality will provide the owner, or the owner's designee, with a written notice of the violation and the time period allowed for the owner to correct the violation. If the owner does not correct the violation within the allowed time period, the municipality may revoke or suspend any, or all, applicable approvals and permits pertaining to any provision of this Ordinance.

2. In lieu of the civil penalties and enforcement remedies set forth in Section 705 of this Ordinance, the Township may enter into settlement agreements with persons who fail to comply with the requirements of this Ordinance. Such settlement agreements may include, among other things, provisions for corrective action, abatement of existing violations and reimbursement to the Township for legal, engineering and other costs incurred by the Township as a result of any violation of this Ordinance.

SECTION 704 VIOLATIONS

1. In the event that a property owner fails to comply with the requirements of this Ordinance, the Township shall provide written notification of the violation(s), and the property owner shall be subject to the penalty provisions of this Ordinance (Section 705) or other penalty provisions as may now or hereafter apply.

2. Any activity conducted in violation of the provisions of this Ordinance is hereby declared a public nuisance.

SECTION 705 PENALTIES

1. For any and every violation of the provisions of this Ordinance, the owner, general agent, or contractor of a building or premises where such violation has been committed or shall exist, and the lessee or tenant of an entire building or entire premises where such violation has been committed or shall exist, and the general agent, architect, builder, contractor, or any other person who knowingly commits, takes part or assists in any such violation or who maintains any building or premises in which any such violation shall exist shall be liable to conviction thereof to a fine or penalty not less than Twenty-Five Dollars ($25.00) nor more than Three Hundred Dollars ($300.00) fine and cost of prosecution, for each and every offense. Whenever such person shall have been notified by the Township's Authorized Staff Representative(s), or by service of summons in a prosecution, or in any other way, that he has committed such violation of this Ordinance, each day that he shall continue such violation after such notification, shall constitute a separate offense punishable by a like fine or penalty.

   Such fines, penalties, and costs shall be collected as like fines or penalties are now by law collected, and in default of payment thereof the violator shall be imprisoned in the County Jail for not more than thirty (30) days.

2. Enforcement Remedies: In case any building, structure, or land is, or is proposed to be, erected, constructed, re-constructed, altered, converted, maintained or used in violation of this Ordinance, the governing body, or with the approval of the governing body, an officer of the Municipality, in addition to other remedies, may institute in the name of the Municipality any appropriate action or proceeding to prevent, restrain, correct or abate such building, structure or land, or to prevent, in or about such premises, any act, conduct, business or use constituting a violation. Additionally, the Municipality may file a municipal lien against the premises.

SECTION 706 OWNERSHIP AND MAINTENANCE

Prior to granting of final approval by the Municipality of a plan the applicant shall either:

A. Satisfactorily establish that the permanent facilities are part of a portion of ground to be dedicated to the Municipality for reasons other than the maintenance of land subject to this Ordinance, or

B. Present to the Municipality a copy of restrictions with an affidavit stating that such restrictions shall be added to the deed of conveyance to each grantee to whom property of the development is to be conveyed.

1. When permanent Storm Water Management Facilities and ownership to these facilities are dedicated to and accepted by the Municipality, it shall be the Municipality's responsibility to maintain these facilities.

2. The Municipality shall have the right in addition to those provisions above set forth, to require the applicant, owner or developer to post a bond with the Municipality prior to the time of approval of the plan in order to assure the faithful performance of the requirements of this Ordinance in the course of completing the land development.

SECTION 707 RIGHT OF ENTRY ONTO PRIVATE PROPERTY

Upon presentation of proper credentials, duly authorized representatives of the Township may enter at reasonable times upon any property within the Township to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Ordinance.

SECTION 708 MODIFICATION OF FACILITIES

A modification which involves a change in storm water management control methods or techniques, or which involves the relocation or redesign of control measures, or which is necessary because soil or other conditions are not stated on the approved plan, shall require the submission of a revised plan by the developer in accordance with the plan requirements as set forth in Article III of this Ordinance.

SECTION 709 MODIFICATION OF ORDINANCE PROVISIONS

1. The provisions of this Ordinance not relating to water quality are intended as minimum standards for the protection of the public health, safety, and welfare. The Township reserves the right to modify or to extend them conditionally in individual cases as may be necessary in the public interest; provided, however, that such variation shall not have the effect of nullifying the intent and purpose of this Ordinance. The list of such modifications and the reasons for them shall be approved by the Township's Authorized Staff Representative(s). Modifications shall be clearly defined and entered on the approved Storm Water Management Site Plan and signed by the Township's Authorized Staff Representative(s). All requests shall be in writing and accompanied by a plan prepared to the minimum standards of a Minor Land Disturbance Plan (see Section 303).

2. The municipality may, after consultation with DEP, approve measures for meeting the state water quality requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, state law including, but not limited to, the Clean Streams Law. The municipality shall maintain a record of consultations with DEP pursuant to this paragraph. Where an NPDES permit for storm water discharges associated with construction activities is required, issuance of an NPDES permit shall constitute satisfaction of consultation with DEP.

3. Where a written Erosion and Sediment Control Plan associated with earth disturbance of 5,000 square feet to one (1) acre is required, review of the written Erosion and Sediment Control Plan shall constitute satisfaction of consultation with DEP.

SECTION 710 APPEALS

1. Any person, partnership, corporation or organization aggrieved by any action of the Township, or its agent, may appeal to the Township Planning Commission within thirty (30) days of that action.

2. Any person, partnership, corporation or organization aggrieved by any action of Township Planning Commission, may appeal to Lancaster County Court of Common Pleas within thirty (30) days of that action.

SECTION 711 REPEALER

Any resolution, ordinance or part of any resolution or ordinance inconsistent herewith any amendments thereof are hereby repealed to the extent of the inconsistency only.

SECTION 712 SEVERABILITY

Should any section, subsection, or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of the Ordinance as a whole, or of any part thereof.

SECTION 713 EFFECTIVE DATE

This Ordinance shall become effective five (5) days after its enactment by Board of Supervisors of Manor Township, Lancaster County, Pennsylvania.

DULY ORDAINED AND ENACTED this _____ day of _____ 20___, by the Board of Supervisors of Manor Township, Lancaster County, Pennsylvania, in lawful session duly assembled.

TOWNSHIP OF MANOR
Lancaster County, Pennsylvania

_____

_____

_____

_____

_____

SEAL

CERTIFICATE

I, the undersigned, Secretary of the Township of MANOR, Lancaster County, Pennsylvania (the "Township"), certify that the foregoing is a true and correct copy of an Ordinance of the Board of Supervisors of the Township which was duly enacted by affirmative vote of a majority of the members of Board of Supervisors of the Township at a meeting duly held on_____; that said Ordinance has been duly recorded in the Ordinance Book of the Township; that said Ordinance was duly published as required by law; and that said Ordinance remains in effect, unaltered and unamended, as of the date of this Certificate.

IN WITNESS WHEREOF, I set my hand and affix the official seal of the Township, this_____ day of _____20___.

_____

Secretary

(SEAL)

APPENDICES

PAGE NO.	APPENDIX TITLE
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A-3	Certification of Plan Accuracy
A-3	Certification of Survey Accuracy
A-3	Storm Drainage Plan Certification
A-3	Carbonate Geology Certification
A-4	Certificate of Ownership, Acknowledgement of Plan, and Offer of Dedication
A-6	Manor Township Board of Supervisors Storm Water Management Site Plan Approval Certificate
A-6	Manor Township Engineer Review Certificate
A-6	Manor Township Planning Commission Review Certificate
A-7	Application for Consideration for a Storm Water Management Site Plan Exemption
A-8	Application for Consideration for a Storm Water Management Site Plan
A-9	Storm Water Management Operation and Maintenance Agreement
A-18	Low Impact Development Practices
A-20	Storm Water Management Design Criteria

CERTIFICATION OF PLAN ACCURACY

I hereby certify that, to the best of my knowledge, the plan shown and described hereon is true and correct to the accuracy required by the Manor Township Storm Water Management Ordinance.

_____, 20___ *_____

* Signature and seal of a professional registered in the Commonwealth of Pennsylvania qualified to perform such duties and responsible for the preparation of the plan.

CERTIFICATION OF SURVEY ACCURACY

I hereby certify that, to the best of my knowledge, the survey shown and described hereon is true and correct to the accuracy required by the Manor Township Storm Water Management Ordinance.

_____, 20___ *_____

* Signature and seal of a professional registered in the Commonwealth of Pennsylvania qualified to perform such duties and responsible for the preparation of the plan.

STORM DRAINAGE PLAN CERTIFICATION

I hereby certify that, to the best of my knowledge, the storm drainage facilities shown and described hereon are designed in conformance with the Manor Township Storm Water Management Ordinance.

_____, 20___ *_____

* Signature and seal of a professional registered in the Commonwealth of Pennsylvania qualified to perform such duties and responsible for the preparation of the storm drainage plan.

CARBONATE GEOLOGY CERTIFICATION

The following note shall be attached to all Storm Water Management Site Plans and signed and sealed by the developer's qualified professional, "I, _____, certify that the proposed detention basin is/is not *(circle one)* underlain by carbonate geology."

CERTIFICATE OF OWNERSHIP, ACKNOWLEDGEMENT OF PLAN, AND OFFER OF DEDICATION (INDIVIDUAL)

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF LANCASTER

On this, the _____day of _____, 20 ____, before me, the undersigned officer, personally appeared _____, who being duly sworn according to law, deposes and says that he is the *_____ of the property shown on this plan, that the plan thereof was made at his direction, that he acknowledges the same to be his act and plan, that he desires the same to be recorded, and that all streets and other property identified as proposed public property (excepting those areas labeled "NOT FOR DEDICATION") are hereby dedicated to the public use.

**_____

***_____

My Commission Expires _____, 20_____

* Identify Ownership or Equitable Ownership
** Signature of the Individual
*** Signature and Seal of Notary Public or Other Authorized to Acknowledge Deeds.

CERTIFICATE OF OWNERSHIP, ACKNOWLEDGEMENT OF PLAN, AND OFFER OF DEDICATION (COPARTNERSHIP)

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF LANCASTER

On this, the _____day of _____, 20 ____, before me, the undersigned officer, personally appeared _____, being the members of the firm of who being duly sworn according to law, deposes and says that the copartnership is the *_____ of the property shown on this plan, that the plan thereof was made at its direction, that it acknowledges the same to be its act and plan and desires the same to be recorded, and that all streets and other property identified as proposed public property (excepting those areas labeled "NOT FOR DEDICATION") are hereby dedicated to the public use.

**_____

***_____

My Commission Expires _____, 20_____

* Identify Ownership or Equitable Ownership
** Signature of the Individual
*** Signature and Seal of Notary Public or Other Officer Authorized to Acknowledge Deeds.

CERTIFICATE OF OWNERSHIP, ACKNOWLEDGEMENT OF PLAN, AND OFFER OF DEDICATION (CORPORATE)

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF LANCASTER

On this, the _____day of _____, 20 ____, before me, the undersigned officer, personally appeared _____, being * _____ of ** who being duly sworn according to law, deposes and says that the corporation is the *** of the property shown on this plan, that he is authorized to execute said plan on behalf of the corporation, that the plan is the act and deed of the corporation, that the corporation desires the same to be recorded and on behalf of the corporation further acknowledges, that all streets and other property identified as proposed public property (excepting those areas labeled "NOT FOR DEDICATION") are hereby dedicated to the public use.

**** _____

***** _____

******* _____

My Commission Expires _____, 20_____

* Individual's Title
** Name of Corporation
*** Identify Ownership or Equitable Ownership
**** Signature of Individual
***** Corporate Seal
****** Signature and Seal of Notary Public or Other Officer Authorized to Acknowledge Deeds

MANOR TOWNSHIP BOARD OF SUPERVISORS
STORM WATER MANAGEMENT SITE PLAN APPROVAL CERTIFICATE

At a meeting held on _____, 20___, the Manor Township Board of Supervisors approved this project including the complete set of plans and information which are filed with the Supervisors in File No. _____, based upon its conformity with the standards of the Manor Township Storm Water Management Ordinance.

*_____

* Signature of the Chairman or Vice Chairman or their designee.

MANOR TOWNSHIP ENGINEER
REVIEW CERTIFICATE

Reviewed by the Manor Township Engineer this _____ day of _____, 20___.

_____

* Signature of the Manor Township Engineer.

MANOR TOWNSHIP PLANNING COMMISSION
REVIEW CERTIFICATE

At a meeting held on _____, 20____, the Manor Township Planning Commission reviewed this plan and a copy of the review comments is on file in the Township office.

*_____

* Signature of the (Vice) Chairman or their designee.

APPLICATION FOR CONSIDERATION FOR A STORM WATER MANAGEMENT SITE PLAN EXEMPTION MANOR TOWNSHIP

DATE OF RECEIPT _____

The undersigned hereby applies for approval under the Manor Township Storm Water Management Ordinance for a Storm Water Management Site Plan Exemption submitted herewith and described below:

1. Plan Name_____Plan No. _____ Plan Date: _____

2. Project Location _____

3. Name of Applicant (if other than owner) _____

   Address_____Phone No. _____

4. Name of Property Owner(s)_____

   Address _____Phone No. _____

6. Total Acreage _____

7. Proposed Activity:
   Are you removing existing impervious as part of this project? [ ] Yes [ ] No
   If yes, total area of existing Impervious to be removed _____ sq. ft.
   Are you removing ground cover, grading, filling, or excavation of an area less than 1,000 square feet? [ ] Yes [ ] No
   If yes, total area of land disturbance: _____ sq. ft.
   Type of Regulated Activity (check all that apply): [ ] Removal of ground cover [ ] Grading
   [ ] Filling [ ] Excavation [ ] Other earth disturbance activity (please describe)

   _____

   [ ] Addition of new impervious surface (1,000 square feet or less)
   Total new impervious surface proposed _____ sq. ft.
   Type of new impervious surface: [ ] Driveway [ ] Shed [ ] Garage [ ] Deck [ ] Walkway
   [ ] Other (please describe) _____

8. Check all items that will be impacted by the project: [ ] Floodplain [ ] Wetlands
   [ ] Slopes greater than 15% [ ] Natural water flow paths (creeks, streams, ponds, swales, etc.)
   [ ] Existing known storm water problem areas [ ] Downstream property owners

9. Sketch: Provide a sketch of the proposed additional impervious area or land disturbance.

I am aware that I cannot commence development of the property and cannot commence excavation, earthmoving, grading, or construction until a Storm Water Management Site Plan Exemption has been has been approved by Manor Township. By signing this application, I certify that all facts in the application and all accompanying documentation are true and correct. This application is being made by me to induce official action on the part of Manor Township, and I understand that any false statements made herein are being made subject to the penalties of 18 Pa. C.S. Section 4904 relating to unsworn falsification to authorities. **I understand and I am aware of and agree to reimburse Manor Township for engineering review, inspection, recording and reasonable attorney fees incurred by Manor Township.**

_____ _____

Date Signature of Landowner or Applicant

_____ _____

Date Exemption Approved Signature of Township

APPLICATION FOR CONSIDERATION FOR A STORM WATER MANAGEMENT SITE PLAN
MANOR TOWNSHIP

DATE OF RECEIPT _____

The undersigned hereby applies for approval under the Manor Township Storm Water Management Ordinance for the Storm Water Management Site Plan submitted herewith and described below:

1. Plan Name_____Plan No. _____ Plan Date: _____

2. Project Location _____

3. Name of Applicant (if other than owner) _____

   Address_____Phone No. _____

4. Name of Property Owner(s)_____

   Address_____ Phone No. _____

5. Land Use and Number of Lots and/or Units (indicate answer by number):

   __ Single-Family (Detached) __ Commercial

   __ Multi-Family (Attached-Sale) __ Industrial

   __ Multi-Family (Attached-Rent) __ Institutional

6. Total Acreage _____

7. Application Classification: (Check One)

   ___ Minor Land Disturbance ___ Major Land Disturbance

I am aware that I cannot commence development of the property and cannot commence excavation, earthmoving, grading, or construction until a plan has been recorded in the office of the Recorder of Deeds or until a Storm Water Management Site Plan has been approved by Manor Township. By signing this application, I certify that all facts in the application and all accompanying documentation are true and correct. This application is being made by me to induce official action on the part of Manor Township, and I understand that any false statements made herein are being made subject to the penalties of 18 Pa. C.S. Section 4904 relating to unsworn falsification to authorities. **I understand and I am aware of and agree to reimburse Manor Township for engineering review, inspection, recording and reasonable attorney fees incurred by Manor Township.**

_____ _____

Date Signature of Landowner or Applicant

STORM WATER FACILITIES AND BEST MANAGEMENT PRACTICES (BMP) OPERATIONS AND MAINTENANCE (O&M) AGREEMENT AND DECLARATION OF EASEMENT

THIS AGREEMENT AND DECLARATION OF EASEMENT made this_____day of _____,20_____, by and between _____ (hereinafter referred to as the "Grantor") and **Manor Township**, Lancaster County, Pennsylvania, a Township duly organized under the laws of the Commonwealth of Pennsylvania, with its municipal office located at 950 West Fairway Drive, Lancaster, PA 17603 (hereinafter referred to as the "Township").

BACKGROUND

Grantor is the owner of premises located at_____ _____ , in Manor Township, Lancaster County, Pennsylvania, as more specifically described in a deed recorded in Record Book _____, Page_____, in the Office of the Recorder of Deeds in and for Lancaster County, Pennsylvania, and as shown on the _____ , prepared by _____ , Drawing No. _____, dated_____ , last revised_____(hereinafter referred to as the "Premises").

Prior to beginning construction on any subdivision or land development, Grantor is required, under the Manor Township Subdivision and Land Development Ordinance and the Manor Township Storm Water Management Ordinance (collectively referred to as the "Ordinances"), to file a final plan with Manor Township. Pursuant to the Ordinances, Grantor must provide storm water management data in its application. The Ordinances require that Grantor's final plan reflect and/or be accompanied with supporting documentation which identifies the ownership of, and the method of administering and maintaining, all permanent storm water management facilities. Drainage courses, swales, grassed waterways, storm water inlets, pipes, conduits, detention basins, retention basins, infiltration structures, and other storm water management facilities, including Best Management Practices facilities ("BMPs"), shall be included under the term "storm water management facilities" in this Agreement and Declaration of Easement.

The purpose of this Agreement and Declaration of Easement is to describe the ownership and maintenance responsibilities for the storm water management facilities which will be installed on the Premises and to impose the ownership and maintenance responsibilities upon Grantor, his heirs, personal representatives and assigns and upon successor owners of the Premises, and set forth the rights of the Township.

NOW, THEREFORE, intending to be legally bound hereby and in consideration of receiving approval of its Subdivision and/or Land Development Plan or its Storm Water Management Site Plan (hereinafter referred to as the "Plan") from Manor Township, and in consideration of receiving permits from the Township to develop the Premises, Grantor, for Grantor and the heirs, personal representatives and assigns of Grantor, covenant and declare as follows:

1. The storm water management facilities will be owned by Grantor, his heirs, personal representatives, successors and assigns.

2. All drainage courses, swales, storm water inlets, pipes, conduits, detention basins BMPs, and other storm water management facilities shall be installed, constructed and maintained by Grantor, his heirs, personal representatives, successors and assigns, in a first-class condition in conformance with the Plan, as approved by Manor Township, including any accompanying storm water management plans and information, and as recorded in the Office of the Recorder of Deeds in and for Lancaster County, and in a manner sufficient to meet or exceed the

performance standards and specifications set forth on the Plan, as approved by Manor Township, including any accompanying storm water management plans and information. These responsibilities shall include, but not be limited to, the following:

A. Liming, fertilizing, seeding and mulching of vegetated channels and all other unstablized soils or areas according to the specifications in the "Erosion and Sediment Pollution Control Manual" published by the Pennsylvania Department of Environmental Protection, the Penn State Agronomy Guide, or similar standard acceptable to Manor Township.

B. Reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not been successfully established.

C. Mowing as necessary to maintain adequate stands of grass and to control weeds. Chemical weed control may be used if federal, state and local laws and regulations are met. Selection of seed mixtures shall be subject to approval by the Township.

D. Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, BMPs, and/or other facilities and thus reducing their capacity.

E. Removal of silt from all permanent drainage structures, in particular BMPs, in order to maintain the design storage volumes. Regular programs shall be established and maintained.

F. Regular inspection of the areas in question to assure proper maintenance and care, including, but not limited to, proper implementation of BMPs. **ADD ANY SPECIFIC INSPECTION REQUIREMENTS IN THE PCSM PLAN.**

G. Regular maintenance to insure that all pipes, swales and detention facilities shall be kept free of any debris or other obstruction. **ADD ANY SPECIFIC MAINTENANCE REQUIREMENTS IN THE PCSM PLAN.**

H. Regular maintenance of all storm water management facilities designed to improve water quality to ensure that the storm water management facilities function in accordance with their design. **ADD ANY SPECIFIC MAINTENANCE REQUIREMENTS IN THE PCSM PLAN SUCH AS:** Maintenance of the infiltration system by mowing grass regularly over the infiltration system; keeping the yard drains and roof drains free of debris in good repair at all times; flushing the infiltration system using a water hose at the cleanouts once every ninety (90) days to insure the infiltration system is clear of debris; keeping the sumps in the yard inlets and downspout sumps free of debris; and inspecting the infiltration system four (4) times per year or after each rain event exceeding one (1) inch.

I. Repair of any subsidence, including subsidence caused by sinkholes.

J. **IF APPLICABLE:** Replacement of displaced riprap within the outlet energy dissipater immediately after it is displaced, particularly after major storm discharge events.

K. **IF APPLICABLE:** Vacuum sweeping of areas of porous paving to keep surface free of sediment, typically three to four times per year and maintaining all areas of porous paving free from sealing, surfacing or re-paving with non-porous materials.

L. Removal of trash and debris on a regular basis.

Include a statement that the approved Operations and Maintenance (O&M) Plan is attached as an exhibit if there are any requirements in addition to those in Paragraph 2.

Grantor, his heirs, personal representatives, successors and assigns, shall be responsible for

performing the foregoing maintenance.

3. Grantor, for himself, his heirs, personal representatives, successors and assigns, agrees that the failure to maintain all drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs, and other storm water management facilities in a first-class condition in conformance with this Agreement and Plan, as approved by Manor Township, including any accompanying storm water management plans and information, shall constitute a nuisance and shall be abatable by the Township as such.

4. The Grantor agrees to provide the Township with an annual written report documenting the following items:

   A. Listing of all Post-Construction Storm Water Management (PCSM) Best Management Practices (BMPs) that were installed to meet requirements in NPDES Permits for Stormwater Discharges Associated with Construction Activities approved since March 10, 2003;

   B. The exact location of the PCSM BMP (e.g., street address);

   C. Information (e.g., name, address, phone number(s)) for BMP owner and entity responsible for BMP Operation and Maintenance (O&M), if different from BMP owner;

   D. The type of BMP and the year it was installed;

   E. Maintenance required for the BMP type according to the Pennsylvania Storm Water BMP Manual or other manuals and resources;

   F. The actual inspection/maintenance activities performed for each BMP during the year;

   G. An assessment by the permittee if proper operation and maintenance occurred during the year and if not, what actions the permittee has taken, or shall take, to address compliance with O&M requirements.

5. Grantor, for himself, his heirs, personal representatives, successors and assigns, authorizes the Township, at any time and from time to time, by its authorized representatives, to enter upon the Premises to inspect the storm water management facilities. Grantor acknowledges that the Township has the right to establish a schedule of regular inspections including, but not limited to, annual inspections. If the Township determines to establish a schedule of inspections of storm water management facilities, Grantor, its successors and assigns, shall reimburse the Township for the costs of such inspection and/or pay any annual fee for the administration of a Township storm water management program.

6. The Township may require that Grantor, and assigns or any future owner or occupier of the Premises or any part thereof, take such corrective measures as the Township may deem reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, as approved by Manor Township, including any accompanying storm water management plans and information.

7. Upon the failure of the owner or occupier of the Premises or any part thereof to comply with the terms of this Storm Water Management Agreement or to take corrective measures following reasonable notice from the Township, the Township, through its authorized representatives, may take such corrective measures as it deems reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, as approved by Manor Township, including any accompanying storm water management plans and information, including, but not limited to, the removal of any blockage or obstruction from drainage pipes, swales, detention basins, and BMPs, and may charge the cost thereof to Grantor, his heirs,

personal representatives, successors and assigns, or any owner of the Premises or any part thereof and, in default of such payment, may cause a municipal lien to be imposed upon the Premises or any part thereof. Any municipal lien filed pursuant to this Agreement shall be in the amount of all costs incurred by the Township, plus a penalty of ten percent (10%) of costs, including the Township's reasonable engineering and attorneys' fees.

8. If ownership or maintenance responsibility of the storm water management facilities is assigned to a home owners' association, condominium unit owners' association, or similar entity, the Township shall be notified. If the association fails to properly maintain the storm water management facilities, the Township shall have the same rights granted to municipalities under Section 705 of the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247, with reference to maintenance of common open space, to maintain the storm water management facilities. Any association so formed shall enter into an agreement with the Township recognizing its duties and the Township's rights under this Agreement.

9. Grantor hereby imposes upon the Premises for the benefit of all present and future owners of the Premises or part of the Premises, the Township, and all other property owners affected by the storm water management facilities, the perpetual right, privilege and easement for the draining of storm water in and through the drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs, and other storm water management facilities depicted on the plan or plans submitted to the Township or hereafter made of record and now or hereafter installed on or constructed upon the Premises and, in addition, easements of access to the storm water facilities.

10. Grantor agrees to indemnify and defend Manor Township and all of its elected and appointed officials, agents and employees (hereafter collectively referred to as the "Indemnitees") against and hold Indemnitees harmless from any and all liability, loss or damage, including attorneys' fees and costs of investigation and defense, as a result of claims, demands, costs or judgments against Indemnitees which arise as a result of the design, installation, construction or maintenance of the storm water facilities.

11. Grantor's personal liability under this Agreement shall cease at such time as:

    A. All storm water management facilities have been constructed in accordance with the specifications of the Township Subdivision and Land Development Ordinance, the Township Storm Water Management Ordinance and the approved plans;

    B. The storm water management facilities have been inspected and approved by the Township Engineer;

    C. All financial security, including any maintenance security, posted by Grantor has been released by the Township; and

    D. Grantor has transferred the Premises and/or all lots to be created from the Premises to third parties. Notwithstanding the foregoing, Grantor's personal liability shall continue for any violations of this Agreement and Declaration of Easement which occurred during the time that Grantor owned the Premises or any lot created from the Premises or in the event the storm water management facilities were not completed, inspected or approved as set forth in A through C herein.

12. It is the intent of the parties to this Agreement that personal liability and maintenance obligations shall pass to subsequent title owners upon change in ownership of the Premises or any lot created from the Premises, and such subsequent owners shall assume all personal liability and maintenance obligations for the time period during which they hold title. Personal liability shall remain for any violations of this Agreement and Declaration of Easement which occurred during the period in which an owner held title.

13. The Township may, in addition to the remedies prescribed herein, proceed with any action at law or in equity to bring about compliance with the Manor Township Storm Water Management Ordinance, the Manor Township Subdivision and Land Development Ordinance, and this Agreement.

14. This Agreement and Declaration of Easement shall be binding upon the Grantor, the successors and assigns of Grantor, and all present and future owners of the Premises or any part thereof and is intended to be recorded in order to give notice to future owners of the Premises of their duties and responsibilities with respect to the storm water management facilities. Grantor shall include a specific reference to this Agreement in any deed of conveyance for the Premises or any part thereof.

15. This Agreement and Declaration of Easement may be amended only by written instrument signed on behalf of all owners of the Premises and Manor Township.

16. When the sense so requires, words of any gender used in this Agreement and Declaration of Easement shall be held to include any other gender, and the words in the singular number shall be held to include the plural, and vice versa.

IN WITNESS WHEREOF, the undersigned have caused this Agreement and Declaration to be executed on the day and year first above written.

Manor Township
Lancaster County, Pennsylvania

Attest: _____ By: _____
(Assistant) Secretary (Vice) Chairman
Township Board of Supervisors

[Manor Township SEAL]

(Individual or Husband and Wife Developer)

Witness:

_____ _____(SEAL)
(Signature of Individual)

_____ _____(SEAL)
(Signature of Spouse if Husband and Wife are Co-Developers)

IF APPLICABLE
Trading and Doing Business as
_____

(Partnership Developer*)

_____
(Name of Partnership)

Witness:

_____ By_____(Seal)
Partner

_____ By_____(Seal)
Partner

_____ By_____(Seal)
Partner

*All Partners must execute the Agreement.

(Corporation Developer)

_____
(Name of Corporation)

ATTEST:

By:_____ By:_____
(Assistant) Secretary (Vice) President

(CORPORATE SEAL)

(Limited Liability Company Landowner***)

_____
(Name of Limited Liability Company)

Witness:

_____ By_____(Seal)
Member

_____ By_____(Seal)
Member

_____ By_____(Seal)
Member

***All Members must sign.

ACKNOWLEDGMENT FOR Manor Township

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF _____)

On this, the _____ day of _____, A.D., 20___, before me, the undersigned officer, a Notary Public in and for the aforesaid Commonwealth and County, personally appeared _____, who acknowledged ___self to be (Vice) Chairman of the Board of Supervisors of Manor Township, Lancaster County, Pennsylvania, and that he/she, as such officer, being authorized to do so, executed the foregoing Storm Water Management Agreement and Declaration of Easement, for the purposes therein contained, by signing the name of such Township by ___self as such officer.

IN WITNESS WHEREOF, I set my hand and official seal.

Notary Public: _____
My Commission expires:_____

ACKNOWLEDGMENT FOR INDIVIDUAL OR HUSBAND AND WIFE DEVELOPER

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF _____)

On this, the _____day of_____, 20____, before me, the undersigned officer, a Notary Public, in and for the aforesaid Commonwealth and County, personally appeared _____, known to me (or satisfactory proven) to be the person(s) whose name(s) is/are subscribed on the within instrument and acknowledged the foregoing Storm Water Management Agreement and Declaration of Easement to be _____ act and deed and desired the same to be recorded as such.

IN WITNESS WHEREOF, I set my hand and official seal.

Notary Public: _____
My Commission expires:_____

ACKNOWLEDGMENT FOR CORPORATE DEVELOPER

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF _____)

On this, the _____day of_____, 20____, before me, a Notary Public, personally appeared, the undersigned officer,_____who acknowledged ___self to be the _____ of _____, a corporation, and that such officer being authorized to do so, acknowledged the foregoing instrument for the purpose therein contained, by signing the name of the corporation by ___self as _____.

In Witness Whereof, I set my hand and official seal.

Notary Public: _____
My Commission expires:_____

ACKNOWLEDGMENT FOR PARTNERSHIP DEVELOPER

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF _____)

On this, the _____day of_____, 20____, before me, a Notary Public, the undersigned officer, personally appeared _____ who acknowledged themselves to be all of the partners of _____, a _____ partnership, and that they, as such partners, being authorized to do so, executed the foregoing instrument for the purposes therein contained, by signing the name of the partnership by themselves as such partners.

In Witness Whereof, I set my hand and official seal.

Notary Public: _____
My Commission expires:_____

ACKNOWLEDGMENT FOR LIMITED LIABILITY COMPANY LANDOWNER

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF _____)

On this, the _____day of_____, 20____, before me, the undersigned officer, personally appeared _____ who acknowledged themselves to be all of the members of _____, a _____ limited liability company, and that they, as such members, being authorized to do so, executed the foregoing instrument for the purposes therein contained, by signing the name of said limited liability company by themselves as such members.

In Witness Whereof, I set my hand and official seal.

Notary Public: _____
My Commission expires:_____

JOINDER BY MORTGAGEE

_____("Mortgagee"), as holder of a certain mortgage on the prem
Pennsylvania, which mortgage, in the amount of _____ dollars ($_____) and dated _____ and is recorded or is about to be recorde referred to as the "Mortgages"), joins in, consents to, and expressly approves the grant of easements and other rights and privileges described in the attached Storm Water Management Agreement and Declaration of Easement (the "Agreement").

The Mortgagee, for itself, its successors and assigns (which shall include any assignee of the Mortgages and any purchaser of the Premises at a sale in foreclosure of the Mortgages or otherwise), hereby covenants and agrees that the rights and privileges herein granted with respect to the Premises shall not be terminated or disturbed by reason of any foreclosure or other action which may be instituted by the Mortgagee, its successors and assigns, as a result of any default under the Mortgages or the debt instruments that such Mortgages secure. Mortgagee by consenting to the Agreement shall not by virtue of its interest as Mortgagee be deemed to have undertaken any of the obligations of the Grantor under the Agreement, including but not limited to construction, maintenance, inspection or indemnification.

IN WITNESS WHEREOF, Mortgagee hereby joins in the execution of the Agreement as of this _____ day of _____, 20___

_____

(Name of Mortgagee)

ATTEST: _____ By:

[SEAL]

ACKNOWLEDGMENT FOR MORTGAGEE

COMMONWEALTH OF PENNSYLVANIA)

) SS:

COUNTY OF _____)

On this, the _____day of_____, 20____, before me, a Notary Public, the undersigned officer, personally appeared, _____ who acknowledged ___self to be the _____ of _____, a corporation, and that such officer being authorized to do so, acknowledged the foregoing instrument for the purpose therein contained, by signing the name of the Bank by ___self as _____.

In Witness Whereof, I set my hand and official seal.

Notary Public: _____
My Commission expires:_____

LOW IMPACT DEVELOPMENT PRACTICES

LOW IMPACT DEVELOPMENT PRACTICES
ALTERNATIVE APPROACHES FOR MANAGING STORM WATER RUNOFF

Natural hydrologic conditions may be altered radically by poorly planned development practices, such as introducing unneeded impervious surfaces, destroying existing drainage swales, constructing unnecessary storm sewers, and changing local topography. A traditional drainage approach of development has been to remove runoff from a site as quickly as possible and capture it in a detention basin. This approach leads ultimately to the degradation of water quality, as well as expenditure of additional resources for detaining and managing concentrated runoff at some downstream location.

The recommended alternative approach is to promote practices that will minimize post-development runoff rates and volumes, which will minimize needs for artificial conveyance and storage facilities. To simulate pre-development hydrologic conditions, forced infiltration is often necessary to offset the loss of infiltration by creation of impervious surfaces. The ability of the ground to infiltrate runoff depends upon the soil types and its conditions.

Preserving natural hydrologic conditions requires careful alternative site design considerations. Site design practices include preserving natural drainage features, minimizing impervious surface area, reducing the hydraulic connectivity of impervious surfaces, and protecting natural depression storage. A well-designed site will contain a mix of all those features. The following describes various techniques to achieve the alternative approaches:

- **Preserving Natural Drainage Features.** Protecting natural drainage features, particularly vegetated drainage swales and channels, is desirable because of their ability to infiltrate and attenuate flows and to filter pollutants. However, this objective is often not accomplished in land development. In fact, commonly held drainage philosophy encourages just the opposite pattern - streets and adjacent storm sewers typically are located in the natural headwater valleys and swales, thereby replacing natural drainage functions with a completely impervious system. As a result, runoff and pollutants generated from impervious surfaces flow directly into storm sewers with no opportunity for attenuation, infiltration, or filtration. Developments designed to fit site topography also minimize the amount of grading on site.
- **Protecting Natural Depression Storage Areas.** Depressional storage areas have no surface outlet, or drain very slowly following a storm event. They can be commonly seen as ponded areas in farm fields during the wet season or after large runoff events. Traditional development practices eliminate these depressions by filling or draining, thereby obliterating their ability to reduce surface runoff volumes and trap pollutants. The volume and release-rate characteristics of depressions should be protected in the design of the development site. The depressions can be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.
- **Avoiding Introduction of Impervious Areas.** Careful site planning should consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways, and other features producing impervious surfaces should be evaluated to minimize impacts on runoff.
- **Reducing the Hydraulic Connectivity of Impervious Surfaces.** Impervious surfaces are significantly less of a problem if they are not directly connected to an impervious conveyance system (such as storm sewer). Two (2) basic ways to reduce hydraulic connectivity are: routing of roof runoff over lawns; and reducing the use of storm sewers. Site grading should promote increasing travel time of storm water runoff and should help reduce concentration of runoff to a single point in the development.

- **Routing Roof Runoff Over Lawns.** Roof runoff can be easily routed over lawns in most site designs. The practice discourages direct connections of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. The routing of roof drains and crowning the driveway to allow runoff to discharge to pervious areas is desirable as the pervious area essentially acts as a filter strip.

- **Reducing the Use of Storm Sewers.** By reducing the use of storm sewers for draining streets, parking lots, and backyards, the potential for accelerating runoff from the development can be greatly reduced. The practice requires greater use of swales and may not be practical for some development sites, especially if there are concerns for areas that do not drain in a "reasonable" time. The practice requires educating local citizens and public works officials, who expect runoff to disappear shortly after a rainfall event.

- **Reducing Street Widths.** Street widths can be reduced by either eliminating on-street parking or by reducing cartway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets, which ultimately could lower maintenance and maintenance-related costs.

- **Using Permeable Paving Materials.** These materials include permeable interlocking concrete paving blocks or porous bituminous concrete. Such materials should be considered as alternatives to conventional pavement surfaces, especially for low use surfaces such as driveways, overflow parking lots, and emergency access roads.

- **Reducing Building Setbacks.** Reducing building setbacks reduces driveway and entry walks and is most readily accomplished along low-traffic streets where traffic noise is not a problem.

- **Constructing Cluster Developments.** Cluster developments can also reduce the amount of impervious area for a given number of lots. The biggest savings is in street length, which also will reduce costs of the development, Cluster development "clusters" the construction activity onto less-sensitive areas without substantially affecting the gross density of development.

In summary, careful consideration of the existing topography and implementation of a combination of the above mentioned techniques may avoid construction of costly storm water control measures. Other benefits include: reduced potential of downstream flooding, reduced water quality degradation of receiving streams and water bodies, enhancement of aesthetics, and reduction of development costs. Beneficial results include: more stable base flows in receiving streams, improved groundwater recharge, reduced flood flows, reduced pollutant loads, and reduced costs for conveyance and storage.

STORM WATER MANAGEMENT DESIGN CRITERIA

RATIONAL METHOD RUNOFF COEFFICIENTS

Hydrologic Soil Group and Slope Range

	A			B			C			D		
Land Use	**0 to 2%**	**2 to 6%**	**6+%**	**0 to 2%**	**2 to 6%**	**6+%**	**0 to 2%**	**2 to 6%**	**6+%**	**0 to 2%**	**2 to 6%**	**6+%**
Cultivated Land	0.08[a] 0.14[b]	0.13 0.18	0.16 0.22	0.11 0.16	0.15 0.21	0.21 0.28	0.14 0.20	0.19 0.25	0.26 0.34	0.18 0.24	0.23 0.29	0.31 0.41
Pasture	0.12 0.15	0.20 0.25	0.30 0.37	0.18 0.23	0.28 0.34	0.37 0.45	0.24 0.30	0.34 0.42	0.44 0.52	0.30 0.37	0.40 0.50	0.50 0.62
Meadow	0.10 0.14	0.16 0.22	0.25 0.30	0.14 0.20	0.22 0.28	0.30 0.37	0.20 0.26	0.28 0.35	0.36 0.44	0.24 0.30	0.30 0.40	0.40 0.50
Forest	0.05 0.08	0.08 0.11	0.11 0.14	0.08 0.10	0.11 0.14	0.14 0.18	0.10 0.12	0.13 0.16	0.16 0.20	0.12 0.15	0.16 0.20	0.20 0.25
Residential 1/8 acre	0.25 0.33	0.28 0.37	0.31 0.40	0.27 0.35	0.30 0.39	0.35 0.44	0.30 0.38	0.33 0.42	0.38 0.49	0.33 0.41	0.36 0.45	0.42 0.54
Residential 1/4 acre	0.22 0.30	0.26 0.34	0.29 0.37	0.24 0.33	0.29 0.37	0.33 0.42	0.27 0.36	0.31 0.40	0.36 0.47	0.30 0.38	0.34 0.42	0.40 0.52
Residential 1/3 acre	0.19 0.28	0.23 0.32	0.26 0.35	0.22 0.30	0.26 0.35	0.30 0.39	0.25 0.33	0.29 0.38	0.34 0.45	0.28 0.36	0.32 0.40	0.39 0.50
Residential 1/2 acre	0.16 0.25	0.20 0.29	0.24 0.32	0.19 0.28	0.23 0.32	0.28 0.36	0.22 0.31	0.27 0.35	0.32 0.42	0.26 0.34	0.30 0.38	0.37 0.48
Residential 1 acre	0.14 0.22	0.19 0.26	0.22 0.29	0.17 0.24	0.21 0.28	0.26 0.34	0.20 0.28	0.25 0.32	0.31 0.40	0.24 0.31	0.29 0.35	0.35 0.46
Industrial	0.67 0.85	0.68 0.85	0.68 0.86	0.68 0.85	0.68 0.86	0.69 0.86	0.68 0.86	0.69 0.86	0.69 0.87	0.69 0.86	0.69 0.86	0.70 0.88
Commercial	0.71 0.88	0.71 0.88	0.72 0.89	0.71 0.89	0.72 0.89	0.72 0.89	0.72 0.89	0.72 0.89	0.72 0.90	0.72 0.89	0.72 0.89	0.72 0.90
Streets	0.70 0.76	0.71 0.77	0.72 0.79	0.71 0.80	0.72 0.82	0.74 0.84	0.72 0.84	0.73 0.85	0.76 0.89	0.73 0.89	0.75 0.91	0.78 0.95
Open Space	0.05 0.11	0.10 0.16	0.14 0.20	0.08 0.14	0.13 0.19	0.19 0.26	0.12 0.18	0.17 0.23	0.24 0.32	0.16 0.22	0.21 0.27	0.28 0.39
Parking	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97

NOTES:

[a]Runoff coefficients for storm recurrence intervals less than twenty-five (25) years.

[b]Runoff coefficients for storm recurrence intervals of twenty-five (25) years or more.

Source: Rawls, W.J., S.L. Long, and R.H. McCuen, 1981. Comparison of Urban Flood Frequency Procedures Preliminary Draft Report prepared for the Soil Conservation Service, Beltsville, Maryland

RUNOFF CURVE NUMBERS (FROM NRCS (SCS) TR-55)

Runoff Curve Numbers for Urban Areas					
Cover Description		**Curve Numbers for Hydrologic Soil Groups**			
Cover Type and Hydrologic Condition	***Average Percent Impervious Area***	***A***	***B***	***C***	***D***
Fully Developed Urban Areas (Vegetation Established)					
Open Space (lawns, parks, golf courses, etc.):					
Poor Condition (grass cover < 50%)		68	79	86	89
Fair Condition (grass cover 50% to 75%)		49	69	79	84
Good Condition (grass cover > 75%)		39	61	74	80
Impervious Areas:					
Paved Parking Lots, Roofs, Driveways, etc.		98	98	98	98
Streets and Roads:					
Paved: Curbed and Storm Sewers		98	98	98	98
Paved: Open Ditches		83	89	92	93
Gravel		76	85	89	91
Dirt		72	82	87	89
Urban Districts:					
Commercial and Business	85%	89	92	94	95
Industrial	72%	81	88	91	93
Residential Districts by Average Lot Size:					
1/8 Acres or less	65%	77	85	90	92
1/4 Acre	38%	61	75	83	87
1/3 Acre	30%	57	72	81	86
1/2 Acre	25%	54	70	80	85
1 Acre	20%	51	68	79	84
2 Acres	12%	46	65	77	82

Runoff Curve Numbers for Cultivated Agricultural Lands

Cover Description			Curve Numbers for Hydrologic Soil Groups			
Cover Type	**Treatment**	**Hydrologic Condition**	**A**	**B**	**C**	**D**
Fallow	Bare Soil	--	77	86	91	94
	Crop Residue Cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row Crops	Straight Row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & Terraced (C & T)	Poor	66	74	80	82
		Good	62	71	78	81
	C & T CR	Poor	65	73	79	81
		Good	61	70	77	80
Small Grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C & T	Poor	61	72	79	82
		Good	59	70	78	81
	C & T + CR	Poor	60	71	78	81
		Good	58	69	77	80
Close Seeded or Broadcast Legumes Or Rotation Meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C & T	Poor	63	73	80	83
		Good	51	67	76	80

Runoff Curve Numbers for Other Agricultural Lands					
Cover Description		***Curve Numbers for Hydrologic Soil Groups***			
Cover Type	***Hydrologic Condition***	***A***	***B***	***C***	***D***
Pasture, Grassland, or Range – Continuous Forage for Grazing	Poor	*77*	*86*	*91*	*94*
	Fair	*76*	*85*	*90*	*93*
	Good	*74*	*83*	*88*	*90*
Meadow – Continuous Grass, Protected from Grazing and Generally Mowed for Hay	--	*30*	*58*	*71*	*78*
Brush – Brush, Weed, Grass Mixture with brush the major element	Poor	*48*	*67*	*77*	*83*
	Fair	*35*	*56*	*70*	*77*
	Good	*30*	*48*	*65*	*73*
Woods – Grass Combination (orchard or tree farm)	Poor	*57*	*73*	*82*	*86*
	Fair	*43*	*65*	*76*	*82*
	Good	*32*	*58*	*72*	*79*
Woods	Poor	*45*	*66*	*77*	*83*
	Fair	*36*	*60*	*73*	*79*
	Good	*30*	*55*	*70*	*77*
Farmsteads – Buildings, Lanes, Driveways and Surrounding Lots.	--	*59*	*74*	*82*	*86*

MANNING'S EQUATION "n" ROUGHNESS COEFFICIENTS

Description	Manning's "n"[1]
Smooth-Wall Plastic Pipe	0.011
Concrete Pipe	0.012
Smooth-Lined Corrugated Metal Pipe	0.012
Corrugated Plastic Pipe	0.024
Annular Corrugated Steel And Aluminum Alloy Pipe (Plain or Polymer Coated)	
68 mm x 13 mm (2 2/3 in x 1/2 in) Corrugations	0.024
75 mm x 25 mm (3 in x 1 in) Corrugations	0.027
125 mm x 25 mm (5 in x 1 in) Corrugations	0.025
150 mm x 50 mm (6 in x 2 in) Corrugations	0.033
Helically Corrugated Steel And Aluminum Alloy Pipe (Plain or Polymer Coated)	
75 mm x 25 mm (3 in x 1 in), 125 mm x 25 mm (5 in x 1 in), or 150 mm x 50 mm (6 in x 2 in) Corrugations	0.024
Helically Corrugated Steel And Aluminum Alloy Pipe (Plain or Polymer Coated)	
68 mm x 13 mm (2 2/3 in x 1/2 in) Corrugations	
a. Lower Coefficients*	
450 mm (18 in) Diameter	0.014
600 mm (24 in) Diameter	0.016
900 mm (36 in) Diameter	0.019
1200 mm (48 in) Diameter	0.020
1500 mm (60 in) Diameter or larger	0.021
b. Higher Coefficients**	0.024
Annular or Helically Corrugated Steel or Aluminum Alloy Pipe Arches or Other Non- Circular Metal Conduit (Plain or Polymer Coated)	0.024
Vitrified Clay Pipe	0.012
Ductile Iron Pipe	0.013
Asphalt Pavement	0.015
Concrete Pavement	0.014
Grass Medians	0.050
Grass - Residential	0.030
Earth	0.020
Gravel	0.030
Rock	0.035
Cultivated Areas	0.030 - 0.050
Dense Brush	0.070 - 0.140
Heavy Timber (Little undergrowth)	0.100 - 0.150
Heavy Timber (with underbrush)	0.40
Streams:	
Some Grass And Weeds (Little or no brush)	0.030 - 0.035
Dense Growth of Weeds	0.035 - 0.050
Some Weeds (Heavy brush on banks)	0.050 - 0.070

Notes:

* Use the lower coefficient if any one (1) of the following conditions apply:

A. A storm pipe longer than twenty (20) diameters, which directly or indirectly connects to an inlet or manhole, located in swales adjacent to shoulders in cut areas, shoulders in cut areas or depressed medians.

B. A storm pipe which is specially designed to perform under pressure.

** Use the higher coefficient if any one (1) of the following conditions apply:

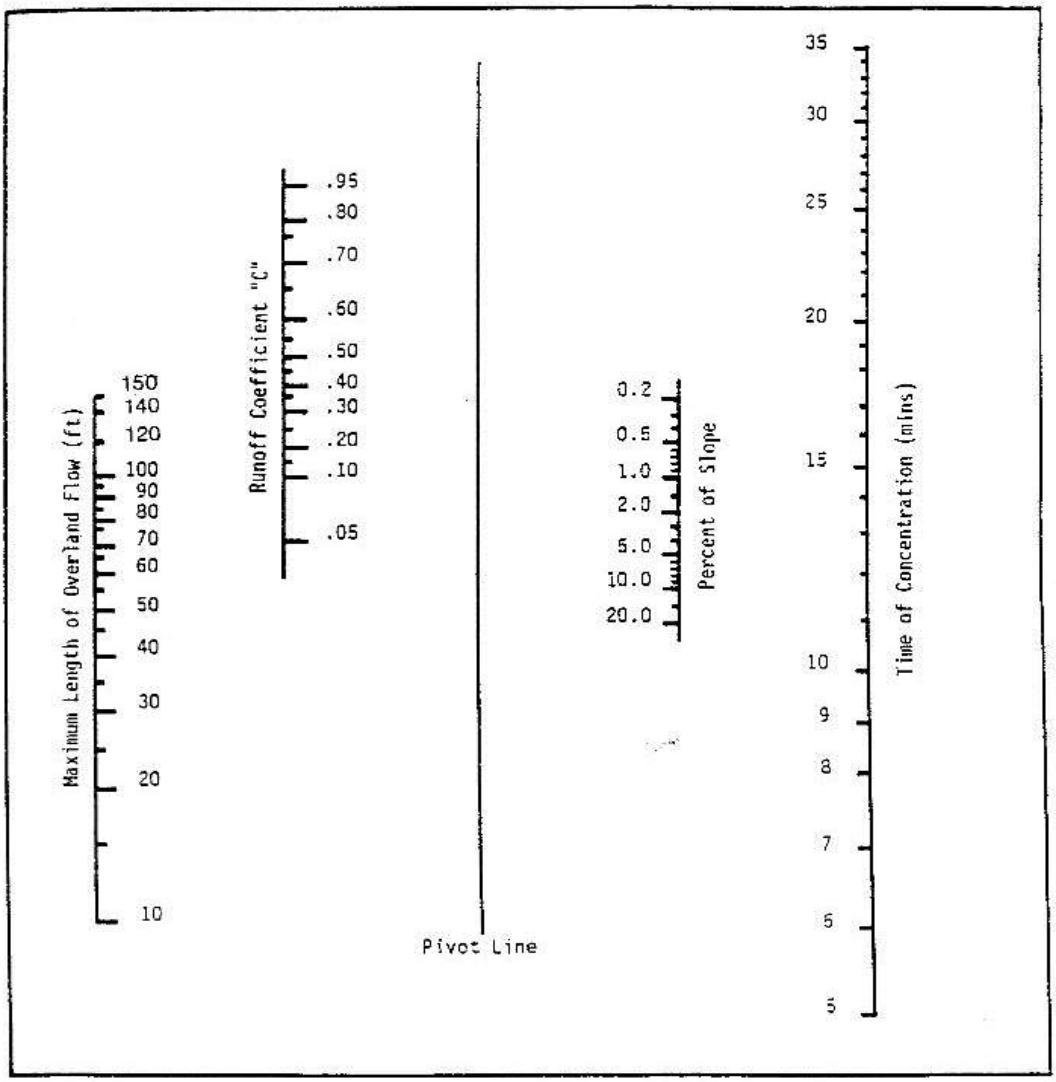
A. A storm pipe which directly or indirectly connects to an inlet or manhole located in highway pavement sections or adjacent to curb or concrete median barrier.

B. A storm pipe which is shorter than twenty (20) diameters long.

C. A storm pipe which is partly lined helically corrugated metal pipe.

NOMOGRAPH FOR DETERMINING SHEET FLOW

(for use with the Rational Method)



Worksheet #1: Time of concentration (T_C) or travel time (T_t)

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)	**Segment ID**			
1. Surface description (table 3-1)				
2. Manning's roughness coeff., n (table 3-1)				
3. Flow length, L (total L ≤ **150 ft) ft				
4. Two-yr 24-hr rainfall, P_2 in				
5. Land slope, s ft/ft				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$ Compute T_t hr		+		=
Shallow concentrated flow	**Segment ID**			
7. Surface description (paved or unpaved)				
8. Flow length, L ft				
9. Watercourse slope, s ft/ft				
10. Average velocity, V (figure 3-1) ft/s				
11. $T_t = \frac{L}{3600\,V}$ Compute T_t hr		+		=
Channel flow	**Segment ID**			
12. Cross sectional flow area, a ft^2				
13. Wetted perimeter, P_w ft				
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft				
15. Channel slope, s ft/ft				
16. Manning's roughness coeff., n				
17. $V = \frac{1.49\,r^{\frac{2}{3}}\,s^{\frac{1}{2}}}{n}$ Compute V ft/s				
18. Flow length, L ft				
19. $T_t = \frac{L}{3600V}$ Compute T_t hr		+		=
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) hr				

*Table 3-1 per latest TR-55, Urban Hydrology for Small Watershed

**150' sheet flow length per latest TR-55 revision

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

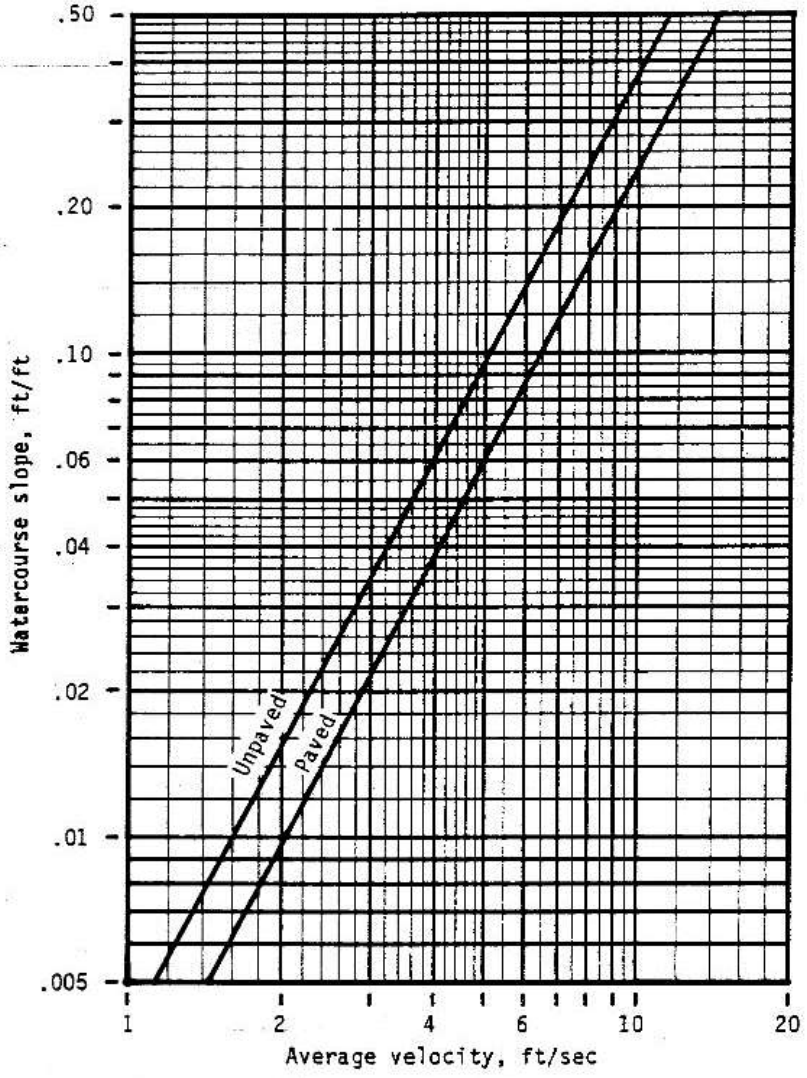


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

MANOR TOWNSHIP
RESOLUTION NO. 21 - 2005

A RESOLUTION REVISING FEES FOR STORM WATER MANAGEMENT REVIEW.

WHEREAS, Manor Township enacted a Storm Water Management Ordinance; and Manor Township has established fees in accordance with the aforesaid Ordinance;

NOW, THEREFORE, BE IT RESOLVED by the Supervisors of the Township of Manor, County of Lancaster, and Commonwealth of Pennsylvania, the Township revise the fee schedule as follows:

MANOR TOWNSHIP
SCHEDULE OF FEES FOR STORMWATER REVIEW

GROSS SITE AREA(ACRES OR PART THEREOF)	ADMIN FEE	RATE SCHEDULE REVIEW FEE	TOTAL
1	$100	$400.00	$500.00
2	$100	$450.00	$550.00
3	$100	$500.00	$600.00
4	$100	$550.00	$650.00
5	$100	$600.00	$700.00
6	$100	$650.00	$750.00
7	$100	$700.00	$800.00
8	$100	$750.00	$850.00
9	$100	$800.00	$900.00
10	$100	$850.00	$950.00
11	$100	$900.00	$1,000.00
12	$100	$950.00	$1,050.00
13	$100	$1,000.00	$1,100.00

14	$100	$1,050.00	$1,150.00
15	$100	$1,100.00	$1,200.00
16	$100	$1,150.00	$1,250.00
17	$100	$1,200.00	$1,30000
18	$100	$1,250.00	$1,350.00
19	$100	$1,300.00	$1,400.00
20	$100	$1,350.00	$1,450.00

Notes:

1. A Review Fee of Fifty Dollars ($50.00) per acre, or part thereof, above twenty (20) acres shall be added to the total fee.

2. The Administrative Fee is non-refundable

3. If the cost incurred by Manor Township to review and process a plan is less than the Review Fee, then a refund for the difference will be issued to the applicant upon completion of action by Manor Township. Manor Township may charge an additional Review Fee for redesigned plans which propose change in facilities from the design of the original application.

4. The review of Storm Water Management designs by the Manor Township Engineer shall be billed at a rate of One Hundred Dollars ($100.00) per hour.

5. The gross site area shall include the entire area of any lot or parcel, any portion of which shall be disturbed by earthmoving or drainage changes or upon which a structure will be built (whether now or in the future), but may exclude the area of any lot within which there will be no land disturbance.

6. For land developments, only where the earth disturbance and all storm water management facilities and easements comprise less than thirty percent (30%) of the gross site area, the applicant may request Manor Township to reduce the Review Fee to correspond to the area affected by the earth disturbance and all storm water management facilities and easements.

RESOLVED this 6th Day of June, 2005

MANOR TOWNSHIP

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John S. May

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Robert K. Aichele

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Richard C. Bauder

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Jay C. Breneman

_____
L. Allen Kreider

ATTEST:

I hereby certify that the foregoing is a true and correct copy of the Resolution duly adopted at a meeting of the Manor Township Supervisors held on the 6th of June, 2005.

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Barry L. Smith