



Solicitor

Union Township

Lebanon County

Pennsylvania

STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. 144

AN ORDINANCE OF THE TOWNSHIP OF UNION, LEBANON COUNTY, PENNSYLVANIA, SETTING FORTH A PLAN FOR STORMWATER MANAGEMENT IN THE TOWNSHIP; SETTING FORTH GENERAL PROVISIONS, DEFINITIONS, REQUIREMENTS FOR STORMWATER MANAGEMENT AND PROCEDURES, INSPECTION REQUIREMENTS, PROVISIONS FOR FEES AND EXPENSES, ENFORCEMENT AND PENALTIES

BE IT ENACTED AND ORDAINED by the Board of Supervisors of the Township of Union, Lebanon County, Pennsylvania, and it is hereby enacted and ordained by the authority of the same as follows:

Section 1. Title. This Ordinance shall be known as the Union Township Stormwater Management Ordinance.

Section 2. Statement of Findings. The governing body of the Township of Union (the "Township") finds that:

- 2.a. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flood 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 stormwater, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge and threatens public health and safety.
- 2.b. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety and welfare and the protection of the people of the Township and all of the people of the Commonwealth of Pennsylvania, their resources and the environment.

Section 3. Purposes. The purpose of this Ordinance is to promote public health, safety and welfare by minimizing the damages described in Section 2 of this Ordinance by provisions designed to:

- 3.a. Control accelerated runoff and erosion and sedimentation problems at their source by regulating activities which cause such problems.
- 3.b. Utilize and preserve the desirable existing natural drainage systems.
- 3.c. Maintain the existing flow and quality of streams and water courses in the Township and in

the Commonwealth of Pennsylvania.

- 3.d. Preserve and restore the flood carrying capacity of streams.
- 3.e. Provide for proper maintenance of all permanent stormwater management structures which are constructed in the Township.
- 3.f. Insure adequate drainage of all low points along the line of streets.
- 3.g. Intercept stormwater runoff along streets at intervals related to the extent and grade of the area drained.
- 3.h. Establish criteria for computing stormwater runoff.
- 3.i. Provide positive drainage away from on-site sewage disposal facilities and buildings.

Section 4. Statutory Authority. The Township is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864, No. 167, known as the "Stormwater Management Act", and pursuant to the express and implied powers granted under the Second Class Township Code and the Municipalities Planning Code, as amended.

Section 5. Applicability. Construction involving any of the following activities are included within, and subject to, the scope of this ordinance:

- 5.a. Land Development.
- 5.b. Subdivision.
- 5.c. Construction of new or additional impervious or semi-pervious areas which total ten thousand (10,000) square feet or more from the effective date of this Ordinance, unless such construction is associated with a single-family detached residential dwelling use or an accessory agricultural building use.
- 5.d. Diversion or piping of any natural or man-made stream channel.
- 5.e. Installation, alteration, modification or removal of stormwater systems or appurtenances thereto.
- 5.f. Any other activity where the Township determines that said activity may adversely affect any existing watercourses, stormwater management facilities or stormwater runoff patterns.

Section 6. Modifications.

- 6.a. Modification of These Provisions by the Township Supervisors. The provisions of this Ordinance are intended as minimum standards for the protection of the public health, safety and welfare. The Township Supervisors may modify or extend said provisions in individual cases as may be deemed necessary in the public interest as set forth hereinafter; provided, however, that such variation shall not have the effect of nullifying the intent and purpose of this Ordinance. If the literal compliance with any mandatory provisions of these regulations is shown to be unreasonable as applied to a specific property, the Township Supervisors may grant a waiver, which is defined herein. All such requests shall be first submitted to the Township Engineer for review, and to the Township Planning Commission for review and for recommendation to the Board of Supervisors for final action.
- 6.b. Modification to Approved Plans. No changes, erasures, modifications or revisions shall be made in any documentation after approval has been made by the Township Supervisors, unless said documentation is first resubmitted to and approved by the Township Supervisors. In all cases "as built" plans must be provided prior to final release of security during the improvements phase.

Section 7. Warning and Disclaimer of Liability. The degree of stormwater protection sought by the provisions of this Ordinance is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study. THIS ORDINANCE DOES NOT IMPLY THAT AREAS SUBJECT TO THE STORMWATER MANAGEMENT REQUIREMENTS OF THIS ORDINANCE WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. Except as specifically provided by the Pennsylvania Stormwater Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. § 680.1 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 by the Township of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, stormwater 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 Board of Supervisors, by enacting and amending this chapter, 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.A. § 8541 et seq., and does not assume any liabilities or obligations.

Section 8. Definitions and General Statement. Words used in the present tense shall include the future tense. Words in the singular shall include the plural and words in the plural shall include the singular. The word “shall” and “will” are mandatory; the word “should” and “may” are permissive. Terms not defined in this Ordinance shall have the meaning customarily assigned to them.

Unless otherwise expressly stated, the following words shall, for the purpose of this Ordinance, have the meaning herein indicated:

- 8.a. ACCELERATED EROSION. The removal of the surface of the land through the combined action of man’s activities and natural processes at a rate greater than would occur because of the natural process alone.
- 8.b. ALTERATION. As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the changing of surface conditions by causing the surface to be more or less impervious; land disturbance.
- 8.c. BMP. Best management practice, a type of stormwater management facility as set forth in this ordinance designed to improve the quality of stormwater runoff.
- 8.d. CARBONATE GEOLOGY. Limestone or dolomite bedrock.
- 8.e. CHANNEL. A natural or artificial watercourse with a definite bed and banks which confine and conduct continuously or periodically flowing water.
- 8.f. CISTERN. An underground reservoir or tank for storing rainwater.
- 8.g. CONSERVATION DISTRICT. The Lebanon County Conservation District.
- 8.h. COUNTY. The County of Lebanon, Commonwealth of Pennsylvania.
- 8.i. CONVEYANCE. The ability of a pipe, culvert, swale or similar facility to carry the peak flow from the design storm.
- 8.j. CULVERT. A structure with appurtenant works which carries a watercourse under or through an embankment or fill.
- 8.k. DEP. The Pennsylvania Department of Environmental Protection or any agency successor thereto.
- 8.l. DESIGN STORM. The magnitude of precipitation from a storm event measured in probability of occurrence (e.g., fifty-year storm) and duration (e.g., twenty-four-hour),

and used in computing stormwater management control systems.

- 8.m. DETENTION BASIN. A basin designed to drain completely after controlling stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.
- 8.n. DEVELOPER. Any landowner, agent of such landowner or tenant with the permission of such landowner, including a firm, association, organization, partnership, trust, company or corporation as well as an individual who makes or causes to be made a subdivision of land or a land development, or other activities covered by this ordinance.
- 8.o. 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.
- 8.p. DOWNSLOPE PROPERTY LINE. That portion of a property line of a parent tract located at the topographically lowest point of the tract such that some or all overland, swale or pipe flow from a development site would be direct toward it.
- 8.q. DRAINAGE CONVEYANCE FACILITY. A stormwater management facility designed to transmit stormwater runoff and shall include streams, channels, swales, pipes, conduits, storm sewers, etc.
- 8.r. DRAINAGE EASEMENT. A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.
- 8.s. EROSION. The removal of soil particles by the action of water, wind, ice or other geological agents.
- 8.t. EXISTING CONDITIONS. The initial condition of a development site prior to the proposed construction.
- 8.u. GRADE. A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein.
- 8.v. GRASSED WATERWAY. A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water from cropland.
- 8.w. GROUNDWATER RECHARGE. Replenishment of existing natural underground water supplies.
- 8.x. IMPERVIOUS SURFACE. A surface which prevents the percolation of water into the ground.
- 8.y. IMPOUNDMENT. A retention or detention basin designed to retain stormwater runoff and infiltrate it into the ground (in the case of a retention basin) or release it at a controlled rate (in the case of a detention basin).
- 8.z. INFILTRATION STRUCTURES. A structure designed to direct runoff into the ground.
- 8.aa. INLET. A surface connection to a closed drain. The upstream end of any structure through which water may flow.
- 8.bb. INTERMITTENT STREAM. A body of water flowing in a channel or bed composed primarily of substrates associated with flowing water, which, during periods of the year, is below the local water table and obtains its flow from both surface runoff and groundwater discharges.
- 8.cc. LAND DEVELOPMENT. Any development of property considered to be a land development under the Union Township Subdivision and Land Development Ordinance, or the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 247, as

amended and reenacted, 53 P.S. § 10101 et seq.

- 8.dd. 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.
- 8.ee. NATURAL DRAINAGEWAY. An existing channel for water runoff that was formed by natural forces.
- 8.ff. NONPOINT SOURCE POLLUTION. Pollution that enters a body of water from diffuse origins in the watershed and does not result from discernible, confined or discrete conveyances.
- 8.gg. OPEN CHANNEL. A drainage element in which stormwater flows with an open surface. Open channels include, but shall not be limited to, natural and man-made drainage ways, swales, streams, ditches, canals and pipes flowing partly full.
- 8.hh. OUTFALL. Point where water flows from a conduit, stream or drain.
- 8.ii. OUTLET. Points of water disposal from a stream, river, lake, tidewater or artificial drain.
- 8.jj. OWNER. Any person, firm, association, syndicate, co-partnership or corporation having proprietary interest in any land sought to be subdivided or developed pursuant to this Ordinance.
- 8.kk. PEAK DISCHARGE. The maximum rate of flow of water at a given point and time resulting from a specified storm event.
- 8.ll. PLANNING COMMISSION. The Union Township Planning Commission.
- 8.mm. POSITIVE DRAINAGE. To draw off or empty surface waters in a manner which eliminates ponding, standing water or any other undesirable condition. For surface grades, a threshold of 1% shall determine positive drainage unless other means or facilities are provided to adequately drain surface waters.
- 8.nn. REGULATED ACTIVITIES. Any activity to which this ordinance is applicable.
- 8.oo. REGULATED ACTIVITY. An action or proposed action that has an impact upon stormwater runoff and which is specified in this ordinance.
- 8.pp. RETENTION BASIN. A basin designed to retain stormwater runoff with its primary release of water being through the infiltration of said water into the ground.
- 8.qq. RETURN PERIOD. The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the ten-year return period rainfall would be expected to recur on the average once every 10 years.
- 8.rr. RISER. A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.
- 8.ss. ROOFTOP DETENTION. Temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces by incorporating controlled-flow roof drains into building designs.
- 8.tt. RUNOFF. That part of precipitation which flows over the land.
- 8.uu. SCS. Soil Conservation Service, U.S. Department of Agriculture (U.S.D.A.).
- 8.vv. SEDIMENT. Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by water.
- 8.ww. SEDIMENT BASIN. A barrier, dam, retention or detention basin designed to retain sediment.

- 8.xx. SEDIMENTATION. The process by which mineral or organic matter is accumulated or deposited by the movement of water.
- 8.yy. SEDIMENT POLLUTION. The placement, discharge or any other introduction of sediment into the waters of the commonwealth occurring from the failure to design, construct, implement or maintain control measures and control facilities in accordance with the requirements of this chapter.
- 8.zz. SEEPAGE PIT/SEEPAGE TRENCH. An area of excavated earth filled with loose stone or similar material and into which stormwater runoff is directed for infiltration into the ground.
- 8.aaa. SEMIPERVIOUS SURFACE. A surface such as stone, rock or other materials which permits some vertical transmission of water into the ground.
- 8.bbb. SHEET FLOW. Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.
- 8.ccc. SOIL-COVER COMPLEX METHOD. A method of runoff computation developed by the SCS (now NRCS) that is based on relating soil type and land use/cover to a runoff parameter called curve number (CN).
- 8.ddd. SOIL GROUP, HYDROLOGIC. A classification of soils by the Soil Conservation Service into four runoff potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much more runoff.
- 8.eee. SPILLWAY. A depression in the embankment of a pond or basin which is used to pass a postdevelopment one-hundred-year storm peak flow rate.
- 8.fff. STORAGE INDICATION METHOD. A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage) with outflow defined as a function of storage volume and depth.
- 8.ggg. STORM FREQUENCY. The number of times that a given storm "event" occurs or is exceeded on the average in a stated period of years. See "return period."
- 8.hhh. 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.
- 8.iii. STORMWATER. Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.
- 8.jjj. STORMWATER MANAGEMENT. A program of controls and measures designed to regulate the quantity and quality of stormwater runoff from a development while promoting the protection and conservation of ground waters and ground water recharge.
- 8.kkk. STORMWATER MANAGEMENT FACILITIES. Those controls and measures used to effect a stormwater management program.
- 8.iii. STREAM ENCLOSURE. A bridge, culvert or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of this commonwealth.
- 8.mmm. SUBDIVISION. Any division or development of property considered to be a subdivision under the Union Township Subdivision and Land Development Ordinance or the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 247, as amended and reenacted, 53 P.S. § 10101 et seq.
- 8.nnn. SWALE. A wide shallow ditch which carries surface water runoff.

- 8.ooo. TOWNSHIP. The Township of Union, Lebanon County, Pennsylvania.
- 8.ppp. WAIVER. A dispensation, granted by the Township Supervisors, from the terms and conditions of this Ordinance where literal enforcement would cause greater economic, planning or site management difficulties than the strict enforcement of this Ordinance would accomplish and when granting of the dispensation would not be contrary to the public interest.
- 8.qqq. WATERCOURSE. A permanent or intermittent stream, river, brook, run, creek, channel, swale, pond, lake or other body of surface water carrying or holding surface water, whether natural or artificial.
- 8.rrr. WATERS OF THE COMMONWEALTH. Any and all rivers, streams, creeks, rivulets, 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.
- 8.sss. WATERSHED. The entire region or area drained by a river or other body of water, whether natural or man-made.
- 8.ttt. WET POND. A pond containing a permanent pool of water designed to store stormwater runoff for a given storm event and release it at a predetermined rate.

Section 9. Submissions. When subdivision or land development plans as defined by the Municipalities Planning Code are submitted, whether preliminary or final or for approval in sections, or any other plans are submitted as required by this or any other Ordinance, a stormwater management plan in accordance with this Ordinance for the entirely developed project shall be submitted. A note stating that a residue parcel is for "Future Development" or will remain as "agriculture" must be supported with data regarding these uses. If temporary facilities are required for construction of a section, such facilities shall be included in the plans submitted.

Section 10. Applicable Regulations and General Requirements.

- 10.a. Where applicable, stormwater management facilities shall comply with the requirements of 25 Pa. Code ch. 105, or any successor title or chapter of rules and regulations of the Pennsylvania Department of Environmental Protection, as set forth in the Pennsylvania Code and any and all other State and Federal regulations which may apply. Approval of a stormwater management plan by the Township shall not be construed as an indication that the plan complies with the standards of any agency of the Commonwealth of Pennsylvania.
- 10.b. Stormwater management plans which involve a State highway shall be subject to the approval of the Pennsylvania Department of Transportation.
- 10.c. Stormwater runoff from a project site shall flow directly into a natural watercourse or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the predevelopment flow conditions. The applicant shall provide proof, in the form of a certified U.S. mail receipt, to the Township or Township Engineer that he/she or his agent has informed the immediate downstream property owner of the effects of the stormwater discharge from the proposed development.
- 10.d. Stormwater 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.
- 10.e. All stormwater runoff flowing over the project site shall be considered in the design of the

stormwater management facilities. In all conditions or locations, positive drainage shall be provided where warranted or as required by the Township Engineer.

Section 11. Stormwater Calculations and Plan and Report Requirements.

- 11.a. A plan indicating the pre-developed drainage areas and time of concentration flow paths used shall be submitted. This plan shall indicate the pre-developed contours of the site in such detail as to be field verified, and shall show all existing stormwater facilities within 200 feet of the property being developed.
- 11.b. A plan indicating the post-developed drainage areas, time of concentration flow paths, and all drainage facilities shall be submitted. This plan shall indicate the post-developed drainage areas, time of concentration flow paths, and all drainage facilities, including plan and profile views of the facilities. This plan shall indicate the post-developed contours of the site. All facilities shall be labeled in an easily understandable manner consistent with the stormwater management report.
- 11.c. A stormwater management report including all assumptions, methods, references, and calculations for all stormwater drainage facilities shall be submitted. The report shall include a summary narrative and tables or charts indicating that the various requirements of the ordinance have been met, and stating any waivers or modifications that will be requested.
- 11.d. The methodology for calculating stormwater runoff shall be either the Soil Cover Complex Method or the Rational Method.
- 11.e. For time of concentration calculations, flow paths shall be representative of the drainage and subdrainage areas contributing to the portions of the affected flow paths. The length of flow path for sheet flow shall not exceed 100 feet.
- 11.f. Runoff coefficients utilized in all calculations shall be those as shown in this Ordinance.
- 11.g. For pre-development computations, all runoff coefficients shall be based on actual land use assuming summer or good land cover conditions.
- 11.h. For post-development computations, all runoff coefficients for cultivated land and fallowed fields shall be based on a winter or poor land cover condition.
- 11.i. Pre-developed runoff shall be calculated for the 2, 10, 25, and 100 year storm events.
- 11.j. Post-developed runoff rates shall be restricted as follows for each pre-developed drainage area:
 - 11.i.1. A minimum of 50% of the volume of the post-developed 2 year storm event shall be completely retained and infiltrated.
 - 11.i.2. The post-developed peak discharge for the 2, 10, and 25 year storm events shall not exceed 75% of the peak discharge for the corresponding pre-developed storm events. The post-developed peak discharge for the 100 year storm event shall not exceed the peak discharge for the corresponding pre-developed storm event. In order to achieve this, it is recommended that methods be considered that will direct runoff from impervious areas to pervious areas or infiltration trenches, that will retain/detain the runoff, or, by some other means suitable to the Township Engineer, reduce the post-developed runoff rate to the pre-developed runoff rate as required.
 - 11.i.3. The post developed 25 year storm event peak discharge shall not exceed the capacity of the receiving stormwater facilities. Calculations shall be provided indicating pre and post developed 25 year peak discharge for all receiving stormwater facilities.

- 11.k. A point discharge from a stormwater pipe shall not be permitted within 50 feet of any surface waters or any waters defined as Waters of the Commonwealth. All point discharges from stormwater pipes within 100 feet of surface waters or Waters of the Commonwealth shall utilize Best Management Practices established by DEP or other applicable authorities.
- 11.l. Stormwater shall not be concentrated onto adjacent properties such that the velocity of the flow for a 25 year storm event peak discharge would be increased beyond that existing prior to subdivision, land development or the commencement of land disturbance activities unless written approval is given by the adjacent property owners to the proposed discharge of surface runoff and the written agreements are approved by the Township. Calculations shall be provided indicating pre and post developed 25 year peak discharge velocities for all receiving stormwater facilities.
- 11.m. When storm drainage will be directed into an adjacent municipality, all provisions for accommodating such storm drainage shall be submitted to the governing body of that municipality for review.

Section 12. Ground Water Recharge (Infiltration/Recharge/Bioretenion)

Maximizing the ground water recharge capacity of the area being developed is required. The provisions of the Pennsylvania Best Management Practices Manual, as revised and amended, shall be required for all regulated activities.

Section 13. Swales, Pipes, Culverts and Other Conveyance Facilities

- 13.a. All stormwater conveyance facilities that service drainage areas within the project site shall be designed based on the 25 year storm event peak discharge to the facility.
- 13.b. All stormwater conveyance facilities that convey offsite stormwater through the project site shall be designed based on the 50 year storm event peak discharge to the facility.
- 13.c. All stormwater conveyance facilities shall, however, be designed such that the runoff from the 100 year storm event will be able to be conveyed within defined facilities without causing any damage to the public and private property.
- 13.d. All stormwater pipes to be maintained by the Township shall be reinforced cement concrete pipe, unless an alternative material is approved by the Board of Supervisors.
- 13.e. All pipes shall have a minimum diameter of 15 inches, and a minimum slope of 0.5%. The crown of the pipe shall be at least 12" below the subgrade elevation.
- 13.f. Changes in horizontal or vertical direction of pipes shall be accomplished by installing an inlet, manhole or junction box.
- 13.g. All stormwater facilities and appurtenances shall be in accordance with PennDOT Form 408, as amended, and in accordance with the requirements of PennDOT's Standards for Roadway Construction, as amended.
- 13.h. All storm sewer crossings of streets shall be perpendicular to the street centerline.
- 13.i. Trench excavations within street right-of-way areas shall be backfilled with suitable stone aggregate materials from the bottom of the trench to the subgrade elevation; all other areas shall be backfilled with suitable stone aggregate materials from the bottom of the trench to the pipe spring line elevation.
- 13.j. Inlets shall be utilized at all inlet ends of pipes within street rights-of-way. Inlets shall also be placed on both sides of the street at low points, at a maximum of 450 feet apart, and at points where the flow in gutters would exceed two (2) inches without such inlets being

installed. Inlet capacity information shall be provided for all inlets. All inlets shall have bicycle-proof inlet grates. Inlets shall be along the curblin at or beyond the curb radius points unless justification for alternate locations is provided. 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. Inlets shall be depressed two inches below the grade of the gutter or ground surface. Manholes may be substituted for inlets at locations where inlets are not required to handle surface runoff.

- 13.k. Where headwalls are utilized, protective grating shall be provided in a manner similar to the detail provided herein.
- 13.l. Endwalls and endsections shall be used where stormwater runoff discharges from a stormwater pipe or culvert.
- 13.m. The capacities of swales and open channels shall be computed from the Manning Equation. Verification that the velocity in the swale does not exceed the permissible velocity for the design swale lining shall be provided. Swales within Township rights-of-way shall be designed such that they can be maintained with existing Township equipment and resources. All such swale linings and configurations shall be subject to review and approval by the Board of Supervisors. Rip-rap lined swales within Township rights-of-way shall be avoided, but may be allowed if specifically approved by the Board of Supervisors.
- 13.n. Stormwater velocities at pipe outlets shall be calculated. Outlet protection consisting of a riprap apron or other suitable control measure shall be provided to assure stability of the receiving facility.
- 13.o. When drainage swales are traversed by driveways or other crossings, design and construction details of the crossings shall be provided, and calculations indicating that the swales will continue to function in accordance with the swale design shall be provided.

Section 14. Basins

- 14.a. Retention/detention facilities shall be designed such that the post- to pre - development requirements set forth herein are met.
- 14.b. Basins shall be designed with an emergency spillway, located in virgin ground, capable of handling the entire 100 year post-developed flow assuming all other outlet facilities are completely blocked. The emergency spillway water discharge elevation shall be at an elevation at least one foot below the top of the basin berm, and the emergency spillway elevation shall be at least six inches above the highest principal outlet.
- 14.c. The top of the berm shall be at least 12" above the peak water elevation for the 100 year storm event.
- 14.d. Compaction requirements and berm material requirements for the impoundment embankment shall be provided to demonstrate that the embankment will be structurally sound under all probable operating conditions.
- 14.e. Pond retention times shall be between 24 and 72 hours after the end of the design storm events (where infiltration is being utilized, the retention times required under that section shall be met).
- 14.f. Maximum water depth shall not exceed 6 feet in residential areas and other areas that may be frequented by pedestrian traffic unless access is restricted by physical means. Maximum water depth shall not exceed 8 feet in non-residential areas that will not be frequented by pedestrian traffic unless access is restricted by physical means.

- 14.g. Minimum top width of embankments shall be 5 feet.
- 14.h. Determination of the need for protection around the perimeter of basins shall be the responsibility of the applicant, and shall be subject to review by the Township.
- 14.i. Minimum grades for turf areas inside detention basins shall be such as to provide for positive drainage, as defined herein. Positive drainage of basin bottom surface is not required only if suitable vegetation and plantings are included to eliminate the adverse affects of standing water and to allow for proper maintenance.
- 14.j. Maximum interior side slopes of detention basins shall be 3 to 1 if access to the basin is restricted by physical means, otherwise maximum side slopes shall be 5 to 1. Maximum exterior side slopes shall be 3:1.
- 14.k. A cutoff trench of impervious material shall be provided.
- 14.l. Properly spaced and sized concrete cutoff collars or factory welded anti-seep collars shall be provided.
- 14.m. Drainage easements, with complete dimensions, shall be provided, at a minimum, corresponding to the 100 year water elevation.

Section 15. Maintenance

- 15.a. All plans shall clearly indicate on the plan(s) to be recorded the ownership and maintenance responsibility of all stormwater facilities.
- 15.b. When any stormwater management facility is located on an individual lot, and when maintenance thereof is the responsibility of that landowner, a description of the facility or systems and the terms of the required maintenance shall be incorporated on a plan of the property. The plan shall be recorded with the Lebanon County Recorder of Deeds. In addition, the Township may require as a condition of approval that any deed conveying any interest in such lot contain language indicating that the conveyance is subject to an express covenant by the grantee that the grantee will maintain the stormwater management facility. Additionally, an agreement and any other legally binding documentation approved in a form by the Board of Supervisors shall be in place prior to plan approval.
- 15.c. Maintenance of natural drainage ways: All natural streams, channels, swales, drainage systems and/or areas of surface water concentration shall be maintained in their existing condition unless an alteration is approved by the municipality. All encroachment activities shall comply with the requirements of Chapter 104 (Water Obstructions and Encroachments) of Title 25, Rules and Regulations of the Pennsylvania Department of Environmental Protection, or any successor provision.
- 15.d. There shall be provided a drainage easement that conforms substantially with the line of any pond, lake, watercourse, drainage way, channel, storm drainage system, or stream of such width as will be adequate to preserve the unimpeded flow of drainage and to provide for widening, deepening, relocation, improving or protecting such features or drainage facilities. Minimum easement width shall be ten feet (10') from each side of the watercourse, waterbody, stream, pond, or lake, but the Township may require a greater easement when necessary. Bearings and distances shall be provided for the boundaries of easements.
- 15.e. Stormwater facilities to be maintained by non-municipal entities shall be provided with adequate easements accessible from public roads over which the Township shall have right of access to correct or maintain such facilities if necessary in the public interest. In such cases, the lot owner will be responsible for all costs of the Township of Union.

Responsibility of such privately maintained facilities shall be conspicuously noted on the plan to be recorded. Areas within easements shall be kept as lawn or in natural condition to allow maintenance and entrance, and shall not be altered in any way from the approved design and shall be maintained to retain the design capacity.

- 15.f. If the Township determines at any time that any permanent stormwater management control facility has been eliminated, altered or improperly maintained, the owner or private entity which owns the property shall be advised of corrective measures required and given a reasonable period of time to take necessary action. If such action is not taken by the property owner, the Township may cause the work to be done and charge all costs against the property in accordance with applicable law.

Section 16. Presubmission

The Township Engineer shall be afforded the opportunity to review the proposed methodology prior to official submission of the stormwater management report, especially where non-conventional methods are proposed. (i.e., infiltration trenches, retention ponds, etc.).

Section 17. Schedule of Inspections

The Municipal Engineer shall inspect all phases of development of the site, and shall be notified of the commencement of such work at least 5 business days prior to beginning. It is the responsibility of the owner, subdivider, developer or his agent to notify the Municipal Engineer 24 hours in advance of the completion of each identified phase of development.

Any portion of the work which does not comply with the approved plan must be corrected by the developer. No work may proceed on any subdivision or land development or building construction until the required corrections have been made.

If at any state of the work, the Township or its Engineer determines that the soil or other conditions are not as stated or shown on the plan, it may refuse to approve further work and the Township or its designee may revoke existing approvals until a revised plan is submitted and approved.

Section 18. Runoff Curve Numbers and Coefficients

Runoff Curve Numbers shall be those as shown in USDA/SCS TR-55. Runoff coefficients for the rational method shall be selected by hydrological soil group and slope range (after Rawls et. al). Copies of the page(s) used from the referenced documents, identifying the specific values to be used, shall be submitted to the Township Engineer for review prior to preparation and submission of design report and calculations.

Section 19.01 Performance Guarantee in Lieu of Installation of Stormwater Improvements

No stormwater plan shall be finally approved unless the Stormwater Improvements shown on such Plan have been completed as required by this Stormwater Management Ordinance. In lieu of the completion of any stormwater improvements required as a condition for the final approval of a stormwater plan, the subdivider or developer shall deposit with the municipality a fiscal security in an amount sufficient to cover the costs of any improvements or common amenities including stormwater detention and/or retention basins. The developer shall be required to provide notification of expiration of security a minimum of thirty (30) days prior to such expiration.

Section 19.02 Guarantee-Without Limitations

Without limitations as to other types of financial security which the municipality may approve, which approval shall not be unreasonably withheld, federal or commonwealth chartered

lending institution irrevocable letters of credit and restrictive escrow accounts in such lending institutions shall be deemed acceptable financial security for the purpose of this section. Such financial security shall be posted with a federal or commonwealth chartered lending institution chosen by the party posting the financial security, provided said lending institution is authorized to conduct such business within the Commonwealth. Such security shall provide for, and secure to the public, the completion of any stormwater improvements which may be required on or before the date fixed in the formal action of approval or accompanying agreement for completion of the stormwater improvements. The municipality shall require a developer, as a condition of approval, to enter into an agreement for the completion of stormwater improvements and all cases deemed appropriate by the municipality and in a form acceptable to the municipality.

Section 19.03 Amount of Guarantee

The amount of financial security to be posted for the completion of the required improvements shall be equal to 110% of the cost of completion estimated as of ninety (90) days following the date scheduled for completion by the developer. Annually the Township may adjust the amount of the financial security by comparing the actual cost of the improvements which have been completed and the estimated costs for the completion of the remaining stormwater improvements as of the expiration of the ninetieth (90th) day after either the original date scheduled for completion or rescheduled date of completion.

Subsequent to said adjustment, the municipality may require the developer to post the additional security in order to assure that the financial security equals said 110%. Any additional security shall be posted by the developer in accordance with this subsection.

The amount of financial security required shall be based upon an estimate of the cost of the completion of the required stormwater improvements, submitted by an applicant or developer and prepared by a professional engineer licensed as such in this Commonwealth and certified by such engineer to be a fair and reasonable estimate of such cost. The Township engineer shall review and approve the cost estimate or, for good cause, refuse to accept the estimate, in which case he shall calculate an accurate cost estimate of the required stormwater improvements. If the applicant or developer and the Township engineer are unable to agree upon an estimate, then the estimate shall be recalculated and rectified by another professional engineer licensed as such in this Commonwealth and chosen mutually by the Township and the applicant or the developer. The estimate certified by the third engineer shall be presumed fair and reasonable and shall be the final estimate.

In the event that a third engineer is chosen, fees for the services of said engineer shall be paid equally by the Township and the applicant or developer.

If the party posting the financial security requires more than one year from the date of posting of the financial security to complete the required improvements, the amount of financial security may be increased by an additional 10% for each one year period beyond the first anniversary date from posting a financial security or to an amount not exceeding 110% of the cost of completing the required improvements as re-established on or about the expiration preceding one year period by using the above bidding procedure.

Any financial guarantee other than a cash escrow shall state on its face certified by the issuing financial institution, that the issuing financial institution agrees that the financial guarantee shall be irrevocable and shall not be allowed to expire, be withdrawn, or reduced in amount without at least ninety (90) days written notice to the Township, until the financial guarantee is released by the Township. A developer who fails to complete the improvements within the allotted time specified in the financial guarantee shall, at least thirty (30) days in advance of the guarantee

expiration date, renew or resubmit a financial guarantee. Failure to keep a financial guarantee in effect until the completion and approval of all stormwater improvements shall be a violation of this ordinance.

Section 19.04 Progressive Installation

In a case where development is projected over a period of years, the planning commission may authorize submission of final plats or stormwater management plans by sections or stages of development subject to such requirements or guarantees and to stormwater management improvements and future sections or stages of development as it finds essential for the protection of any finally approved section of the development.

Section 19.05 Release from Guarantee

As the work of installing the required stormwater management improvements proceeds, the party posting the financial security may request the release, from time to time, of such portions of the financial security which represents work which has been satisfactorily completed. As a prerequisite of such request, the developer shall be required to follow the construction observation schedule applicable to stormwater management improvements being installed. Said schedule shall be provided by the Township to the developer or his agent at the time of preliminary and final plan approvals. In the event any developer fails to comply with this schedule by not giving the required prior notices to the Township engineer, the Township may, in addition to all other enforcement remedies available to the Township, require the developer to immediately present to the Township engineer any and all proof required by the Township engineer to demonstrate that any and all stormwater management improvements constructed without the necessary observation by the Township engineer have been constructed and conformed with the applicable stormwater management plans and ordinances. The proof required shall be within the sole discretion of the Township engineer. The developers shall bare all costs and expenses associated with the presentation of such proof and the Township engineers review thereof. Any such requests for release of financial security shall be made in writing to the municipal governing body and within forty-five (45) days of receipt of such request the Township engineer, shall review the request and make a determination and recommendation as to the amount of security which may be released or reduced in order to assure that sufficient security shall remain to finish all uncompleted stormwater management improvements. The municipality may authorize release by the lending institution of an amount as estimated by the Township engineer in accordance with the above. In no instance shall the amount of the financial security remaining be less than 15% of the original security amount. If the municipality fails to act within said forty-five (45) day period, the release of funds shall be deemed to have been approved as requested. The municipality may, prior to final release at the time of completion and certification by it engineer, require retention of 10% of the estimated cost of the aforesaid stormwater management improvement. The applicant shall assume the necessary expense incurred for the inspection of the stormwater management improvements. Such inspection costs shall be based upon a schedule established by the Township Board of Supervisors by resolution and amended in the same fashion from time to time as deemed necessary.

Section 19.06 Maintenance Guarantee

Where a municipality accepts dedication of all or some of the required stormwater management improvements following completion, the municipality may require the posting of financial security to secure such structural integrity of the said stormwater management

improvements as well as the functioning of said improvements in accordance with the design and specifications depicted on the final plat for a term not to exceed 18 months from the date of acceptance of dedication.

Said financial security shall be of the same type as otherwise required in this section with regard to installation of such stormwater management improvements. The amount of financial security shall not exceed 15% of the actual cost of installation of said stormwater management improvements. The municipality may require developers, as a condition of approval, to enter into a maintenance guarantee agreement in a form acceptable to the Township.

Section 19.07 Remedies to Effect the Completion of Improvements

In the event that any required improvements have not been installed as provided in this ordinance or in accordance with the approved final plat, the Township is hereby granted the power to enforce any financial security, or other security by appropriate legal and equitable remedies. If proceeds of such financial security are insufficient to pay the cost of installing or making repairs or corrections to all improvements covered by said security, the Township may, at its option install part of such stormwater management improvements in all or part of the subdivision or land development and may institute appropriate legal or equitable action to recover the monies necessary to complete the remainder of the stormwater management improvements. All of the proceeds, whether resulting from the security or from any legal or equitable action brought against the developer, or both, shall be used solely for the installation of the improvements covered by such security, and not for any other municipal purpose. Failure to properly install the required stormwater management improvements shall also constitute a violation of this order, punishable as provided by law and any underlying agreements.

Section 20. Ratification and Repeals

All Ordinances or parts of Ordinances that are inconsistent with the Provisions of this Ordinance are hereby repealed in so far as but only in so far as the same are inconsistent with the provisions of this ordinance.

Section 21. Severability

If any sentence, clause, section or part of this Ordinance for any reason is found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses, sections or parts of this Ordinance. It is hereby declared that the intent of the Board of Supervisors that this Ordinance would have been adopted if such unconstitutional, illegal or invalid sentence, clause, section or part thereof had not been included herein.

Section 22. Effective Date

This Ordinance shall be effective five (5) days after enactment.

ORDAINED and ENACTED as an Ordinance by the Board of Supervisors of the Township of Union, County of Lebanon, Pennsylvania, in lawful session duly assembled, this ___ day of _____, 2010.

UNION TOWNSHIP
BOARD OF SUPERVISORS