

# Executive Session – 6:30 p.m. - Legal

## Haverford Township – Board of Commissioners

Meeting: Monday, October 7, 2024

Location: Commissioners Meeting Room – 1014 Darby Rd, Havertown, Pa. 19083

### Work Session Agenda

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Presentation: Safe Streets For All Study – CH Planning

Commissioner Committee Report

Police Chief Report

Next Week:

Ordinance No. P8-2024  
Stormwater Management Amendment (1<sup>st</sup> Reading)

Ordinance No. P13-2024  
Traffic – (1<sup>st</sup> Reading)

Resolution No. 2402-2024  
ARPA - Public Works Heavy Equipment, Paving at Public Works Yard, Farwood Road  
Sidewalk Project and Emergency Sewer Replacement – Landover Road

Resolution No. 2403-2024  
ARPA – Recreation - Various

Resolution No. 2404-2024  
ARPA – Discover Haverford – Horticultural Maintenance Services

Resolution No. 2405-2024  
ARPA – C H Planning Parking Study

Resolution No. 2406-2024  
ARPA - Purchasing (5) Dual Port Electric Vehicle Charging Stations for the Police  
Parking Lot

Resolution No. 2407-2024  
Safe Streets for All - Comprehensive Safety Action Plan

Resolution No. 2408-2024

ARPA – Police Department - Two (2) Electric Vehicles

Resolution No. 2409-2024

PECO 2024 Green Region Grant - Lawrence Road Park and Brookline Park

Resolution No. 2410-2024

Giant Food Market – Liquor License Modification

Contract Agreements:

Formalized contract for professional services with Pennoni Associates, Inc. to obligate funding available through the American Rescue Plan Act for the completion of previously awarded ARPA projects that are anticipated to still in process after the obligation deadline of December 31, 2024.

Formalized contract with Discover Haverford – ARPA Funding for Horticultural Maintenance Services

Formalized contract with the Chester County Intermediate Unit

Authorization:

Donation – Pipeline 58

Contract Awards:

Electricity & Natural Gas Procurement Contract  
City Avenue (Farwood Road) – Sidewalk Project  
Public Works Paving Complex – 1 Hilltop Road

Purchases:

Public Works Heavy Equipment – Roll-Off Truck

Parks and Recreation – Various

Police Department – Five (5) Dual Port Electric Vehicle Charging Stations and Two (2) Electric Vehicles

Haverford Township Free Library Renovation & Addition Project - Construction Change Orders

Appointments:

Naming Committee (2)

6<sup>th</sup> Ward Senior Citizens Advisory Council

Proclamations:  
Haverford Skatium – 50<sup>th</sup> Anniversary  
National Friends of Libraries Week

# Township of Haverford

Ordinance Number P8-2024

Amending Chapter 78 – Erosion and Sediment Control – Stormwater Management

AN ORDINANCE OF THE TOWNSHIP OF HAVERFORD, DELAWARE COUNTY, AMENDING CHAPTER 78, “EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT”, TO PROVIDE FOR AMENDED EROSION AND SEDIMENT CONTROL PLAN, PERMIT, APPLICATION, AND INSPECTION REQUIREMENTS; TO ENSURE MUNICIPAL SEPARATE STORM SEWER SYSTEM COMPLIANCE WITH THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION INCLUDING A REDUCTION OF THE THRESHOLD FOR A CERTAIN STORMWATER REVIEWS BY THE TOWNSHIP FOR PROJECTS INVOLVING NEW IMPERVIOUS SURFACES OF 500 SQUARE FEET OR MORE, INCREASE THE FREQUENCY OF BMP INSPECTIONS, AND CHANGE THE METHOD OF STORMWATER CALCULATIONS.

WHEREAS, the Home Rule Charter of the Township of Haverford (“Township”) and the Pennsylvania First Class Township Code authorize the Haverford Township Board of Commissioners (“Board”) to make and adopt ordinances consistent with the constitution and laws of this Commonwealth and with the Haverford Township Charter (“Charter”) when necessary for the proper management, care and control of the Township and the maintenance of peace, good government, health and welfare of the Township and its citizens; and

WHEREAS, the Haverford Township Code, Chapter 78, “Erosion and Sediment Control; Stormwater Management”, provides for erosion and sedimentation control and stormwater management requirements for projects and developments in the Township to, in part, better control stormwater runoff in the Township, minimize accelerated erosion and loss of natural infiltration, and to ensure compliance with all commonwealth and federal agencies; and

WHEREAS, the Board desires to ensure that Chapter 78 complies with all revised Municipal Separate Storm Sewer System requirements from the Pennsylvania Department of Environmental Protection; and

WHEREAS, the Board desires to amend the thresholds in Chapter 78 that require differing levels of review by the Township for projects involving grading, excavation, and/or the installation of new imperious surfaces; and

WHEREAS, to protect the health, safety, and welfare of the residents and visitors of Haverford Township, and to arrange for the orderly development, zoning, and use of properties within the Township, the Board of desires to amend Chapter 78 of its Code, in its entirety, to provide revisions pertaining to erosion and sedimentation control and stormwater management plan, permit, application, and inspection requirements;

WHEREAS, the Board has met the procedural requirements of the Charter for the adoption of the proposed ordinance, including advertising and multiple readings of the ordinance at public meetings; and



NOW, THEREFORE, be it ORDAINED and ENACTED by the Haverford Township Board of Commissioners, Chapter 78 of Haverford Township Code of Ordinances shall be amended in its entirety and replaced pursuant to the articles and sections as set forth below:

SECTION I: AMENDMENTS TO CODE. The Haverford Township Code of Ordinances, Chapter 78, "Erosion and Sediment Control; Stormwater Management", is hereby amended to provide as follows:

## CHAPTER 78 Erosion and Sediment Control; Stormwater Management

### ARTICLE I. Erosion and Sediment Control.

#### § 78-1. Short title.

This chapter shall be known and may be cited as the "Township of Haverford Erosion and Sediment Control Ordinance."

#### § 78-2. Purpose and Scope.

- A. The purpose of this chapter is to regulate the modification of the natural terrain, the alteration of drainage, the maintenance of artificial structures and surfaces and to provide for certain erosion and sediment control measures within the Township of Haverford so as to assure and safeguard health, safety, ecology and general welfare in the Township of Haverford.
- B. Scope of provisions. New grading, excavations and fills or changes, additions, repairs or alterations made to existing excavations and fills shall conform to the provisions of this chapter, except that this chapter shall not apply to work performed by the Township in a public street or on public property.

#### § 78-3. Erosion and sediment control plans required; exceptions.

- A. A grading permit will not be required in the following situation, but in all other respects the provisions of this chapter shall apply:
- B. An excavation which does not exceed three feet in vertical depth at its deepest point measured from the natural ground surface nor cover an area of more than 200 square feet. This exception shall not affect the applicability of this chapter nor the requirement of a grading permit for any fill or grading made with the material from such excavation.

#### § 78-4. Permit required.

- A. It shall be unlawful for any person, firm or corporation to pave, fill, strip, grade or regrade any land within the Township of Haverford without first securing a permit as hereunder provided, except as otherwise stated in 78-3.
- B. It shall be unlawful for any person, firm or corporation to disturb, modify, block, divert or affect the natural overland or subsurface flow of stormwater within the Township of Haverford without first securing a permit as hereunder provided.

- C. It shall be unlawful for any person, firm or corporation to construct, erect or install any drainage dam, ditch, culvert, drainpipe, bridge or any other structure or obstruction affecting the drainage of any premises in the Township of Haverford without first securing a permit as hereunder provided.

§ 78-5. Permit Application.

- A. Any person, firm or corporation proposing to engage in an activity requiring a permit hereunder shall apply for a permit by written application on a form furnished by the Township of Haverford.
- B. A separate application shall be required for each grading permit. Two hard copies and one digital copy of the proposed plan, including specifications and timing schedules, shall be submitted with each application for a permit.
- C. Applications for review required under this chapter shall be accompanied by a review fee as fixed by resolution of the Board of Commissioners, which may be amended from time to time.
- D. All applications for a permit involving an area of disturbance greater than 500 square feet shall be accompanied by a escrow deposit, to the benefit of the Township of Haverford in an amount as provided by Township resolution.

§ 78-6. Submission of property plan; information required.

The application for a permit shall be accompanied by a plan of the property showing:

A boundary line survey of the site on which the work is to be performed, showing the existing and proposed contours of the land and the proposed contours after completion of proposed grading.

- A. A description of the features, existing and proposed, surrounding the site which are of importance to the proposed development, including the nature of fill material and trees to be removed as a result of the proposed construction
- B. Description of the type and classification of the soil.
- C. Details and location of any proposed drainage structures and pipes.
- D. The lowest floor elevation of any proposed building based upon North American Vertical Datum of 1988 and the elevation of the one-hundred-year flood.
- E. The location and description of existing and future manmade features of importance to the proposed development, i.e., cuts and fills, buildings, roads, etc.
- F. Plans and specifications of soil erosion and sediment control measures in accordance with standards and specifications of the Delaware County Conservation District or the Township of Haverford.
- G. A time schedule indicating the anticipated starting and completion dates of the development sequence and the time of exposure of each area prior to the completion of effective erosion and sediment control measures.
- H. All plans and specifications accompanying applications for permits shall include

provisions for both interim (temporary) and ultimate (permanent) erosion and sediment control.

- (1) The design, installation and maintenance of erosion and sediment control measures shall be accomplished in accordance with standards and specifications established by the Delaware County Conservation District as adapted from standards and specifications of the Soil Conservation Service, United States Department of Agriculture.
- (2) Technical standards for the design and installation of erosion and sediment control measures are on file with the Township of Haverford office, the office of the Delaware, County Conservation District and other governmental agency offices.
- (3) Standards and specifications adopted for the purposes of this chapter and by the Delaware County Conservation District include but are not limited to the following basic conservation measures:
  - (a) Temporary cover on critical areas.
  - (b) Permanent grass and cover on critical areas on prepared seedbed.
  - (c) Permanent grass and cover on critical areas on unprepared seedbed.
  - (d) Sodding.
  - (e) Mulching.
  - (f) Temporary diversion.
  - (g) Permanent diversion.
  - (h) Grassed waterway or outlet.
  - (i) Grade stabilization structure.
  - (j) Debris basin.
  - (k) Drain.
  - (l) Drainage, main or lateral.

§ 78-7. Submission of drainage study; contents; disposal of stormwater runoff; soils investigation report.

A. Stormwater management plans shall be as required in this chapter.

- (1) The application for a permit shall be accompanied by a plan of the property showing the location of all present and proposed ditches, streams, pipes and other drainage structures and proposed cuts and fills. In addition to showing present elevations and dimensions and location and extent of all proposed grading and/or drainage, the plan shall clearly indicate all buildings, parking areas and driveways. Further, the plan shall indicate the present and proposed sources, storage and disposition of water being channeled through or across the premises, together with elevations, gradients and maximum flow rates. The application shall describe

the work to be performed, the materials to be used and the manner or method of performance, including provisions for protecting and maintaining existing drainage facilities whether on public or private property. The applicant shall supply data supporting the plan developed by a registered professional civil engineer or an engineer qualified in hydrology.

(2) Stormwater management plans shall be prepared in accordance with this chapter.

B. The following provisions apply to the carrying and disposal of stormwater runoff:

(1) The applicant shall agree to the granting and recording of easements for drainage facilities, including acceptance of the discharge of water on the property of others, provisions for maintenance of slopes and swales and access for the maintenance of anti-erosion facilities.

C. If load-bearing fill is proposed, a soils investigation report shall be submitted, which shall consist of test borings, laboratory testings and engineering analysis to correlate surface and subsurface conditions with the proposed grading plan. The results of the investigation shall be presented in a report by a registered professional soils engineer or geologist, which shall include data regarding the nature, distribution and supporting ability of existing soils and rocks on the site, conclusions and recommendations to ensure stable soil conditions and groundwater control, as applicable. The Township of Haverford may require such supplemental reports and data as it deems necessary. Recommendations included in such reports and approved by the Township of Haverford shall be incorporated in the plan or specifications.

(1) Fills toeing out on natural slopes steeper than four horizontal to one vertical shall not be made unless approved by the Township of Haverford after receipt of a report, deemed acceptable by the Township of Haverford Engineer, by a registered professional soils engineer certifying that he has investigated the property, made soil tests and that, in his opinion, such steeper slopes will safely support the proposed fill.

(2) Natural and/or existing slopes exceeding five horizontal to one vertical shall be benched or continuously stepped into competent materials prior to placing all classes of fill.

#### § 78-8. Issuance of permit.

Upon the submission of an application which conforms to the provisions of this chapter, the Director of Code Enforcement or their designee, after consultation with the Township of Haverford Engineer, shall issue the necessary permit.

#### § 78-9. Performance standards.

A. Notwithstanding any provision of this chapter or any condition of the permit, the permittee is responsible for the prevention of damage to other property or personal injury which may be affected by the activity requiring a permit.

B. No person, firm or corporation shall modify, fill, excavate, pave, grade or regrade land in any manner so close to a property line as to endanger or damage any adjoining

street, sidewalk, alley or any other public or private property without supporting and protecting such property from settling, cracking, erosion, sediment or other physical damage or personal injury which might result.

- C. No person, firm or corporation shall deposit or place any debris or any other material whatsoever or to cause such to be thrown or placed in any drainage ditch or drainage structure in such a manner as to obstruct free flow.
- D. No person, firm or corporation shall fail to adequately maintain in good operating order any drainage facility on his premises. All drainage ditches, culverts, drainpipes and drainage structures shall be kept open and free-flowing at all times.
- E. The owner of any property on which any work has been done pursuant to a permit granted under this chapter shall continuously maintain and repair all graded surfaces and antierosion devices, retaining walls, drainage structures or means and other protective devices, plantings and ground cover installed or completed.
- F. All graded surfaces shall be seeded, sodded and/or planted or otherwise protected from erosion within 60 days and shall be watered, tended and/or maintained until growth, in the case of vegetation, is well established. The disturbed area and duration of exposure shall be kept to a practical minimum.
- G. All trees in the area of extreme grade change shall be removed unless protected with suitable tree wells. However, extreme precautions shall be taken to prevent the unnecessary removal of trees.
- H. When required, adequate provisions shall be made for dust control measures as are deemed acceptable by the Township of Haverford.
- I. A quality control program is critical for fills, therefore, whenever fill material is to be used, each layer of compacted fill should be tested to determine its dry density as per ASTM D 1556. The density of each layer should not be less than 95% of maximum dry density as determined by ASTM D 1557.
  - (1) Inspection procedure shall follow the general procedure as stated in § 78-10.
  - (2) Compaction test reports shall be kept on file at the site and shall be subject to review at all times.
  - (3) The degree of compaction required shall be determined by the Township of Haverford Engineer following the guidelines in Subsection J above.
  - (4) Where the provisions of Subsection J are determined to be inapplicable, they may be waived by the Township of Haverford Engineer.

§ 78-10. Inspections; availability and inspection of as-built plans; issuance of occupancy permit.

- A. The Township Engineer shall, when requested by the Director of Code Enforcement or their designee, make inspections hereinafter required and shall either approve that portion of the work which has been completed or notify the permit holder wherein the same fails to comply with the provisions of this chapter. Where it is found by inspection that the conditions are not as stated or shown in the application, the Township

Engineer may refuse to approve further work until approval is obtained for a revised grading plan.

- B. Plans for the grading work shall be approved by the Township Engineer and shall be maintained at the site during the progress of the grading work and until the work has been approved.
- C. The permit holder shall notify the Township Engineer in order to obtain inspections, in accordance with the following schedule, at least 48 hours before the inspection is to be made:
  - (1) Initial inspection. When work on the excavation or fill is about to be commenced.
  - (2) Rough grading. When all rough grading has been completed.
  - (3) Drainage facilities. When drainage facilities are to be installed and before such facilities are backfilled.
  - (4) Special structures. When excavations are complete for retaining and crib walls, and when reinforcing steel is in place and before concrete is poured.
  - (5) Final inspection. When all work, including the installation of all drainage and other structures, has been completed.
- D. If at any of the work the Township Engineer shall determine by inspection that the nature of the grading is not in accordance with the approved permit or is not functioning as designed and/or is likely to endanger property or streets or alleys or create hazardous conditions, the Township Engineer may require, as a condition to allowing the work to be done, that such reasonable safety precautions be taken as the Township Engineer considers advisable to avoid such likelihood of danger. Safety precautions may include but shall not be limited specifying a flatter exposed slope, construction or additional drainage facilities, berms, terracing, compaction or cribbing.
- E. Any and all as-built plans shall be available on the site at all times and be subject to inspection and inquiry.
- F. Satisfactory compliance with this chapter shall be necessary before issuance of an occupancy permit.

§ 78-11. Payment of inspection costs by applicant; deposit of sum to cover costs required.

All applicants shall bear all cost of inspections required hereunder and shall deposit with the Director of Finance such sum as the Director of Code Enforcement shall determine to be necessary to guarantee payment of the cost of such inspections.

§ 78-12. Violations and penalties.

Any person, firm or corporation violating any provision of this article shall, upon summary conviction before any District Justice of the Peace, pay a fine not exceeding \$1,000 and costs of prosecution; and in default of one payment of the fine and costs, the violator may be sentenced to the county jail for a term of not more than 90 days. Each and every day in which any person, firm or corporation shall be in violation of this article shall constitute a

separate offense.

## Article II

### Stormwater Management General Provisions

#### § 78-13. Short Title.

This Ordinance shall be known and may be cited as the “Township of Haverford Stormwater Management Ordinance.”

#### § 78-14. Statement of Findings.

The Board of Commissioners of Haverford Township finds that:

- A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases runoff volumes, 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 upstream and downstream communities, infiltration, threatens public health and safety, and increases nonpoint source pollution of water resources.
- B. Inadequate planning and management of stormwater runoff resulting from land development throughout a watershed can also harm surface water resources by changing the natural hydrologic patterns, accelerating stream flows (which increase scour and erosion of streambeds and streambanks, thereby elevating sedimentation), destroying aquatic habitat, and elevating aquatic pollutant concentrations and loadings such as sediments, nutrients, heavy metals, and pathogens. Groundwater resources are also impacted through loss of recharge.
- C. A comprehensive program of stormwater management (SWM), including minimization of impacts of development, redevelopment, 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.
- D. Stormwater is an important water resource by providing infiltration for water supplies and supports the base flow of streams, which also protects and maintains surface water quality.
- E. Impacts from stormwater runoff can be minimized by using project designs that maintain the natural hydrologic regime and sustain high water quality, infiltration, stream baseflow, and aquatic ecosystems. The most cost-effective and environmentally advantageous way to manage stormwater runoff is through nonstructural project design that minimizes impervious surfaces and sprawl, avoids sensitive areas (i.e., stream buffers, floodplains, steep slopes), and considers topography and soils to maintain the natural hydrologic regime.
- F. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.
- G. Federal and state regulations require certain municipalities to implement a program

of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES) program.

- H. Nonstormwater discharges to municipal separate storm sewer systems can contribute to pollution of waters of the commonwealth by Haverford Township.
- I. The use of green infrastructure and low impact development (LID) are intended to address the root cause of water quality impairment by using systems and practices which use or mimic natural processes to: 1) infiltration and recharge, 2) evapotranspire, and/or 3) harvest and use precipitation near where it falls to earth. Green infrastructure practices, LID, and Cluster Development (CD) contribute to the restoration or maintenance of pre-development hydrology.

§ 78-15. Purpose.

The purpose of this ordinance is to promote the public health, safety, and general welfare, property, and water quality by implementing drainage and stormwater management practices, criteria, and provisions included herein for land development, construction, and Earth Disturbance Activities, to achieve the following throughout the Township:

- A. Promote alternative project designs and layouts that minimize the impacts on surface and groundwater.
- B. Promote nonstructural best management practices (BMPs).
- C. Minimize increases in runoff stormwater volume.
- D. Minimize impervious surfaces.
- E. Manage accelerated stormwater runoff and erosion and sedimentation problems and stormwater runoff impacts at their source by regulating activities that cause these problems.
- F. Provide review procedures and performance standards for stormwater planning and management.
- G. Utilize and preserve existing natural drainage systems as much as possible.
- H. Manage stormwater impacts close to the runoff source, requiring a minimum of structures and relying on natural processes.
- I. Focus on infiltration of stormwater to maintain base flow, to prevent degradation of surface and groundwater quality, and to otherwise protect water resources.
- J. Protect base flows and quality of streams and watercourses, where possible.
- K. Meet legal water quality requirements under state law, including regulations at 25 Pennsylvania Code Chapter 93 to protect, maintain, reclaim, and restore the existing and designated uses of the Waters of the Commonwealth.
- L. Address the quality and quantity of stormwater discharges from the development site.
- M. Provide standards to meet certain NPDES MS4 permit requirements.



- N. Implement an illicit discharge detection and elimination program that addresses non-stormwater discharges into the Municipality's separate storm sewer system (MS4).
- O. Preserve the flood-carrying capacity of streams.
- P. Protect water quality by removing and/or treating pollutants prior to discharge to ground- and surface waters throughout Haverford Township, and to protect, restore, and maintain the chemical, physical, and biological quality of ground and surface waters.
- Q. Reduce flooding impacts and prevent a significant increase in surface runoff rates and volumes, pre-development to post-development, which could worsen flooding downstream in the watershed, enlarge floodplains, erode stream banks, and create other flood-related health, welfare or property losses; in general, to preserve and restore the natural flood-carrying capacity of streams and their floodplains.
- R. Prevent accelerated scour, erosion and sedimentation of stream channels.
- S. Provide performance standards and design criteria based on watershed-wide stormwater management planning.
- T. Provide proper operation and maintenance of all permanent stormwater management facilities and BMPs that are implemented within the Township.
- U. Implement the requirements of Total Maximum Daily Loads (TMDLs) where applicable to waters within or impacted by the Township.

§ 78-16. Statutory Authority.

The Township is empowered or required to regulate land use activities that affect runoff and surface and groundwater quality and quantity by the authority of:

- A. Act of October 4, 1978, 32 P.S., P.L. 864 (Act 167) § 680.1 et seq., as amended, the "Stormwater Management Act" (hereinafter referred to as "the Act");
- B. Water Resources Management Act of 2002, as amended;
- C. First Class Township Code, 53, Section 55101 et seq;
- D. Act of July 31, 1968, P.L. 805, No. 247, Pennsylvania Municipalities Planning Code, Act 247, as amended.

§ 78-17. Applicability/regulated activities.

All regulated activities and all activities that may affect stormwater runoff, including but not limited to land development, redevelopment, and earth disturbance activity located within the municipality, are subject to regulation by this Ordinance.

- A. This article shall apply to all areas of Haverford Township.
- B. This article shall only apply to permanent structural and nonstructural stormwater management BMPs constructed as part of any of the regulated activities listed in this section.
- C. This article contains only the stormwater management performance standards and design criteria that are necessary or desirable from a watershed-wide perspective.

Local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.) shall continue to be regulated by the applicable municipal ordinances and applicable state regulations.

D. The following activities are defined as "regulated activities" and shall be regulated by this article unless exempted by § 78-18:

1. Land development.
2. Subdivisions.
3. Alteration of the natural hydrologic regime.
4. Construction or reconstruction of or addition of new impervious surfaces (i.e., driveways, parking lots, roads, etc.).
5. Construction of new buildings or additions to existing buildings.
6. Redevelopment.
7. Diversion piping or encroachments in any natural or man-made channel.
8. Nonstructural and structural stormwater management BMPs or appurtenances thereto.
9. Earth disturbance activities of greater than 5,000 square feet.
10. Earth disturbances within 50 feet of other sensitive environmental features, such as streams, ponds, lakes and wetlands.
11. Any of the above regulated activities which were approved more than five years prior to the effective date of this article and resubmitted for municipal approval.

Table 105.1 summarizes the applicability requirements of the ordinance. "Regulated impervious surface" in Table 105.1 includes new, additional, or replacement impervious surface/cover. Repaving existing surfaces without reconstruction does not constitute "replacement."

#### § 78-18. Exemptions.

Exemptions for land use activities. An exemption shall not relieve the Applicant from implementing the requirements of the municipal Ordinance or from implementing such measures as are necessary to protect public health, safety, and property. An exemption shall not relieve the Applicant from complying with the special requirements for watersheds draining to identified high quality (HQ) or exceptional value (EV) waters or any other current or future state or municipal water quality protection requirements. If a drainage problem is documented or known to exist downstream of, or is expected from the proposed activity, then the Municipality may withdraw exemptions listed in Table 105.1 and require the Applicant to comply with all requirements of this Ordinance. Even though the Applicant is exempt, he is not relieved from complying with other municipal ordinances or regulations.

Table 105.1 summarizes the exemptions from certain provisions of this Ordinance.

Exemptions are for the items noted in Table 105.1 only, and shall not relieve the Applicant from other applicable sections of this Ordinance.

Any regulated activity that is exempt from some provisions of the Ordinance is exempt only from those provisions. If development is to take place in phases, the developer is responsible for implementing the requirements of the Ordinance as the impervious cover/earth disturbance threshold is met. The date of the municipal Ordinance adoption shall be the starting point from which to consider tracts as “parent tracts” in which future subdivisions and respective impervious area and earth disturbance computations shall be cumulatively considered. Exemption shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, and property. For example:

If a property owner proposed a 150 square foot shed after adoption of the municipal stormwater management ordinance, that property owner be exempted from the water quality and quantity requirements of the ordinance as noted in Table 105.1 of the ordinance. If, at a later date, the property owner proposes to construct a 499 square foot room addition, the applicant would be required to comply with the requirements for the Simplified Method for the full 649 square feet of impervious cover created since adoption of the municipal ordinance. If an additional 700 square foot swimming pool/patio is proposed later, the property owner would be required implement the full stormwater quantity and quality control submission requirements of this ordinance for the total 1, 349 square feet of additional impervious surface added to the original property since adoption of the municipal ordinance.

A. Exemptions for land use activities. The following land use activities are exempt from the SWM site plan submission requirements of this article:

(1) Use of land for gardening for home consumption.

(2) Agriculture when operated in accordance with a conservation plan, nutrient management plan, or erosion and sedimentation control plan approved by the County Conservation District, including activities such as growing crops, rotating crops, tilling of soil, and grazing animals. Installation of new or expansion of existing farmsteads, animal housing, waste storage, and production areas having impervious surfaces that result in a net increase in earth disturbance of greater than 5,000 square feet shall be subject to the provisions of this article.

(3) High Tunnel if:

a. The High Tunnel or its flooring does not result in an impervious surface exceeding 25% of all structures located on the Landowner’s total contiguous land area; and

b. The High Tunnel meets one of the following:

i. The High Tunnel is located at least 100 feet from any perennial stream or watercourse, public road, or neighboring property line.

ii. The High Tunnel is located at least 35 feet from any perennial stream or watercourse, public road or neighboring property line and located on land with a slope not greater than 7%.

- iii. The High Tunnel is supported with a buffer or diversion system that does not directly drain into a stream or other watercourse by managing stormwater runoff in a manner consistent with the requirements of Pennsylvania Act 167.

(4) Forest management operations which are following the Department of Environmental Protection's (DEP) management practices contained in its publication "Soil Erosion and Sedimentation Control Guidelines for Forestry" and are operating under an approved erosion and sedimentation plan and must comply with the stream buffer requirements in § 78-42.

(4) Road replacement, development, or redevelopment that has less than 1,000 square feet of new, additional, or replaced impervious surface/cover, or in the case of earth disturbance only, less than 5,000 square feet of disturbance, is exempt from this article.

(5) Repaving without reconstruction.

(6) Construction, development, redevelopment, road replacement, or other operations of or by the Township.

B. Exemptions for land development activities.

(1) The following land development and earthmoving activities are exempt from the SWM site plan submission requirements of this article.

- (a) A maximum of 500 square feet of new, additional, or replacement proposed impervious surface.

- (b) Up to a maximum of 5,000 square feet of disturbed earth.

(2) These criteria shall apply to the total development even if the development is to take place in phases. The date of the municipal ordinance adoption shall be the starting point from which to consider tracts as "parent tracts" upon which future subdivisions and respective earth disturbance computations shall be cumulatively considered.

The activities exempted above are still encouraged to implement the stormwater management practices as indicated in Appendix B.

(3) The developer should first determine if the proposed activity will result in the introduction of 500 square feet or more of new, additional, or replacement impervious surface. If not, the developer should next determine if the proposed activity will involve earthmoving of over 5,000 square feet. If not, then the project is exempt from the SWM site plan requirements. Examples:

- (a) A project introducing 500 square feet of impervious cover, but only 4,900 square feet of earthmoving is regulated by this article.

- (b) A project involving 5,100 square feet of earthmoving, but resulting in 400 square feet of impervious cover is regulated.

- (c) A project introducing 400 square feet of impervious cover and involving 4,900 square feet of earthmoving is exempt from the SWM site plan requirements of this article.

C. Additional exemption criteria:

- (1) Exemption responsibilities. An exemption shall not relieve the applicant from implementing such measures as are necessary to protect public health, safety, and property.
- (2) HQ and EV streams. An exemption shall not relieve the applicant from meeting the special requirements for watersheds draining to identified high quality (HQ) or exceptional value (EV) waters and source water protection areas (SWPA) and requirements for nonstructural project design sequencing (§ 78-33).
- (3) Drainage problems. If a drainage problem is documented or known to exist downstream of or is expected from the proposed activity, then Haverford Township may require the applicant to comply with this article.
- (4) Emergency exemption. Emergency maintenance work performed for the protection of public health, safety, and welfare. A written description of the scope and extent of any emergency work performed shall be submitted to the Township of Haverford within two calendar days of the commencement of the activity. If the Township of Haverford finds that the work is not an emergency, then the work shall cease immediately, and the requirements of this article shall be addressed as applicable.
- (5) Maintenance exemption. Any maintenance to an existing stormwater management system made in accordance with plans and specifications approved by the Township Engineer or the Township of Haverford.
- (6) Even though the developer is exempt, they are not relieved from complying with other regulations.

§78-19. Repealer.

Any other ordinance provision(s) or regulation of the municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

§ 78-20. Severability.

In the event that a court of competent jurisdiction declares any section or provision of this ordinance invalid, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

§ 78-21. Compatibility with other ordinances or legal requirements.

- A. Approvals issued and actions taken under this Ordinance do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other code, law, regulation or ordinance.
- B. To the extent that this article imposes more rigorous or stringent requirements for stormwater management, the specific requirements contained in this article shall be followed.
- C. Nothing in this article shall be construed to affect any of Haverford Township's requirements regarding stormwater matters that do not conflict with the provisions of this article, such as local stormwater management design criteria (e.g., inlet

spacing, inlet type, collection system design and details, outlet structure design, etc.). Conflicting provisions in other municipal ordinances or regulations shall be construed to retain the requirements of this article addressing state water quality requirements. The requirements of this Ordinance shall supersede any conflicting requirements in other municipal ordinances or regulations.

#### § 78-22. 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 Township purporting to validate such a violation.

#### § 78-23. Waivers.

- A. If the Township determines that any requirement under this Ordinance cannot be achieved for a particular regulated activity, the Township may, after an evaluation of alternatives, approve measures other than those in this Ordinance, subject to Section § 78-22, Waivers; paragraphs B and C.
- B. Waivers or modifications of the requirements of this Ordinance may be approved by the Township if enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that the modifications will not be contrary to the public interest and that the purpose of the Ordinance is preserved. Cost or financial burden shall not be considered a hardship. Modification may be considered if an alternative standard or approach will provide equal or better achievement of the purpose of the Ordinance. A request for modifications shall be in writing and accompany the Stormwater Management Site Plan submission. The request shall provide the facts on which the request is based, the provision(s) of the Ordinance involved and the proposed modification.
- C. No waiver or modification of any regulated stormwater activity involving earth disturbance greater than or equal to one acre may be granted by the Township unless that action is approved in advance by the Department of Environmental Protection (DEP) or the Delaware County Conservation District.

#### § 78-24. Word Usage.

For the purposes of this article, certain terms and words used herein shall be interpreted as follows:

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender or nonbinary; and words of feminine gender include masculine gender or nonbinary.
- B. The word "includes" or "including" shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.
- C. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, unit of government, or any other similar entity.

- D. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.
- E. The words "used" or "occupied" include the words "intended, designed, maintained, or arranged to be used, occupied, or maintained."

As used in this article, the following terms shall have the meanings indicated:

#### ACCELERATED EROSION

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

#### 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.

#### 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.

#### APPLICANT

A landowner, developer, or other person who has filed an application to the municipality for approval to engage in any regulated activity at a project site in the municipality. The Township shall not be considered an Applicant under this Ordinance.

#### AS-BUILT DRAWINGS

Engineering or site drawings maintained by the contractor as he constructs the project and upon which he documents the actual locations of the building components and changes to the original contract documents. These documents, or a copy of same, are turned over to the municipal Engineer at the completion of the project.

#### BANKFULL

The channel at the top-of-bank or point from where water begins to overflow onto a floodplain.

#### BASEFLOW

Portion of stream discharge derived from groundwater; the sustained discharge that does not result from direct runoff or from water diversions, reservoir releases, piped discharges, or other human activities.

#### BEST MANAGEMENT PRACTICES (BMP)

Activities, facilities, designs, measures, or procedures used to manage stormwater impacts

from regulated activities, to meet state water quality requirements, to promote infiltration, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: “structural” or “nonstructural.” In this Ordinance, nonstructural BMPs or measures include certain low impact development practices used to minimize the contact of pollutants with stormwater runoff. These practices aim to limit the total volume of stormwater runoff and manage stormwater at its source by techniques such as protecting natural systems and incorporating existing landscape features. Nonstructural BMPs include, but are not limited to, low impact development practices such as the protection of sensitive and special value features such as wetlands and riparian areas, the preservation of open space while clustering and concentrating development, the reduction of impervious cover, and the disconnection of rooftops from storm sewers. Structural BMPs are those that consist of a physical to capture and treat stormwater 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, bioretention, wet ponds, permeable paving, grassed swales, riparian buffers, sand filters, detention basins, and manufactured devices. Structural and nonstructural stormwater BMPs are permanent appurtenances to the project site.

#### BIORETENTION

A stormwater retention area that utilizes woody and herbaceous plants and soils to remove pollutants before infiltration occurs.

#### BUFFER

See “Riparian Buffer”.

#### CHANNEL

An open drainage feature through which stormwater flows. Channels include, but shall not be limited to, natural and man-made drainageways, swales, streams, ditches, canals, and pipes flowing partly full.

#### CHANNEL EROSION

The widening, deepening, or headward cutting of channels and waterways caused by stormwater runoff or bankfull flows.

#### CISTERN

An underground reservoir or tank for storing rainwater.

#### CONSERVATION DISTRICT

The Delaware County Conservation District.

#### CONVEYANCE

A natural or manmade, existing, or proposed Stormwater Management Facility, feature or



channel used for the transportation or transmission of stormwater from one place to another. For the purposes of this Ordinance, Conveyance shall include pipes, drainage ditches, channels, and swales (vegetated and other), gutters, stream channels, and like facilities or features.

#### CULVERT

A structure with its appurtenant works which carries water under or through an embankment or fill.

#### DAM

A man-made barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid. A dam may include a refuse bank, fill, or structure for highway, railroad, or other purposes which impounds or may impound water or another fluid or semifluid.

#### DEPARTMENT

The Pennsylvania Department of Environmental Protection. Also referred to as “DEP”, “PA DEP” or “PADEP”.

#### DESIGNEE

The agent of the Delaware County Planning Department, Delaware County Conservation District, and/or agent of the governing body involved with the administration, review, or enforcement of any provisions of this article by contract or memorandum of understanding.

#### DESIGN PROFESSIONAL (QUALIFIED)

A Pennsylvania-registered professional engineer, registered landscape architect, or registered professional land surveyor trained to develop stormwater management plans, or any person licensed by the Pennsylvania Department of State or qualified by law to perform the work required by the ordinance.

#### DESIGN STORM

The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a five-year storm) and duration (e.g., 24 hours), used in the design and evaluation of stormwater management systems. Also see Return Period.

#### DETENTION BASIN

An impoundment designed to collect and retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate. Detention basins are designed to drain completely soon after a rainfall event and become dry until the next rainfall event.

#### DETENTION VOLUME

The volume of runoff that is captured and released into the waters of the Commonwealth at a controlled rate.

#### DEVELOPER

A person, or company, or organization who seeks to undertake any regulated earth disturbance activities at a project site in Haverford Township. The Township shall not be considered a Developer under this Ordinance.

#### DEVELOPMENT, LAND

Any human-induced change to improved or unimproved real estate, whether public or private, including but not limited to land development, construction, installation, or expansion of a building or other structure, land division, street construction, drilling, and site alteration, such as embankments, dredging, grubbing, grading, paving, parking or storage facilities, excavation, filling, stockpiling, or clearing. As used in this article, development encompasses both new development and redevelopment.

#### DEVELOPMENT SITE (SITE)

See Project Site.

#### DIAMETER AT BREAST HEIGHT (DBH)

The outside bark diameter at breast height which is defined as 4.5 feet (1.37m) above the forest floor on the uphill side of the tree.

#### DIFFUSED DRAINAGE DISCHARGE

Drainage discharge that is not confined to a single point location or channel, including sheet flow or shallow concentrated flow.

#### DISCHARGE

- A. (verb) To release water from a project, site, aquifer, drainage basin, or other point of interest;
- B. (noun) The rate and volume of flow of water such as in a stream, generally expressed in cubic feet per second (see "peak discharge").

#### DISCHARGE POINT

The point of discharge for a stormwater facility.

#### DISTURBED AREAS

An unstabilized land area where an earth disturbance activity is occurring or has occurred.

#### DITCH

A man-made waterway constructed for irrigation or stormwater conveyance purposes.

#### DOWNSLOPE PROPERTY LINE

That portion of the property line of the lot, tract, or parcels of land being developed, located such that overland or pipe flow from the project site would be directed towards it by gravity.

#### DRAINAGE CONVEYANCE FACILITY

A stormwater management facility designed to transport stormwater runoff that includes channels, swales, pipes, conduits, culverts, and storm sewers.

## DRAINAGE EASEMENT

A right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

## 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; road maintenance; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

## EMERGENCY SPILLWAY

A conveyance area that is used to pass peak discharge greater than the maximum design storm controlled by the stormwater facility.

## ENCROACHMENT

A structure or activity that changes, expands or diminishes the course, current, or cross-section of a watercourse, floodway or body of water.

## EROSION

The natural process by which the surface of the land is worn away by water, wind or chemical action.

## EROSION AND SEDIMENT (E&S) CONTROL PLAN

A plan that is designed to minimize accelerated erosion and sedimentation. Said plan must be submitted to and approved by the appropriate conservation district before construction can begin.

## EVAPOTRANSPIRATION (ET)

The combined processes of evaporation from the water or soil surface and transpiration of water by plants.

## EXCEPTIONAL VALUE WATERS

Surface waters of high quality which satisfy Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, § 93.4b(b) (relating to anti-degradation).

## EXISTING CONDITIONS

The dominant land cover during the 5-year period immediately preceding a proposed regulated activity.

## FEMA

Federal Emergency Management Agency.

## FINANCIAL HARDSHIP

A situation where the greatest possible profit cannot be fully realized from development/redevelopment on a given parcel of land due to added costs or burdens

associated with the design, construction, and/or maintenance of stormwater structures, facilities, buffers and/or setbacks.

#### FLOOD

A temporary condition of partial or complete inundation of land areas from the overflow of streams, rivers, and other waters of this commonwealth.

#### FLOODPLAIN

Any land area susceptible to inundation by water from any natural source or delineated by applicable Department of Housing and Urban Development, Federal Emergency Management Agency (FEMA) maps and studies as being a special flood hazard area.

#### FLOODWAY

The channel of the watercourse and those portions of the adjoining floodplains that are reasonably required to carry and discharge the 100-year flood (also called the base flood or one percent (1%) annual chance flood). Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year floodway, it is assumed--absent evidence to the contrary--that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

#### FLUVIAL GEOMORPHOLOGY

The study of landforms associated with river channels and the processes that form them.

#### 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.

#### FREEBOARD

A vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, swale, or diversion berm. The space is required as a safety margin in a pond or basin.

#### GRADE

A. (noun) A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein.

B. (verb) To finish the surface of a roadbed, the top of an embankment, or the bottom of an excavation.

#### GRASSED WATERWAY

A natural or man-made waterway, usually broad and shallow, covered with erosion-resistant grasses used to convey surface water.

#### GREEN INFRASTRUCTURE

Systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater on the site where it is generated. Also referred to as Green Stormwater Infrastructure (GSI).

## GROUNDWATER

Water beneath the earth's surface that supplies wells and springs and is often between saturated soil and rock.

## GROUNDWATER RECHARGE

The replenishment of existing natural underground water supplies from rain or overland flow.

## HEC-HMS

The U.S. Army Corps Of Engineers, Hydrologic Engineering Center (HEC) – Hydrologic Modeling System (HMS). This model was used to model the Darby-Cobbs and Crum Creek watersheds during the Act 167 plan development and was the basis for the standards and criteria of this article.

## HIGH QUALITY WATERS

Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, § 93.4b(a).

## HIGH TUNNEL

A structure which meets the following:

1. Is used for the production, processing, keeping, storing, sale or shelter of an agricultural commodity as defined in section 2 of the Act of December 19, 1974 (P.L. 973, No. 319), known as the “Pennsylvania Farmland and Forest Land Assessment Act of 1974,” or the storage of agricultural equipment or supplies; and
2. Is constructed with all the following:
  - a. has a metal, wood, or plastic frame;
  - b. when covered, has a plastic, woven textile, or other flexible covering; and
  - c. has a floor made of soil, crushed stone, matting, pavers, or a floating concrete slab.

## HOTSPOTS

Areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

## HYDROGRAPH

A graph representing the discharge of water versus time for a selected point in the drainage system.

## HYDROLOGIC REGIME

The hydrologic cycle or balance that sustains quality and quantity of stormwater, baseflow, storage and groundwater supplies under natural conditions.

#### HYDROLOGIC SOIL GROUP (HGS)

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 (NRCS1,2).

#### IMPERVIOUS SURFACE (IMPERVIOUS AREA)

Impervious surfaces shall include, but are not limited to, streets, sidewalks, swimming pool surface, pavements, additional indoor living spaces, patios, garages, storage sheds, and similar structures, driveway areas, or roofs, tennis or other paved courts. For the purposes of determining compliance with this Ordinance, compacted soils or stone surfaces used for vehicle parking and movement shall be considered impervious. Uncompacted gravel areas with no vehicular traffic shall be considered pervious per review by the Township Engineer. Surfaces that were designed to allow infiltration (i.e. pavers and areas of porous pavement) are not to be considered impervious surface if designed to function as a BMP per review by the Township Engineer. Additionally, for the purposes of determining compliance with this Ordinance, the total horizontal projection area of all ground-mounted and free-standing solar collectors, including solar photovoltaic cells, panels, and arrays, shall be considered pervious so long as the Township Engineer determines that the area underneath the solar photovoltaic cells, panels, and arrays is maintained as a vegetated pervious surface.

#### IMPOUNDMENT

A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

#### INFILL

Development that occurs on smaller parcels that remain undeveloped but are within or in very close proximity to urban or densely developed areas. Infill development usually relies on existing infrastructure and does not require an extension of water, sewer, or other public utilities.

#### INFILTRATION

Movement of surface water into the soil, where it is absorbed by plant roots, evaporated into the atmosphere, or percolated downward to recharge groundwater.

#### INFILTRATION STRUCTURES

A structure designed to direct runoff into the underground water (e.g., French drains, seepage pits, or seepage trenches).

#### INFLOW

The flow entering the stormwater management facility and/or BMP.

#### INLET

The upstream end of any structure through which water may flow.

#### INTERMITTENT STREAM

A stream that flows only part of the time. Flow generally occurs for several weeks or months in response to seasonal precipitation or groundwater discharge.

#### INVERT

The lowest surface, the floor or bottom of a culvert, drain, sewer, channel, basin, BMP, or orifice.

#### 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.

#### LAND DEVELOPMENT (DEVELOPMENT)

Inclusive of any or all of the following meanings:

- i. 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;
- ii. Any subdivision of land;
- iii. Development in accordance with Section 503(1.1) of the PA Municipalities Planning Code

#### LIMITING ZONE

A soil horizon or condition in the soil profile or underlying strata that includes one of the following:

- A. A seasonal high water table, whether perched or regional, determined by direct observation of the water table or indicated by soil mottling.
- B. A rock with open joints, fracture or solution channels, or masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.
- C. A rock formation, other stratum, or soil condition that is so slowly permeable that it effectively limits downward passage of water.

#### LOT

A designated parcel, tract, or area of land established by a plat or otherwise as permitted by law and to be used, developed, or built upon as a unit.

#### LOW IMPACT DEVELOPMENT (LID)

Site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. LID can be applied to new development, urban retrofits, and revitalization projects. LID utilizes design techniques that infiltrate, filter, evaporate, and store runoff close to its source. Rather than rely on costly large-scale conveyance and treatment systems, LID addresses stormwater through a variety of small, cost-effective landscape features located on-site.

#### MAIN STEM (MAIN CHANNEL)

Any stream segment or other runoff conveyance used as a reach in watershed-specific hydrologic models.

#### MANAGED RELEASE CONCEPT (MRC)

A post-construction stormwater management (PCSM) strategy that comprises the collection, management, and filtration of captured runoff from the contributing drainage area through a best management practice (BMP) that is preferably vegetated and includes release of a portion of the captured runoff through an underdrain within the BMP. If the MRC BMP is not vegetated, then pretreatment is required to meet water quality requirements. MRC is intended to be used for project areas or subareas where infiltration is considered infeasible to meet regulatory requirements. Refer to the "Managed Release Concept" Version 1.2 (August 25, 2020) guidance document or latest guidance from PA DEP.

#### MANNING EQUATION (MANNING FORMULA)

A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow, and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

#### MAXIMUM DESIGN STORM

The maximum (largest) design storm that is controlled by the stormwater facility.

#### MUNICIPAL ENGINEER or TOWNSHIP ENGINEER

A professional engineer licensed as such in the Commonwealth of Pennsylvania, duly appointed as the Engineer for a municipality, planning agency, or joint planning commission.

#### MUNICIPALITY or TOWNSHIP

Haverford Township, Delaware County, Pennsylvania.

#### NATURAL CONDITION

Predevelopment condition.

#### NATURAL HYDROLOGIC REGIME



See "Hydrologic Regime."

#### NATURAL RECHARGE AREA

Undisturbed surface area or depression where stormwater collects and a portion of which infiltrates and replenishes the underground and groundwater.

#### NONPOINT SOURCE POLLUTION

Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

#### NONSTORMWATER DISCHARGES

Water flowing in stormwater collection facilities, such as pipes or swales, which is not the result of a rainfall event or snowmelt.

#### NONSTRUCTURAL BEST MANAGEMENT PRACTICES (BMPs)

Methods of controlling stormwater runoff quantity and quality, such as innovative site planning, impervious area and grading reduction, protection of natural depression areas, temporary ponding on site, and other techniques.

#### NPDES

National Pollutant Discharge Elimination System, the federal government's system for issuance of permits under the Clean Water Act, which is delegated to DEP in Pennsylvania.

#### NRCS

Natural Resource Conservation Service (previously SCS).

#### OPEN CHANNEL

A conveyance channel that is not enclosed.

#### OUTFALL

"Point source," as described in 40 CFR § 122.2, at the point where Haverford Township's storm sewer system discharges to surface waters of the commonwealth.

#### OUTFLOW

The flow exiting the stormwater management facility and/or BMP.

#### OUTLET

Points of water disposal to a stream, river, lake, tidewater, or artificial drain.

#### PARENT TRACT

The parcel of land from which a land development or subdivision originates, determined from the date of municipal adoption of this article.

#### PARKING LOT STORAGE

Involves the use of parking areas as temporary impoundments with controlled release rates during rainstorms.

#### PEAK DISCHARGE

The maximum rate of stormwater runoff from a specific storm event.

#### PENN STATE RUNOFF MODEL

The computer-based hydrologic model developed at Pennsylvania State University.

#### PENNSYLVANIA STORMWATER BEST MANAGEMENT PRACTICES MANUAL

(Document Number 363-0300-002) (December 2006, and as subsequently amended) - The Best Management Practices Manual published by the Pennsylvania Department of Environmental Protection. The manual is to supplement federal and state regulations and the Department of Environmental Protection's Comprehensive Stormwater Management Policy that emphasizes effective site planning as the preferred method of managing runoff while also providing numerous examples of BMPs that can be employed in Pennsylvania to further avoid and minimize flooding and water resource problems.

#### PERVIOUS AREA

Any area not defined as impervious.

#### PIPE

A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

#### PLANNING COMMISSION

The Planning Commission of Haverford Township.

#### POINT SOURCE

Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel or conduit from which stormwater is or may be discharged, as defined in state regulations at 25 Pennsylvania Code § 92.1.

#### POSTCONSTRUCTION

Period after construction during which disturbed areas are stabilized, stormwater controls are in place and functioning, and all proposed improvements in the approved land development plan are completed.

#### PRECONSTRUCTION

Prior to commencing construction activities.

#### PREDEVELOPMENT CONDITION

Undeveloped/natural condition.

#### PRETREATMENT

Techniques employed in stormwater BMPs to provide storage or filtering to trap coarse materials and other pollutants before they enter the system, but not necessarily designed to meet the water quality volume requirements of § 78-37.

#### PROJECT SITE

The specific area of land where any regulated activities in Haverford Township are planned, conducted or maintained.

#### QUALIFIED PROFESSIONAL

Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

#### RATIONAL FORMULA

A rainfall-runoff relation used to estimate peak flow.

#### REACH

Any stream segment or other runoff conveyance used in the watershed-specific hydrologic models.

#### RECHARGE

The replenishment of groundwater through the infiltration of rainfall, other surface waters, or land application of water or treated wastewater.

#### RECONSTRUCTION

Demolition and subsequent rebuilding of impervious surface.

#### RECORD DRAWINGS

Original documents revised to suit the as-built conditions and subsequently provided by the engineer to the client. The engineer reviews the contractor's as-builts against their own records for completeness, then either turns these over to the client or transfers the information to a set of reproducible, in both cases for the client's permanent records.

#### REDEVELOPMENT

Any development that requires demolition or removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding and repaving are not considered to be redevelopment. Interior remodeling projects and tenant improvements are also not considered to be redevelopment.

#### REGULATED ACTIVITIES

Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff. Actions or proposed actions that have an impact on stormwater runoff quality or quantity and that are specified in § 78-17 of this article.

#### 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. Defined under NPDES Phase II regulations as earth disturbance activity of one acre or more with a point source discharge to surface waters or Haverford Township's storm sewer system or five acres or more regardless of the planned runoff. This includes earth disturbance on any portion of, part, or during any stage of a larger common plan of development.

#### REGULATED IMPERVIOUS SURFACE

Proposed impervious surface as part of a current proposed activity and all existing impervious surfaces installed after February 15, 2005 as part of a previous activity.

#### RELEASE RATE

The percentage of existing conditions' peak rate of runoff from a site or subarea to which the proposed conditions' peak rate of runoff must be reduced to protect downstream areas.

#### REPAVING

Replacement of the impervious surface that does not involve reconstruction of an existing paved (impervious) surface.

#### REPLACEMENT PAVING

Reconstruction of and full replacement of an existing paved (impervious) surface.

#### RETENTION BASIN

A structure in which stormwater is stored and not released during the storm event. Retention basins are designed for infiltration purposes and do not have an outlet. The retention basin must infiltrate stored water in four days or less.

#### 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.

#### 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).

#### RIPARIAN

Pertaining to anything connected with or immediately adjacent to the banks of a stream or other body of water.

#### RIPARIAN BUFFER

An area of land adjacent to a body of water and managed to maintain the integrity of stream channels and shorelines to 1) reduce the impact of upland sources of pollution by trapping,

filtering, and converting sediments, nutrients, and other chemicals, and 2) supply food, cover and thermal protection to fish and other wildlife.

#### 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.

#### ROAD MAINTENANCE

Earth disturbance activities within the existing road cross section, such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches, and other similar activities.

#### ROOF DRAINS

A drainage conduit or pipe that collects water runoff from a roof and leads it away from the structure.

#### ROOFTOP DETENTION

The temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces using controlled-flow roof drains in building designs.

#### RUNOFF

Any part of precipitation that flows over the land surface.

#### SALDO

Subdivision and Land Development Ordinance.

#### SEDIMENT

Soils or other materials transported by surface water as a product of erosion.

#### SEDIMENT BASIN

A barrier, dam, or retention or detention basin located and designed in such a way as to retain rock, sand, gravel, silt, or other material transported by water during construction.

#### SEDIMENT POLLUTION

The placement, discharge, or any other introduction of sediment into the waters of the commonwealth.

#### SEDIMENTATION

The process by which mineral or organic matter is accumulated or deposited by the movement of water or air.

#### SEEPAGE PIT/SEEPAGE TRENCH

An area of excavated earth filled with loose stone or similar coarse material into which surface water is directed for infiltration into the underground water.

#### SEPARATE STORM SEWER SYSTEM

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) primarily used for collecting and conveying stormwater runoff.

#### SHALLOW CONCENTRATED FLOW

Stormwater runoff flowing in shallow, defined ruts prior to entering a defined channel or waterway.

#### SHEET FLOW

A flow process associated with broad, shallow water movement on sloping ground surfaces that is not channelized or concentrated.

#### SOIL COVER COMPLEX METHOD

A method of runoff computation developed by NRCS that is based on relating soil type and land use/cover to a runoff parameter called curve number (CN).

#### SOURCE WATER PROTECTION AREAS (SWPA)

The zone through which contaminants, if present, are likely to migrate and reach a drinking water well or surface water intake.

#### SPECIAL PROTECTION SUBWATERSHEDS

Watersheds that have been designated by DEP as EV or HQ waters.

#### SPILLWAY

A conveyance that is used to pass the peak discharge of the maximum design storm that is controlled by the stormwater facility.

#### 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.

#### 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.

#### 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").

#### STORM SEWER

A system of pipes and/or open channels that conveys intercepted runoff and stormwater from other sources but excludes domestic sewage and industrial wastes.

#### STORMWATER

Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

#### STORMWATER CONTROL MEASURE

Physical features used to effectively control, minimize, and treat stormwater runoff. Also may be referred to as Stormwater Management Practice (SMP). [See Best Management Practice (BMP)].

#### STORMWATER MANAGEMENT DISTRICT

Those subareas of a watershed in which some type of detention is required to meet the plan requirements and the goals of Act 167.

#### STORMWATER MANAGEMENT FACILITY

Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff quality, rate, or quantity, including Best Management Practices and Stormwater Control Measures. Typical stormwater management facilities include, but are not limited to: detention and retention basins, open channels, storm sewers, pipes, and infiltration facilities.

#### STORMWATER MANAGEMENT PERMIT (SWM PERMIT)

A permit issued by Haverford Township after the SWM Site plan has been approved.

#### STORMWATER MANAGEMENT PLAN

The watershed plan, known as the "Darby and Cobbs Creeks Watershed Act 167 Stormwater Management Plan," for managing those land use activities that will influence stormwater runoff quality and quantity and that would impact the Darby and Cobbs Creeks watershed adopted by Delaware County, Chester County, Montgomery County and Philadelphia County as required by the Act of October 4, 1978, P.L. 864 (Act 167).

#### STORMWATER MANAGEMENT SITE PLAN (SWM SITE PLAN)

The plan prepared by the developer or his representative indicating how stormwater runoff will be managed at the development site in accordance with this Ordinance. Stormwater Management Site Plan will be designated as SWM Site Plan throughout this Ordinance.

#### STREAM

A natural watercourse.

#### STREAM BUFFER

The land area adjacent to each side of a stream essential to maintaining water quality (see "buffer").

#### STREAM ENCLOSURE

A bridge, culvert, or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of the commonwealth.

#### SUBAREA (SUBWATERSHED)

The smallest drainage unit of a watershed for which stormwater management criteria have

been established in the stormwater management plan.

## SUBDIVISION

As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247; 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, partition by the court for distribution to heirs or devisees, transfer of ownership, or building or lot development; provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres not involving any new street or easement of access or any residential dwelling shall be exempted.

## SURFACE 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 waters, or parts thereof, whether natural or artificial, within or on the boundaries of the commonwealth.

## SWALE

A low-lying stretch of land that gathers or carries surface water runoff.

## TIMBER OPERATIONS

See "Forest Management."

## TIME-OF-CONCENTRATION (T<sub>c</sub>)

The time required for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

## TOP-OF-BANK

Highest point of elevation in a stream channel cross section at which a rising water level just begins to flow out of the channel and over the floodplain.

## UNDEVELOPED CONDITION

Natural condition (see also "Predevelopment Condition").

## USDA

United States Department of Agriculture

## VERNAL POND

Seasonal depressional wetlands that are covered by shallow water for variable periods from winter to spring but may be completely dry for most of the summer and fall.

## WATERCOURSE

A channel or conveyance of surface water having a defined bed and banks, whether natural or artificial, with perennial or intermittent flow.



## 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.

## WATERSHED

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

## WELLHEAD

- A. A structure built over a well;
- B. The source of water for a well.

## WELLHEAD PROTECTION AREA

The surface and subsurface area surrounding a water supply well, well field, or spring supplying a public water system through which contaminants are reasonably likely to move toward and reach the water source.

## WET BASIN

Pond for urban runoff management that is designed to detain urban runoff and always contains water.

## WETLAND

Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

## WOODS

A natural ground cover with more than one viable tree of a DBH of six inches or greater per 1,500 square feet which existed within three years of application; a cover condition for which SCS curve numbers have been assigned or to which equivalent rational method runoff coefficients have been assigned.

### § 78-25. General Requirements.

For any of the activities regulated by this article, the preliminary or final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any earth disturbance activity may not proceed until the property owner or applicant or their agent has received written approval of a SWM site plan from Haverford Township and an adequate erosion and sediment control plan review by the Conservation District.

### § 78-26. SWM site plan contents.

The SWM site plan shall consist of a general description of the project including sequencing items described in § 78-35 [Nonstructural project design (sequencing to minimize stormwater impacts)], calculations, maps, and plans. A note on the maps shall refer to the associated computations and erosion and sediment control plan by title and date. The cover sheet of the computations and erosion and sediment control plan shall refer to the associated maps by title and date. All SWM site plan materials shall be submitted to Haverford Township in a format that is clear, concise, legible, neat, and well organized; otherwise, the SWM Site plan shall not be accepted for review and shall be returned to the applicant. The following items shall be included in the SWM site plan:

A. General.

1. General description of the project including those areas described in § 78-35 [Nonstructural project design (sequencing to minimize stormwater impacts)].
2. General description of proposed permanent stormwater management techniques, including construction specifications of the materials to be used for stormwater management facilities.
3. Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.
4. An erosion and sediment control plan, including all reviews and letters of adequacy from the Conservation District.
5. A general description of proposed nonpoint source pollution controls.
6. A justification must be included in the SWM Site Plan if BMPs other than green infrastructure methods and LID practices are proposed to achieve the volume, rate, and water quality controls under this Ordinance.
7. The SWM Site Plan Application and completed fee schedule form and associated fee (Appendix C-1).
8. The SWM Site Plan Checklist (Appendix C-2).

B. Maps or Plan Sheets. Map(s) or plan sheets of the project area shall be submitted on twenty-four-inch by thirty-six-inch sheets and/or shall be prepared in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Delaware County. If the SALDO has more stringent criteria than this article, then the more stringent criteria shall apply. The contents of the map(s) shall include, but not be limited to:

1. The location of the project relative to highways, municipal boundaries, or other identifiable landmarks.
2. Existing contours at intervals of two feet.
3. Existing streams, lakes, ponds, or other waters of the commonwealth within the project area.
4. Other physical features including flood hazard boundaries, stream buffers, existing drainage courses, areas of natural vegetation to be preserved, and the total extent

of the upstream area draining through the site.

5. The locations of all existing and proposed utilities, sanitary sewers, and water lines within 50 feet of property lines.
6. An overlay showing soil names and boundaries.
7. Limits of earth disturbance, including the type and amount of impervious area that would be added.
8. Proposed structures, roads, paved areas, and buildings.
9. Final contours at intervals of two feet.
10. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.
11. The date of submission.
12. A graphic and written scale of one-inch equals no more than 50 feet; for tracts of 20 acres or more, the scale shall be one inch equals no more than 100 feet.
13. A north arrow.
14. The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.
15. Existing and proposed land use(s).
16. A key map showing all existing man-made features beyond the property boundary that would be affected by the project.
17. Location of all open channels.
18. Overland drainage patterns and swales.
19. A fifteen-foot-wide access easement around all stormwater management facilities that would provide ingress to and egress from a public right-of-way.
20. The location of all erosion and sediment control facilities.
21. A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off site. All off-site facilities shall meet the performance standards and design criteria specified in this article
22. A statement, signed by the applicant, acknowledging that any revision to the approved SWM site plan must be approved by Haverford Township, and that a revised erosion and sediment control plan must be submitted to the Conservation District for a determination of adequacy.
23. The following signature block signed and sealed by the qualified Licensed Professional responsible for the preparation of the SWM site plan:

"I, (Licensed Professional), on this date (date of signature), hereby certify that the SWM site plan meets all design standards and criteria of the Haverford Township

Stormwater Management Code."

24. The following signature block for the Municipality:

"On behalf of Haverford Township, (Municipal Official or Designee), on this date (date of signature), has reviewed and hereby certifies to the best of my knowledge that the SWM Site Plan meets all design standards and criteria of the Haverford Township Stormwater Management Ordinance."

C. Supplemental information to be submitted to Haverford Township.

1. A written description of the following information shall be submitted by the applicant and shall include:
  - a. The overall stormwater management concept for the project designed in accordance with § 78-35, Nonstructural project design (sequencing to minimize stormwater impacts).
  - b. Stormwater runoff computations as specified in this article.
  - c. Stormwater management techniques to be applied both during and after development.
  - d. Expected project time schedule.
  - e. Development stages or project phases, if so proposed.
  - f. An operations and maintenance plan in accordance with § 78-48, Responsibilities for operations and maintenance of stormwater controls and BMPs of this article.
2. An erosion and sediment control plan.
3. A description of the effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.
4. A declaration of adequacy and highway occupancy permit from the Pennsylvania Department of Transportation (PennDOT) District office when utilization of a PennDOT storm drainage system is proposed.

D. Stormwater management facilities.

1. All stormwater management facilities must be located on a plan and described in detail.
2. The locations of existing and proposed septic tank infiltration areas and wells must be shown.
3. All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

§ 78-27. SWM Site Plan submission.

Haverford Township shall require receipt of a complete SWM site plan, as specified in this

article.

- A. Proof of application or documentation of required permit(s) or approvals for the programs listed below shall be part of the plan:
  - 1. NPDES permit for stormwater discharges from construction activities.
  - 2. DEP joint permit application.
  - 3. PennDOT highway occupancy permit.
  - 4. Chapter 105 (Dam Safety and Waterway Management).
  - 5. Chapter 106 (Floodplain Management).
  - 6. Any other permit under applicable state or federal regulations.
- B. The plan shall be coordinated with the state and federal permit process and the municipal SALDO review process. The process implementing the provisions in this article is illustrated in Appendixes D-1 and D-2.
- C. For projects that require SALDO approval, the SWM site plan shall be submitted by the applicant as part of the preliminary plan submission where applicable for the regulated activity.
- D. For regulated activities that do not require SALDO approval, see § 78-26, SWM site plan requirements.
- E. Six (6) copies of the SWM site plan shall be submitted and distributed as follows:
  - 1. Two copies to Haverford Township accompanied by the requisite municipal review fee, as specified in this article.
  - 2. Two copies to the County Conservation District.
  - 3. One copy to the municipal Engineer.
  - 4. One copy to the County Planning Commission/Department.
- F. Any submissions to the agencies listed above that are found to be incomplete shall not be accepted for review and shall be returned to the applicant with a notification in writing of the specific manner in which the submission is incomplete.

§ 78-28. Stormwater Management (SWM) Site Plan Review.

- A. The municipal Engineer shall review the SWM site plan for consistency with this article and the respective Act 167 stormwater management plan. Any plan found incomplete shall not be accepted for review and shall be returned to the applicant.
- B. The municipal Engineer shall review the SWM site plan for any subdivision or land development against the municipal SALDO provisions not otherwise superseded by this article.
- C. The Conservation District, in accordance with established criteria and procedures, shall review the SWM site plan for consistency with stormwater management and erosion and sediment pollution control requirements and provide comments to Haverford Township.

The applicant shall respond to the Conservation District comments on the SWM site plan prior to being considered for final approval by the Township.

- D. For activities regulated by this article, the municipal Engineer shall notify the applicant and Haverford Township in writing whether the SWM site plan is consistent with the stormwater management plan ordinance.
  - (1) If the municipal Engineer determines that the SWM site plan is consistent with the stormwater management ordinance, the Municipal Engineer shall forward a letter of consistency to the Township who will then forward a copy to the applicant.
  - (2) If the Municipal Engineer determines that the SWM site plan is inconsistent or noncompliant with the stormwater management ordinance, the municipal Engineer shall forward a letter to the Township with a copy to the applicant citing the reason(s) and specific Code sections for the inconsistency or noncompliance. Inconsistency or noncompliance may be due to inadequate information to make a reasonable judgment as to compliance with the stormwater management plan. Any SWM site plans that are inconsistent or noncompliant may be revised by the applicant and resubmitted when consistent with this article.
- E. For regulated activities specified in § 78-17, Applicability and Regulated Activities of this article that require a building permit, the Municipal Engineer shall notify the Municipal Building Permit Officer in writing whether the SWM site plan is consistent with the stormwater management ordinance. The Municipal Building Permit Officer shall forward a copy of the consistency/inconsistency letter to the applicant. Any SWM site plan deemed inconsistent may be revised by the applicant and resubmitted consistent with this article.
- F. For regulated activities under this article that require an NPDES permit application, the applicant shall forward a copy of the Township Engineer's letter stating that the SWM site plan is consistent with the stormwater management ordinance to the Conservation District. DEP and the Conservation District may consider the Township Engineer's review comments in determining whether to issue a permit.
- G. Haverford Township shall not grant preliminary or final approval to any subdivision or land development for regulated activities specified in § 78-17, Applicability and Regulated Activities, of this article if the SWM site plan has been found by the Township Engineer to be inconsistent with the stormwater management ordinance. All required permits from DEP must be obtained prior to approval of any subdivision or land development.
- H. No building permits for any regulated activity specified in § 78-17, Applicability and Regulated Activities of this article shall be approved by Haverford Township if the SWM site plan has been found to be inconsistent with the stormwater management plan, as determined by the Township Engineer and Conservation District, or without considering the comments of the Township Engineer and Conservation District. All required permits from DEP must be obtained prior to issuance of a building permit.
- I. The Applicant shall be responsible for completing record drawings of all stormwater management facilities included in the approved SWM site plan. The record drawings and an explanation of any discrepancies with the design plans shall be submitted to

the Township Engineer for final approval. In no case shall Haverford Township approve the record drawings until Haverford Township receives a copy of an approved declaration of adequacy and/or highway occupancy permit from the PennDOT District office, NPDES permit, and any other applicable permits or approvals from DEP or the Conservation District. The above permits and approvals must be based on the record drawings.

- J. Haverford Township's approval of a SWM site plan shall be valid for a period not to exceed five years commencing on the date that Haverford Township signs the approved SWM site plan. If stormwater management facilities included in the approved SWM site plan have not been constructed, or if constructed, record drawings of these facilities have not been approved within this five-year time period, then Haverford Township may consider the SWM site plan inconsistent or noncompliant and may revoke any and all permits. SWM site plans that are determined to be inconsistent or noncompliant by Haverford Township shall be resubmitted in accordance with § 78-30, Resubmission of Inconsistent or Noncompliant SWM Site Plans, of this article.

§ 78-29. Revision of SWM Site Plans.

- A. A revision to a submitted SWM site plan under review by Haverford Township for a development site that involves the following shall require a resubmission to Haverford Township of a revised SWM site plan consistent with § 78-26 of this article and be subject to review as specified in § 78-28 of this article:
  - (1) Change in stormwater management facilities or techniques;
  - (2) Relocation or redesign of stormwater management facilities; or
  - (3) Is necessary because soil or other conditions are not as stated on the SWM site plan as determined by the Municipal Engineer.
- B. A revision to an already approved or inconsistent or noncompliant SWM site plan shall be submitted to Haverford Township, accompanied by the applicable municipal review and inspection fee. A revision to a SWM site plan for which a formal action has not been taken by Haverford Township shall be submitted to Haverford Township accompanied by the applicable municipal review and inspection fee.

§ 78-30. Resubmission of inconsistent or noncompliant SWM site plans.

An inconsistent or noncompliant SWM site plan may be resubmitted with the revisions addressing the Township Engineer's concerns documented in writing. It must be addressed to Haverford Township in accordance with § 78-27 contents of this article, distributed accordingly, and be subject to review as specified in § 78-28 of this article. The applicable Township review and inspection fee must accompany a resubmission of an inconsistent or noncompliant SWM site plan.

§78-31. General Requirements for stormwater management.

- A. Applicants proposing regulated activities in Haverford Township which do not fall under the exemption criteria shown in §78-18 shall submit a stormwater management site plan consistent with this ordinance and the applicable watershed stormwater management plan to Haverford Township for review. The stormwater management

criteria of this Ordinance shall apply to the total proposed development even if development is to take place in stages.

- B. The applicant is required to design the site to minimize surface discharge of stormwater and the creation of impervious surfaces in order to maintain, as much as possible, the natural hydrologic regime.
- C. The SWM site plan must be designed consistent with the sequencing provisions of §78-35 to ensure maintenance of the natural hydrologic regime, to promote infiltration, and to protect groundwater and surface water quality and quantity. The SWM site plan designer must proceed sequentially in accordance with this Ordinance.
- D. Stormwater drainage systems shall be designed in order to preserve natural flow conditions to the maximum extent practicable.
- E. Alteration of existing drainage discharge onto adjacent property shall only be proposed in accordance with PADEP guidance document “Chapter 102 Off-Site Discharges of Stormwater to Non-Surface Waters – Frequently Asked Questions (FAQ)” dated January 2, 2019, or latest guidance document from PADEP. Such discharge shall be subject to any applicable discharge criteria specified in this Ordinance and still must meet the requirements of Act 167.
- F. Areas of existing diffused drainage discharge, whether proposed to be concentrated or maintained as diffused drainage areas, shall be subject to any applicable discharge criteria in the general direction of existing discharge, except as otherwise provided by this Ordinance. If diffused drainage discharge is proposed to be concentrated and discharged onto adjacent property, the Applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge or otherwise prove that no erosion, sedimentation, flooding, or other impacts will result from the concentrated discharge.
- G. Where a development site is traversed by a stream, drainage easements shall be provided on either side of, and conform to the line of such streams. The terms of the easement shall conform to the stream buffer requirements contained in §78-42.
- H. Any stormwater management facilities regulated by this article that would be located in or adjacent to waters of the commonwealth or delineated wetlands shall be subject to approval by DEP through the joint permit application or the environmental assessment approval process or, where deemed appropriate, by the DEP general permit process. When there is a question as to whether wetlands may be involved, it is the responsibility of the applicant or his agent to show that the land in question cannot be classified as wetlands; otherwise, approval to work in the area must be obtained from DEP
- I. Any proposed stormwater management facilities regulated by this article that would be located on state highway rights-of-way shall be subject to approval by PennDOT.
- J. Minimization of impervious surfaces and infiltration of runoff through seepage beds, infiltration trenches, etc., is encouraged where soil conditions permit in order to reduce the size or eliminate the need for detention facilities or other structural BMPs.
- K. Rooftop runoff may go directly to an infiltration BMP or be evapotranspired.



- L. All regulated activities within the Municipality shall be designed, implemented, operated, and maintained to meet the purposes of this Ordinance, through these two elements:
  - 1. Erosion and sediment control during earth disturbance activities (e.g., during construction), and
  - 2. Water quality protection measures after completion of earth disturbance activities (i.e., after construction), including operations and maintenance.
- M. No regulated activity within the Municipality shall commence until the Municipality issues approval of a SWM plan, which demonstrates compliance with the requirements of this ordinance.
- N. The BMPs shall be designed, implemented, and maintained to meet state water quality requirements and any other more stringent requirements as determined by the Township. Applicants shall utilize the Pennsylvania Stormwater Best Management Practices Manual (PA BMP Manual), as amended, or other sources acceptable to the Township Engineer, for testing and design standards for BMPs, and where there is a conflict with the provisions of this Ordinance, the most restrictive applies.
- O. Post-construction water quality protection shall be addressed as required by §78-37.
- P. Operations and maintenance of permanent stormwater BMPs shall be addressed as required by this article.
- Q. All BMPs used to meet the requirements of this Ordinance shall conform to the state water quality requirements and any more stringent requirements as set forth by Haverford Township.
- R. Techniques described in Appendix E (Low Impact Development) of this Ordinance shall be considered because they reduce the costs of complying with the requirements of this Ordinance and the state water quality requirements.
- S. In selecting the appropriate BMPs or combinations thereof, the Applicant shall consider the following:
  - 1. Total contributing drainage area.
  - 2. Permeability and infiltration rate of the site's soils.
  - 3. Slope and depth to bedrock.
  - 4. Seasonal high water table.
  - 5. Proximity to building foundations and wellheads.
  - 6. Erodibility of soils.
  - 7. Land availability and configuration of the topography.
  - 8. Peak discharge and required volume control.
  - 9. Stream bank erosion.

10. Efficiency of the BMPs to mitigate potential water quality problems.

11. The volume of runoff that will be effectively treated.

12. The nature of the pollutant being removed.

13. Maintenance requirements.

14. Creation/protection of aquatic and wildlife habitat.

15. Recreational value.

16. Enhancement of aesthetic and property values.

R. The design of all stormwater management facilities shall incorporate sound engineering principles and practices in a manner that does not aggravate existing stormwater problems. The Township reserves the right to disapprove any design that would result in construction in or continuation of a stormwater problem area.

S. The applicant may meet the stormwater management criteria through off-site stormwater management measures as long as the proposed measures are in the same subwatershed as shown in Ordinance Appendix A.

U. The following standards for protection of adjacent and downgradient properties from off-site conveyance must be accomplished:

For any location where a new concentrated discharge of stormwater from any frequency rainfall event, up to and including the 100-year storm and the volume of runoff up to and including the 2-year storm onto or through adjacent property(ies) or downgradient property(ies), the following are required:

1. A drainage easement (or other legal agreement/approval) must be obtained for conveyance of discharges onto or through adjacent properties per the PADEP guidance document "Chapter 102 Off-Site Discharges of Stormwater to Non-Surface Wasters – Frequently Asked Questions (FAQ)" dated January 2, 2019, or latest guidance document from PADEP.

2. The conveyance must be designed to avoid erosion, flooding, or other damage to the properties through which it is being conveyed.

3.

#### § 78-32. Authorization to Construct and Term of Validity.

Haverford Township's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Township may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section § 78-33, Permit requirements by other governmental entities; As-Built Plans, Completion Certificate, and Final inspection, within the term of validity, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the shall be resubmitted in accordance with Section § 78-30 of this Ordinance.

§ 78-33. Permit requirements by other governmental entities.

The following permit requirements may apply to certain regulated earth disturbance activities and must be met prior to commencement of regulated earth disturbance activities, as applicable:

- A. All regulated earth disturbance activities subject to permit requirements by DEP under regulations at 25 Pennsylvania Code Chapter 102.
- B. Work within natural drainageways subject to permit by DEP under 25 Pennsylvania Code Chapter 105.
- C. Any stormwater management facility that would be located in or adjacent to surface waters of the commonwealth, including wetlands, subject to permit by DEP under 25 Pennsylvania Code Chapter 105.
- D. Any stormwater management facility that would be located on a state highway right-of-way or require access from a state highway shall be subject to approval by PennDOT.
- E. Culverts, bridges, storm sewers, or any other facilities which must pass or convey flows from the tributary area and any facility which may constitute a dam, subject to permit by DEP under 25 Pennsylvania Code Chapter 105.

§ 78-34. Erosion and sediment control during regulated earth disturbance activities.

- A. No regulated earth disturbance activities within Haverford Township shall commence until Haverford Township receives an approval from the Conservation District of an erosion and sediment control plan for construction activities.
- B. DEP has regulations that require an erosion and sediment control plan for any earth disturbance activity of 5,000 square feet or more, under 25 Pennsylvania Code § 102.4(b).
- C. In addition, under 25 Pennsylvania Code Chapter 92, a DEP "NPDES construction activities" permit is required for regulated earth disturbance activities. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate DEP regional office or County Conservation District must be provided to Haverford Township.
- D. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate PA DEP regional office or County Conservation District must be provided to the Township. The issuance of an NPDES construction permit (or permit coverage under the statewide General Permit (PAG-2)) satisfies the requirements of §78-33.
- E. A copy of the erosion and sediment control plan and any required permit, as required by DEP regulations, shall be available on the project site at all times.
- F. Additional erosion and sediment control design standards and criteria are recommended to be applied where infiltration BMPs are proposed. They shall include the following:
  - (1) Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum infiltration

capacity.

- (2) Infiltration BMPs shall not be constructed nor receive runoff until the entire drainage area contributory to the infiltration BMP has achieved final stabilization.

§ 78-35. Nonstructural project design (sequencing to minimize stormwater impacts).

A. The design of all regulated activities shall include the following to minimize stormwater impacts.

- (1) The applicant shall find practicable alternatives to the surface discharge of stormwater, such as those listed in Appendix F, Table F-5, the creation of impervious surfaces, and the degradation of waters of the commonwealth and must maintain as much as possible the natural hydrologic regime of the site.
- (2) The applicant shall apply Low Impact Development (LID) methods such as those listed in Appendix E, provided that use of this method does not conflict with other local codes.
- (3) An alternative is practicable if it is available and capable of implementation after taking into consideration existing technology and logistics in light of overall project purposes and other municipal requirements.
- (4) All practicable alternatives to the discharge of stormwater are presumed to have less adverse impact on quantity and quality of waters of the commonwealth unless otherwise demonstrated.

B. The applicant shall demonstrate that the regulated activities were designed in the following sequence. The goal of the sequence is to minimize the increases in stormwater runoff and impacts to water quality resulting from the proposed regulated activity:

- (1) Prepare an existing resource and site analysis map (ERSAM) showing environmentally sensitive areas, including but not limited to, steep slopes, ponds, lakes, streams, wetlands, hydric soils, vernal pools, stream buffers and hydrologic soil groups. Land development, any existing recharge areas, and other requirements outlined in the municipal SALDO shall also be included.
- (2) Establish a stream buffer according to § 78-42.
- (3) Prepare a draft project layout avoiding sensitive areas identified in Subsection B(1).
- (4) Identify site-specific existing conditions drainage areas, discharge points, recharge areas, and hydrologic soil groups A and B (areas conducive to infiltration).
- (5) Evaluate nonstructural stormwater management alternatives:
  - (a) Minimize earth disturbance.
  - (b) Minimize impervious surfaces.
  - (c) Break up large impervious surfaces.
- (6) Satisfy the infiltration volume requirements (§ 78-36) and provide for stormwater pretreatment prior to infiltration.

- (7) Provide for water quality protection in accordance with § 78-37 water quality requirements.
- (8) Provide streambank erosion protection in accordance with § 78-38 streambank erosion requirements.
- (9) Determine into what management district the site falls (Appendix A) and conduct an existing conditions runoff analysis.
- (10) Prepare final project design to maintain existing conditions drainage areas and discharge points, to minimize earth disturbance and impervious surfaces and, to the maximum extent possible, to ensure that the remaining site development has no surface or point discharge.
- (11) Conduct a proposed conditions runoff analysis based on the final design that meets the management district requirements (§ 78-39).
- (12) Manage any remaining runoff prior to discharge through detention, bioretention, direct discharge or other structural control.

#### § 78-36. Infiltration Volume Requirements

Providing for infiltration consistent with the natural hydrologic regime is required. Design of the infiltration facilities shall consider infiltration to compensate for the reduction in the recharge that occurs when the ground surface is disturbed or impervious surface is created. It is recommended that roof runoff be directed to infiltration BMPs that may be designed to compensate for the runoff from parking areas. These measures are required to be consistent with § 78-17 and to take advantage of utilizing any existing recharge areas. Infiltration may not be feasible on every site due to site-specific limitations such as soil type. If it cannot be physically accomplished, then the design professional shall be responsible to show that this cannot be physically accomplished.

If it cannot be physically accomplished, then the design professional shall be responsible for demonstrating to the satisfaction of the municipality that this cannot be physically accomplished on the site (e.g., shallow depth to bedrock or limiting zone, open voids, steep slopes, etc. per the PA BMP Manual. A financial hardship as defined in §78-24 is not acceptable to avoid implementing infiltration facilities. If infiltration can be physically accomplished, the volume of runoff to be infiltrated shall be determined from §78-36.A(2) depending on demonstrated site conditions, and shall be the greatest volume that can be physically infiltrated or alternative methods consistent with the PA BMP Manual (as amended) or other PADEP guidance, such as the Managed Release Concept, may be used to manage this volume with approval from the Municipal Engineer. For example:

- Any applicant (developer or redeveloper) shall first attempt to infiltrate the volume required in §78-36.A(2)[a].
- If the §78-36.A(2)[a] requirement cannot be physically accomplished, then the applicant is required to attempt to infiltrate the volume required in §78-36.A(2)[b].
- Finally, if the §78-36.A(2)[b] infiltration volume cannot be physically accomplished, the applicant must, at a minimum, infiltrate the volume required in §78-36.A(2)[c].

A. Infiltration BMPs shall meet the following minimum requirements:

1. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:
  - a. A minimum depth of 24 inches between the bottom of the BMP and the top of the limiting zone unless bioretention is used.
  - b. An infiltration rate sufficient to accept the additional stormwater load and dewater completely as determined by field tests conducted by the applicant's design professional.
  - c. The infiltration facility shall be capable of completely infiltrating the retention (infiltration) volume ( $Re_v$ ) below grade within four days (96 hours).
  - d. Pretreatment shall be provided prior to infiltration.

2. The size of the infiltration facility shall be based upon the following volume criteria:

- a. Modified Control Guideline One (MCG-1) of the PA BMP Manual – The retention (infiltration) volume ( $Re_v$ ) to be captured and infiltrated shall be the net 2-year 24-hour volume. The net volume is the difference between the post-development runoff volume and the pre-development runoff volume. The post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation shall not be increased. For modeling purposes, existing (pre-development) non-forested pervious areas must be considered meadow in good condition or its equivalent, and twenty (20) percent of existing impervious area, when present, shall be considered meadow in good condition.
- b. Infiltrating the entire  $Re_v$  volume in Section §78-36.A(2)[a] (above) may not be feasible on every site due to site-specific limitations such as shallow depth to bedrock or the water table. If it cannot be physically accomplished, then the following criteria from Modified Control Guideline Two (MCG-2) of the PA BMP Manual must be satisfied:

At least the first one-inch (1.0") of runoff from new or replacement impervious surfaces shall be infiltrated.

$$Re_v = 1 \text{ (inch)} * \text{impervious area (square feet)} \div 12 \text{ (inches)} = \text{cubic feet (cf)}$$

An asterisk (\*) in equations denotes multiplication.

- c. Only if infiltrating the entire  $Re_v$  volume in §78-36.A(2)[b] cannot be physically accomplished, then the following minimum criteria from Modified Control Guideline Two (MCG-2) of the PA BMP Manual must be satisfied:

Wherever possible, infiltration facilities should be designed to accommodate infiltration of the entire water quality volume ( $WQ_v$ ) in §78-36.A(2)[a]; however, in all cases at least the first one-half inch (0.5") of the  $WQ_v$  shall be infiltrated. The minimum infiltration volume ( $Re_v$ ) required would, therefore, be computed as:

$$\text{Rev} = I * \text{impervious area (square feet)} \div 12 \text{ (inches)} = \text{cubic feet (cf)}$$

An asterisk (\*) in equations denotes multiplication.

Where:

I = The maximum equivalent infiltration amount (inches) that the site can physically accept or 0.50 inch, whichever is greater.

The retention volume values derived from the methods in §78-36.A(2)[a], §78-36.A(2)[b], or §78-36.A(2)[c] is the minimum volume the Applicant must control through an infiltration BMP facility. If site conditions preclude capture of runoff from portions of the impervious area, the infiltration volume for the remaining area should be increased an equivalent amount to offset the loss.

Only if the minimum of 0.50 inch of infiltration requirement cannot be physically accomplished, a waiver from §78-36, Infiltration Volume Requirements, is required from the Municipality.

B. Soils. A detailed soils evaluation of the project site shall be required to determine the suitability of infiltration facilities. The evaluation shall be performed by a qualified design professional and at a minimum address soil permeability, depth to bedrock, and subgrade stability. The general process for designing the infiltration BMP shall be:

1. Analyze hydrologic soil groups as well as natural and man-made features within the site to determine general areas of suitability for infiltration practices. In areas where development on fill material is under consideration, conduct geotechnical investigations of subgrade stability; infiltration may not be ruled out without conducting these tests.
2. Provide field tests such as required in the PA BMP Manual.
3. Design the infiltration structure for the required retention (Rev) volume based on field-determined capacity at the level of the proposed infiltration surface.
4. If on-lot infiltration structures are proposed by the applicant's design professional, it must be demonstrated to Haverford Township that the soils are conducive to infiltrate on the lots identified.

C. Stormwater hotspots.

(1) Below is a list of examples of designated hotspots. If a site is designated as a hotspot, it has important implications for how stormwater is managed. First and foremost, untreated stormwater runoff from hotspots shall not be allowed to recharge into groundwater where it may contaminate water supplies. Therefore, the groundwater recharge requirement shall NOT be applied to development sites that fit into the hotspot category (the entire WQv must still be treated). Second, a greater level of stormwater treatment shall be considered at hotspot sites to prevent pollutant wash off after construction. The Environmental Protection Agency's (EPA) NPDES stormwater program requires some industrial sites to prepare and implement a stormwater pollution prevention plan. Stormwater runoff from hotspots shall be pretreated prior to surface or groundwater infiltration to prevent pollutant runoff. Industrial sites referenced in 40 CFR 125 are examples of hotspots.

(a) Examples of hotspots:

Vehicle salvage yards and recycling facilities

Vehicle fueling stations

Vehicle service and maintenance facilities

Vehicle and equipment cleaning facilities

Fleet storage areas (bus, truck, etc.)

Industrial sites based on Standard Industrial Codes

Marinas (service and maintenance)

Outdoor liquid container storage

Outdoor loading/unloading facilities

Public works storage areas

Facilities that generate or store hazardous materials

Commercial container nursery

Contaminated sites/brownfields

Other land uses and activities as designated by an appropriate review authority

(b) The following land uses and activities are not normally considered hotspots:

Residential streets and rural highways

Residential development

Institutional development

Office developments

Nonindustrial rooftops

Pervious areas, except golf courses and nurseries [which may need an integrated pest management (IPM) plan].

(2) While large highways [average daily traffic volume (ADT) greater than 30,000] are not designated as stormwater hotspots, it is important to ensure that highway stormwater management plans adequately protect groundwater.

(3) The Environmental Protection Agency's (EPA) NPDES stormwater program requires some industrial sites to prepare and implement a stormwater pollution prevention plan.

D. Infiltration facilities should, to the greatest extent practicable, be located to avoid introducing contaminants via groundwater, and be in conformance with an approved



source water protection assessment or source water protection plan.

- E. Roadway drainage systems should provide an opportunity to capture accidental spills. Road de-icing material storage facilities shall be designed to avoid salt and chloride runoff from entering waterways and infiltration facilities. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration facility and perform a hydrologic justification study if possible.
- F. Extreme caution shall be exercised where infiltration is proposed in SWPAs as defined by the local municipality or water authority.
- G. Infiltration facilities shall be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.
- H. Extreme caution shall be exercised where salt or chloride (municipal salt storage) would be a pollutant since soils do little to filter this pollutant, and it may contaminate the groundwater. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration facility and perform a hydrogeologic justification study if necessary.
- I. The antidegradation analysis found in Chapter 93 shall be applied in HQ or EV streams.
- J. An impermeable liner will be required in detention basins where the possibility of groundwater contamination exists. A detailed hydrogeologic investigation may be required by Haverford Township.
- K. Haverford Township shall require the applicant to provide safeguards against groundwater contamination for land uses that may cause groundwater contamination should there be a mishap or spill.

#### § 78-37. Water quality requirements.

The applicant shall comply with the following water quality requirements of this article.

- A. No regulated earth disturbance activities within Haverford Township shall commence until approval by Haverford Township of a plan which demonstrates compliance with postconstruction state water quality requirements.
- B. The BMPs shall be designed, implemented, and maintained to meet state water quality requirements and any other more stringent requirements as determined by Haverford Township.
- C. To control post-construction stormwater impacts from regulated activities and conform to state water quality requirements, BMPs which replicate pre-development stormwater infiltration and runoff conditions must be provided in the site design such that post-construction stormwater discharges do not degrade the physical, chemical, or biological characteristics of the receiving waters. The green infrastructure and Low Impact Development (LID) practices provided in the PA BMP Manual, as well as the guidance on green infrastructure and LID provided in Appendix E shall be utilized for all regulated activities wherever possible. This may be achieved by the following:

- (1) Infiltration: replication of preconstruction stormwater infiltration conditions;
- (2) Treatment: use of water quality treatment BMPs to ensure filtering out of the chemical and physical pollutants from the stormwater runoff; and
- (3) Streambank and streambed protection: management of volume and rate of postconstruction stormwater discharges to prevent physical degradation of receiving waters (e.g., from scouring).

D. Developed areas shall provide adequate storage and treatment facilities necessary to capture and treat stormwater runoff. The infiltration volume computed under § 78-36 may be a component of the water quality volume if the applicant chooses to manage both components in a single facility. If the infiltration volume is less than the water quality volume, the remaining water quality volume may be captured and treated by methods other than infiltration BMPs. The required water quality volume (WQv) is the storage capacity needed to capture and treat a portion of stormwater runoff from the developed areas of the site.

- (1) To achieve this goal, the following criterion is established:

The Post-construction total runoff volume shall not exceed the Predevelopment total runoff volume for all storms equal to or less than the two-year, 24-hour duration precipitation (design storm). If the Township Engineer concurs that this criterion cannot be met, a minimum of one half (0.5)-inches of runoff from all Regulated Impervious Surfaces shall be managed. For modeling purposes, existing (pre-development) non-forested pervious areas must be considered meadow in good condition or its equivalent, and twenty (20) percent of existing impervious area, when present, shall be considered meadow in good condition.

This volume requirement can be managed by the permanent volume of a wet basin or the detained volume from other BMPs. Where appropriate, wet basins shall be utilized for water quality control and shall follow the guidelines of the PA BMP Manual referenced in Appendix G.

Release of water can begin at the the start of the storm (i.e. the invert of the water quality orifice is at the inver of the facility). The design of the facility shall provide for protection from clogging and unwanted sedimentation.

E. For areas within defined special protection subwatersheds that include EV and HQ waters, the temperature and quality of water and streams shall be maintained through the use of temperature-sensitive BMPs and stormwater conveyance systems.

F. To accomplish the above, the applicant shall submit original and innovative designs to the Township engineer for review and approval. Such designs may achieve the water quality objectives through a combination of different BMPs.

G. Evapotranspiration may be quantified and credited towards meeting volume requirements according to the PADEP Post Construction Stormwater Management (PCSM) Spreadsheet and Instructions (December 2020) or the most recent guidance from PADEP.

H. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate DEP regional office must be provided to Haverford Township.

§ 78-38. Streambank erosion requirements.

A. In addition to the control of water quality volume (in order to minimize the impact of stormwater runoff on downstream streambank erosion), the primary requirement is to design a BMP to detain the proposed conditions two-year, twenty-four-hour design storm to the existing conditions one-year flow using the SCS Type II distribution. Additionally, provisions shall be made (such as adding a small orifice at the bottom of the outlet structure) so that the proposed conditions one-year storm takes a minimum of 24 hours to drain from the facility from a point where the maximum volume of water from the one-year storm is captured (i.e., the maximum water surface elevation is achieved in the facility). Release of water can begin at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility).

B. The minimum orifice size in the outlet structure to the BMP shall be three inches in diameter where possible, and a trash rack shall be installed to prevent clogging. On sites with small drainage areas contributing to this BMP that do not provide enough runoff volume to allow a twenty-four-hour attenuation with the three-inch orifice, the calculations shall be submitted showing this condition. Orifice sizes less than three inches can be utilized, provided that the design will prevent clogging of the intake.

C. In "Conditional Direct Discharge Districts" (District C) only (see § 78-39), the objective is not to attenuate the storms greater than the two-year recurrence interval. This can be accomplished by configuring the outlet structure not to control the larger storms or by a bypass channel that diverts only the two-year stormwater runoff into the basin or conversely, diverts flows in excess of the two-year storm away from the basin.

§ 78-39. Stormwater peak rate control and management districts.

A. The Darby and Cobbs Creeks watershed has been divided into stormwater management districts as shown on the Management District Map in Appendix A. In addition to the requirements specified in Table 408.1 below, the erosion and sedimentation control (§ 78-34), the nonstructural project design (§ 78-35), the infiltration volume requirements (§ 78-36), the water quality (§ 78-37), and the streambank erosion (§ 78-38) requirements shall be implemented.

(1) Standards for managing runoff from each subarea in the Darby and Cobbs Creeks watershed for the two-, five-, ten-, twenty-five-, fifty-, and one-hundred-year design storms are shown in Table 408.1. Development sites located in each of the management districts must control proposed conditions runoff rates to existing conditions runoff rates for the design storms in accordance with Table 408.1.

TABLE 408.1

PEAK RATE CONTROL STANDARDS BY STORMWATER

MANAGEMENT DISTRICT IN THE

DARBY-COBBS CREEK WATERSHED

District	Proposed Storm	Condition	Design	Existing Storm	Condition	Design
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TABLE 408.1

A	2 – year	1 – year
	5 – year	5 – year
	10 – year	10 – year
	25 – year	25 – year
	100 – year	100 – year
B-1	2 – year	1 – year
	10 – year	5 – year
	25 – year	10 – year
	50 – year	25 – year
	100 – year	100 – year
B-2	2 – year	1 – year
	5 – year	2 – year
	25 – year	5 – year
	50 – year	10 – year
	100 – year	100 – year
C	Conditional Direct Discharge District	

(2) In District C, development sites that can discharge directly to the Darby-Cobbs Creek main channel, major tributaries, or indirectly to the main channel through an existing stormwater drainage system (i.e., storm sewer or tributary) may do so without control of the proposed conditions peak rate of runoff greater than the five-year storm. Sites in District C will still have to comply with the groundwater recharge and infiltration volume requirement criteria, the water quality criteria, and streambank erosion criteria. If the proposed conditions runoff is intended to be conveyed by an existing stormwater drainage system to the main channel, assurance must be provided that such system has adequate capacity to convey the flows greater than the two-year existing conditions peak flow or will be provided with improvements to furnish the required capacity. When adequate capacity in the downstream system does not exist and will not be provided through improvements, the proposed conditions peak rate of runoff must be controlled to the existing conditions peak rate as required in District A provisions (i.e., ten-year proposed conditions flows to ten-year existing conditions flows) for the specified design storms.

B. General. Proposed conditions rates of runoff from any regulated activity shall not exceed the peak release rates of runoff from existing conditions for the design storms specified

on the Stormwater Management District Watershed Map (Appendix A) and this section of the article.

- C. District boundaries. The boundaries of the stormwater management districts are shown on an official map that is available for inspection at the municipal and County Planning offices. A copy of the official map at a reduced scale is included in Appendix A. The exact location of the stormwater management district boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours (or most accurate data required) provided as part of the SWM site plan.
- D. Sites located in more than one district. For a proposed development site located within two or more stormwater management district category subareas, the peak discharge rate from any subarea shall meet the management district criteria for which the discharge is located. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea. An exception to the above may be granted if discharges from multiple subareas recombine in proximity to the discharge site. In this case, peak discharge in any direction may follow Management District A criteria, provided that the overall site discharge meets the management district criteria for which the discharge is located.
- E. Off-site areas. Off-site areas that drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site.
- F. Site areas. Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area utilizing stormwater management measures shall be subject to the management district criteria. In other words, unimpacted areas bypassing the stormwater management facilities would not be subject to the management district criteria.
- G. "No harm" option. For any proposed development site not located in a Conditional Direct Discharge District, the applicant has the option of using a less-restrictive runoff control (including no detention) if the applicant can prove that "no harm" would be caused by discharging at a higher runoff rate than that specified by the stormwater management plan. The "no harm" option is used when an Applicant can prove that the proposed conditions hydrographs can match existing conditions hydrographs and if it can be proved that the proposed conditions will not cause increases in peaks at all points downstream. Proof of "no harm" must be shown based upon the following downstream impact evaluation which shall include a downstream hydraulic capacity analysis consistent with Subsection H to determine if adequate hydraulic capacity exists. The applicant shall submit to Haverford Township this evaluation of the impacts due to increased downstream stormwater flows in the watershed.
  - (1) The hydrologic regime of the site must be maintained.
  - (2) The downstream impact evaluation shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications due to the proposed development upon a dam, highway, structure, natural point of restricted streamflow, or any stream channel section established with the

concurrence of the municipality.

- (3) The evaluation shall continue downstream until the increase in flow diminishes due to additional flow from tributaries and/or stream attenuation.
- (4) The peak flow values to be used for downstream areas for the design return period storms (two-, five-, ten-, fifty-, and one-hundred-year) shall be the values from the calibrated model for the respective watershed. These flow values can be obtained from the original Act 167 watershed stormwater management plans.
- (5) Applicant-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no-harm," except in conjunction with proposed capacity improvements for the problem areas consistent with Subsection H.
- (6) Financial distress shall not constitute grounds for the municipality to approve the use of the "no-harm" option.
- (7) Capacity improvements to conveyance facilities or obstructions may be provided as necessary to implement the "no harm" option as long as it can be demonstrated through the downstream hydraulic capacity analysis that the improvements would not create any harm downstream.
- (8) Any "no harm" justifications shall be submitted by the applicant as part of the drainage plan submission per this article.

H. Downstream hydraulic capacity analysis. Any downstream hydraulic capacity analysis conducted in accordance with this article shall use the following criteria for determining adequacy for accepting increased peak flow rates:

- (1) Natural or man-made channels or swales must be able to convey the increased runoff associated with a two-year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP Erosion and Sediment Pollution Control Program Manual.
- (2) Natural or man-made channels or swales must be able to convey increased twenty-five-year return period runoff without creating any hazard to persons or property.
- (3) Culverts, bridges, storm sewers, or any other facilities which need to pass or convey flows from the tributary area must be designed in accordance with DEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased twenty-five-year return period runoff.
- (4) Water quality requirements as defined in §78-37.
- (5) Post-construction peak rates shall not exceed the existing peak rates for the respective sub-area.

I. Alternate criteria for redevelopment sites. For redevelopment sites, one of the following minimum design parameters shall be accomplished, whichever is most appropriate for the given site conditions as determined by Haverford Township;

- (1) Meet the full requirements specified by Table 408.1 and Stormwater peak rate control and management districts, § 78-39 ; or
- (2) Reduce the total pre-development impervious surface on the site by at least 20% based upon a comparison of existing impervious surface to regulated impervious surface. In this case, calculations must be provided that show the peak rate has not increased.

§ 78-40. Calculation Methodology.

A. Stormwater runoff from all development sites with a drainage area of greater than five (5) acres shall be calculated using a generally accepted calculation technique that is based on the NRCS soil cover complex method. Table 409.1 summarizes acceptable computation methods, and the method selected by the design professional shall be based on the individual limitations and suitability of each method for a particular site.

Credits providing an automatic reduction in impervious area and a corresponding reduction in stormwater impacts for the reduction of design volume, peak rate, and channel protection are available for protecting existing trees as well as revegetating and reforestation are outlined in Appendix E. No more than 25% of the Volume Reduction may be met through Nonstructural BMP credits.

Haverford Township may allow the use of the Rational Method to estimate peak discharges from drainage areas that contain less than five (5) acres. The use of the Rational Method to estimate peak discharges for drainage areas greater than five (5) acres shall be permitted only upon approval of the Township engineer.

TABLE 409.1

ACCEPTABLE COMPUTATION METHODOLOGIES  
FOR STORMWATER MANAGEMENT PLANS

Method	Developed By	Applicability
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans where limitations described in TR-55.
HEC-1/HEC-HMS	US Army Corps of Engineers	Applicable where use of a full hydrologic computer is desirable or necessary.
PSRM	Penn State University	Applicable where use of a hydrologic model is desirable or necessary; simpler than TR-20 or HEC-1.

TABLE 409.1

Other methods	Varies	Other computation methodologies approved by the municipality and/or municipal Engineer.
HEC RAS	US Army Corp of Engineers	"No harm" option

- B. All calculations consistent with this article using the soil cover complex method shall use the appropriate design rainfall depths for the various return period storms. Rainfall depths shall be according to NOAA Atlas 14 values consistent with a partial duration series. When stormwater calculations are performed for routing procedures or water quality functions, the duration of rainfall shall be twenty-four (24) hours.
- C. The following criteria shall be used for runoff calculations:
  - (1) For development sites not considered redevelopment, the ground cover used in determining the existing conditions flow rates shall be as follows:
    - (a) Wooded sites shall use a ground cover of "woods in good condition." Portions of a site having more than one viable tree of a DBH of six inches or greater per 1,500 square feet shall be considered "wooded" where such trees existed within three years of application.
    - (b) The undeveloped portion of the site including agriculture, bare earth and fallow ground, shall be considered as "meadow in good condition," unless the natural ground cover generates a lower curve (CN) number or Rational "c" value (i.e., woods) as listed in Tables F-2 or F-3 in Appendix F of this article.
  - (2) For development and redevelopment sites, the ground cover used in determining the existing conditions flow rates for the developed portion of the site shall be based upon actual land cover conditions.
- D. All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration (duration) and storm events with rainfall intensities obtained from NOAA Atlas 14 partial duration series estimates, or the latest version of the PennDOT Drainage Manual (PDM Publication 584). Times of concentration shall be calculated based on the methodology recommended in the respective model used. Times of concentration for channel and pipe flow shall be computed using a minimum of five (5) minutes.
- E. Runoff curve numbers (CN) for both existing and proposed conditions to be used in the soil cover complex method shall be obtained from Table F-2 in Appendix F of this article.
- F. Runoff coefficients (c) for both existing and proposed conditions for use in the rational method shall be obtained from Table F-3 in Appendix F of this article.
- G. Hydraulic computations to determine the capacity of pipes, culverts, and storm sewers shall be consistent with methods and computations contained in the Federal Highway



Administration Hydraulic Design Series Number 5 (Publication No. FWHA-NHI-01-020 HDS No. 5). Hydraulic computations to determine the capacity of open channels shall be consistent with methods and computations contained in the Federal Highway Administration Hydraulic Engineering Circular Number 15 (Publication No. FHWA-BHI-05-114 HEC 15). Values for Manning's roughness coefficient ( $n$ ) shall be consistent with Table F-4 in Appendix F.

- H. Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this article using any generally accepted hydraulic analysis technique or method.
- I. The design of any stormwater detention facilities intended to meet the performance standards of this article shall be verified by routing the design storm hydrograph through these facilities using the storage-indication method. The design storm hydrograph shall be computed using a calculation method that produces a full hydrograph. Haverford Township may approve the use of any generally accepted full hydrograph approximation technique that shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.

§ 78-41. Other requirements.

- A. Any stormwater facility located on state highway rights-of-way shall be subject to approval by PennDOT.
- B. All wet basin designs shall incorporate biologic controls consistent with the West Nile Guidance found in Appendix H, PADEP document 363-0300-001 "Design Criteria – Wetlands Replacement/Monitoring," or contact the Pennsylvania State Cooperative Wetland Center ([www.wetlands.psu.edu/](http://www.wetlands.psu.edu/)) or the Penn State Cooperative Extension Office ([www.extension.psu.edu/extmap.html](http://www.extension.psu.edu/extmap.html)).
- C. Any stormwater management facility (i.e., detention basin) required or regulated by this article designed to store runoff and requiring a berm or earthen embankment shall be designed to provide an emergency spillway to handle flow up to and including the one-hundred-year proposed conditions. The height of embankment must provide a minimum 1.0 foot of freeboard above the maximum pool elevation computed when the facility functions for the one-hundred-year proposed conditions inflow. Should any stormwater management facility require a dam safety permit under DEP Chapter 105, the facility shall be designed in accordance with Chapter 105 and meet the regulations of Chapter 105 concerning dam safety. Chapter 105 may be required to pass storms larger than the one-hundred-year event.
- D. Any facilities that constitute water obstructions (e.g., culverts, bridges, outfalls, or stream enclosures) and any work involving wetlands governed by DEP Chapter 105 regulations (as amended or replaced from time to time by DEP) shall be designed in accordance with Chapter 105 and will require a permit from DEP.
- E. Any other drainage conveyance facility that does not fall under Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the twenty-five-year design storm with a minimum 1.0 foot of freeboard measured below the lowest point along the top of the roadway. Any facility that constitutes a dam as defined in DEP Chapter 105 regulations may require a permit under dam safety

regulations. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements. The larger events (50 year and 100 year) must also be safely conveyed in the direction of natural flow without creating additional damage to any drainage structures, nearby structures, or roadways.

- F. Any drainage conveyance facility and/or channel not governed by Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the twenty-five-year design storm. Conveyance facilities to or exiting from stormwater management facilities (i.e., detention basins) shall be designed to convey the design flow to or from that structure. Roadway crossings located within designated floodplain areas must be able to convey runoff from a one-hundred-year design storm. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.
- G. Conveyance facilities transporting flow to or exiting from stormwater management facilities (i.e. detention basins) shall be designed to convey the 100-year frequency storm.
- H. Roadway crossings or structures located within designated floodplain areas must be able to convey runoff from a 100-year design storm consistent with FEMA Floodplain Management requirements.
- I. Adequate erosion protection shall be provided along all open channels and at all points of discharge.
- J. The design of all stormwater management facilities shall incorporate sound engineering principles and practices. Haverford Township reserves the right to disapprove any design that would result in construction in or continuation of a stormwater problem area.

#### §78-42. Riparian Buffers

- A. Except as required by Chapter 102, if a perennial or intermittent stream passes through, or a waterbody (i.e., lake, pond, wetland) is present on the site, the Applicant shall create a Riparian Buffer extending a minimum of 50 feet, to either side of the top-of-bank of the channel, lake, or wetland
- B. The Riparian Buffer shall be planted with native vegetation and maintained in a vegetated state (Refer to Appendix B, Pennsylvania Native Plant List, contained in the PA BMP Manual or latest guidance document from PADEP).
  - 1. The following provisions also apply to Riparian Buffers on lots in existence at the time of adoption of this Ordinance:
    - a. If the applicable rear or side yard setback is less than 50 feet, the buffer width may be reduced to twenty-five (25) percent of the setback or twenty-five (25) feet, whichever is greater.
    - b. If a stream traverses a site in a manner that significantly reduces the use of the site, the buffer may be either:
      - i. Reduced to twenty-five (25) feet on either side, with municipal approval, or
      - ii. Reduced to ten (10) feet with municipal waiver

2. Permitted uses within the Riparian Buffer include the following, subject to municipal approval and provided that they comply with all federal, state, and local regulations:
  - a. Recreational trails. See Ordinance Appendix J Riparian Buffer Trail Guidelines.
  - b. Utility rights-of-way
  - c. Bridges
  - d. Other uses subject to Township approval.
3. If an existing buffer is legally prescribed (i.e., deed, covenant, easement, etc.) and it exceeds the requirements of this Ordinance, the existing buffer shall be maintained.

#### § 78-43. Inspections.

- A. The Municipal Engineer or his municipal designee shall inspect all phases of the installation of the permanent BMPs and/or stormwater management facilities as deemed appropriate by the municipal Engineer.
- B. During any stage of the work, if the municipal Engineer or his municipal designee determines that the permanent BMPs and/or stormwater management facilities are not being installed in accordance with the approved stormwater management plan, the municipality shall revoke any existing permits or other approvals and issue a cease and desist order until a revised SWM site plan is submitted and approved, as specified in this article, and until the deficiencies are corrected.
- C. A final inspection of all BMPs and/or stormwater management facilities shall be conducted by the municipal Engineer or his municipal designee to confirm compliance with the approved SWM site plan prior to the issuance of any occupancy permit.

#### §78-44. As-Built Plans, Completion Certificate, and Final Inspection

- A. The developer shall be responsible for providing as-built plans of all SWM BMPs included in the approved SWM site plan for activities involving regulated impervious surfaces 1,000 sq. ft. or greater and for earth disturbances 5,000 sq. ft. or greater. The as-built plans and all explanation of any discrepancies with the construction plans shall be submitted to the Municipality within three (3) months of the completion of construction of the SWM BMPs.
- B. As-built plans shall show the location (including latitude and longitude coordinates) and as-built conditions of all SWM BMPs and include the following information: impervious surfaces included in the approved SWM site plan; topographic contours; and existing, proposed, and built impervious surfaces shown in the as-built drawings.
- C. The as-built submission shall include a certification of completion signed by a Design Professional verifying that all permanent SWM BMPs have been constructed according to the approved plans and specifications.
- D. The municipality will review the as-built submission for consistency with the approved SWM site plan as well as actual conditions at the project site. After receipt of the completion certification by the Municipality, the Municipality may conduct a final inspection.

E. If an NPDES Permit for Stormwater Discharges Associated with Construction Activities was required for the Regulated Activity, a Notice of Termination (NOT) approval must be obtained upon completion of construction prior to final approval of the project by the Municipality.

§ 78-45. Municipality SWM site plan review and inspection fee.

Fees shall be established by Haverford Township to defray plan review and construction inspection costs incurred by the municipality. All fees shall be paid by the applicant at the time of SWM site plan submission. A review and inspection fee schedule shall be established by resolution of the Board of Commissioners based on the size of the regulated activity and based on the municipality's costs for reviewing SWM site plans and conducting inspections pursuant to § 78-43 Haverford Township shall periodically update the review and inspection fee schedule to ensure that review costs are adequately reimbursed.

§ 78-46 Expenses covered by fees.

A. The fees required by this article shall at a minimum cover:

- a. Administrative costs.
- b. The review of the SWM site plan by Haverford Township and the Township Engineer.
- c. The inspection of stormwater management facilities and drainage improvements during construction.
- d. The site inspections.
- e. The inspection of stormwater management facilities and drainage improvements during construction.
- f. Attendance at meetings.
- g. The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the SWM site plan
- h. Any additional work required to enforce any permit provisions regulated by this article, correct violations, and assure proper completion of stipulated remedial actions.
- i. In addition, any and all costs for the review of plans and the inspection of stormwater management facilities and drainage improvements during construction by the municipal engineer, shall be deducted from the applicant's escrow account.
- j.

§ 78-47. Performance guarantee.

A. For SWM Site Plans that involve subdivision and land development, the applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as

(1) required by the approved SWM site plan equal to or greater than the full construction cost of the required controls; or

(2) The amount and method of payment provided for in the SALDO.

B. For other regulated activities, Haverford Township may require a financial guarantee from the applicant.

§ 78-48 Responsibilities for operations and maintenance (O&M) of stormwater controls and BMPs.

A. No regulated earth disturbance activities within Haverford Township shall commence until approval by the municipality of a stormwater control and BMP operations and maintenance plan that describes how the permanent (e.g., postconstruction) stormwater controls and BMPs will be properly operated and maintained.

B. The Township shall make the final determination on the continuing maintenance responsibilities prior to final approval of the SWM Site Plan. The municipality may require a dedication of such facilities as part of the requirements for approval of the SWM Site Plan. Such a requirement is not an indication that the municipality will accept the facilities. The Township reserves the right to accept or reject the ownership and operating responsibility for any portion of the stormwater management controls.

C. Facilities, areas, or structures used as SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.

A. The O&M Plan shall be recorded as a restrictive deed covenant that runs with the land.

B. The Municipality may take enforcement actions against an owner for any failure to satisfy the provisions of this Article.

D. The following items shall be included in the stormwater control and BMP operations and maintenance plan:

(1) Map(s) of the project area, in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Delaware County. The contents of the maps(s) shall include, but not be limited to:

(a) Clear identification of the location and nature of permanent stormwater controls and BMPs;

(b) The location of the project site relative to highways, municipal boundaries, or other identifiable landmarks;

(c) Existing and final contours at intervals of two feet, or others as appropriate;

(d) Existing streams, lakes, ponds, or other bodies of water within the project site area;

(e) Other physical features, including flood hazard boundaries, sinkholes, streams, existing drainage courses, and areas of natural vegetation to be preserved;

(f) The locations of all existing and proposed utilities, sanitary sewers, and waterlines within 50 feet of property lines of the project site;

(g) Proposed final changes to the land surface and vegetative cover, including the

type and amount of impervious area that would be added;

- (h) Proposed final structures, roads, paved areas, and buildings; and
- (i) A fifteen-foot-wide access easement around all stormwater controls and BMPs that would provide ingress to and egress from a public right-of-way.

(2) A description of how each permanent stormwater control and BMP will be operated and maintained, and the identity and contact information associated with the person(s) responsible for operations and maintenance.

(3) The name of the project site, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.

(4) A statement, signed by the landowner, acknowledging that the stormwater controls and BMPs are fixtures that can be altered or removed only after approval by Haverford Township.

C. The stormwater control and BMP operations and maintenance plan for the project site shall establish responsibilities for the continuing operation and maintenance of all permanent stormwater controls and BMPs, as follows:

(1) If a plan includes structures or lots which are to be separately owned and in which streets, sewers, and other public improvements are to be dedicated to Haverford Township, stormwater controls and BMPs may also be dedicated to and maintained by the municipality;

(2) If a plan includes operations and maintenance by a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the operation and maintenance of stormwater controls and BMPs shall be the responsibility of the owner or private management entity.

§ 78-49. Municipal review of a stormwater control and BMP operations and maintenance plan.

A. The municipality shall review the stormwater control and BMP operations and maintenance plan for consistency with the purposes and requirements of this article and any permits issued by DEP.

B. The municipality shall notify the applicant in writing whether or not the stormwater control and BMP operations and maintenance plan is approved.

C. The municipality will require an as-built plan showing all constructed stormwater controls and BMPs and an explanation of any discrepancies with the approved operations and maintenance plan.

§ 78-50. Adherence to an approved stormwater control and BMP operations and maintenance plan.

It shall be unlawful to alter or remove any permanent stormwater control and BMP required by an approved stormwater control and BMP operations and maintenance plan or to allow the property to remain in a condition which does not conform to an approved stormwater control and BMP operations and maintenance plan.

§ 78-51. Operation and Maintenance Agreements for privately owned stormwater controls and BMPs.

- A. Prior to final approval of the SWM Site Plan, the property owner shall sign and record an Operation and Maintenance (O&M) Agreement as drafted by the Township (in a similar form as Appendix I, but as may be amended by the Township) covering all stormwater control facilities which are to be privately owned. The maintenance agreement shall be transferred with transfer of ownership in perpetuity.
  - a. The owner, successor and assigns shall maintain all facilities in accordance with the approved maintenance schedule in the O&M Agreement.
  - b. The owner shall convey to the Township conservation easements to assure access for periodic inspections by the Township and maintenance, as necessary.
  - c. The owner shall keep on file with the Township the name, address, and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information shall be submitted by the owner to the Municipality within ten (10) working days of the change.
- B. The owner is responsible for operation and maintenance (O&M) of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the Township may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.
- C. Other items may be included in the agreement where determined necessary to guarantee the satisfactory operation and maintenance of all permanent stormwater controls and BMPs. The agreement shall be subject to the review and approval of the Township.

§ 78-52. Stormwater management easements.

- A. Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the Township.
- B. Stormwater management easements shall be provided by the applicant or property owner if necessary for access for inspections and maintenance or the preservation of stormwater runoff conveyance, infiltration, and detention areas and other stormwater controls and BMPs by persons other than the property owner. The purpose of the easement shall be specified in any agreement under § 78-51.

§ 78-53. Maintenance agreement for privately owned stormwater facilities.

- A. Prior to final approval of the site's SWM site plan, the applicant shall sign and record the Operation and Maintenance (O&M) Agreement as drafted by the Township, covering all stormwater control facilities that are to be privately owned.
- B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The Operation and Maintenance (O&M) Agreement shall be subject to the review and approval of the Municipal Solicitor and Board of Commissioners.

§ 78-54. Recording of an approved stormwater control and BMP operations and

maintenance plan and related agreements.

A. The owner of any land upon which permanent stormwater controls and BMPs will be placed, constructed, or implemented, as described in the stormwater control and BMP operations and maintenance plan, shall record the following documents in the Office of the Recorder of Deeds for Delaware County within 15 days of approval of the stormwater control and BMP operations and maintenance plan by the municipality:

- (1) The operations and maintenance plan, or a summary thereof,
- (2) Operations and Maintenance Agreement for Privately Owned Stormwater Controls and BMPs under § 78-51; and
- (3) Stormwater Management Easements under § 78-52.

B. The municipality may suspend or revoke any approvals granted for the project site upon discovery of failure on the part of the owner to comply with this section.

#### § 78-55. Municipal Stormwater Control and BMP Operation and Maintenance Fund.

A. The Township shall inspect SWM BMPs, facilities, and/or structures installed under this Ordinance according to the following frequencies, at a minimum, to ensure the BMPs, facilities and/or structures continue to function as intended. Persons installing stormwater controls or BMPs shall be required to pay a specified amount to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:

(1) If the stormwater control or BMP is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by Haverford Township for a period of 10 years, as estimated by the municipal Engineer. After that period of time, inspections will be performed at the expense of the municipality. The following minimum inspection frequencies are required:

- 1) Annually for the first 5 years.
- 2) Once every 3 years thereafter
- 3) During or immediately after the cessation of a 25-year or greater storm, as determined by the Municipal Engineer.
- 4) The Township Engineer may request that the landowners or landowner's designee submit an inspection report after the cessation of a 10-year or greater storm event if there is reason to believe that a BMP has sustained damage that impacts its ability to function as designed and if the BMP's failure would result in damage to downgradient properties.

(2) If the stormwater control or BMP is to be owned and maintained by Haverford Township, the deposit shall cover the estimated costs for maintenance and inspections for 10 years. The municipal Engineer will establish the estimated costs utilizing information submitted by the applicant. The following minimum inspection frequencies are required:



- 1) Annually for the first 5 years.
- 2) Once every 3 years thereafter
- 3) During or immediately after the cessation of a 25-year or greater storm, as determined by the Municipal Engineer.

(3) The above referenced inspections shall be conducted during or immediately following precipitation events or in dry weather conditions if the BMP design parameters include dewatering with a specified period of time. A written inspection report shall be created to document each inspection. The inspection report shall contain the date and time of the inspection, the individual(s) who completed the inspection, the location of the BMP, Stormwater Management Facility or structure inspected, observations on performance, and recommendations for improving performance, if applicable.

(4) The amount of the deposit to the fund shall be converted to present worth of the annual series values. The municipal Engineer shall determine the present worth equivalents, which shall be subject to the approval of the governing body.

B. If a stormwater control or BMP is proposed that also serves as a recreational facility (e.g., ball field or lake), Haverford Township may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreational purpose.

C. If at some future time a stormwater control or BMP (whether publicly or privately owned) is eliminated due to the installation of storm sewers or other storage facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

D. If stormwater controls or BMPs are accepted by Haverford Township for dedication, the municipality may require persons installing stormwater controls or BMPs to pay a specified amount to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to help defray costs of operations and maintenance activities. The amount may be determined as follows:

(1) The amount shall cover the estimated costs for operations and maintenance for 10 years, as determined by Haverford Township.

(2) The amount shall then be converted to present worth of the annual series values.

E. If a stormwater control or BMP is proposed that also serves as a recreational facility (e.g., ball field or lake), Haverford Township may adjust the amount due accordingly.

F. Haverford Township shall require applicants to pay a fee to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to cover long-term maintenance of stormwater controls and BMPs.

G. Haverford Township may require applicants to pay a fee to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to cover inspections, long term maintenance of stormwater BMPs and conveyances, and stormwater related problems

which may arise from the land development and earth disturbance.

§ 78-56. Prohibited Discharges and Connections.

- A. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter the Township's separate storm sewer system, riparian buffers, wetlands, or other waters of this Commonwealth, and any connections to the storm drain system from indoor drains and sinks, is prohibited.
- B. No person in Haverford Township shall allow, or cause to allow, stormwater discharges into a regulated small MS4, or discharges into waters of this Commonwealth, which are not composed entirely of stormwater, except as provided in subsection C below, and discharges authorized under a state or federal permit.
- C. The following discharges are authorized unless they are determined to be significant contributors to pollution to a regulated small MS4 or to the waters of this Commonwealth:
  - a. Discharges from firefighting activities.
  - b. Discharges from potable water sources including water line flushing and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).
  - c. Non-contaminated irrigation drainage water.
  - d. Routine external building washdown (which does not use detergents or other compounds).
  - e. Non-contaminated HVAC condensation and water from geothermal systems.
  - f. Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.
  - g. Springs and water from crawl space pumps.
  - h. Uncontaminated water from foundation or from footing drains.
  - i. Flows from riparian habitats and wetlands.
  - j. Lawn watering.
  - k. Pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used.
  - l. Uncontaminated groundwater
  - m. Non-contaminated hydrostatic test water discharges if such discharges do not contain detectable concentrations of TRC.
  - n. Diverted stream flows.
- D. In the event that the municipality determines that any of the discharges identified in

Subsection C significantly contribute pollutants to a regulated small MS4 or to the waters of this Commonwealth, or is so notified by DEP, the Township will notify the responsible person(s) to cease the discharge.

- E. Upon notice provided by the Township under §78-56.D the discharger will have a reasonable time, as determined by the Township, to cease the discharge consistent with the degree of pollution caused by the discharge.
- F. Nothing in this section shall affect a discharger's responsibilities under state law.

§ 78-57. Roof Drains and Sump Pumps.

- A. Roof drains and sump pumps shall not be connected to sanitary sewers.
- B. Roof drains and sump pumps shall not be connected to streets, storm sewers, or roadside ditches except on a case by case basis as determined by the Township.
- C. Roof drains and sump pumps shall discharge to infiltration areas or vegetative BMPs to the maximum extent practicable where advantageous to do so.

§ 78-58. Prohibited connections.

The following connections are prohibited, except as provided in § 78-56.C above:

- A. Any drain or conveyance, whether on the surface or subsurface, which allows any non-stormwater 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.
- B. Any drain or conveyance connected from a commercial or industrial land use to the separate storm sewer system which has not been documented in plans, maps, or equivalent records and approved by Haverford Township.
- C. Any drain or conveyance that delivers non-stormwater discharges directly into wetlands, riparian buffers, or other waters of the Commonwealth is prohibited.

§ 78-59. Alteration of SWM BMPs

- A. No person shall modify, remove, fill, landscape, or alter any existing stormwater control or BMP unless it is part of an approved maintenance program without the written approval of Haverford Township.
- B. No person shall place any structure, fill, landscaping, or vegetation into a stormwater control or BMP or within a drainage easement which would limit or alter the functioning of the stormwater control or BMP without the written approval of Haverford Township.

§ 78-60. Right-of-entry.

- A. Upon presentation of proper credentials, the Township or its designated agent may enter at reasonable times upon any property within the municipality to inspect the condition, implementation, or operation and maintenance of all erosion and sediment controls and permanent stormwater BMPs, conveyances, or other stormwater management facilities both during and after the completion of the regulated activity, or for compliance with any

requirement of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

- B. Stormwater control and BMP owners and operators shall allow persons working on behalf of Haverford Township ready access to all parts of the premises for the purposes of determining compliance with this article.
- C. Persons working on behalf of Haverford Township shall have the right to temporarily locate on any stormwater control or BMP in the municipality such devices as are necessary to conduct monitoring and/or sampling of the discharges from such stormwater control or BMP.
- D. Unreasonable delays in allowing the municipality access to a stormwater control or BMP is a violation of this article.
- E. If the property owner or representative does not grant access to the Municipality within 24 hours of the notification, it will be a violation of this Ordinance.

§ 78-61. Public nuisance.

- A. The violation of any provision of this article is hereby deemed a public nuisance.
- B. Each day that a violation continues shall constitute a separate violation.

§ 78-62. Enforcement generally.

- A. Whenever Haverford Township finds that a person has violated a prohibition or failed to meet a requirement of this article, the municipality may order compliance by written notice to the responsible person. Such notice may, without limitation, require the following remedies:
  - a. Performance of monitoring, analyses, and reporting;
  - b. Elimination of prohibited connections or discharges;
  - c. Cessation of any violating discharges, practices, or operations;
  - d. Abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
  - e. Payment of a fine to cover administrative and remediation costs;
  - f. Implementation of stormwater controls and BMPs; and
  - g. Operation and maintenance of stormwater controls and BMPs.
- B. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violations(s). Said notice may further advise that, if applicable, should the violator fail to take the required action within the established deadline, the work will be done by Haverford Township or designee, and the expense thereof shall be charged to the violator.
- C. Failure to comply within the time specified shall also subject such person to the penalty provisions of this article. All such penalties shall be deemed cumulative and shall not prevent the municipality from pursuing any and all other remedies available in law or

equity.

§ 78-63. Suspension and revocation of permits and approvals.

- A. Any building, land development, or other permit or approval issued by the Township pursuant to this Ordinance may be suspended or revoked for:
  - a. Non-compliance with or failure to implement any provision of the permit.
  - b. A violation of any provision of this Ordinance or any other applicable law, ordinance, rule, or regulation relating to the regulated activity.
  - c. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard, nuisance, pollution, or endangers the life or property of others.
- B. A suspended permit or approval may be reinstated by the Municipality when:
  - a. The Township engineer or designee has inspected and approved the corrections to the stormwater controls and BMPs or the elimination of the hazard or nuisance.
  - b. The Township is satisfied that the violation or the article, law, or rule and regulations has been corrected.
- C. A permit or approval that has been revoked by the Township cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.
- D. Prior to revocation or suspension of a permit and at the request of the applicant, the governing body shall schedule a hearing to discuss the noncompliance if there is no immediate danger to life, public health, or property. The expense of a hearing shall be the applicant's responsibility.

§ 78-64. Violations and penalties.

- A. Any person violating the provisions of this article shall be guilty of a misdemeanor and upon conviction shall be subject to a fine of not more than \$1,000 for each violation, recoverable with costs, or imprisonment of not more than 90 days, or both. Each day that the violation continues shall be a separate offense.
- B. In addition, the Township, through its Solicitor, may institute injunctive, mandamus, or any other appropriate action or proceeding at law or in equity for the enforcement of this article. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.

§ 78-65. Notification

In the event that a person fails to comply with the requirements of this article or fails to conform to the requirements of any permit issued hereunder, the Township shall provide written notification of the violation. Such notification shall state the nature of the violation(s) and establish a time limit for correction of these violation(s). Failure to comply within the time specified shall subject such person to the penalty provisions of this article. All such

penalties shall be deemed cumulative and shall not prevent the Township from pursuing any and all remedies. It shall be the responsibility of the owner of the real property on which any regulated activity is proposed to occur, is occurring, or has occurred to comply with the terms and conditions of this article.

#### §78- 66. Enforcement

The Board of Commissioners is hereby authorized and directed to enforce all of the provisions of this article. All inspections regarding compliance with the SWM site plan shall be the responsibility of the Township Engineer or other qualified persons designated by the Board of Commissioners.

- A. A set of design plans approved by the Township shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made by the Township or designee during construction.
- B. It shall be unlawful for any person, firm, or corporation to undertake any regulated activity under § 78-17 on any property except as provided for in the approved SWM site plan and pursuant to the requirements of this article. It shall be unlawful to alter or remove any control structure required by the SWM site plan pursuant to this article or to allow the property to remain in a condition which does not conform to the approved SWM site plan.
- C. At the completion of the project and as a prerequisite for the release of the performance guarantee, the owner or his representatives shall:
  - (1) Provide a certification 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 as-built (record) drawings.
- D. After receipt of the certification by Haverford Township, a final inspection shall be conducted by the municipal Engineer or designated representative to certify compliance with this article.
- E. Occupancy permit. An occupancy permit shall not be issued unless the certification of completion pursuant to § 78-66.C(1) has been secured. The occupancy permit shall be required for each lot owner and/or applicant for all subdivisions and land developments in Haverford Township.

#### § 78-67. Appeals.

- A. Any person aggrieved by any action of the Township or its designee may appeal to the Board of Commissioners of Haverford Township within 30 days of that action.
- B. Any person aggrieved by any decision of the Board of Commissioners of Haverford Township may appeal to the County Court of Common Pleas in the County where the activity has taken place within 30 days of the municipal decision.

SECTION II. ATTACHMENTS TO CHAPTER 78. The following attachments, consolidated

herein and attached to this Ordinance as Exhibit "A", shall serve as the attachments/appendices to Chapter 78, as so referenced above.

Attachment 1 - Table 105.1 Applicability

Attachment 2 - Appendix A Watershed Map

Attachment 3 - Appendix B

Attachment 4 - Appendix C-1 SWM Site Plan Application

Attachment 5 - Appendix C-2 SWM Site Plan Checklist

Attachment 6 - Appendix D Review Procedure Flowchart, Darby-Cobbs Creeks Watershed Stormwater Mgmt

Attachment 7 - Appendix E LID Practices

Attachment 8 - Appendix F Design Criteria

Attachment 9 - Appendix I Operations and Management Agreement

Attachment 10 - Appendix J Riparian Buffer Trail Guidelines

SECTION III. REDLINED ORDINANCE FOR REFERENCE. For ease of reference, the majority of deletions, additions and changes to Chapter 78, and a summary of the changes to the Attachments, are attached hereto as Exhibit "B".

SECTION IV: REPEALER. All Ordinances or parts of Ordinances inconsistent herewith or in conflict with any of the specific terms enacted hereby, to the extent of said inconsistencies or conflicts, are hereby specifically repealed.

SECTION V: REVISIONS. The Haverford Township Board of Commissioners does hereby reserve the right, from time to time, to adopt modifications of, supplements to, or amendments of this Ordinance.

SECTION VI: SEVERABILITY. If any section, sentence, clause, phrase or word of this Ordinance shall be declared illegal, invalid or unconstitutional by any Court of competent jurisdiction, such declaration shall not prevent, preclude or otherwise foreclose enforcement of any of the remaining portions of this Ordinance.

SECTION VII: EFFECTIVE DATE. This amendment shall become effective upon the legal date of its adoption.

SECTION VIII: FAILURE TO ENFORCE NOT A WAIVER. The failure of Haverford Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder

Enacted and Adopted this                      day of                      , 2024.

Township of Haverford

By: \_\_\_\_\_

C. Lawrence Holmes, Esq.

President

Attest: \_\_\_\_\_

David R. Burman

Township Manager/Secretary

EXHIBIT "A"  
ATTACHMENTS TO CHAPTER 78



**EXHIBIT "B"**  
**SUBSTANTIALLY COMPLETE REDLINED CHAPTER 78 FOR REFERENCE**

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

78 Attachment 1

**TABLE 105.1**

**APPLICABILITY**

Section	Type of Project	Regulated Impervious Surface				Earth Disturbance	
		499 square feet	500-999 square feet	1,000 square feet to 1 acre	Greater than 1 acre	5,000 square feet to 1 acre	Greater than 1 acre
§ 78-26 Drainage Plan Requirements	Development	N/A	Modified	Yes	Yes	Modified	Yes
	Redevelopment	N/A	Modified	Yes	Yes	Modified	Yes
§ 78-33 Nonstructural Project Design	Development	N/A	Yes	Yes	Yes	Yes	Yes
	Redevelopment	N/A	Yes	Yes	Yes	Yes	Yes
§ 78-34 Groundwater Recharge	Development	N/A	Yes	Yes	Yes	N/A	Yes
	Redevelopment	N/A	Yes	Yes	Yes	N/A	Yes
§ 78-35 Water Quality Requirements	Development	N/A	Yes	Yes	Yes	N/A	Yes
	Redevelopment	N/A	Yes	Yes	Yes	N/A	Yes
§ 78-36 Stream Bank Erosion Requirements	Development	N/A	Exempt	Yes	Yes	N/A	Yes
	Redevelopment	N/A	Exempt	Exempt	Yes	N/A	Yes
§ 78-37 Stormwater Peak Rate Control and Management Districts	Development	N/A	Exempt	Yes	Yes	Yes	Yes
	Redevelopment	N/A	Exempt	Yes	Yes	Yes	Yes

HAVERFORD CODE

Section	Type of Project	Proposed Impervious Surface				Earth Disturbance	
		499 square feet	500-999 square feet	1,000 square feet to 1 acre	Greater than 1 acre	5,000 square feet to 1 acre	Greater than 1 acre
Erosion and Sediment Pollution Control Plan Submission to the Conservation District	Earth Disturbance	See "earth disturbance requirements"	See "earth disturbance requirements"	See "earth disturbance requirements"	See "earth disturbance requirements"	Yes	Yes
		(Refer to municipal earth disturbance requirements, as applicable)					

Legend:

Yes - Drainage plan required with associated section provision.

N/A - Not applicable – exempt from drainage plan submission.

Exempt - Exempt from required section provision; drainage plan submission may still be required if other section provisions are applicable (yes in box).

Modified - Modified drainage plan required.

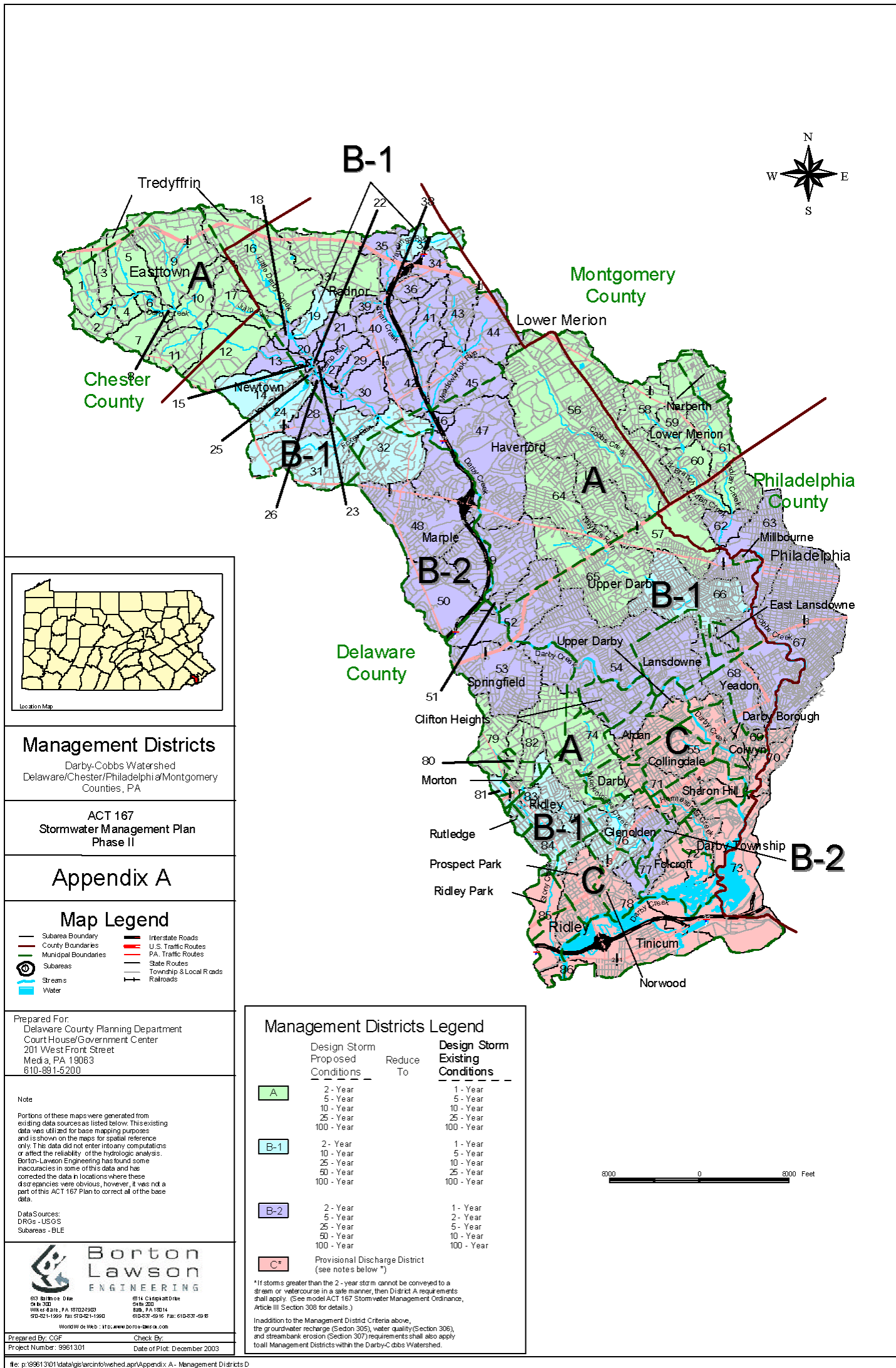
Notes:

- Sites with less than 1,000 square feet of regulated impervious surface, but between 5,000 square feet and one acre of earth disturbance must submit a drainage plan to Haverford Township which need only consist of the items in § 78-25A(2) and (4); B(7), (8), (11) and (22); and D(1) and (3) and related supportive material needed to determine compliance with §§ 78-33 and 78-37.
- Sites with more than 1,000 square feet, but less than 2,000 square feet of regulated impervious surface must submit a drainage plan; however, it need not consist of the items in §§ 78-36 and 78-37.

Township of Haverford

APPENDIX A

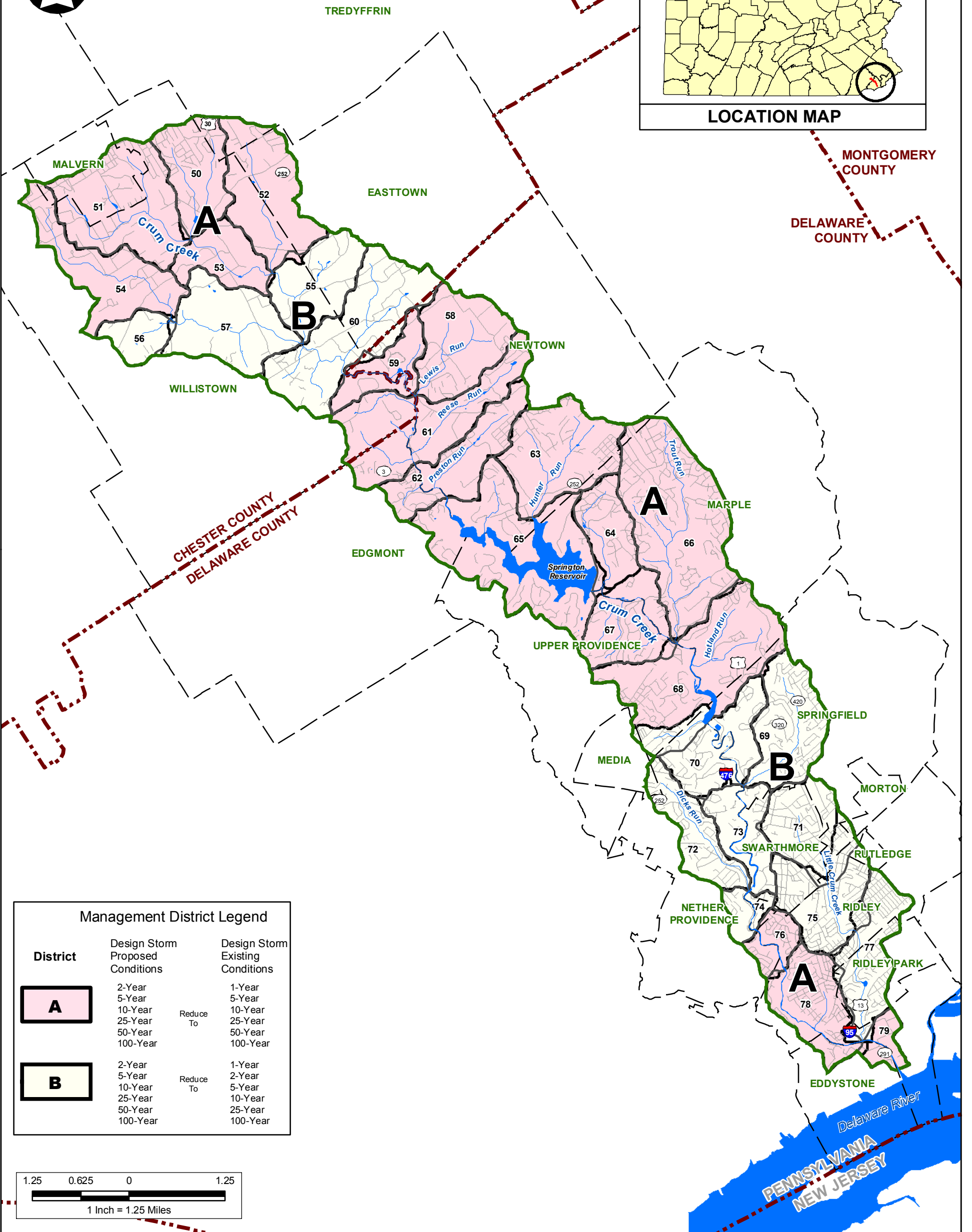
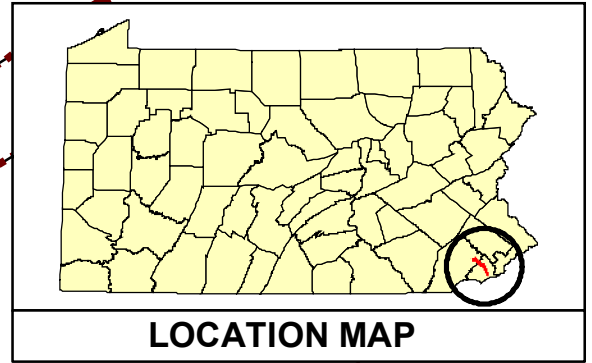
DARBY-COBBS STORMWATER MANAGEMENT DISTRICT WATERSHED MAP



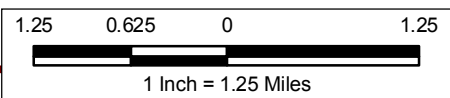
**ORDINANCE APPENDIX A**

**WATERSHED STORMWATER MANAGEMENT  
DISTRICT MAPS**

# CRUM CREEK PHASE II - ACT 167 STORMWATER MANAGEMENT PLAN



Management District Legend			
District	Design Storm Proposed Conditions	Design Storm Existing Conditions	
<b>A</b>	2-Year	Reduce To	1-Year
	5-Year		5-Year
	10-Year		10-Year
	25-Year		25-Year
	50-Year		50-Year
	100-Year	100-Year	
<b>B</b>	2-Year	Reduce To	1-Year
	5-Year		2-Year
	10-Year		5-Year
	25-Year		10-Year
	50-Year		25-Year
	100-Year	100-Year	



## APPENDIX A MANAGEMENT DISTRICTS

Prepared For:  
Delaware County Planning Department  
Courthouse and Government Center Bldg  
201 West Front Street  
Media, PA 19063  
610-891-5200

Legend	
WATERSHED BOUNDARY	Roads
SURFACE WATER	INTERSTATE
STREAMS	US HIGHWAY
SUBAREAS	PA HIGHWAY
COUNTY BOUNDARIES	OTHER ROADS
MUNICIPAL BOUNDARIES	

NOTE:  
Portions of this map were generated from existing data sources as listed below. These data are shown on the map for spatial reference only. These data did not enter into any computations or affect the reliability of the hydrologic analysis. Borton-Lawson Engineering has found some inaccuracies in some of these data and has corrected the data in locations where discrepancies were obvious; however, it was not a part of this Act 167 Plan to correct all of the mapping data.

DATA SOURCES:  
Watershed Boundary - PADEP  
State Roads - PennDOT, 2004  
Local Roads - PennDOT, 2001  
Counties - PennDOT, 2002  
Municipalities - PennDOT, 2001  
Streams - PaDEP/ERRI, 2001  
Lakes - Aqua America, 2001  
Delaware River - USFWS (derived from NWI coverages)  
Management Districts/ Subareas - Delineated by Borton-Lawson, 2006

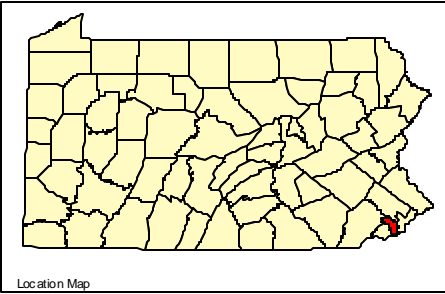
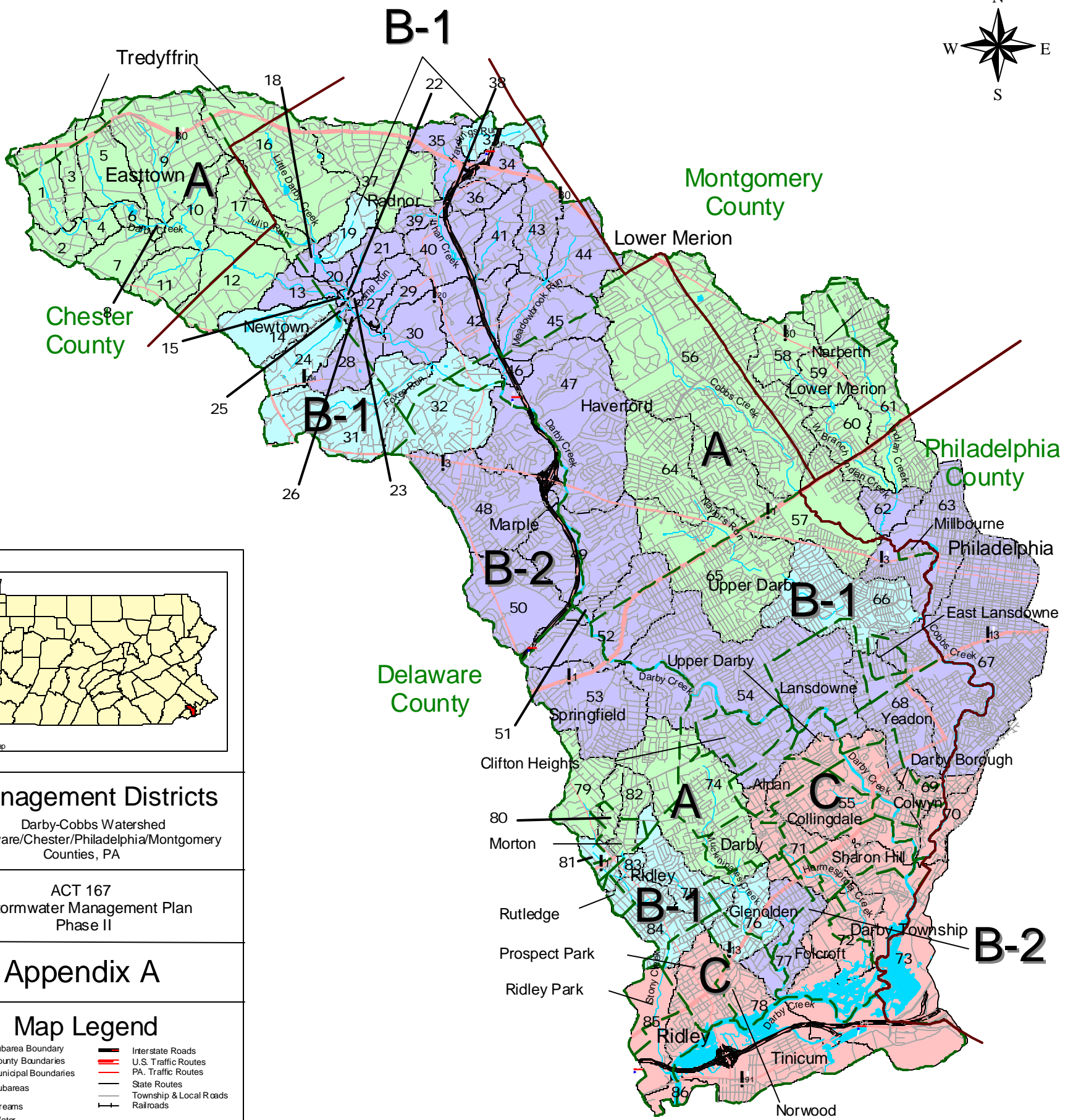
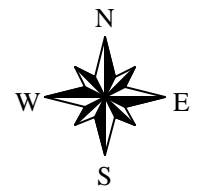
**Borton  
Lawson**  
ENGINEERING

Northeast Pennsylvania  
613 Baltimore Drive  
Wilkes-Barre, PA 18702  
Tel: 570-821-1999

Lehigh Valley  
3893 Adler Place  
Bethlehem, PA 18017  
Tel: 484-821-0470

PREPARED BY: WSB CHECKED BY: SJD  
Date: 10/08/2008 PROJECT #: 2004-1553-00





### Management Districts

Darby-Cobbs Watershed  
Delaware/Chester/Philadelphia/Montgomery  
Counties, PA

ACT 167  
Stormwater Management Plan  
Phase II

### Appendix A

#### Map Legend

- Subarea Boundary
- County Boundaries
- Municipal Boundaries
- Subareas
- Streams
- Water
- Interstate Roads
- U.S. Traffic Routes
- PA. Traffic Routes
- State Routes
- Township & Local Roads
- Railroads

Prepared For:  
Delaware County Planning Department  
Court House/Government Center  
201 West Front Street  
Media, PA 19063  
610-891-5200

Note:  
Portions of these maps were generated from existing data sources as listed below. This existing data was utilized for base mapping purposes and is shown on the maps for spatial reference only. This data did not enter into any computations or affect the reliability of the hydrologic analysis. Borton-Lawson Engineering has found some inaccuracies in some of this data and has corrected the data in locations where these discrepancies were obvious, however, it was not a part of this ACT 167 Plan to correct all of the base data.

Data Sources:  
DRGs - USGS  
Subareas - BLE



613 Baltimore Drive Suite 300 Wilkes-Barre, PA 18702-7903 570-821-1999 Fax 570-821-1990  
6814 Chispaht Drive Suite 200 Bath, PA 18014 610-837-5916 Fax 610-837-5918  
World Wide Web : <http://www.borton-lawson.com>

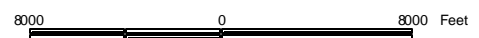
Prepared By: CGF Check By:  
Project Number: 99613.01 Date of Plot: December 2003

#### Management Districts Legend

	Design Storm Proposed Conditions	Reduce To	Design Storm Existing Conditions
<b>A</b>	2 - Year 5 - Year 10 - Year 25 - Year 100 - Year		1 - Year 5 - Year 10 - Year 25 - Year 100 - Year
<b>B-1</b>	2 - Year 10 - Year 25 - Year 50 - Year 100 - Year		1 - Year 5 - Year 10 - Year 25 - Year 100 - Year
<b>B-2</b>	2 - Year 5 - Year 25 - Year 50 - Year 100 - Year		1 - Year 2 - Year 5 - Year 10 - Year 100 - Year
<b>C*</b>	Provisional Discharge District (see notes below *)		

\* If storms greater than the 2 - year storm cannot be conveyed to a stream or watercourse in a safe manner, then District A requirements shall apply. (See model ACT 167 Stormwater Management Ordinance, Article III Section 308 for details.)

In addition to the Management District Criteria above, the groundwater recharge (Section 305), water quality (Section 306), and streambank erosion (Section 307) requirements shall also apply to all Management Districts within the Darby-Cobbs Watershed.



## **ORDINANCE APPENDIX B**

### **Simplified Approach to Stormwater Management for Small Projects**

**Applicability: Stormwater management procedures for projects with between five hundred (500) square feet and (999) square feet of proposed impervious area.**



# **SIMPLIFIED APPROACH TO STORMWATER MANAGEMENT FOR SMALL PROJECTS**

## **Introduction**

The following procedures have been developed to allow homeowners to comply with stormwater management criteria for new projects to meet the requirements of the Act 167 Stormwater Management Ordinance of the Municipality including sizing, designing, locating, and installing on-lot measures, referred to herein as “Best Management Practices” (BMPs). Pennsylvania Act 167 was authorized on October 4, 1978 (32 P.S., P.L. 864) and gave Pennsylvania municipalities the power to regulate activities that affect stormwater runoff and surface and groundwater quantity and quality.

Individual home construction projects on single-family lots which result in between 500 square feet and 999 square feet of impervious area (including the building footprint, driveway, sidewalks, and parking areas) are not required to submit formal drainage plans to the Municipality or County; however, they are still required to address water quality and infiltration goals as outlined in this Simplified Approach document. If the guidelines presented in this brochure are followed, the individual homeowner will not require professional services to comply with these water quality and infiltration goals.

Section B.1 describes requirements and a simplified method for designing a suitable BMP, and a description of what needs to be included on the simple sketch plan. Section B.2 presents definitions of key terms. Section B.3 presents options of BMPs that can be considered for on-lot stormwater management. An example of how to obtain the size and dimensions of a BMP is explained in Section B.4. Section B.5 describes the requirements to be met for the modified Operation, Maintenance, and Inspection Plan.

The Simplified Approach requires:

- The first 1” of rainfall runoff from new impervious surfaces to be captured (see definition in Section B.2).

The purpose of this is to help reduce stormwater runoff in the community, to maintain groundwater recharge, to prevent degradation of surface and groundwater quality, and to otherwise protect water resources and public safety.

## **What needs to be sent to the Municipality?**

Even though a formal drainage plan is not required for individual lot owners, the Simplified Method worksheet found in Table B-4 and a simple sketch plan containing the features described in Step 5 of Section B.1 needs to be submitted to the Municipality, and if applicable, the contractor prior to construction. The Operation and Maintenance Agreement found in Section B.5 needs to be signed and submitted with the simple sketch plan to the Municipality for approval.

## **B.1 Determination of Simplified Approach Volume Requirements**

All proposed impervious areas must be included in the determination of the amount of new impervious areas and the size of proposed BMPs needed to control stormwater. Proposed impervious areas on an individual residential lot include: roof area, pavement, sidewalks, driveways, patios, porches, permanent pools, or parking areas. Sidewalks, driveways, or patios that are constructed with gravel or pervious pavers that will not be converted to an impervious surface in the future need not be included in this calculation. Therefore, the amount of proposed impervious area can be reduced for proposed driveways, patios, and sidewalks through the use of gravel, pervious pavement, and turf pavers. All proposed impervious areas must be constructed so that runoff is conveyed to a BMP; no runoff can be directed to storm sewers, inlets, or other impervious areas (i.e., street).

In addition, the use of low impact development is recommended to further minimize the effect of the new construction on water, land, and air. Low impact development is a method of development that incorporates design techniques that include: minimizing the amount of land disturbance, reducing impervious cover, disconnecting gutters and directing runoff to vegetated areas to infiltrate, and redirecting the flow of runoff from impervious driveways to vegetated areas instead of to the street or gutter.

**Below are the steps that must be undertaken to meet the Ordinance requirements. The results obtained for each step must be included in the Simplified Method Worksheet found in Table B-4:**

**STEP 1** – Determine the total area of all proposed impervious surfaces that will need to drain to one or more BMPs. Determine locations where BMPs need to be placed so that runoff from all of the proposed impervious surfaces can be captured. Select the BMPs to be used and determine the requirements of each from Section B.3. For instance, the back half of a garage may drain 200 square feet of roof to a rain barrel, and the front half of a garage may drain 200 square feet of roof and 540 square feet of driveway to a bioretention area. Then, obtain the required storage volume and surface area needed for each of the proposed BMPs from the appropriate heading below.

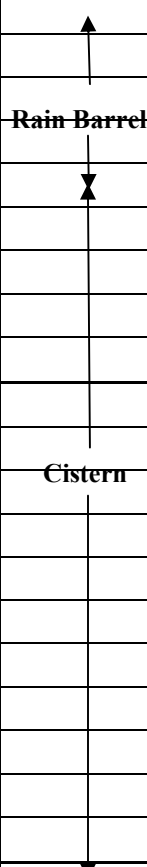
### **For Rain Barrels/Cisterns**

**STEP 2** –Select the proposed impervious area value in Column 1 of Table B-1 that is closest to, but not less than, the determined value.

**STEP 3** – Determine the volume that needs to be provided in cubic feet and gallons to satisfy the volume requirements using Columns 2 and 3 in Table B-1.

**Table B-1: Simplified Method - Calculating Rain Barrel/Cistern Storage Volume for 1" Rainfall<sup>1</sup>**

Column 1	Column 2	Column 3	
Proposed Impervious Area (square feet)	Volume of Rain Barrel/Cistern <sup>2</sup> (cubic feet)	Volume of Rain Barrel/Cistern (gallons)	
<i>I</i>	$V_{RBcf}$	$V_{RBgal}$	
Sum of all Proposed Impervious Areas	$(1*(1/12)*I)/0.75=V_{RBcf}$	$VRBcf * 7.48=VRBgal$	
50	6	42	
100	11	83	
150	17	125	
200	22	166	
250	28	208	
300	33	249	
350	39	291	
400	44	332	
450	50	374	
500	56	416	
550	61	457	
600	67	499	
650	72	540	
700	78	582	
750	83	623	
800	89	665	
850	94	706	
900	100	748	
950	106	790	
999	111	830	



<sup>1</sup>The typical volume of a rain barrel is between 50-200 gallons, so more than 1 rain barrel may be needed. Larger volumes may require a cistern.

<sup>2</sup>Assume that the rain barrel/cistern is 25% full

**For Rain Gardens/Bioretenction or Dry Well #1:**

**STEP 2** – Select the proposed impervious area value in Column 1 of Table B-2 that is closest to, but not less than, the determined value.

**STEP 3** - Determine the volume that needs to be provided in cubic feet to satisfy the volume requirements using Column 2 in Table B-2.

**STEP 4** – Using the value from Column 2 determined above, select the depth (D) of the proposed BMP, and then simply determine the surface area needed for that depth from Column 3 of Table B-2.

Note: The arrows under Column 3 in Table B-2 indicate which range of depths is appropriate for each BMP. To determine the depth based on the area, select an area that corresponds to the required volume that is closest to, but not more than the area to be used. To determine the area based on the depth, select a depth that is closest to, but not less than, the depth that is to be used.

**Table B-2: Simplified Method - Calculating Rain Garden/Bioretenation and Dry Well #1 Storage Volume and Surface Area for 1" Rainfall**

Column 1	Column 2	Column 3								
Proposed Impervious Area (square feet)	Volume of Rain Garden/Bioretenation or Dry Well #1 <sup>1</sup> (cubic feet)	Surface Area of Rain Garden/Bioretenation or Dry Well #1 Acceptable Depths for Each BMP are indicated by the arrows below (square feet)								
		<i>Area Required for a BMP with a Depth(D) of 0.5'</i>	<i>Area Required for a BMP with a Depth(D) of 1.0'</i>	<i>Area Required for a BMP with a Depth(D) of 1.5'</i>	<i>Area Required for a BMP with a Depth(D) of 2.0'</i>	<i>Area Required for a BMP with a Depth(D) of 2.5'</i>	<i>Area Required for a BMP with a Depth(D) of 3.0'</i>	<i>Area Required for a BMP with a Depth(D) of 3.5'</i>	<i>Area Required for a BMP with a Depth(D) of 4.0'</i>	
		Rain Garden /Bioretenation (0.5'-1.0')		Dry Well #1 (1.5'-4.0')						
<i>I</i>	<i>V</i>	<i>A(sf)</i>								
Sum of all Proposed Impervious Areas	$1*(1/12)*I= V$	$V/D=A$								
50	4	8	4	3	2	2	1	1	1	
100	8	17	8	6	4	3	3	2	2	
150	13	25	13	8	6	5	4	4	3	
200	17	33	17	11	8	7	6	5	4	
250	21	42	21	14	10	8	7	6	5	
300	25	50	25	17	13	10	8	7	6	
350	29	58	29	19	15	12	10	8	7	
400	33	67	33	22	17	13	11	10	8	
450	38	75	38	25	19	15	13	11	9	
500	42	83	42	28	21	17	14	12	10	
550	46	92	46	31	23	18	15	13	11	
600	50	100	50	33	25	20	17	14	13	
650	54	108	54	36	27	22	18	15	14	
700	58	117	58	39	29	23	19	17	15	
750	63	125	63	42	31	25	21	18	16	
800	67	133	67	44	33	27	22	19	17	
850	71	142	71	47	35	28	24	20	18	
900	75	150	75	50	38	30	25	21	19	
950	79	158	79	53	40	32	26	23	20	
999	83	167	83	56	42	33	28	24	21	

<sup>1</sup>Assume that the rain garden/bioretenation or the dry well #1 are 0% full

## **For Infiltration Trench or Dry Well #2:**

**STEP 2** – Select the proposed impervious area value in Column 1 of Table B-3 that is closest to, but not less than, the determined value.

**STEP 3** - Determine the volume that needs to be provided in cubic feet to satisfy the volume requirements using Column 2 in Table B-3.

**STEP 4** – Using the value from Column 2 determined above, select the depth (D) of the proposed BMP, and then simply determine the surface area needed from Column 3 of Table B-3.

Note: The arrows under Column 3 in Table B-3 indicate which range of depths is appropriate for each BMP. To determine the depth based on the area, select an area that corresponds to the required volume that is closest to, but not less than, the area to be used. To determine the area based on the depth, select a depth that is closest to, but not less than, the depth that is to be used.

**STEP 5** - Sketch a simple site plan as shown in Figure B-1 that includes:

- Name and address of the owner of the property, and or name and address of the individual preparing the plan, along with the date of submission.
- Location of proposed structures, driveways, or other paved areas with approximate size in square feet.
- Location, orientation, and dimensions of all proposed BMPs. For all rain gardens/bioretenion, infiltration trenches, and dry wells, the length, width, and depth must be included on the plan. For rain barrels or cisterns the volume must be included.
- Location of any existing or proposed on-site septic system and/or potable water wells showing rough proximity to infiltration facilities.
- Location of any existing waterbodies such as; streams, lakes, ponds, wetlands, or other waters of the Commonwealth within fifty (50) feet of the project site, and the distance to the project site and/or BMPs. The project or BMPs cannot be located less than fifty (50) feet away from a perennial or intermittent stream. If an existing buffer is legally prescribed (i.e., deed, covenant, easement, etc.) and it exceeds the requirements of this Ordinance, the existing buffer shall be maintained.
- Location of all existing structures including buildings, driveways, and roads within fifty (50) feet of the project site.

Fill in the simplified method worksheet found in Table B-4, then submit the worksheet and the simple site sketch to the Municipality. Additionally, the operation and maintenance agreement found in Section B.5 must be signed and submitted to the Municipality.

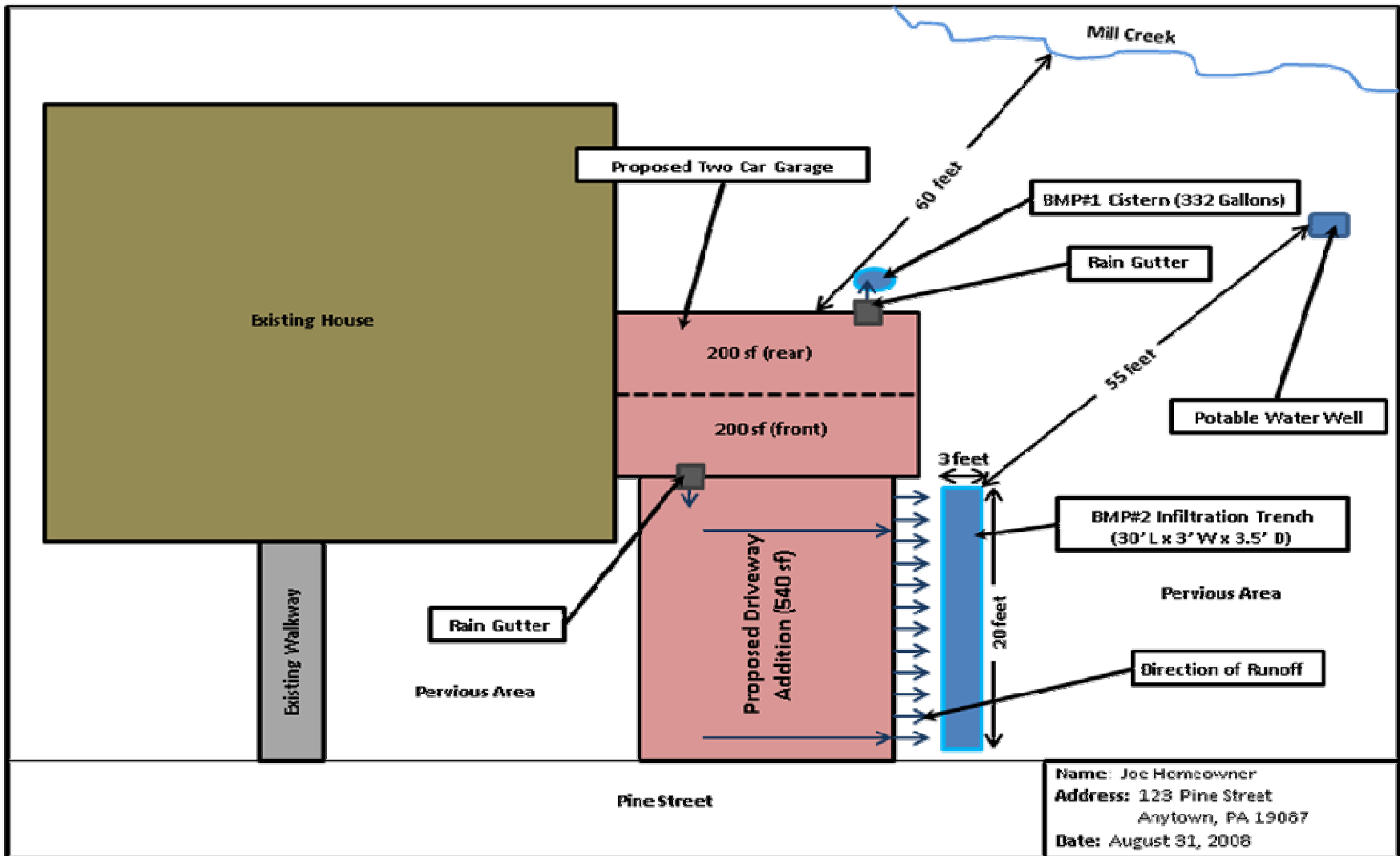
**Table B-3: Simplified Method - Calculating Infiltration Trench and Dry Well #2 Storage Volume and Surface Area for 1” Rainfall**

Column 1	Column 2	Column 3							
Total Proposed Impervious Area (square feet)	Volume of Infiltration Trench or Dry Well #2 <sup>1</sup> (cubic feet)	Surface Area of Infiltration Trench or Dry Well #2 Acceptable Depths for Each BMP are indicated by the arrows below (square feet)							
		Area Required for a BMP with a Depth(D) of 1.5'	Area Required for a BMP with a Depth(D) of 2.0'	Area Required for a BMP with a Depth(D) of 2.5'	Area Required for a BMP with a Depth(D) of 3.0'	Area Required for a BMP with a Depth(D) of 3.5'	Area Required for a BMP with a Depth(D) of 4.0'	Area Required for a BMP with a Depth(D) of 4.5'	Area Required for a BMP with a Depth(D) of 5.0'
<i>I</i>	<i>V</i>	<i>A(sf)</i>							
Sum of all Proposed Impervious Areas	$(1*(1/12)*I)/\text{Void Ratio } (0.4)*=V$	$V/D=A$							
50	10	7	5	4	3	3	3	2	2
100	21	14	10	8	7	6	5	5	4
150	31	21	16	13	10	9	8	7	6
200	42	28	21	17	14	12	10	9	8
250	52	35	26	21	17	15	13	12	10
300	63	42	31	25	21	18	16	14	13
350	73	49	36	29	24	21	18	16	15
400	83	56	42	33	28	24	21	19	17
450	94	63	47	38	31	27	23	21	19
500	104	69	52	42	35	30	26	23	21
550	115	76	57	46	38	33	29	25	23
600	125	83	63	50	42	36	31	28	25
650	135	90	68	54	45	39	34	30	27
700	146	97	73	58	49	42	36	32	29
750	156	104	78	63	52	45	39	35	31
800	167	111	83	67	56	48	42	37	33
850	177	118	89	71	59	51	44	39	35
900	188	125	94	75	63	54	47	42	38
950	198	132	99	79	66	57	49	44	40
999	208	139	104	83	69	59	52	46	42

<sup>1</sup>Assume a void ratio of 40%



Figure B-1: Typical Dry Well Configuration filled with Stone Fill (Left) and Structural Prefabricated Chamber (Right)



B-11

**Table B-4: Simplified Method Worksheet**

Simplified Method Worksheet				
STEP 1				
Proposed Impervious Surface for BMP #1	Proposed Impervious Surface for BMP #2	Proposed Impervious Surface for BMP #3		
STEPS 2&3				
Rain Barrel or Cistern				
Proposed Impervious Surface from Column 1 in Table B-1	Volume from Column 2 or 3 in Table B-1			
Rain Garden/Bioretention or Dry Well #1				
Proposed Impervious Surface from Column 2 in Table B-2	Volume of BMP from Column 2 in Table B-2	Area of BMP from Column 3 in Table B-2	Depth of BMP from Column 3 in Table B-2	Types of Material to Be Used
Infiltration Trench or Dry Well #2				
Proposed Impervious Surface from Column 2 in Table B-3	Volume of BMP from Column 2 in Table B-3	Area of BMP from Column 3 in Table B-3	Depth of BMP from Column 3 in Table B-3	Types of Material to Be Used
Note: For additional BMPs, use additional sheets				

## **B.2 Definitions**

**Best Management Practice (BMP)** - Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from land development, to protect and maintain water quality and groundwater recharge and to otherwise meet the purposes of the Municipal Stormwater Management Ordinance, including but not limited to infiltration trenches, dry wells, bioretention, rain gardens, permeable paving, rain barrels, and cisterns.

**Capture** - Collecting runoff to be stored for reuse or allowed to slowly infiltrate into the ground.

**Geotextile** - A fabric manufactured from synthetic fiber that is used to achieve specific objectives, including infiltration, separation between different types of media (i.e., between soil and stone), or filtration.

**Hotspot** - Areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants that are higher than those that are typically found in stormwater (e.g., vehicle salvage yards and recycling facilities, vehicle fueling stations, fleet storage areas, vehicle equipment and cleaning facilities, and vehicle service and maintenance facilities).

**Impervious Surface** - A surface that prevents the infiltration of water into the ground. Impervious surfaces include, but are not limited to, streets, sidewalks, pavements, swimming pools, driveway areas or roofs.

**Infiltration** - Movement of surface water into the soil, where it is absorbed by plant roots, evaporated into the atmosphere, or percolated downward to recharge groundwater.

**Low Impact Development** - A land development and construction approach that uses various land planning, design practices, and technologies to simultaneously conserve and protect natural resource systems, and reduce infrastructure costs.

**Pervious Surface** - Any surface that is not impervious.

**Runoff** - Any part of precipitation that flows over the land surface.

**Stormwater** - Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

**Void Ratio** - The ratio of the volume of void space to the volume of solid substance in any material.

### B.3 Description of BMPs

The following is a description of several types of BMPs that could be implemented. The requirements of each BMP as described below are taken directly from the PA BMP Manual. Refer to the PA BMP Manual which can be found on the PA Department of Environmental Protection's website.

#### Rain Barrels/Cisterns

Rain barrels are large containers that collect drainage from roof leaders and temporarily store water to be released to lawns, gardens, and other landscaped areas after the rainfall has ended. Rain barrels are typically between 50 and 200 gallons in size. The stored water can also be used as a non-potable water supply. Cisterns are larger than rain barrels having volumes of 200 gallons or more, and can be placed on the surface or underground. Figures B-2 and B-3 show examples of rain barrels and cisterns, respectively, that could be used. Rain barrels and cisterns are manufactured in a variety of shapes and sizes. All of these facilities must make provisions for the following items:

- There must be a means to release the water stored between storm events in order for the necessary storage volume to be available for the next storm.
- Stormwater must be kept from entering other potable systems, and pipes and storage units must be clearly marked "Do Not Drink."
- An overflow outlet should be placed a few inches below the top with an overflow pipe to divert flow away from structures.
- Use screens to filter debris, and covers (lids) to prevent mosquitoes.
- Make sure cisterns are watertight and do not leak.
- Rain barrels are typically assumed to be 25% full to calculate volume since they are not always emptied before each storm.\*

Figure B-2: Rain Barrels



Source (pic on left): <http://www.rfcity.org/Eng/Stormwater/YourProperty/YourProperty.htm>  
Source (pic on right): <http://www.floridata.com/tracks/transplantedgardener/Rainbarrels.cfm>

\*This 25% has already been taken into account in Table 3.

**Figure B-3: Cisterns**



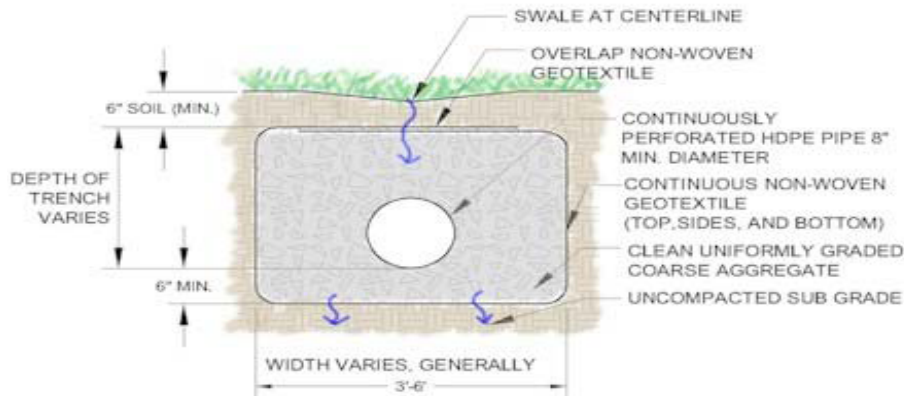
Source (for both pics): Pennsylvania Stormwater BMP Manual (2006)

### **Infiltration Trench**

An infiltration trench is a long, narrow, rock-filled trench with or without a perforated pipe that receives stormwater runoff and has no outlet. Runoff is stored in the void space between the stones and in the pipe and infiltrates through the bottom and into the underlying soil matrix. Infiltration trenches perform well for removal of fine sediment and associated pollutants. Figure B-4 shows a typical infiltration trench configuration. Infiltration trenches shall incorporate or make provisions for the following elements:

- Perforated pipe is to be set level.
- The width is limited to between **3 and 8 feet**, and the depth ranges from **2 to 6 feet**.
- Trench should be wrapped in nonwoven geotextile (see definition in Section B.2) on the top, sides, and bottom.
- There should be a positive overflow that allows stormwater that cannot be stored or infiltrated to be discharged into a nearby vegetated area.
- Roof downspouts may be connected to infiltration trenches, but should contain a cleanout to collect sediment and debris before entering the infiltration area.
- Infiltration testing is recommended to ensure that the soil is capable of infiltrating stormwater. A description of how an infiltration test is performed is found in Appendix C of the PA BMP Manual.
- It is recommended that there be a 2-foot clearance above the regularly occurring seasonal high water table and a minimum depth to bedrock of 2 feet.
- The infiltration trench should be at least 50 feet from individual water supply wells, 100 feet from community or municipal water supply wells, and 50 feet from any septic system component. It should not be located near hotspots (see definition in Section B.2).
- The infiltration trench should be located so that it presents no threat to sub-surface structures such as building foundations and basements.
- Protect infiltration areas from compaction.
- The ratio of the collected area to the footprint of the facility should be as small as possible with a ratio of less than 5:1 preferred.

**Figure B-4: Typical Infiltration Trench**



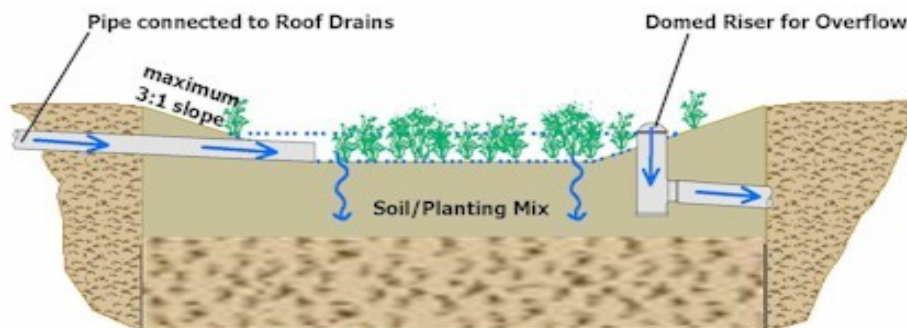
Source: Pennsylvania Stormwater BMP Manual (2006)

### **Rain Garden/Bioretention Area**

A rain garden (bioretention area) is an excavated depression area on the surface of the land in which native vegetation is planted to filter and use stormwater runoff. Runoff ponds on top of the surface of the rain garden and then infiltrates into an enhanced soil below the surface where plants can use the water to grow. Bioretention also improves water quality, vegetation filters the water, and the root systems encourage or promote infiltration. Figure B-5 shows a typical rain garden. Key elements of a rain garden include:

- Ponding depths of **1 foot** or less (recommended).
- Native vegetation that can tolerate dry and wet weather.
- An overflow area where, if the bioretention area were to overflow, the water would flow over pervious area (i.e., grass, meadow), and would not cause harm to property, or;
- An overflow such as a domed riser to allow excess flow from large storms to travel to other substantial infiltration areas or pervious areas.
- Typical side slopes of 3:1 are recommended, with 2:1 being the maximum.
- The soil/planting mix depth should be between 1.5 feet and 6 feet deep.

**Figure B-5: Typical Rain Garden/Bioretention Area**



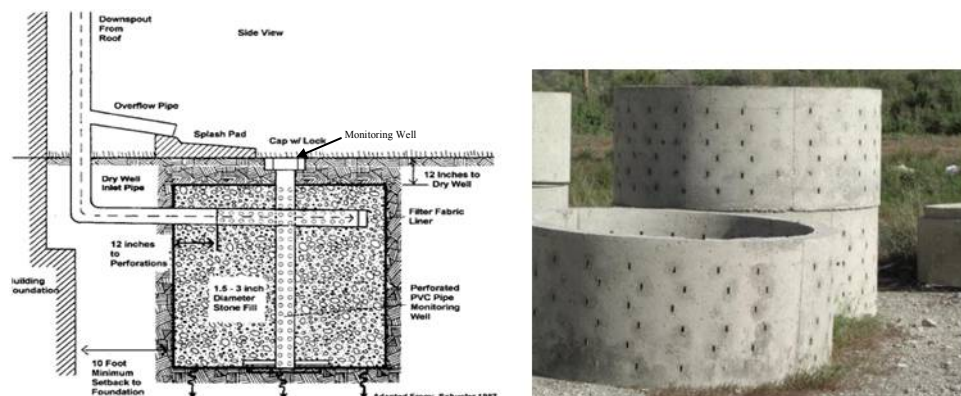
Source: Pennsylvania Stormwater BMP Manual (2006)

## Dry Wells

A dry well, also referred to as a seepage pit is a subsurface storage facility that temporarily stores and infiltrates runoff from the roofs of buildings or other impervious surfaces. A dry well can be either a structural prefabricated chamber (Dry Well #1) or an excavated pit filled with stone fill (Dry Well #2). Dry wells discharge the stored runoff via infiltration into the surrounding or underlying soils. Figure B-6 shows a typical prefabricated dry well and a typical dry well configuration with stone fill. The following elements shall be incorporated into all dry well designs:

- These facilities should be located a minimum of ten (10) feet from the building foundation to avoid foundation seepage problems and are not recommended if their installation would create a risk for basement flooding.
- Construction of a dry well should be performed after surface soils in all other areas of the site are stabilized to avoid clogging.
- During construction, compaction of the subgrade soil in the bottom of the dry well should be avoided, and construction should be performed only with light machinery.
- Depth of a dry well should be between **1.5 feet and 4 feet**. Gravel fill should consist of stone of an average of one and one half to three (1.5 – 3.0) inches in diameter with the gravel fill wrapped in a nonwoven geotextile that separates the stone fill from the surrounding soil.
- At least 1 foot of soil needs to be placed over the top of the dry well.
- Dry wells should be inspected at least four (4) times annually as well as after large storm events.
- Dry wells should have overflow pipes to allow high volumes of runoff to connect to other on-site substantial infiltration areas or pervious areas.
- Every dry well needs to have at least one monitoring well.
- Infiltration testing is recommended to ensure that the underlying soil is capable of infiltrating the needed volume of stormwater.

**Figure B-6: Typical Dry Well Configuration filled with Stone Fill (DRY WELL #2) (Left) and Structural Prefabricated Chamber (DRY WELL #1) (Right)**



Source (for pic on left): <http://www.seagrant.sunysb.edu/pages/BMPsForMarinas.htm>

Source (for pic on right): <http://www.copelandconcreteinc.net/1800652.html>

## B.4 Example

### Simplified Approach Volume Determination:

Joe Homeowner wants to build a 400 square foot two car garage, and a 540 square foot (30' L x 18' W) impervious driveway that is graded so that the stormwater runoff drains to the grassy area along one edge of the driveway. (A duplicate of Table B-1 is provided below in Table B-5, a duplicate of Table B-3 is provided below in Table B-6 and outlines the steps of this example) a duplicate of Figure B-1 (Figure B-7) and a duplicate of Table B-4 are provided in Table B-7.

**STEP 1** - Determine the total area of all proposed impervious surfaces to drain to each BMP:

Garage Roof (Front)	10 ft. x 20 ft.	=	200 sq. ft.
Garage Roof (Rear)	10 ft. x 20 ft.	=	200 sq. ft.
Driveway (Front)	30 ft. x 18 ft.	=	540 sq. ft.
			-----
<b>Total Proposed Impervious Surface</b>			<b>940 sq. ft.</b>

Note: If the driveway used pervious pavement (i.e., paving blocks), then the total impervious area would only be 400 square feet, and no stormwater management practices would need to control runoff from the driveway.

Select a BMP or combination of BMPs from Section B.3 to be used to satisfy the volume requirement. Determine the length, width, depth and other requirements for the BMPs in Section B.3. A BMP needs to be placed to catch runoff from the back of the garage, and a BMP needs to be placed to capture runoff from the front of the garage and the driveway. Figure B-7 shows the direction the runoff flows and the locations where the BMPs are to be placed.

Joe Homeowner would like to use a rain barrel (BMP #1) to capture the runoff from the rear of the garage and an infiltration trench (BMP #2) to capture runoff from the front of the garage and the driveway.

### **STEP 2 and 3 for BMP #1 (Rain Barrel/Cistern)**

**STEP 2** - Select the proposed impervious area value for BMP #1, the rain barrel or cistern, in Column 1 that is closest to, but not less than 200 in Table B-5:

The value in Column 1 that is closest to but is not less than 200 is 200.

**STEP 3** - Determine the volume that BMP #1 must be to satisfy the volume requirements using Columns 2 and 3 in Table B-5:



The volume in gallons of the rain barrel/cistern to be used as BMP #1, assuming the rain barrel/cistern is 25% full, is determined by finding the row in Column 3 that corresponds to the impervious area value determined in Step 1. Therefore, the volume of BMP #1, the rain barrel/cistern must be  $\geq 166$  gallons. A combination of rain barrels could be used in succession as shown in Figure B-2, or a cistern could be used.

**Table B-5: Example – Calculating Storage Volume for Rain Barrel/Cistern**

Column 1	Column 2	Column 3	
Proposed Impervious Area (square feet)	Volume of Rain Barrel/Cistern <sup>1</sup> (cubic feet)	Volume of Rain Barrel/Cistern (gallons)	
<i>I</i>	$V_{RBcf}$	$V_{RBgal}$	
Sum of all Proposed Impervious Areas	$(1*(1/12)*I)/0.75=V_{RBcf}$	$V_{RBcf} * 7.48=V_{RBgal}$	
50	6	42	↑
100	11	83	Rain Barrel
150	17	125	↓
<b>2</b> 200	22	<b>3</b> 166	↓
250	28	208	↑
300	33	249	
350	39	291	
400	44	332	
450	50	374	
500	56	416	
550	61	457	
600	67	499	Cistern
650	72	540	
700	78	582	
750	83	623	
800	89	665	
850	94	706	
900	100	748	
950	106	790	↓
999	111	830	↓

<sup>1</sup>Assume that the rain barrel/cistern is 25% full

### **STEPS 2 through 4 for BMP #2 (Infiltration Trench)**

**STEP 2** - Select the proposed impervious area value for BMP #2, the infiltration trench, using Column 1 in Table B-6:

Find the row in Column 1 that is closest to but not less than 740 (200 from the front of the garage + 540 from the driveway). Therefore, the value selected is 750.

**STEP 3** - Determine the volume that BMP #2, the infiltration trench must be to satisfy the volume requirements using Column 2 in Table B-6:

The volume of the infiltration trench to be used as BMP #2, assuming a void ratio of 40%, is determined by finding the row in Column 2 that is in the same row as 750 square feet from Step 2. Therefore, the volume of BMP #2 must be 156 cubic feet.

**STEP 4** - Utilizing the value from Column 2 determined above, and the surface area that the proposed BMP will occupy, identify the proposed depth and corresponding surface area needed using Column 3 in Table B-6:

Joe Homeowner would like to place the infiltration trench along the edge of the driveway that the runoff drains to, so it would have a length of 20 feet. The smallest width that can be used, as stated in the infiltration trench requirements in Section B.3, is 3 feet. Therefore, the area of the infiltration trench is:

$$20 * 3 = 60 \text{ square feet}$$

To find the minimum depth of the trench, move toward the right side of the table from 156 cubic feet in Column 2 to Column 3, and find the column with a value of as close to but not more than 60 square feet, which is 52 square feet. Then obtain the minimum depth of the facility by reading the depth from the column heading at the top of the table. Therefore, the depth of the trench would need to be 3 feet.

**Selected BMPs: Rain barrel(s)  $\geq$  166 gallons and a 20' L x 3' W x 3' D infiltration trench**

**STEP 5** – Make a sketch of the site plan as shown in Figure B-7, and fill in the simplified method worksheet found as shown in Table B-7.

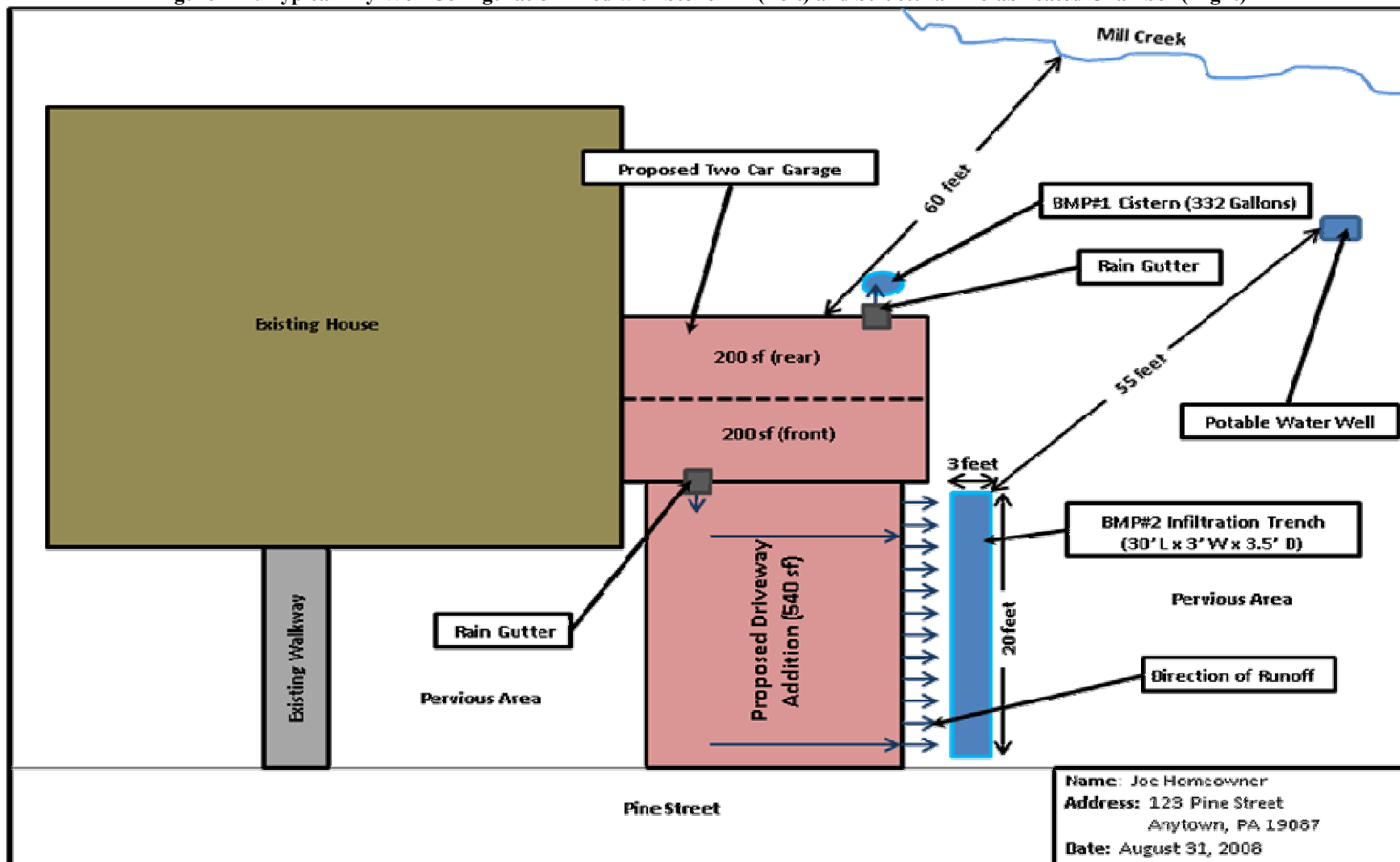
Table B-6: Example – Calculating Storage Volume Surface Area and Depth for Infiltration Trench

Column 1	Column 2	Column 3							
Total Proposed Impervious Area (square feet)	Volume of Infiltration Trench or Dry Well #2* (cubic feet)	Surface Area of Infiltration Trench or Dry Well #2 Acceptable Depths for Each BMP are indicated by the arrows below (square feet)							
		Area Required for a BMP with a Depth(D) of 1.5'	Area Required for a BMP with a Depth(D) of 2.0'	Area Required for a BMP with a Depth(D) of 2.5'	Area Required for a BMP with a Depth(D) of 3.0'	Area Required for a BMP with a Depth(D) of 3.5'	Area Required for a BMP with a Depth(D) of 4.0'	Area Required for a BMP with a Depth(D) of 4.5'	Area Required for a BMP with a Depth(D) of 5.0'
<i>I</i>	<i>V</i>	<i>A(sf)</i>							
Sum of all Proposed Impervious Areas	$(1*(1/12)*I)/\text{Void Ratio } (0.4)*=V$	$V/D=A$							
50	10	7	5	4	3	3	3	2	2
100	21	14	10	8	7	6	5	5	4
150	31	21	16	13	10	9	8	7	6
200	42	28	21	17	14	12	10	9	8
250	52	35	26	21	17	15	13	12	10
300	63	42	31	25	21	18	16	14	13
350	73	49	36	29	24	21	18	16	15
400	83	56	42	33	28	24	21	19	17
450	94	63	47	38	31	27	23	21	19
500	104	69	52	42	35	30	26	23	21
550	115	76	57	46	38	33	29	25	23
600	125	83	63	50	42	36	31	28	25
650	135	90	68	54	45	39	34	30	27
700	146	97	73	58	49	42	36	32	29
<b>2</b> 750	<b>3</b> 156	104	78	63	<b>4</b> 52	45	39	35	31
800	167	111	83	67	56	48	42	37	33
850	177	118	89	71	59	51	44	39	35
900	188	125	94	75	63	54	47	42	38
950	198	132	99	79	66	57	49	44	40
999	208	139	104	83	69	59	52	46	42

\*Assume a void ratio of 40%

Figure B-7: Typical Dry Well Configuration filled with Stone Fill (Left) and Structural Prefabricated Chamber (Right)

B-23



**Table B-7: Example – Simplified Method Worksheet with Results**

Simplified Method Worksheet				
STEP 1				
Proposed Impervious Surface for BMP #1	Proposed Impervious Surface for BMP #2	Proposed Impervious Surface for BMP #3		
200	740			
STEPS 2&3				
Rain Barrel or Cistern				
Proposed Impervious Surface from Column 1 in Table B-5	Volume from Column 2 or 3 in Table B-5			
200	166 gallons			
Rain Garden/Bioretenention or Dry Well #1				
Proposed Impervious Surface from Column 2 in Table B-2	Volume of BMP from Column 2 in Table B-2	Area of BMP from Column 3 in Table B-2	Depth of BMP from Column 3 in Table B-2	Types of Material to Be Used
Infiltration Trench or Dry Well #2				
Proposed Impervious Surface from Column 2 in Table B-6	Volume of BMP from Column 2 in Table B-6	Area of BMP from Column 3 in Table B-6	Depth of BMP from Column 3 in Table B-6	Types of Material to Be Used
740	156	52	3	Infiltration Trench, Uniformly Graded Aggregate, HDPE 8" pipe, geotextile material, grass planted on top
Note: For additional BMPs, use additional sheets				

## **B.5 Simplified Operation, Inspection, and Maintenance Plan**

It is the property owner's responsibility to properly maintain BMPs. It is also the property owner's responsibility to inform any future buyers of the function, operation, and maintenance needed for any BMPs on the property prior to the purchase of the property. The following maintenance agreement outlines the maintenance required for each type of BMP, the responsibilities of the property owner, and the rights of the Municipality in regards to inspection and enforcement of the maintenance requirements. The Operation and Maintenance Agreement must be signed and submitted to the Municipality.

### **STORMWATER BEST MANAGEMENT PRACTICES OPERATIONS, MAINTENANCE, AND INSPECTION AGREEMENT**

**THIS AGREEMENT**, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_, by and between \_\_\_\_\_, (hereinafter the "Landowner"), and \_\_\_\_\_, \_\_\_\_\_ (County, Township, or Borough) Pennsylvania, (hereinafter "Municipality");

#### **WITNESSETH**

**WHEREAS**, the Landowner is the owner of certain real property as recorded by deed in the land records of \_\_\_\_\_ County, Pennsylvania, Deed Book \_\_\_\_\_ at Page \_\_\_\_\_, (hereinafter "Property"); and,

**WHEREAS**, the Landowner \_\_\_\_\_ recognizes that the stormwater management best management practices or BMPs (hereinafter referred to as "the BMP" or "BMPs") must be maintained for the development called, \_\_\_\_\_, located at \_\_\_\_\_ (address of property where BMP is located); and,

**WHEREAS**, the Municipality and the Landowner, its administrators, executors, successors, heirs, or assigns, agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site stormwater Best Management Practices be constructed and maintained on the property; and,

**WHEREAS**, the Landowner is required to inform future buyers of the property about the function of, operation, and maintenance requirements of the BMP or BMPs prior to the purchase of the property by said future buyer, and upon purchase of the property the future buyer assumes all responsibilities as Landowner and must comply with all components of this agreement.

**WHEREAS**, for the purposes of this agreement, the following definition shall apply:

- BMP – “Best Management Practice;” activities, facilities, designs, measures, or procedures used to manage stormwater impacts from land development, to protect and maintain water quality and groundwater recharge, and to otherwise meet the purposes of the Municipal Stormwater Management Ordinance, including, but not limited to, infiltration trenches, dry wells, bioretention, rain gardens, permeable paving, rain barrels, and cisterns.

**WHEREAS**, it is required that the BMP or BMPs as shown on the simple sketch plan further referred to as the “Plan” and in accordance with the sizing calculations found on the simplified method worksheet further referred to as the “Calculation Worksheet” be constructed and maintained by the Landowner, its administrators, executors, successors, heirs, or assigns.

**WHEREAS**, the Municipality requires that stormwater management BMPs be constructed and adequately operated and maintained by the Landowner, its administrators, executors, successors, heirs, or assigns, in accordance with the following maintenance requirements.

- Vegetation along the surface of an infiltration trench should be maintained in good condition, and any bare spots should be revegetated as soon as possible.

- Vehicles shouldn't be parked or driven on an infiltration trench, and care should be taken to avoid excessive compaction by mowers.
- Any debris such as leaves blocking flow from reaching an infiltration trench or bioretention/rain garden should be routinely removed.
- While vegetation is being established, pruning and weeding may be required for a bioretention/rain garden.
- Mulch in a bioretention/rain garden needs to be re-spread when erosion is evident. Once every two to three years or after major storms the entire area may require mulch replacement.
- At least twice a year the landowner needs to inspect the bioretention/rain garden for sediment buildup and vegetative conditions.
- During periods of extended drought, the bioretention/rain garden requires watering.
- Trees and shrubs in a bioretention/rain garden need to be inspected at least twice per year by the landowner to evaluate their health. If they are in poor health, they need to be replaced.
- Dry wells need to be inspected by the landowner at least four times a year and after significant rainfalls, and debris/trash, sediment, and any other waste material need to be removed and disposed of at suitable disposal/recycling sites and in compliance with local, state, and federal waste regulations.
- For dry wells, gutters need to be regularly cleaned out, and proper connections must be maintained to facilitate the effectiveness of the dry well.
- The filter screen for the dry well that intercepts roof runoff must be replaced as necessary.
- Dry wells that are damaged need to be fixed or replaced within two weeks of being damaged.
- If an intermediate sump box exists in conjunction with a dry well, it must be cleaned out at least once per year.
- Rain barrels and cisterns need to be cleared of debris routinely at least every three months and after significant storms to allow stormwater from gutters to enter them.



- Gutters that directly convey rain water to dry wells, rain barrels, and cisterns need to be routinely cleared of trash and debris at least every three months and after significant storms.
- Rain barrels and cisterns must be kept covered.
- Rain barrels and cisterns should be routinely emptied so that they are only ¼ of the way full to allow for storage of additional rainwater.
- Overflow outlets from rain barrels and cisterns must be kept free and clear of debris.
- Rain barrels and cisterns that are damaged need to be fixed or replaced within two weeks of being damaged.

**NOW, THEREFORE**, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The BMPs shall be constructed by the Landowner in accordance with specifications identified in the Plan and Calculation Worksheet.
2. The Landowner shall operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality and in accordance with the specific maintenance requirements outlined in this agreement.
3. The Landowner hereby grants permission to the Municipality, its authorized agents, and employees to enter upon the property at reasonable times and upon presentation of proper identification, to inspect the BMP(s) whenever it deems necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.
4. In the event that the Landowner fails to operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality, the Municipality or its representatives may enter upon the property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the Municipality to erect any permanent structure on the land of the Landowner. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.

5. In the event that the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred within ten days of receipt of an invoice from the Municipality.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the on-site BMP(s) by the Landowner; provided, however, that this Agreement shall not be deemed to create or affect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, heirs, and other successors in interests, shall release the Municipality's employees and designated representatives from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality. In the event that a claim is asserted against the Municipality, its designated representatives, or employees, the Municipality shall promptly notify the Landowner and the Landowner shall defend, at his own expense, any suit based on the claim. If any judgment or claims against the Municipality's employees or designated representatives shall be allowed, the Landowner shall pay all costs and expenses regarding said judgment or claim.

This Agreement shall be recorded at the Office of the Recorder of Deeds of \_\_\_\_\_ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs, and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For the Municipality:

\_\_\_\_\_

(SEAL)

For the Landowner:

\_\_\_\_\_

ATTEST:

\_\_\_\_\_ (City, Borough, Township)

County of \_\_\_\_\_, Pennsylvania

I, \_\_\_\_\_, a Notary Public in and for the County and State aforesaid, whose commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, do hereby certify that \_\_\_\_\_ whose name(s) is/are signed to the foregoing Agreement bearing date of the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, has acknowledged the same before me in my said County and State.

**GIVEN UNDER MY HAND THIS** \_\_\_\_\_ day of \_\_\_\_\_, 200\_.

\_\_\_\_\_

\_\_\_\_\_

**NOTARY PUBLIC**

**(SEAL)**

**ORDINANCE APPENDIX C**  
**STORMWATER MANAGEMENT DESIGN CRITERIA**

**TABLE C-1**  
**RUNOFF CURVE NUMBERS**

**TABLE C-2**  
**RATIONAL RUNOFF COEFFICIENTS**

**TABLE C-3**  
**MANNING ROUGHNESS COEFFICIENTS**

**TABLE C-1**  
**RUNOFF CURVE NUMBERS**

LAND USE DESCRIPTION		HYDROLOGIC SOIL GROUP			
		A	B	C	D
	Hydrologic Condition				
Open Space					
Grass cover < 50%	Poor	68	79	86	89
Grass cover 50% to 75%	Fair	49	69	79	84
Grass cover > 75%	Good	39	61	74	80
Meadow		30	58	71	78
Agricultural					
Pasture, grassland, or range – Continuous forage for grazing	Poor	68	79	86	89
Pasture, grassland, or range – Continuous forage for grazing	Fair	49	69	79	84
Pasture, grassland, or range – Continuous forage for grazing	Good	39	61	74	80
Brush—brush-weed-grass mixture with brush the major element	Poor	48	67	77	83
Brush—brush-weed-grass mixture with brush the major element	Fair	35	56	70	77
Brush—brush-weed-grass mixture with brush the major element	Good	30	48	65	73
Fallow Bare soil	-----	77	86	91	94
Crop residue cover (CR)	Poor	76	85	90	93
	Good	74	83	88	90
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

Commercial	(85% impervious)	89	92	94	95
Industrial	(72% impervious)	81	88	91	93
Institutional	(50% impervious)	71	82	88	90

Residential districts by average lot size:

	% Impervious				
1/8 acre or less * (townhouses)	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
Farmstead		59	74	82	86
Smooth surfaces (concrete, asphalt, gravel, or bare compacted soil)		98	98	98	98
Water		98	98	98	98
Mining/newly graded areas (pervious areas only)		77	86	91	94

\* Includes multi-family housing unless justified lower density can be provided.

Note: Existing site conditions of bare earth or fallow ground shall be considered as meadow when choosing a CN value.

Source: NRCS (SCS) TR-55



**TABLE C-3**

**MANNING’S ROUGHNESS COEFFICIENTS**

**Roughness Coefficients (Manning’s “n”) for Overland Flow**

<b>Surface Description</b>	<b>n</b>	
	-	-
Dense growth	0.4	0.5
Pasture	0.3	0.4
Lawns	0.2	0.3
Bluegrass sod	0.2	0.5
Short grass prairie	0.1	0.2
Sparse vegetation	0.05	0.13
Bare clay-loam soil (eroded)	0.01	0.03
Concrete/asphalt - very shallow depths (less than 1/4 inch)	0.10	0.15
- small depths (1/4 inch to several inches)	0.05	0.10

**Roughness Coefficients (Manning’s “n”) for Channel Flow**

<b>Reach Description</b>	<b>n</b>
Natural stream, clean, straight, no rifts or pools	0.03
Natural stream, clean, winding, some pools or shoals	0.04
Natural stream, winding, pools, shoals, stony with some weeds	0.05
Natural stream, sluggish deep pools and weeds	0.07
Natural stream or swale, very weedy or with timber underbrush	0.10
Concrete pipe, culvert, or channel	0.012
Corrugated metal pipe	0.012-0.027 <sup>(1)</sup>
High density polyethylene (HDPE) pipe	
Corrugated	0.021-0.029 <sup>(2)</sup>
Smooth lined	0.012-0.020 <sup>(2)</sup>

(1) Depending upon type, coating, and diameter

(2) Values recommended by the American Concrete Pipe Association, check manufacturer’s recommended value

Source: U.S. Army Corps of Engineers, HEC-1 Users Manual



**ORDINANCE APPENDIX D**

STORMWATER CONTROLS AND BEST MANAGEMENT  
PRACTICES  
OPERATIONS AND MAINTENANCE AGREEMENT

**STORMWATER CONTROLS AND BEST MANAGEMENT PRACTICES  
OPERATIONS AND MAINTENANCE AGREEMENT**

**THIS AGREEMENT**, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_, (hereinafter the “Landowner”), and \_\_\_\_\_ County, Pennsylvania, (hereinafter “Municipality”);

**WITNESSETH**

**WHEREAS**, the Landowner is the owner of certain real property as recorded by deed in the land records of \_\_\_\_\_ County, Pennsylvania, Deed Book \_\_\_\_\_ at Page \_\_\_\_\_, (hereinafter “Property”).

**WHEREAS**, the Landowner is proceeding to build and develop the Property; and

**WHEREAS**, the Stormwater Controls and BMP Operations and Maintenance Plan approved by the Municipality (hereinafter referred to as the “Plan”) for the Property identified herein, which is attached hereto as Appendix A and made part hereof, provides for management of stormwater within the confines of the Property through the use of Best Management Practices (BMPs); and

**WHEREAS**, the Municipality and the Landowner, his successors, and assigns agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site stormwater BMPs be constructed and maintained on the Property; and

**WHEREAS**, for the purposes of this agreement, the following definitions shall apply:

BMP – “Best Management Practice”-activities, facilities, designs, measures, or procedures used to manage stormwater impacts from land development, to protect and maintain water quality and infiltration, and to otherwise meet the purposes of the municipal Stormwater Management Ordinance, including but not limited to infiltration trenches, seepage pits, filter strips, bioretention, wet ponds, permeable paving, rain gardens, grassed swales, forested buffers, sand filters, and detention basins.

- Infiltration Trench – A BMP surface structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,
- Seepage Pit – An underground BMP structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,
- Rain Garden – A BMP overlain with appropriate mulch and suitable vegetation designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or underground aquifer, and

**WHEREAS**, the Municipality requires, through the implementation of the Plan, that stormwater management BMPs as required by said Plan and the municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, his successors, and assigns.

**NOW, THEREFORE**, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The BMPs shall be constructed by the Landowner in accordance with the plans and specifications identified in the Plan.
2. The Landowner shall operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality and in accordance with the specific maintenance requirements noted on the Plan.
3. The Landowner hereby grants permission to the Municipality, its authorized agents, and employees to enter upon the property, at reasonable times and upon presentation of proper identification, to inspect the BMP(s) whenever it deems necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the Property.
4. In the event that the Landowner fails to operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the Municipality to erect any permanent structure on the land of the Landowner. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.
5. In the event that the Municipality, pursuant to this Agreement, performs work of any nature or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred within ten (10) days of receipt of an invoice from the Municipality.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the on-site BMP(s) by the Landowner; provided, however, that this Agreement shall not be deemed to create or affect any additional liability on any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, and other successors in interest shall release the Municipality's employees and designated representatives from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality. In the event that a claim is asserted against the Municipality, its designated representatives, or employees, the Municipality shall

promptly notify the Landowner, and the Landowner shall defend, at his own expense, any suit based on the claim. If any judgment or claims against the Municipality's employees or designated representatives shall be allowed, the Landowner shall pay all costs and expenses regarding said judgment or claim.

- 8. The Municipality shall inspect the BMP(s) at a minimum of once every two (2) years to ensure their continued functioning.

This Agreement shall be recorded at the Office of the Recorder of Deeds of \_\_\_\_\_ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude and shall be binding on the Landowner, his administrators, executors, assigns, heirs, and any other successors in interest, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For the Municipality:

\_\_\_\_\_

(SEAL)

For the Landowner:

\_\_\_\_\_

ATTEST:

\_\_\_\_\_ (City, Borough, Township)

County of \_\_\_\_\_, Pennsylvania

I, \_\_\_\_\_, a Notary Public in and for the County and State aforesaid, whose commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, do hereby certify that \_\_\_\_\_ whose name(s) is/are signed to the foregoing Agreement bearing date of the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, has acknowledged the same before me in my said County and State.

**GIVEN UNDER MY HAND THIS** \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_

\_\_\_\_\_

**NOTARY PUBLIC**

**(SEAL)**

**ORDINANCE APPENDIX E**

**RIPARIAN BUFFER TRAIL GUIDELINES**

# Riparian Buffer Trail Guidelines

## **Introduction**

Riparian buffers are used as non-structural best management practices (BMPs) for protecting and enhancing water quality. Depending on their size, location, and design, riparian buffers often supply additional environmental, economic, aesthetic, and recreational value. Passive recreational trails can be a compatible use within riparian buffers if the trails are sized and placed appropriately. The trail guidelines below are meant to supplement Section 257-17, Water Quality Requirements, and do not alter or modify the regulations set forth in Section 257-12, General Requirements. All other applicable rules and requirements should be followed, including all federal, state, permitting, and local stormwater and floodplain ordinances.

Installing a trail does not relieve a developer or municipality of the minimum buffer and vegetation requirements described in Section 257-17-C, or infiltration and peak rate controls in Sections 257-16 and 257-17. Effort shall be made to mitigate water quality and peak rate adjacent the trail structure to avoid collecting runoff in a large facility and creating a point discharge. This can be accomplished by trail-side stone filtration trenches, vegetative filter strips, small bio-retention facilities, and other mechanisms subject to site constraints and municipal engineer approval. See Figure J-1. In situations where site constraints negate the feasibility of trail-side mitigation methods, effort shall be made to collect runoff in multiple stormwater facilities for segmented portions of the trail, in place of detaining stormwater in one large facility. Level spreaders shall be constructed at facility outlets to decrease point-source discharges.

As with all trails, adequate land acquisition, easements, and/or landowner permission should be obtained in advance of any trail placement. Care should be given when designing and installing trails so as not to compromise the buffer's ability to protect water quality. Many factors such as slope, vegetation, and soil type will determine the type, size, and placement of the trail within the riparian buffer. Heavily used trails and trails with wide impervious surfaces should be set back farther from the stream edge to help mitigate the effects of any associated increase in runoff. Note: failure to comply with these guidelines (Installing a trail with inadequate setback from the stream bank) could result in increased stormwater runoff, decreased water quality, stream bank degradation, and damage to the buffer or trail.

## **Trail Recommendations**

### **Location, Size, and Orientation**

All trails should be a reasonable width appropriate for the site conditions. It is not recommended that the width of any paved trail exceed twenty five (25) percent of the total buffer width. All trail designs and specifications are subject to approval by the municipality.

Natural vegetation must be present throughout the buffer as described in Section 306 of the ordinance. Grassy areas should be managed as meadows or be reforested and should not be mowed as lawn in any part of the buffer. Where existing vegetation is insufficient to protect water quality, additional native species should be planted to enhance the buffer.

Paved trails, if appropriate to the site, are permitted and must be located at least twenty-five (25) feet from the top of the stream bank. In limited instances, paved trails be placed closer to a stream due to topography, or in order to accommodate passive educational and recreational activities, but must always be at least ten (10) feet from the top of the stream bank. Although this can be achieved by diverting the entire trail closer to the stream, more conservative methods should be considered, such as smaller spur trails or loop trails. These smaller trails provide access to the stream, but reduce the total traffic along the sensitive stream bank.

In rare instances where the buffer width is reduced due to zoning setback or geographical constraints, the municipality should strongly consider whether the benefits of a trail outweigh the benefits of a wider buffer.

### **Signage**

The installation of interpretive and educational signage is strongly encouraged along the trail. Signs should point out local natural resources and educate the public on how riparian buffers protect the watershed. There should be minimum disturbance in the vegetated buffer between the trail and the stream. Therefore, all appurtenances (e.g. benches, educational signs, kiosks, fountains, etc.) should be installed on the landward side of the trail, if possible. All appurtenances shall be installed in compliance with federal, state, local, stormwater, floodplain, and other regulations and permitting requirements (e.g. anchoring, etc.)

### **Parking Areas**

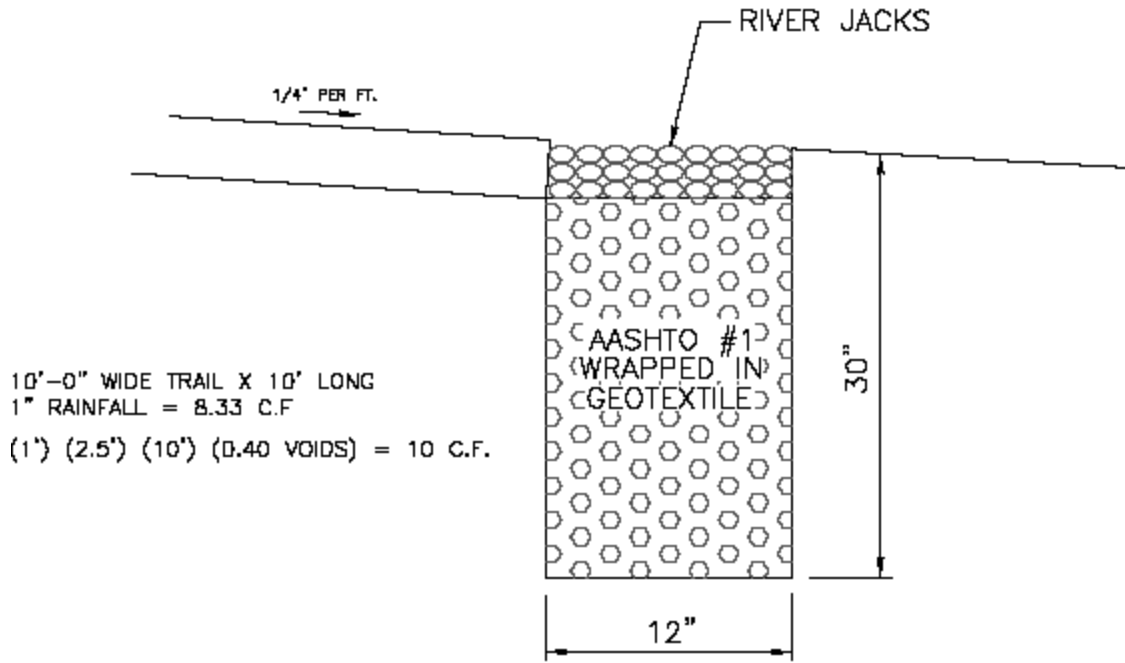
New trailheads and trail parking areas shall meet all the infiltration, rate control, and minimum setback requirements of this ordinance. Every effort should be made to coordinate trail access with existing parking areas. Any new parking areas and trailhead clearings should not encroach on the riparian buffer in any way.

### **Trail Maintenance**

The installation and maintenance of all trails should be performed in a manner that minimizes site disturbance and prevents runoff and erosion. Soil disturbance should be avoided if possible. The removal of native trees and other native vegetation should also be kept to a minimum. If large or heavy equipment is required for trail installation, special care should be given not to damage existing trees and tree roots.

**FIGURE J-1**

**EXAMPLE DESIGN OF A TRAIL-SIDE  
STONE FILTRATION TRENCH**



Source:

James MacCombie, Herbert E. MacCombie Jr. P.E. Consulting Engineers & Surveyors Inc.



# **ORDINANCE APPENDIX F**

## **LOW IMPACT DEVELOPMENT (LID) PRACTICES**

# LOW IMPACT DEVELOPMENT (LID) PRACTICES

## ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF

Natural hydrologic conditions can be altered radically by poorly planned development practices such as introducing unnecessary 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 proposed conditions runoff rates and volumes, which will minimize needs for artificial conveyance and storage facilities. To simulate pre-development hydrologic conditions, infiltration is often necessary to offset the loss of infiltration by creation of impervious surfaces. The ability of the ground to infiltrate 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 of those features. The following describes various techniques to achieve the alternative approach:

- **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 are typically 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 either 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 a storm sewer). Two 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 stormwater 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 connection of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. By routing roof drains and crowning the driveway to run off to the lawn, the lawn is essentially used as a filter strip.
- **Reducing the Use of Storm Sewers.** By reducing use of storm sewers for draining streets, parking lots, and back yards, 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 roadway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets which ultimately could lower maintenance.
- **Limiting Sidewalks to One Side of the Street.** A sidewalk on one side of the street may suffice in low-traffic neighborhoods. The lost sidewalk could be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials.
- **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 impervious cover associated with 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 occurs with street length, which also will reduce costs of the development. Cluster development groups the

construction activity in less-sensitive areas without substantially affecting the gross density of development.

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

**ORDINANCE APPENDIX G**  
**WEST NILE VIRUS GUIDANCE**

## WEST NILE VIRUS GUIDANCE

(This source is from the Monroe County, PA Conservation District that researched the potential of West Nile Virus problems from BMPs due to a number of calls they were receiving)

### **Monroe County Conservation District Guidance: Stormwater Management and West Nile Virus**

#### **Source: Brodhead McMichaels Creeks Watershed Act 167 Stormwater Management Ordinance Final Draft 2/23/04**

The Monroe County Conservation District recognizes the need to address the problem of nonpoint source pollution impacts caused by runoff from impervious surfaces. The new stormwater policy being integrated into Act 167 stormwater management regulations by the PA Department of Environmental Protection (PADEP) will make nonpoint pollution controls an important component of all future plans and updates to existing plans. In addition, to meet post-construction anti-degradation standards under the state National Pollutant Discharge Elimination System (NPDES) permitting program, applicants will be required to employ Best Management Practices (BMPs) to address nonpoint pollution concerns.

Studies conducted throughout the United States have shown that wet basins and in particular constructed wetlands are effective in traditional stormwater management areas such as channel stability and flood control and are one of the most effective ways to remove stormwater pollutants (United States Environmental Protection Agency 1991, Center for Watershed Protection 2000). From Maryland to Oregon, studies have shown that as urbanization and impervious surfaces increase in a watershed, the streams in those watersheds become degraded (CWP 2000). Although there is debate over the threshold of impervious cover when degradation becomes apparent (some studies show as little as 6% while others show closer to 20%), there is agreement that impervious surfaces cause nonpoint pollution in urban and urbanizing watersheds and that degradation is ensured if stormwater BMPs are not implemented.

Although constructed wetlands and ponds are desirable from a water quality perspective, there may be concerns about the possibility of these stormwater management structures becoming breeding grounds for mosquitoes. The Conservation District feels that although it may be a valid concern, **municipalities should not adopt ordinance provisions prohibiting wet basins for stormwater management.**

### **Mosquitoes**

The questions surrounding mosquito production in wetlands and ponds have intensified in recent years by the outbreak of the mosquito-borne West Nile Virus. As is the case with all vector-borne maladies, the life cycle of West Nile Virus is complicated, traveling from mosquito to bird, back to mosquito, and then to other animals including humans. *Culex pipiens* was identified as the vector species in the first documented cases from New York in 1999. This species is still considered the primary transmitter of the disease across its range. Today there are some 60 species of mosquitoes that inhabit Pennsylvania. Along with *C. pipiens*, three other

species have been identified as vectors of West Nile Virus while four more have been identified as potential vectors.

The four known vectors in NE Pennsylvania are *Culex pipiens*, *C. restuans*, *C. salinarius*, and *Ochlerotatus japonicus*. All four of these species prefer, and almost exclusively use, artificial containers (old tires, rain gutters, birdbaths, etc.) as larval habitats. In the case of *C. pipiens*, the most notorious of the vector mosquitoes, the dirtier the water, the better they like it. The important factor is that these species do not thrive in functioning wetlands where competition for resources and predation by larger aquatic and terrestrial organisms is high.

The remaining four species, *Aedes vexans*, *Ochlerotatus Canadensis*, *O. triseriatus*, and *O. trivittatus*, are currently considered potential vectors due to laboratory tests (except the *O. trivittatus*, which did have one confirmed vector pool for West Nile Virus in PA during 2002). All four of these species prefer vernal habitats and ponded woodland areas following heavy summer rains. These species may be the greatest threat of disease transmission around stormwater basins that pond water for more than four days. This can be mitigated, however, by establishing ecologically functioning wetlands.

### **Stormwater Facilities**

If a stormwater wetland or pond is constructed properly and a diverse ecological community develops, mosquitoes should not become a problem. Wet basins and wetlands constructed as stormwater management facilities should be designed to attract a diverse wildlife community. If a wetland is planned, proper hydrologic soil conditions and the establishment of hydrophytic vegetation will promote the population of the wetland by amphibians and other mosquito predators. In natural wetlands, predatory insects and amphibians are effective at keeping mosquito populations in check during the larval stage of development while birds and bats prey on adult mosquitoes.

The design of a stormwater wetland must include the selection of hydrophytic plant species for their pollutant uptake capabilities and for not contributing to the potential for vector mosquito breeding. In particular, species of emergent vegetation with little submerged growth are preferable. By limiting the vegetation growing below the water surface, larvae lose protective cover, and there is less chance of anaerobic conditions occurring in the water.

Stormwater ponds can be designed for multiple purposes. When incorporated into an open space design, a pond can serve as a stormwater management facility and a community amenity. Aeration fountains and stocked fish should be added to keep larval mosquito populations in check.

Publications from the PA Department of Health and the Penn State Cooperative Extension concerning West Nile Virus identify aggressive public education about the risks posed by standing water in artificial containers (tires, trash cans, rain gutters, bird baths) as the most effective method to control vector mosquitoes.

## **Conclusion**

The Conservation District understands the pressure faced by municipalities when dealing with multifaceted issues such as stormwater management and encourages the incorporation of water quality management techniques into stormwater designs. As Monroe County continues to grow, conservation design, infiltration, and constructed wetlands and ponds should be among the preferred design options to reduce the impacts of increases in impervious surfaces. When designed and constructed appropriately, the runoff mitigation benefits to the community from these design options will far outweigh their potential to become breeding grounds for mosquitoes.



# **ORDINANCE APPENDIX H**

## **REFERENCES**

## REFERENCES

### BMP Manuals

#### California

California Stormwater BMP Handbook: New Development and Redevelopment (January 2003)  
– separate file available at <http://www.cabmphandbooks.org/Development.asp>

#### Georgia

Georgia Stormwater Management Manual Volume 2: Technical Handbook (August 2001)-  
separate file (<http://www.georgiastormwater.com/>)

#### Maryland

2000 Maryland Stormwater Design Manual –  
[http://www.mde.state.md.us/Programs/Waterprograms/SedimentandStormwater/  
stormwater design/index.asp](http://www.mde.state.md.us/Programs/Waterprograms/SedimentandStormwater/stormwater%20design/index.asp)

#### Massachusetts

Stormwater Management, Volume Two: Stormwater Technical Handbook (Massachusetts,  
1997) – separate file available at <http://www.state.ma.us/dep/brp/stormwtr/stormpub.htm>

#### Minnesota

Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold  
Climates (July 2001) –  
<http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm>

#### New Jersey

Revised Manual for New Jersey: Best Management Practices for Control of Nonpoint Source  
Pollution from Stormwater (Fifth Draft May 2000) –  
<http://www.state.nj.us/dep/watershedmgt/bmpmanual.htm>

#### New York

New York State Stormwater Management Design Manual (2001) –  
<http://www.dec.state.ny.us/website/dow/swmanual/swmanual.html>

#### Pennsylvania

Pennsylvania Department of Environmental Protection *Pennsylvania Stormwater Best  
Management Practices Manual*, Pub. No. 363-0300-002, December 30, 2006

#### Washington

Stormwater Management Manual for Western Washington (August 2001) –  
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

## Federal

Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring (FHWA) – <http://www.fhwa.dot.gov/environment/ultraurb/3fs1.htm>

USEPA Infiltration Trench Fact Sheet (September 1999) –  
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/post.cfm>

## Riparian Buffer References

Alliance for the Chesapeake Bay, Pennsylvania Department of Environmental Protection, September 2000. *Forest Buffer Toolkit*, Stream ReLeaf Program.

Penn State College of Agricultural Sciences, 1996. *Establishing Vegetative Buffer Strips Along Streams to Improve Water Quality*. Publication # AGRS-67.

Fike, Jean, June 1999. *Terrestrial & Palustrine Plant Communities of Pennsylvania*, Pennsylvania Natural Diversity Inventory, The Nature Conservancy, Western Pennsylvania Conservancy, and Pennsylvania Department of Conservation and Natural Resources.

Pennsylvania Association of Conservation Districts, Inc., Keystone Chapter, Soil and Water Conservation Society, Pennsylvania Department of Environmental Protection, Natural Resources Conservation Service, 1998. *Pennsylvania Handbook of Best Management Practices for Developing Areas*. Prepared by CH2MHill.

Palone, R. S. and A. H. Todd (eds), 1997. *Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers*. Chesapeake Bay Program and Northeastern Area State and Private Forestry. Natural Resources Conservation Service Cooperative State Research Education and Extension Services.

Rupprecht, R., Kilgore, C., and Gunther, R., “Riparian and Wetland Buffers for Water-Quality Protection.” *Stormwater* Nov.-Dec. 2009, Vol 10, No. 8: 46-51. Print.

The Federal Interagency Stream Restoration Working Group (FISRWG, 10/1998). *Stream Corridor Restoration Principles, Processes, and Practices*. GPO Item No. 0120-A; SuDocs No. A57.6/2:EN3/PT.653. ISBN-0-934213-59-3. Published October 1998. Revised August 2000.

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

78 Attachment 4

Township of Haverford

Appendix C-1

STORMWATER MANAGEMENT SITE PLAN APPLICATION

(To be attached to the "land subdivision plan or development plan review application" or "minor land subdivision plan review application")

Application is hereby made for review of the Stormwater Management Plan and related data as submitted herewith in accordance with the \_\_\_\_\_ Stormwater Management Ordinance.

\_\_\_\_\_ Final Plan \_\_\_\_\_ Preliminary Plan \_\_\_\_\_ Sketch Plan

Date of Submission \_\_\_\_\_ Submission No. \_\_\_\_\_

1. Name of subdivision or development \_\_\_\_\_

2. Name of Applicant \_\_\_\_\_ Telephone No. \_\_\_\_\_

(if corporation, list the corporation's name and the names of two officers of the corporation)

\_\_\_\_\_ Officer 1

\_\_\_\_\_ Officer 2

Address \_\_\_\_\_

Zip \_\_\_\_\_

Applicant's interest in subdivision or development (if other than property owner, give owner's name and address)

3. Name of property owner \_\_\_\_\_ Telephone No. \_\_\_\_\_

Address \_\_\_\_\_

Zip \_\_\_\_\_

4. Name of engineer or surveyor \_\_\_\_\_ Telephone No. \_\_\_\_\_

Address \_\_\_\_\_

Zip \_\_\_\_\_

5. Type of subdivision or development proposed:

- |                                       |                         |                              |
|---------------------------------------|-------------------------|------------------------------|
| _____ Single-family Lots              | _____ Townhouses        | _____ Commercial (Multi-Lot) |
| _____ Two-family Lots                 | _____ Garden Apartments | _____ Commercial (One Lot)   |
| _____ Multi-family Lots               | _____ Mobile Home Park  | _____ Industrial (Multi-lot) |
| _____ Cluster Type Lots               | _____ Campground        | _____ Industrial (One Lot)   |
| _____ Planned Residential Development | _____ Other (_____)     |                              |

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- 6. Linear feet of new road proposed \_\_\_\_\_ L.F.
- 7. Area of proposed and existing impervious area on the entire tract.
  - a. Existing (to remain) \_\_\_\_\_ S.F. \_\_\_\_\_ % of property
  - b. Proposed \_\_\_\_\_ S.F. \_\_\_\_\_ % of property
- 8. Stormwater
  - a. Does the peak rate of runoff from proposed conditions exceed that flow which occurred for existing conditions for the designated design storm? \_\_\_\_\_
  - b. Design storm utilized (on-site conveyance systems) (24 hr.) \_\_\_\_\_  
No. of Subarea \_\_\_\_\_  
Watershed Name \_\_\_\_\_  
  
Explain: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
  - c. Does the submission and/or district meet the criteria for the applicable management district? \_\_\_\_\_
  - d. Number of subarea(s) from Ordinance Appendix A of the Darby-Cobbs Creek Watershed Stormwater Management Plan \_\_\_\_\_
  - e. Type of proposed runoff control \_\_\_\_\_
  - f. Does the proposed stormwater control criteria meet the requirements/guidelines of the Stormwater Ordinance? \_\_\_\_\_  
  
If not, what variances/waivers are requested? \_\_\_\_\_  
\_\_\_\_\_  
  
Reasons \_\_\_\_\_
  - g. Does the plan meet the requirements of Article III of the Stormwater Ordinance? \_\_\_\_\_  
  
If not, what variances/waivers are requested? \_\_\_\_\_  
  
Reasons \_\_\_\_\_
  - h. Was TR-55, June 1986, utilized in determining the time of concentration? \_\_\_\_\_
  - i. What hydrologic method was used in the stormwater computations? \_\_\_\_\_  
\_\_\_\_\_
  - j. Is a hydraulic routing through the stormwater control structure submitted? \_\_\_\_\_  
\_\_\_\_\_
  - k. Is a construction schedule or staging attached? \_\_\_\_\_
  - l. Is a recommended maintenance program attached? \_\_\_\_\_

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGMENT

- 9. Erosion and Sediment Pollution Control (E&S):
  - a. Has the stormwater management and E&S plan, supporting documentation, and narrative been submitted to the \_\_\_\_\_ [County Name] \_\_\_\_\_ County Conservation District? \_\_\_\_\_
  - b. Total area of earth disturbance \_\_\_\_\_ S.F.
  
- 10. Wetlands
  - a. Have the wetlands been delineated by someone trained in wetland delineation? \_\_\_\_\_
  - b. Have the wetland lines been verified by a state or federal permitting authority? \_\_\_\_\_
  - c. Have the wetland lines been surveyed? \_\_\_\_\_
  - d. Total acreage of wetlands within the property \_\_\_\_\_
  - e. Total acreage of wetlands disturbed \_\_\_\_\_
  - f. Supporting documentation \_\_\_\_\_
  
- 11. Filing.
  - a. Has the required fee been submitted? \_\_\_\_\_  
Amount \_\_\_\_\_
  
  - b. Has the proposed schedule of construction inspection to be performed by the Applicant's engineer been submitted?
  
  - c. Name of individual who will be making the inspections \_\_\_\_\_
  
  - d. General comments about stormwater management at the development  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

HAVERFORD CODE

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF \_\_\_\_\_ [County Name] \_\_\_\_\_

On this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned officer, personally appeared \_\_\_\_\_ who, being duly sworn according to law, deposes and says that \_\_\_\_\_ are owners of the property described in this application and that the application was made with \_\_\_\_\_ knowledge and/or direction and does hereby agree with the said application and to the submission of the same.

\_\_\_\_\_ Property Owner

My Commission Expires \_\_\_\_\_ 20 \_\_\_\_\_  
Notary Public \_\_\_\_\_

THE UNDERSIGNED HEREBY CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF THE INFORMATION AND STATEMENTS GIVEN ABOVE ARE TRUE AND CORRECT.

SIGNATURE OF APPLICANT \_\_\_\_\_

(Information Below This Line To Be Completed By The Municipality)

\_\_\_\_\_ (Name of) Municipality official submission receipt:

Date complete application received \_\_\_\_\_ Plan number \_\_\_\_\_

Fees \_\_\_\_\_ Date fees paid \_\_\_\_\_ Received by \_\_\_\_\_

Official submission receipt date \_\_\_\_\_

Received by \_\_\_\_\_

\_\_\_\_\_  
Municipality

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

78 Attachment 5

Township of Haverford

Appendix C-2



Delaware County Conservation District
Rose Tree Park - Hunt Club
1521 N. Providence Rd.
Media, PA 19063
Phone: 610-892-9484
Fax: 610-892-9489
Email: Info@delcoed.org

Project: \_\_\_\_\_
Municipality: \_\_\_\_\_
Engineer: \_\_\_\_\_
Submittal No.: \_\_\_\_\_
Date: \_\_\_\_\_
Project ID: \_\_\_\_\_ (for County use ONLY)

ARTICLE I: GENERAL PROVISIONS

Reference: Section 105 Applicability/Regulated Activities

- 1. Is the Proposed Project within the Darby-Cobbs, Crum or Ridley Creek watershed? [ ] Yes [ ] No
2. Does the Proposed Project meet the definition of a "Regulated Activity"? [ ] Yes [ ] No

STOP - If you have checked NO for either of the above questions, you are not required to submit a Storm Water Management Plan under the Darby-Cobbs Creek Storm Water management Ordinance.

ARTICLE I: GENERAL PROVISIONS

Reference: Section 106 Exemptions

Note: Parent Tract refers to the total parcel configuration on June 30, 2005 and includes any subdivision of lands which may have occurred after than date.

Parent Tract Area: \_\_\_\_\_ acres

Total Existing Impervious Area (as of June 30, 2005): \_\_\_\_\_ acres

Total New Impervious Area (all Phases): \_\_\_\_\_ acres

Parcel IS Exempt [ ]

Parcel IS NOT Exempt [ ]



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ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 404 Nonstructural Project Design

- 1. Has an Existing Resource and Site Analysis Map (ERSAM) been prepared?

Yes No, Explain

- 2. Are any of the following Environmentally Sensitive areas identified on site?

- Steep Slopes Yes No Unknown
Ponds/Lakes/Vernal Pools Yes No Unknown
Streams Yes No Unknown
Wetlands Yes No Unknown
Hydric Soils Yes No Unknown
Flood plains Yes No Unknown
Stream Buffer Zones Yes No Unknown
Hydrologic Soil Groups A or B Yes No Unknown
Recharge Areas Yes No Unknown
Others: Yes No Unknown

- 3. Does the site layout plan avoid Environmentally Sensitive Areas identified on site?

Yes No, Explain

- 4. Has a stream buffer been established per Section 406.G.?

Yes No, Explain

ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 405 Groundwater Recharge

- 1. Is the proposed activity considered a "Stormwater Hotspot"? Yes No

- 2. Have provisions been installed to promote groundwater recharge on site?

Yes No, Explain

- 3. Total Recharge Volume Required: cubic feet (using: Method A; Method B)

- 4. How is the Required Recharge Volume being addressed?

- Infiltration Trench Dry Swales
Infiltration Basin Other:
Bioretention

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGMENT

ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 406 Water Quality Requirements

- 1. Have provisions been installed to address stormwater runoff water quality on site?  
 Yes  No, Explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- 2. Total Water Quality Volume Required: \_\_\_\_\_ acre feet
- 3. Is the site in a Special Protection watershed which includes Exceptional Value (EV) of High Quality (HQ) waters?  Yes  No
- 4. How is the Required Water Quality Volume being addressed?  

<input type="checkbox"/> Wet Detention Basin	<input type="checkbox"/> Sand Filter
<input type="checkbox"/> Extended Dry Detention Basin	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Bioretention	<input type="checkbox"/> Other: _____

ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 407 Streambank Erosion Requirements

- 1. Has the two-year proposed conditions flow been reduced to the one-year existing conditions flow?  
 Yes  No, Explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- 2. Does the proposed conditions one-year storm drain over a minimum twenty-four-hour period?  
 Yes  No, Explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 408 Stormwater Peak Rate Control and Management Districts

- 1. In which of the following Storm Water Management District(s) is the site located?  

<input type="checkbox"/> A	<input type="checkbox"/> B-2
<input type="checkbox"/> B-1	<input type="checkbox"/> C
- 2. Does the Proposed Conditions Runoff meet the Criteria established in Table 408.1?  
 Yes  No, if you answered Yes proceed to Section V.
  - a. Are you claiming "No Harm" as described in Section 408 in lieu of meeting the requirements of this District?  
 Yes  No, Explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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b. If you are claiming "No Harm", has a Downstream Impacts Evaluation been prepared in accordance with Section 408 \_\_\_\_?

Yes  No, Explain \_\_\_\_\_

c. Are claiming "Hardship", as described in Section 408 \_\_\_\_ in lieu of meeting the requirements of this District?

Yes  No, Explain \_\_\_\_\_

---

ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 409 Calculation Methodology

1. Which method(s) are utilized in the site stormwater management plan for computing stormwater runoff rates and volumes?

- |  |  |
|--|--|
| <input type="checkbox"/> TR-20         | <input type="checkbox"/> PSRM            |
| <input type="checkbox"/> TR-55         | <input type="checkbox"/> Rational Method |
| <input type="checkbox"/> HEC-1/HEC-HMS | <input type="checkbox"/> Other: _____    |

2. Were Table F-1 or Figure F-4 in Appendix F utilized in rainfall determination?

Yes  No, Explain \_\_\_\_\_

3. Were Table F-2 (Runoff Curve Numbers) or Table F-3 in the Appendix F (Rational Runoff Coefficients) utilized in calculations for runoff?

Yes  No, Explain \_\_\_\_\_

4. For any proposed storm water detention facility, were the appropriate design storms routed through the facility using the Storage-Indication Method?

Yes  No, Explain \_\_\_\_\_

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGMENT

ARTICLE IV: STORMWATER MANAGEMENT

Reference: Section 410 Other Requirements

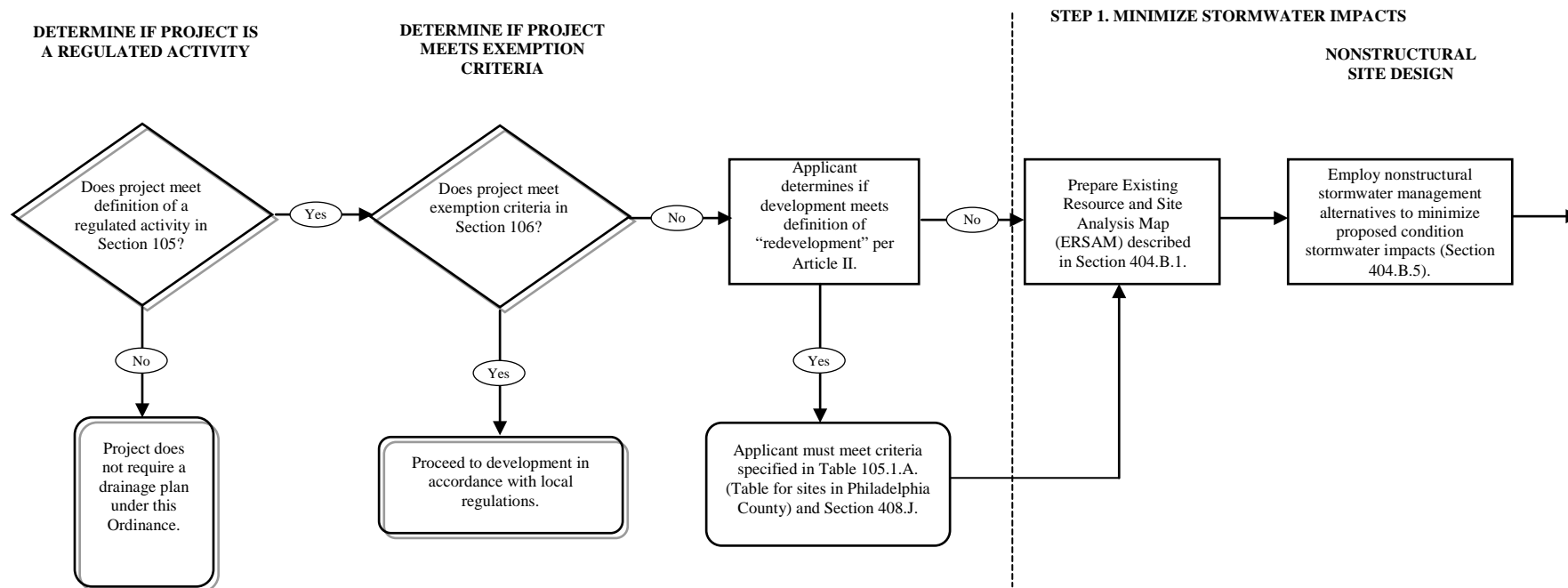
1. Is this project subject to PENNDOT approval?  
 Yes  No
  - a. If "YES" have these plans been forwarded to PENNDOT for review?  
 Yes  No, Explain \_\_\_\_\_  
\_\_\_\_\_
2. Have proposed wet detention basins incorporated biologic control consistent with the West Nile Guidelines presented in Appendix H?  
 Yes  No  Not Applicable
3. Are any proposed stormwater facilities subject to PADEP Chapter 105 permitting?  
 Yes  No
  - a. If "YES" have these plans been forwarded to PADEP for review?  
 Yes  No, Explain \_\_\_\_\_  
\_\_\_\_\_

ARTICLE VII: MAINTENANCE RESPONSIBILITIES

Reference: Section 702 Responsibilities for Operations and Maintenance of Stormwater Control/BMPs

1. Has a Stormwater Control and BMP Operations and Maintenance Plan been approved by the Municipality?  
 Yes  No, Explain \_\_\_\_\_  
\_\_\_\_\_
2. Who shall assume responsibility for implementing the Stormwater Control and BMP Operations and Maintenance Plan?  
 Municipality       Homeowner Association  
 Private Owner       Other \_\_\_\_\_

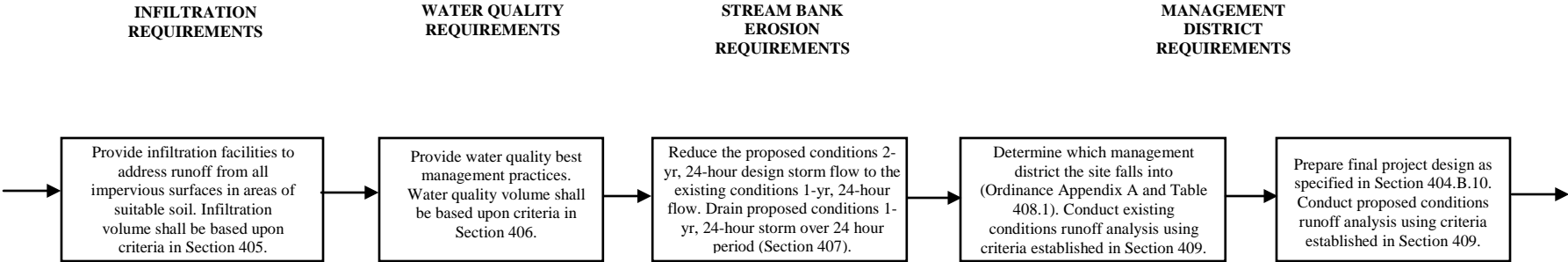
**DARBY AND COBBS CREEKS WATERSHED  
STORMWATER MANAGEMENT  
Water Quality and Quantity Control Drainage Plan  
Applicant Plan Preparation Procedure**



EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

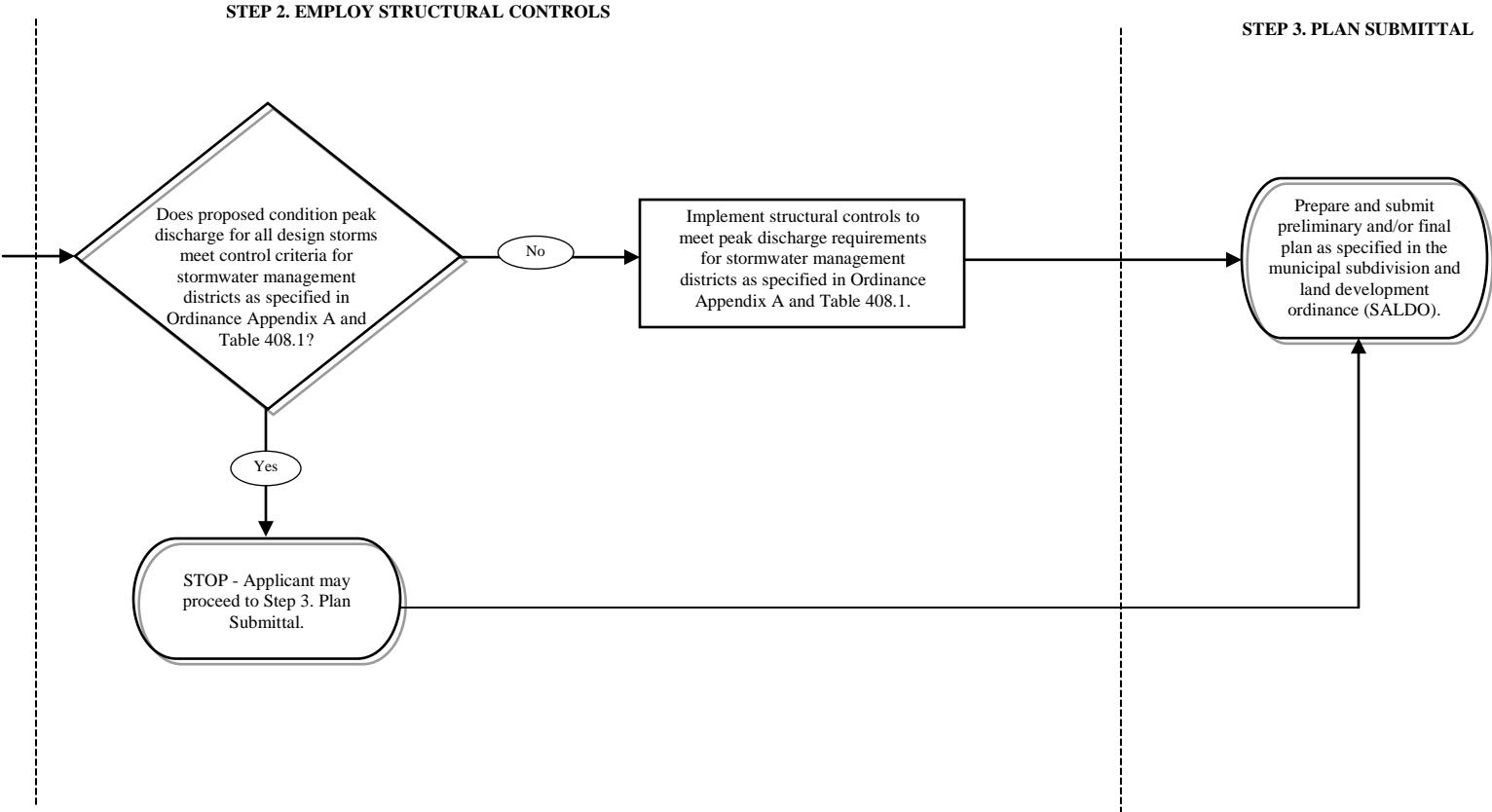
**DARBY AND COBBS CREEKS WATERSHED  
STORMWATER MANAGEMENT  
Water Quality and Quantity Control Drainage Plan  
Applicant Plan Preparation Procedure**

**STEP 1. MINIMIZE STORMWATER IMPACTS**



EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

**DARBY AND COBBS CREEKS WATERSHED  
STORMWATER MANAGEMENT  
Water Quality and Quantity Control Drainage Plan  
Applicant Plan Preparation Procedure**

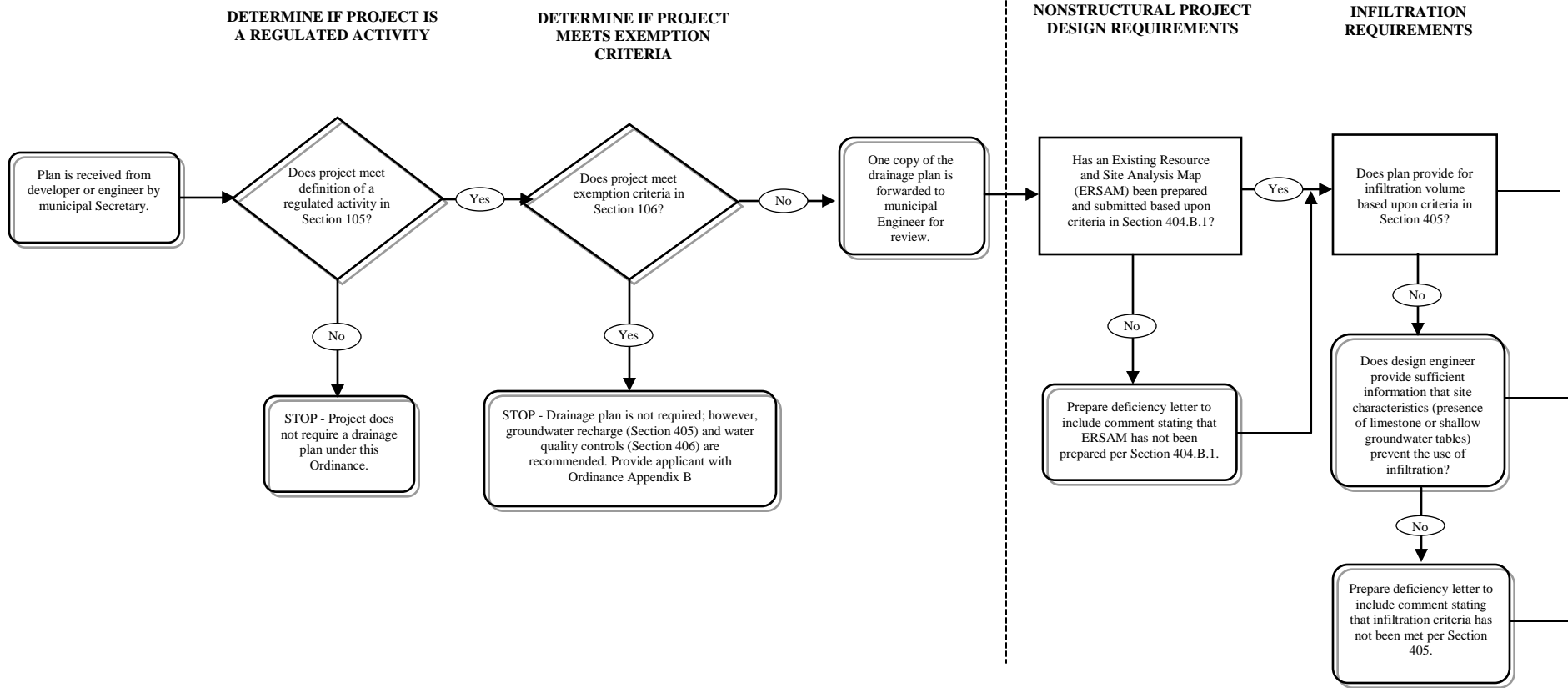


EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

**DARBY AND COBBS CREEKS WATERSHED  
STORMWATER MANAGEMENT  
Water Quality and Quantity Control Drainage Plan  
Municipal Review Procedure**

STEP 1. PRELIMINARY REVIEW BY ZONING OFFICER

STEP 2. DETAILED REVIEW BY MUNICIPAL ENGINEER

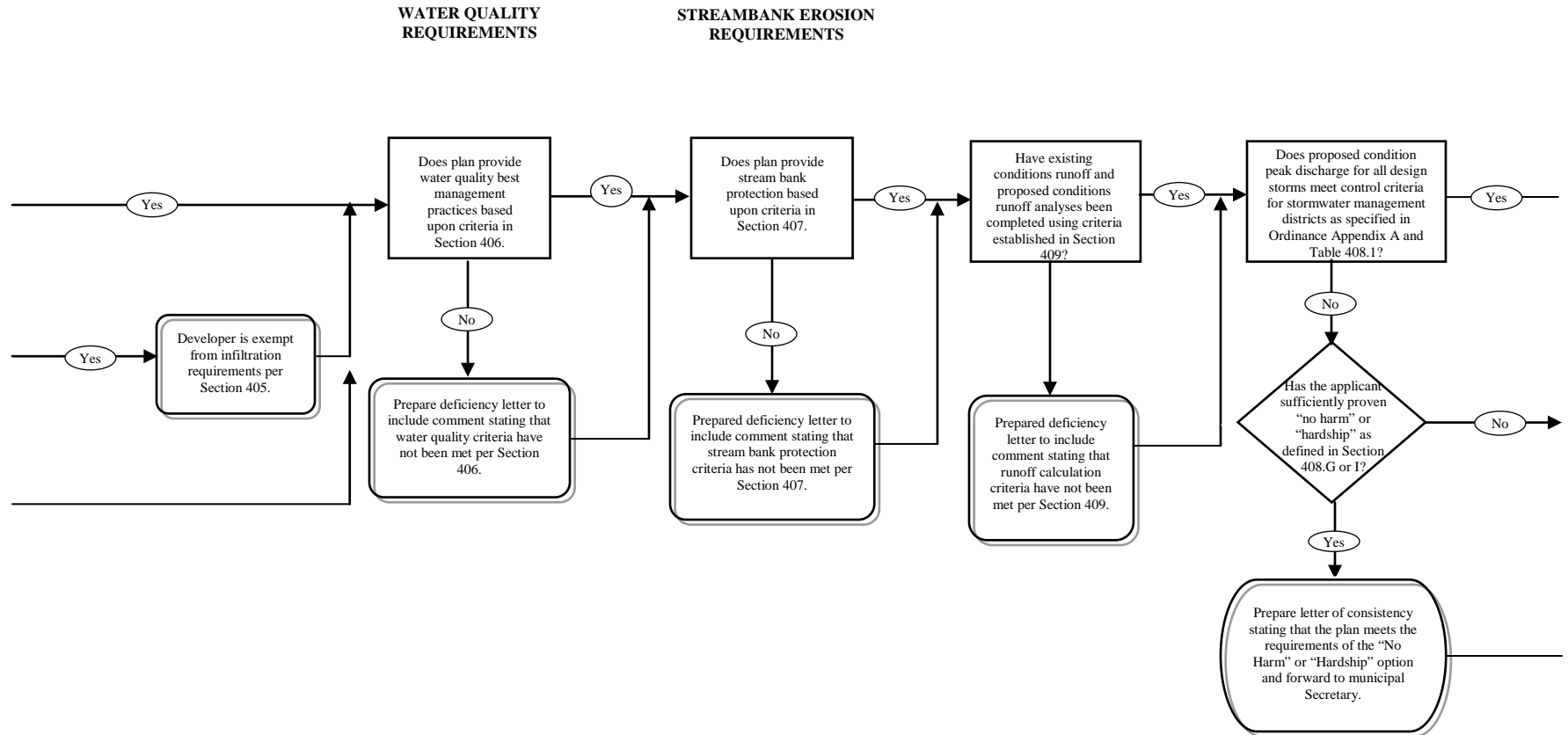




EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

**DARBY AND COBBS CREEKS WATERSHED  
STORMWATER MANAGEMENT  
Water Quality and Quantity Control Drainage Plan  
Municipal Review Procedure**

STEP 2. DETAILED REVIEW BY MUNICIPAL ENGINEER

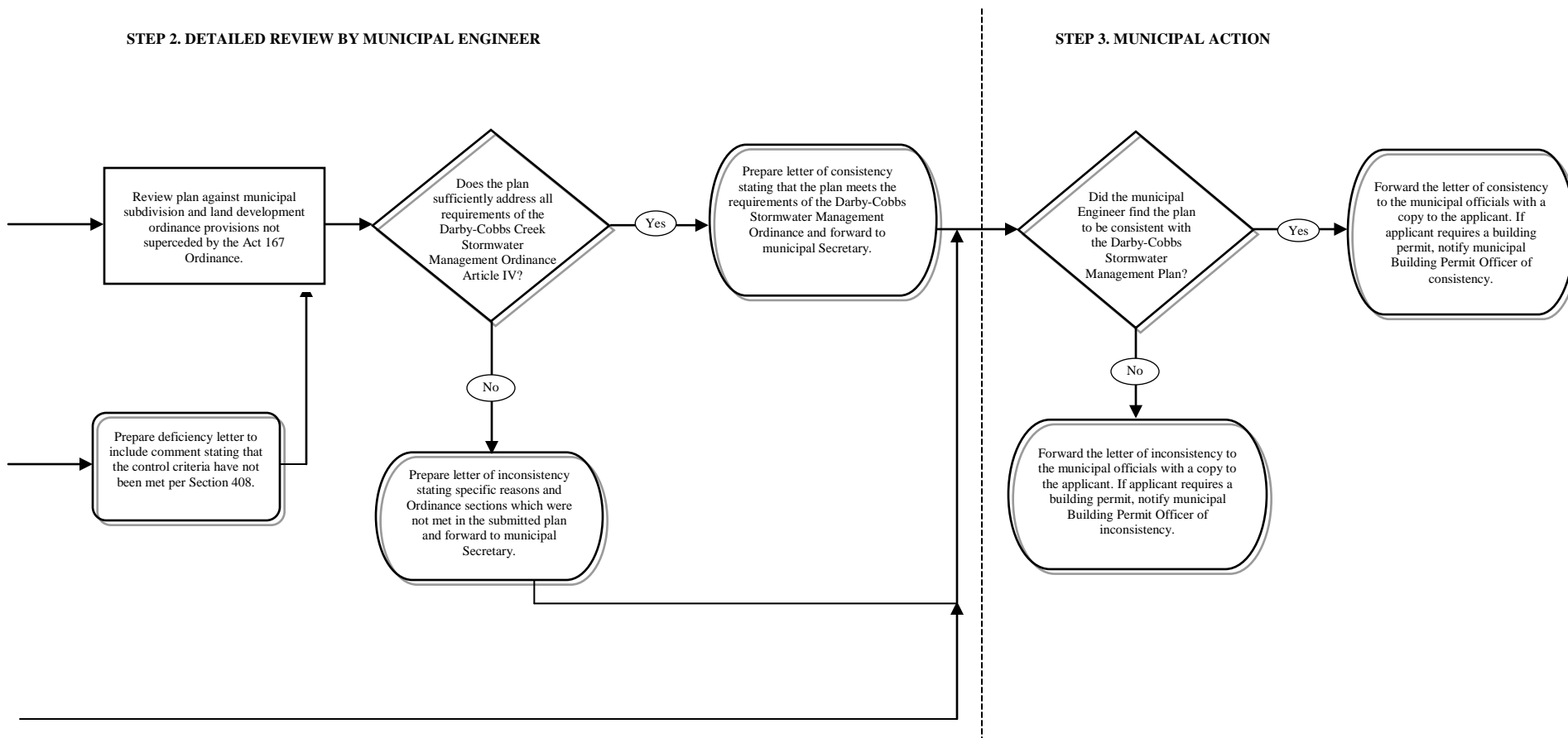


EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

**DARBY AND COBBS CREEKS WATERSHED  
STORMWATER MANAGEMENT  
Water Quality and Quantity Control Drainage Plan  
Municipal Review Procedure**

**STEP 2. DETAILED REVIEW BY MUNICIPAL ENGINEER**

**STEP 3. MUNICIPAL ACTION**



**APPENDIX E**

**LOW IMPACT DEVELOPMENT (LID) PRACTICES**

**ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF**

Natural hydrologic conditions can be altered radically by poorly planned development practices such as introducing unnecessary 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 proposed conditions' runoff rates and volumes, which will minimize needs for artificial conveyance and storage facilities. To simulate predevelopment hydrologic conditions, infiltration is often necessary to offset the loss of infiltration by creation of impervious surfaces. The ability of the ground to infiltrate 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 of those features. The following describes various techniques to achieve the alternative approach:

- **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 are typically 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 either 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.

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- **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 a storm sewer). Two 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 stormwater 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 connection of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. By routing roof drains and crowning the driveway to run off to the lawn, the lawn is essentially used as a filter strip.
- **Reducing the Use of Storm Sewers.** By reducing use of storm sewers for draining streets, parking lots, and back yards, 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.** Narrower neighborhood streets could reduce impervious and lower maintenance.
- **Limiting Sidewalks to One Side of the Street.** A sidewalk on one side of the street may suffice in low-traffic neighborhoods. The lost sidewalk could be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials.
- **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 impervious cover associated with 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 occur with street length, which also will reduce costs of the development. Cluster development

## EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

groups the construction activity in less-sensitive areas without substantially affecting the gross density of development.

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

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

78 Attachment 8

**Township of Haverford**

**APPENDIX F**

**Design Criteria**

**Table F-1**

**DESIGN STORM RAINFALL AMOUNT (INCHES)**

The design storm rainfall amount chosen for design should be obtained from the PennDOT region in which the site is located according to Figure F-2. *according to NOAA Atlas 14 (most recent publication) consistent with a partial duration series.*

<b>Duration</b>	<b>Region 5</b>						
	<b>Precipitation Depth (in)</b>						
	<del>1 Yr</del>	<del>2 Yr</del>	<del>5 Yr</del>	<del>10 Yr</del>	<del>25 Yr</del>	<del>50 Yr</del>	<del>100 Yr</del>
5 min	0.33	0.38	0.45	0.50	0.56	0.63	0.68
15 min	0.64	0.75	0.90	1.00	1.15	1.35	1.50
1 hr	1.10	1.35	1.61	1.85	2.15	2.60	2.98
2 hrs	1.34	1.66	2.00	2.34	2.70	3.26	3.76
3 hrs	1.50	1.86	2.28	2.67	3.09	3.69	4.29
6 hrs	1.86	2.28	2.82	3.36	3.90	4.62	5.40
12 hrs	2.28	2.76	3.48	4.20	4.92	5.76	6.72
24 hrs	2.64	3.36	4.32	5.28	6.24	7.20	8.40

Source: "Field Manual of Pennsylvania Department of Transportation," Storm Intensity Duration Frequency Charts, PDT-IDF, May 1986.

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**Figure F-1**

**ALTERNATING BLOCK METHOD FOR  
RAINFALL DISTRIBUTION**

The Alternating Block Method can be utilized to develop design hydrographs from the PennDOT Storm Intensity Duration Frequency (PDT IDF) curves. This method redistributes the incremental rainfall values developed from the PDT IDF curves in a quasi symmetrical form, where the block of maximum incremental depth is positioned at the middle of the required duration and the remaining blocks of rainfall are arranged in descending order, alternately to the right and to the left of the central block. Example F-1 below shows this method for a one hundred-year, two-hour duration storm with ten-minute time intervals.

**Example F-1  
100-year, 2-hour Duration Storm Hydrograph Development  
Region 5**

(1)	(2)	(3)	(4)	(5)
Time (minutes)	100-year Rainfall Intensity (inches/hour)	100-year Accumulated Rainfall Depth (inches)	100-year Incremental Rainfall Depth (inches)	100-year Rainfall Distribution (inches)
0	0.00	0.00	0.00	0.00
10	6.91	1.15	1.15	0.07
20	5.34	1.78	0.63	0.15
30	4.41	2.21	0.43	0.21
40	3.78	2.52	0.32	0.26
50	3.33	2.78	0.26	0.43
60	2.98	2.98	0.21	1.15
70	2.75	3.20	0.22	0.63
80	2.51	3.35	0.15	0.32
90	2.28	3.42	0.07	0.22
100	2.15	3.58	0.16	0.16
110	2.01	3.69	0.11	0.11
120	1.88	3.76	0.07	0.07

Source: *Applied Hydrology*, Chow, Maidment, Mays, 1988

Notes

Values from Column (2) are derived from the appropriate rainfall chart based on the location of the site under analysis. (Region 5, in this example; therefore, use Figure F-4)

Column (3) = Column (2) x Column (1) / 60 minutes (i.e., 6.91 inches / hr x 10 min / 60 = 1.15).

Column (4) = Difference in Column(3) for each time interval (i.e., 1.78 — 1.15 = 0.63).

## EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

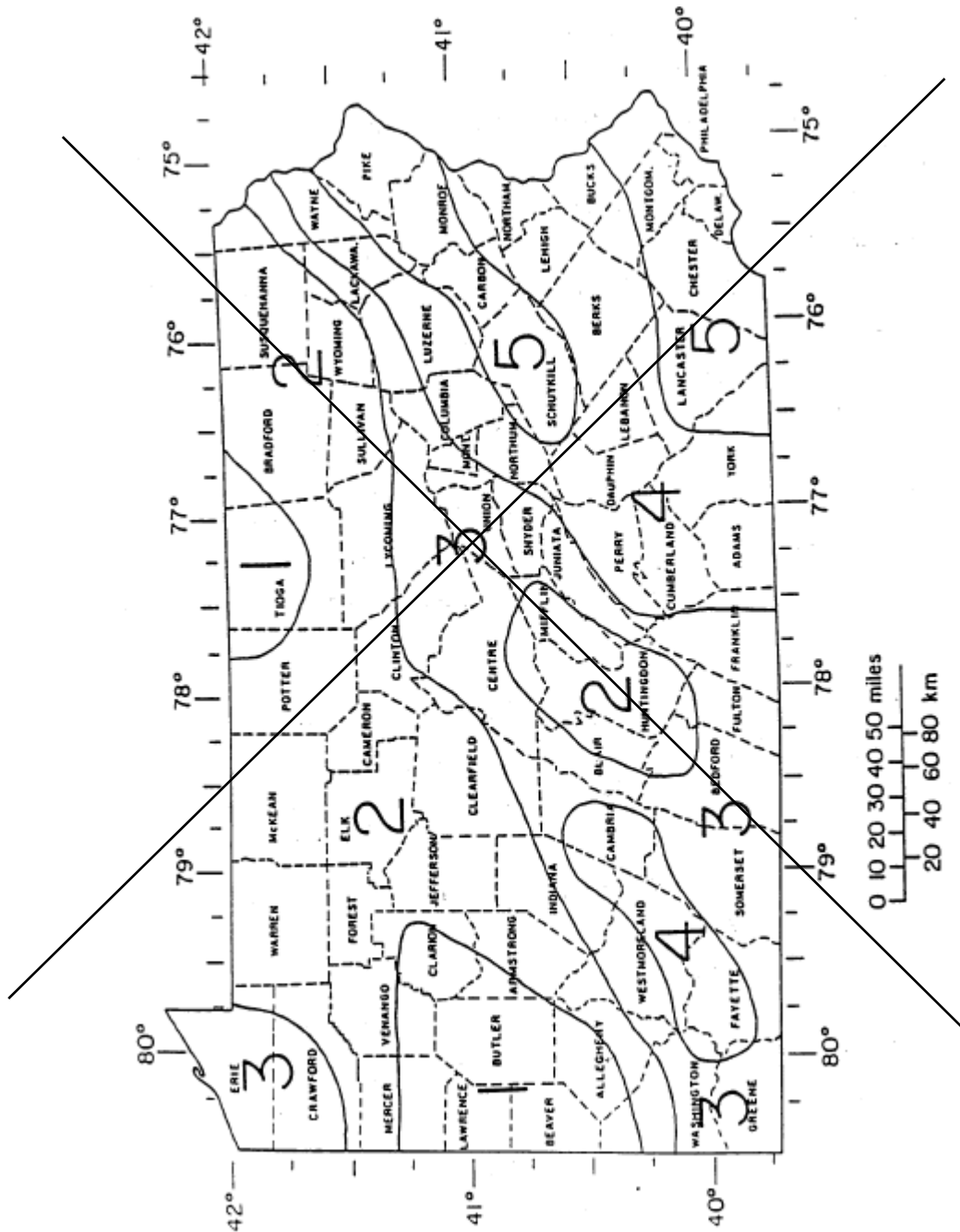
Column (5) is Column (4) rearranged with the maximum increment from Column (4) placed at the middle of the event (time = 60 minutes, in this example), then rearranging the remaining values from Column (4) in descending order, alternately right and left (below and above) the central block.



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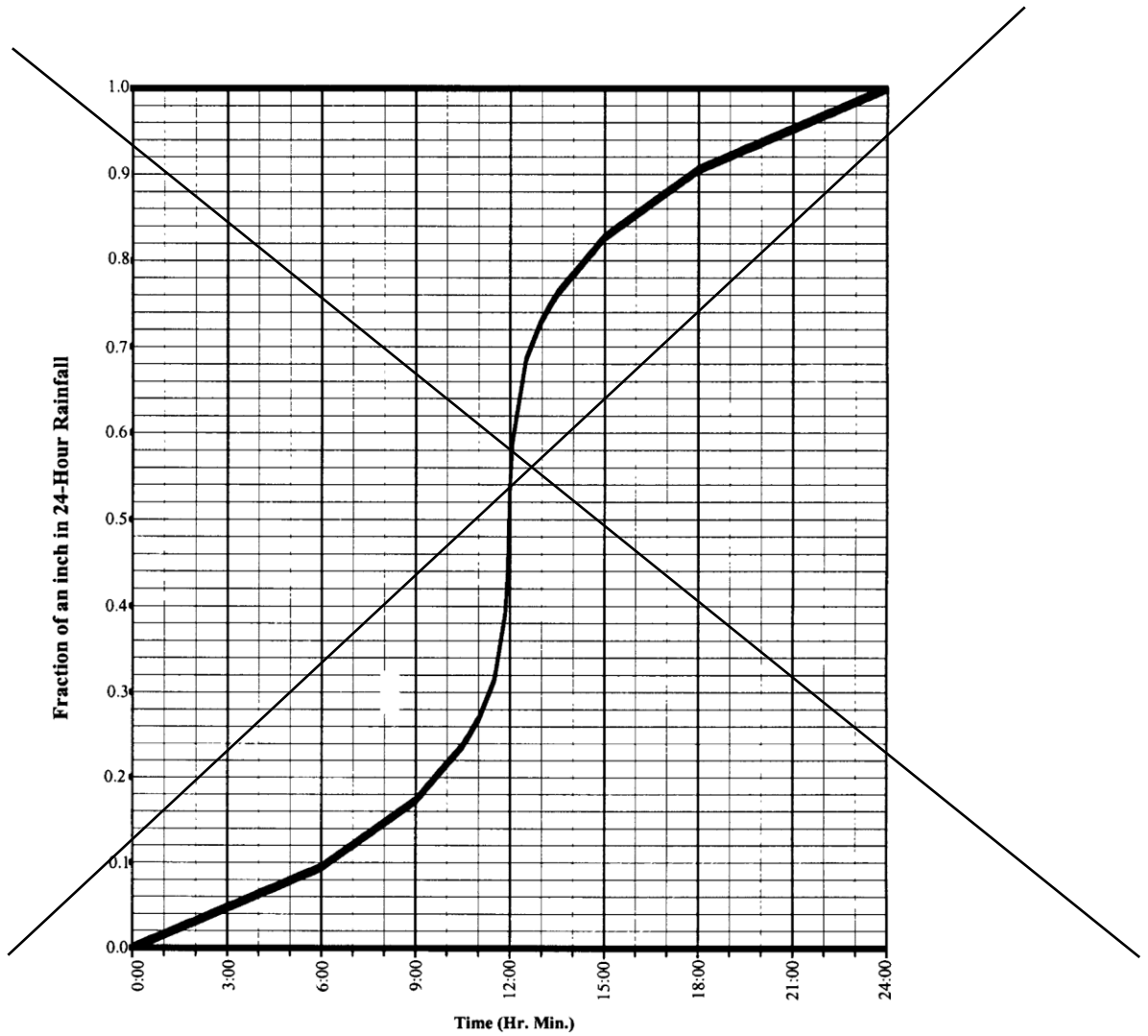
FIGURE F-2

PENNDOT DELINEATED REGIONS



Source: "Field Manual of Pennsylvania Department of Transportation,"  
Storm Intensity Duration Frequency Charts, PDT-IDF, May 1986.

**FIGURE F-3**  
**NRCS (SCS) TYPE II**  
**RAINFALL DISTRIBUTION S-CURVE**



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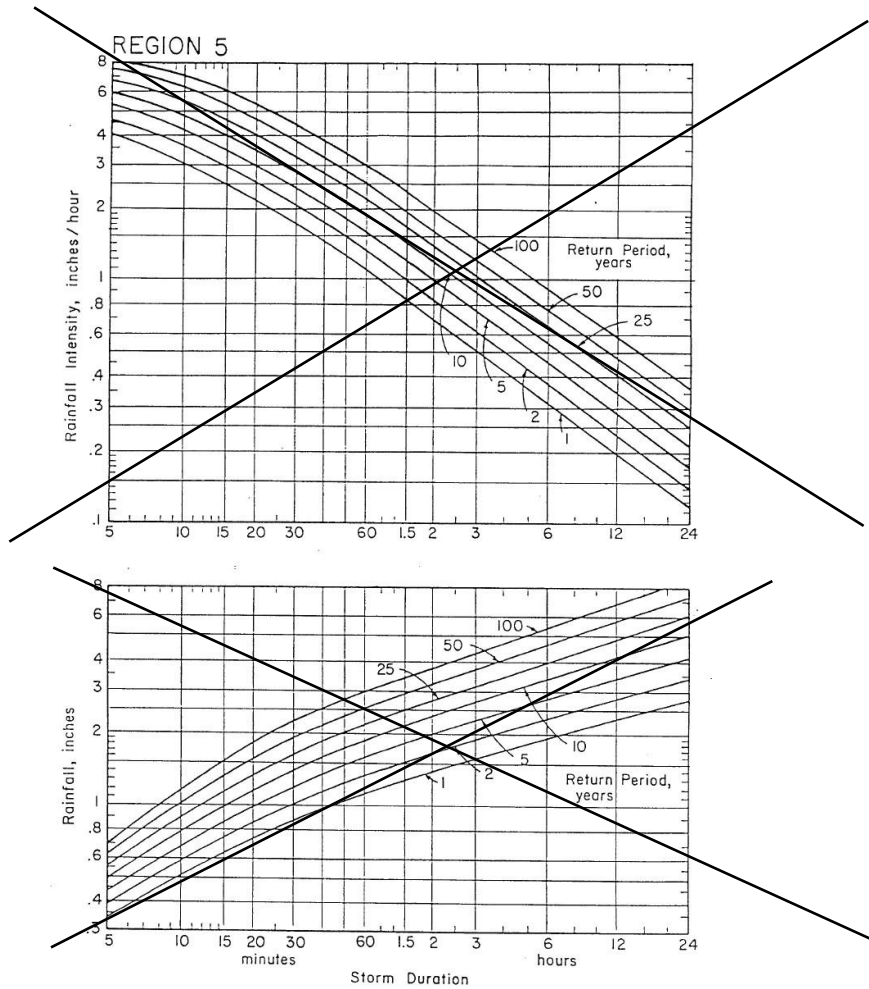
<u>Time</u> <u>(Hr:Min)</u>	<u>P<sub>T</sub>/P<sub>24</sub></u>	<u>Time</u> <u>(Hr:Min)</u>	<u>P<sub>T</sub>/P<sub>24</sub></u>
0:00	0.0000	13:00	0.7315
1:00	0.0158	14:00	0.7840
2:00	0.0316	15:00	0.8273
3:00	0.0473	16:00	0.8533
4:00	0.0631	17:00	0.8793
5:00	0.0789	18:00	0.9053
6:00	0.0947	19:00	0.9211
7:00	0.1207	20:00	0.9369
8:00	0.1467	21:00	0.9527
9:00	0.1727	22:00	0.9684
10:00	0.2160	23:00	0.9842
11:00	0.2685	0:00	1.0000
12:00	0.5403		

Note: Rainfall Distribution Curve developed from PennDOT Rainfall Intensity-Duration-Frequency Curves (Aron, 1986)

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

**FIGURE F-4**

**~~PennDOT REGION 5 STORM INTENSITY-DURATION-FREQUENCY CURVE~~**



~~Source: "Field Manual of Pennsylvania Department of Transportation,"  
Storm Intensity Duration Frequency Charts, PDT-IDF, May 1986.~~

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**TABLE F-2-1**

**RUNOFF CURVE NUMBERS**

Land Use Description	Hydrologic Soil Group				
	Hydrologic Condition	A	B	C	D
Open Space					
Grass cover less than 50%	Poor	68	79	86	89
Grass cover 50% to 75%	Fair	49	69	79	84
Grass cover greater than 75%	Good	39	61	74	80
Meadow		30	58	71	78
Agricultural					
Pasture, grassland, or range – Continuous forage for grazing	Poor	68	79	86	89
Pasture, grassland, or range – Continuous forage for grazing	Fair	49	69	79	84
Pasture, grassland, or range – Continuous forage for grazing	Good	39	61	74	80
Brush—brush-weed-grass mixture with brush the major element	Poor	48	67	77	83
Brush—brush-weed-grass mixture with brush the major element	Fair	35	56	70	77
Brush—brush-weed-grass mixture with brush the major element	Good	30	48	65	73
Fallow Bare soil	-----	77	86	91	94
Crop residue cover (CR)	Poor	76	85	90	93
	Good	74	83	88	90
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
Commercial	(85% impervious)	89	92	94	95
Industrial	(72% impervious)	81	88	91	93
Institutional	(50% impervious)	71	82	88	90

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

Land Use Description	Hydrologic Soil Group				
	Hydrologic Condition	A	B	C	D
Residential districts by average lot size:					
	% Impervious				
1/8 acre or less* (townhouses)	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
Farmstead		59	74	82	86
Smooth surfaces (concrete, asphalt, gravel, or bare compacted soil)		98	98	98	98
Water		98	98	98	98
Mining/newly graded areas (pervious areas only)		77	86	91	94

\* Includes multifamily housing unless justified lower density can be provided.

Note: Existing site conditions of bare earth or fallow ground shall be considered as meadow when choosing a CN value.

Source: NRCS (SCS) TR-55

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**TABLE F-3-2**

**RATIONAL RUNOFF COEFFICIENTS**

LAND USE DESCRIPTION	HYDROLOGIC SOIL GROUP			
	A	B	C	D
Cultivated land : without conservation treatment	.49	.67	.81	.88
: with conservation treatment	.27	.43	.61	.67
Pasture or range land: poor condition	.38	.63	.78	.84
: good condition	---*	.25	.51	.65
Meadow: good condition	---*	---*	.44	.61
Woods: thin stand, poor cover, no mulch	---*	.34	.59	.70
: good cover	---*	---*	.45	.59
Open spaces, lawns, parks, golf courses, cemeteries				
Good condition: grass cover on 75% or more of the area	---*	.25	.51	.65
Fair condition: grass cover on 50% to 75% of the area	---*	.45	.63	.74
Commercial and business areas (85% impervious)	.84	.90	.93	.96
Industrial districts (72% impervious)	.67	.81	.88	.92
Residential:				
Average lot size      Average % impervious				
1/8 acre or less      65	.59	.76	.86	.90
¼ acre      38	.25	.49	.67	.78
1/3 acre      30	---*	.49	.67	.78
½ acre      25	---*	.45	.65	.76
1 acre      20	---*	.41	.63	.74
Paved parking lots, roofs, driveways, etc.	.99	.99	.99	.99
Streets and roads:				
Paved with curbs and storm sewers	.99	.99	.99	.99
Gravel	.57	.76	.84	.88
Dirt	.49	.69	.80	.84

Notes: Values are based on SCS definitions and are average values.

Values indicated by "\*" should be determined by the design engineer based on site characteristics.

Source: New Jersey Department of Environmental Protection, Technical Manual for Stream Encroachment, August 1984

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

**TABLE F-4-3**

**MANNING'S ROUGHNESS COEFFICIENTS**

**Roughness Coefficients (Manning's "n") for Overland Flow**

<b>Surface Description</b>	<b>n</b>
Dense growth	0.4 to 0.5
Pasture	0.3 to 0.4
Lawns	0.2 to 0.3
Bluegrass sod	0.2 to 0.5
Short grass prairie	0.1 to 0.2
Sparse vegetation	0.05 to 0.13
Bare clay-loam soil (eroded)	0.01 to 0.03
Concrete/asphalt:	
very shallow depths (less than 1/4 inch)	0.10 to 0.15
small depths (1/4 inch to several inches)	0.05 to 0.10

**Roughness Coefficients (Manning's "n") for Channel Flow**

<b>Reach Description</b>	<b>n</b>
Natural stream, clean, straight, no rifts or pools	0.03
Natural stream, clean, winding, some pools or shoals	0.04
Natural stream, winding, pools, shoals, stony with some weeds	0.05
Natural stream, sluggish deep pools and weeds	0.07
Natural stream or swale, very weedy or with timber underbrush	0.10
Concrete pipe, culvert, or channel	0.012
Corrugated metal pipe	0.012-0.027 <sup>(1)</sup>
High density polyethylene (HDPE) pipe	
Corrugated	0.021-0.029 <sup>(2)</sup>
Smooth lined	0.012-0.020 <sup>(2)</sup>

<sup>(1)</sup> Depending upon type, coating, and diameter

<sup>(2)</sup> Values recommended by the American Concrete Pipe Association, check manufacturer's recommended value./

Source: U.S. Army Corps of Engineers, HEC-1 Users Manual



HAVERFORD CODE

**TABLE F-54**

**NONSTRUCTURAL STORMWATER MANAGEMENT MEASURES**

<b>Nonstructural Stormwater Measure</b>	<b>Description</b>
Natural area conservation	Conservation of natural areas such as forest, wetlands, or other sensitive areas in a protected easement, thereby retaining their existing hydrologic and water quality characteristics.
Disconnection of rooftop runoff	Rooftop runoff is disconnected and then directed over a pervious area where it may either infiltrate into the soil or filter over it. This is typically obtained by grading the site to promote overland flow or by providing bioretention on single-family residential lots.
Disconnection of nonrooftop runoff	Disconnect surface impervious cover by directing it to pervious areas where it is either infiltrated or filtered through the soil.
Buffers	Buffers effectively treat stormwater runoff. Effective treatment constitutes capturing runoff from pervious and impervious areas adjacent to the buffer and treating the runoff through overland flow across a grassy or forested area.
Grass channel (open section roads)	Open grass channels are used to reduce the volume of runoff and pollutants during smaller storms.
Environmentally sensitive rural development	Environmental site design techniques are applied to low-density or rural residential development.

Source: Maryland Department of the Environment, "Maryland Stormwater Design Manual," Baltimore, MD, 2000

**ORDINANCE APPENDIX G**  
**WEST NILE VIRUS GUIDANCE**

## WEST NILE VIRUS GUIDANCE

(This source is from the Monroe County, PA Conservation District that researched the potential of West Nile Virus problems from BMPs due to a number of calls they were receiving)

### **Monroe County Conservation District Guidance: Stormwater Management and West Nile Virus**

#### **Source: Brodhead McMichaels Creeks Watershed Act 167 Stormwater Management Ordinance Final Draft 2/23/04**

The Monroe County Conservation District recognizes the need to address the problem of nonpoint source pollution impacts caused by runoff from impervious surfaces. The new stormwater policy being integrated into Act 167 stormwater management regulations by the PA Department of Environmental Protection (PADEP) will make nonpoint pollution controls an important component of all future plans and updates to existing plans. In addition, to meet post-construction anti-degradation standards under the state National Pollutant Discharge Elimination System (NPDES) permitting program, applicants will be required to employ Best Management Practices (BMPs) to address nonpoint pollution concerns.

Studies conducted throughout the United States have shown that wet basins and in particular constructed wetlands are effective in traditional stormwater management areas such as channel stability and flood control and are one of the most effective ways to remove stormwater pollutants (United States Environmental Protection Agency 1991, Center for Watershed Protection 2000). From Maryland to Oregon, studies have shown that as urbanization and impervious surfaces increase in a watershed, the streams in those watersheds become degraded (CWP 2000). Although there is debate over the threshold of impervious cover when degradation becomes apparent (some studies show as little as 6% while others show closer to 20%), there is agreement that impervious surfaces cause nonpoint pollution in urban and urbanizing watersheds and that degradation is ensured if stormwater BMPs are not implemented.

Although constructed wetlands and ponds are desirable from a water quality perspective, there may be concerns about the possibility of these stormwater management structures becoming breeding grounds for mosquitoes. The Conservation District feels that although it may be a valid concern, **municipalities should not adopt ordinance provisions prohibiting wet basins for stormwater management.**

### **Mosquitoes**

The questions surrounding mosquito production in wetlands and ponds have intensified in recent years by the outbreak of the mosquito-borne West Nile Virus. As is the case with all vector-borne maladies, the life cycle of West Nile Virus is complicated, traveling from mosquito to bird, back to mosquito, and then to other animals including humans. *Culex pipiens* was identified as the vector species in the first documented cases from New York in 1999. This species is still considered the primary transmitter of the disease across its range. Today there are some 60 species of mosquitoes that inhabit Pennsylvania. Along with *C. pipiens*, three other

species have been identified as vectors of West Nile Virus while four more have been identified as potential vectors.

The four known vectors in NE Pennsylvania are *Culex pipiens*, *C. restuans*, *C. salinarius*, and *Ochlerotatus japonicus*. All four of these species prefer, and almost exclusively use, artificial containers (old tires, rain gutters, birdbaths, etc.) as larval habitats. In the case of *C. pipiens*, the most notorious of the vector mosquitoes, the dirtier the water, the better they like it. The important factor is that these species do not thrive in functioning wetlands where competition for resources and predation by larger aquatic and terrestrial organisms is high.

The remaining four species, *Aedes vexans*, *Ochlerotatus Canadensis*, *O. triseriatus*, and *O. trivittatus*, are currently considered potential vectors due to laboratory tests (except the *O. trivittatus*, which did have one confirmed vector pool for West Nile Virus in PA during 2002). All four of these species prefer vernal habitats and ponded woodland areas following heavy summer rains. These species may be the greatest threat of disease transmission around stormwater basins that pond water for more than four days. This can be mitigated, however, by establishing ecologically functioning wetlands.

### **Stormwater Facilities**

If a stormwater wetland or pond is constructed properly and a diverse ecological community develops, mosquitoes should not become a problem. Wet basins and wetlands constructed as stormwater management facilities should be designed to attract a diverse wildlife community. If a wetland is planned, proper hydrologic soil conditions and the establishment of hydrophytic vegetation will promote the population of the wetland by amphibians and other mosquito predators. In natural wetlands, predatory insects and amphibians are effective at keeping mosquito populations in check during the larval stage of development while birds and bats prey on adult mosquitoes.

The design of a stormwater wetland must include the selection of hydrophytic plant species for their pollutant uptake capabilities and for not contributing to the potential for vector mosquito breeding. In particular, species of emergent vegetation with little submerged growth are preferable. By limiting the vegetation growing below the water surface, larvae lose protective cover, and there is less chance of anaerobic conditions occurring in the water.

Stormwater ponds can be designed for multiple purposes. When incorporated into an open space design, a pond can serve as a stormwater management facility and a community amenity. Aeration fountains and stocked fish should be added to keep larval mosquito populations in check.

Publications from the PA Department of Health and the Penn State Cooperative Extension concerning West Nile Virus identify aggressive public education about the risks posed by standing water in artificial containers (tires, trash cans, rain gutters, bird baths) as the most effective method to control vector mosquitoes.

## **Conclusion**

The Conservation District understands the pressure faced by municipalities when dealing with multifaceted issues such as stormwater management and encourages the incorporation of water quality management techniques into stormwater designs. As Monroe County continues to grow, conservation design, infiltration, and constructed wetlands and ponds should be among the preferred design options to reduce the impacts of increases in impervious surfaces. When designed and constructed appropriately, the runoff mitigation benefits to the community from these design options will far outweigh their potential to become breeding grounds for mosquitoes.

# **ORDINANCE APPENDIX H**

## **REFERENCES**

## REFERENCES

### BMP Manuals

#### California

California Stormwater BMP Handbook: New Development and Redevelopment (January 2003)  
– separate file available at <http://www.cabmphandbooks.org/Development.asp>

#### Georgia

Georgia Stormwater Management Manual Volume 2: Technical Handbook (August 2001)-  
separate file (<http://www.georgiastormwater.com/>)

#### Maryland

2000 Maryland Stormwater Design Manual –  
[http://www.mde.state.md.us/Programs/Waterprograms/SedimentandStormwater/  
stormwater\\_design/index.asp](http://www.mde.state.md.us/Programs/Waterprograms/SedimentandStormwater/stormwater_design/index.asp)

#### Massachusetts

Stormwater Management, Volume Two: Stormwater Technical Handbook (Massachusetts,  
1997) – separate file available at <http://www.state.ma.us/dep/brp/stormwtr/stormpub.htm>

#### Minnesota

Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold  
Climates (July 2001) –  
<http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm>

#### New Jersey

Revised Manual for New Jersey: Best Management Practices for Control of Nonpoint Source  
Pollution from Stormwater (Fifth Draft May 2000) –  
<http://www.state.nj.us/dep/watershedmgt/bmpmanual.htm>

#### New York

New York State Stormwater Management Design Manual (2001) –  
<http://www.dec.state.ny.us/website/dow/swmanual/swmanual.html>

#### Pennsylvania

Pennsylvania Department of Environmental Protection *Pennsylvania Stormwater Best  
Management Practices Manual*, Pub. No. 363-0300-002, December 30, 2006

#### Washington

Stormwater Management Manual for Western Washington (August 2001) –  
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

## Federal

Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring (FHWA) – <http://www.fhwa.dot.gov/environment/ultraurb/3fs1.htm>

USEPA Infiltration Trench Fact Sheet (September 1999) –  
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/post.cfm>

## Riparian Buffer References

Alliance for the Chesapeake Bay, Pennsylvania Department of Environmental Protection, September 2000. *Forest Buffer Toolkit*, Stream ReLeaf Program.

Penn State College of Agricultural Sciences, 1996. *Establishing Vegetative Buffer Strips Along Streams to Improve Water Quality*. Publication # AGRS-67.

Fike, Jean, June 1999. *Terrestrial & Palustrine Plant Communities of Pennsylvania*, Pennsylvania Natural Diversity Inventory, The Nature Conservancy, Western Pennsylvania Conservancy, and Pennsylvania Department of Conservation and Natural Resources.

Pennsylvania Association of Conservation Districts, Inc., Keystone Chapter, Soil and Water Conservation Society, Pennsylvania Department of Environmental Protection, Natural Resources Conservation Service, 1998. *Pennsylvania Handbook of Best Management Practices for Developing Areas*. Prepared by CH2MHill.

Palone, R. S. and A. H. Todd (eds), 1997. *Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers*. Chesapeake Bay Program and Northeastern Area State and Private Forestry. Natural Resources Conservation Service Cooperative State Research Education and Extension Services.

Rupprecht, R., Kilgore, C., and Gunther, R., “Riparian and Wetland Buffers for Water-Quality Protection.” *Stormwater* Nov.-Dec. 2009, Vol 10, No. 8: 46-51. Print.

The Federal Interagency Stream Restoration Working Group (FISRWG, 10/1998). *Stream Corridor Restoration Principles, Processes, and Practices*. GPO Item No. 0120-A; SuDocs No. A57.6/2:EN3/PT.653. ISBN-0-934213-59-3. Published October 1998. Revised August 2000.



EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

78 Attachment 9

**Township of Haverford**

**Appendix I**

**STORMWATER CONTROLS AND BEST MANAGEMENT  
PRACTICES OPERATION AND MAINTENANCE AGREEMENT**

**THIS AGREEMENT**, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_, by and between \_\_\_\_\_, (hereinafter the "Landowner"), and \_\_\_\_\_, \_\_\_\_\_ County, Pennsylvania, (hereinafter "Municipality");

**WITNESSETH**

**WHEREAS**, the Landowner is the owner of certain real property as recorded by deed in the land records of \_\_\_\_\_ County, Pennsylvania, Deed Book \_\_\_\_\_ at Page \_\_\_\_\_, (hereinafter "Property").

**WHEREAS**, the Landowner is proceeding to build and develop the Property; and

**WHEREAS**, the Stormwater Controls and BMP Operation and Maintenance Plan approved by the Municipality (hereinafter referred to as the "Plan") for the property identified herein, which is attached hereto as Appendix A and made part hereof, provides for management of stormwater within the confines of the Property through the use of Best Management Practices (BMPs); and

**WHEREAS**, the Municipality and the Landowner, his successors, and assigns agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site stormwater BMPs be constructed and maintained on the Property; and

**WHEREAS**, for the purposes of this agreement, the following definitions shall apply:

BMP – "Best Management Practice"-activities, facilities, designs, measures, or procedures used to manage stormwater impacts from land development, to protect and maintain water quality and groundwater recharge, and to otherwise meet the purposes of the municipal Stormwater Management Ordinance, including but not limited to infiltration trenches, seepage pits, filter strips, bioretention, wet ponds, permeable paving, rain gardens, grassed swales, forested buffers, sand filters, and detention basins.

- Infiltration Trench – A BMP surface structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,
- Seepage Pit – An underground BMP structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,

## HAVERFORD CODE

- Rain Garden — A BMP overlain with appropriate mulch and suitable vegetation designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or underground aquifer, and

**WHEREAS**, the Municipality requires, through the implementation of the Plan, that stormwater management BMPs as required by said Plan and the municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, his successors, and assigns.

**NOW, THEREFORE**, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The BMPs shall be constructed by the Landowner in accordance with the plans and specifications identified in the Plan.
2. The Landowner shall operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality and in accordance with the specific maintenance requirements noted on the Plan.
3. The Landowner hereby grants permission to the Municipality, its authorized agents, and employees to enter upon the property, at reasonable times and upon presentation of proper identification, to inspect the BMP(s) whenever it deems necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.
4. In the event that the Landowner fails to operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the Municipality to erect any permanent structure on the land of the Landowner. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.
5. In the event that the Municipality, pursuant to this Agreement, performs work of any nature or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred within 10 days of receipt of an invoice from the Municipality.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the on-site BMP(s) by the Landowner, provided, however, that this Agreement shall not be deemed to create or effect any additional liability on any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, and other successors in interest shall release the Municipality's employees and designated representatives from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality. In the event that a claim is asserted against the Municipality, its designated representatives, or employees, the Municipality shall promptly notify the Landowner, and the Landowner shall defend, at his own expense, any suit based on the claim. If any judgment or claims against the Municipality's employees or designated representatives shall be allowed, the Landowner shall pay all costs and expenses regarding said judgment or claim.

EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT

- 8. The Municipality shall inspect the BMP(s) at a minimum of once every three years to ensure their continued functioning.

This Agreement shall be recorded at the Office of the Recorder of Deeds of \_\_\_\_\_ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude and shall be binding on the Landowner, his administrators, executors, assigns, heirs, and any other successors in interest, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For the Municipality:

\_\_\_\_\_

(SEAL)

For the Landowner:

\_\_\_\_\_

ATTEST:

\_\_\_\_\_ (City, Borough, Township)

County of \_\_\_\_\_, Pennsylvania

I, \_\_\_\_\_, a Notary Public in and for the County and State aforesaid, whose commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, do hereby certify that \_\_\_\_\_ whose name(s) is/are signed to the foregoing Agreement bearing date of the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, has acknowledged the same before me in my said County and State.

**GIVEN UNDER MY HAND THIS** \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_.

\_\_\_\_\_  
**NOTARY PUBLIC**

\_\_\_\_\_  
**(SEAL)**

# **Riparian Buffer Trail Guidelines**

## **Introduction**

Riparian buffers are used as non-structural best management practices (BMPs) for protecting and enhancing water quality. Depending on their size, location, and design, riparian buffers often supply additional environmental, economic, aesthetic, and recreational value. Passive recreational trails can be a compatible use within riparian buffers if the trails are sized and placed appropriately. The trail guidelines below are meant to supplement Section §78-37, Water Quality Requirements, and do not alter or modify the regulations set forth in Section §78-25, General Requirements. All other applicable rules and requirements should be followed, including all federal, state, permitting, and local stormwater and floodplain ordinances.

Installing a trail does not relieve a developer or municipality of the minimum buffer and vegetation requirements described in §78-42, or infiltration and peak rate controls in Sections §78-36 and §78-39. Effort shall be made to mitigate water quality and peak rate adjacent the trail structure to avoid collecting runoff in a large facility and creating a point discharge. This can be accomplished by trail-side stone filtration trenches, vegetative filter strips, small bio-retention facilities, and other mechanisms subject to site constraints and municipal engineer approval. See Figure J-1. In situations where site constraints negate the feasibility of trail-side mitigation methods, effort shall be made to collect runoff in multiple stormwater facilities for segmented portions of the trail, in place of detaining stormwater in one large facility. Level spreaders shall be constructed at facility outlets to decrease point-source discharges.

As with all trails, adequate land acquisition, easements, and/or landowner permission should be obtained in advance of any trail placement. Care should be given when designing and installing trails so as not to compromise the buffer's ability to protect water quality. Many factors such as slope, vegetation, and soil type will determine the type, size, and placement of the trail within the riparian buffer. Heavily used trails and trails with wide impervious surfaces should be set back farther from the stream edge to help mitigate the effects of any associated increase in runoff. Note: failure to comply with these guidelines (Installing a trail with inadequate setback from the stream bank) could result in increased stormwater runoff, decreased water quality, stream bank degradation, and damage to the buffer or trail.

## **Trail Recommendations**

### **Location, Size, and Orientation**

All trails should be a reasonable width appropriate for the site conditions. It is not recommended that the width of any paved trail exceed twenty five (25) percent of the total buffer width. All trail designs and specifications are subject to approval by the municipality.

Natural vegetation must be present throughout the buffer as described in Section 306 of the ordinance. Grassy areas should be managed as meadows or be reforested and should not be mowed as lawn in any part of the buffer. Where existing vegetation is insufficient to protect water quality, additional native species should be planted to enhance the buffer.

Paved trails, if appropriate to the site, are permitted and must be located at least twenty-five (25) feet from the top of the stream bank. In limited instances, paved trails be placed closer to a stream due to topography, or in order to accommodate passive educational and recreational activities, but must always be at least ten (10) feet from the top of the stream bank. Although this can be achieved by diverting the entire trail closer to the stream, more conservative methods should be considered, such as smaller spur trails or loop trails. These smaller trails provide access to the stream, but reduce the total traffic along the sensitive stream bank.

In rare instances where the buffer width is reduced due to zoning setback or geographical constraints, the municipality should strongly consider whether the benefits of a trail outweigh the benefits of a wider buffer.

### **Signage**

The installation of interpretive and educational signage is strongly encouraged along the trail. Signs should point out local natural resources and educate the public on how riparian buffers protect the watershed. There should be minimum disturbance in the vegetated buffer between the trail and the stream. Therefore, all appurtenances (e.g. benches, educational signs, kiosks, fountains, etc.) should be installed on the landward side of the trail, if possible. All appurtenances shall be installed in compliance with federal, state, local, stormwater, floodplain, and other regulations and permitting requirements (e.g. anchoring, etc.)

### **Parking Areas**

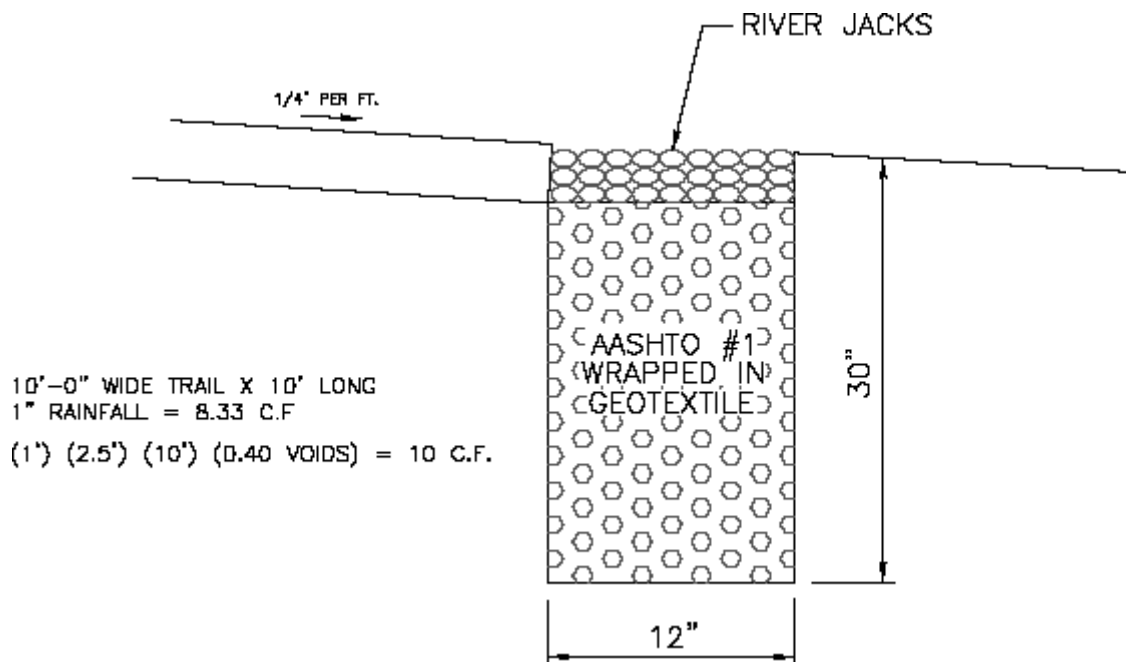
New trailheads and trail parking areas shall meet all the infiltration, rate control, and minimum setback requirements of this ordinance. Every effort should be made to coordinate trail access with existing parking areas. Any new parking areas and trailhead clearings should not encroach on the riparian buffer in any way.

### **Trail Maintenance**

The installation and maintenance of all trails should be performed in a manner that minimizes site disturbance and prevents runoff and erosion. Soil disturbance should be avoided if possible. The removal of native trees and other native vegetation should also be kept to a minimum. If large or heavy equipment is required for trail installation, special care should be given not to damage existing trees and tree roots.

**FIGURE J-1**

**EXAMPLE DESIGN OF A TRAIL-SIDE  
STONE FILTRATION TRENCH**



Source:

James MacCombie, Herbert E. MacCombie Jr. P.E. Consulting Engineers & Surveyors Inc.

**Chapter 78**

**EROSION AND SEDIMENT CONTROL; STORMWATER MANAGEMENT**

	ARTICLE I		
	Erosion and Sediment Control		
§ 78-1.	Short title.	§ 78-23.	Definitions.
§ 78-2.	Purpose <u>and Scope</u> .	§ 78-24.	General drainage plan requirements.
§ 78-3.	Erosion and sediment control plans required; <del>no-fee permit</del> <u>exceptions</u> .	§ 78-25.	Drainage plan contents.
§ 78-4.	Permit required.	§ 78-26.	Plan submission.
§ 78-5.	Application for permit; fees.	§ 78-27.	Drainage plan review.
§ 78-6.	Submission of property plan; information required.	§ 78-28.	Modification of plans.
§ 78-7.	Submission of drainage study; contents; disposal of stormwater runoff; soils investigation report.	§ 78-29.	Resubmission of inconsistent or noncompliant drainage plans.
§ 78-8.	Issuance of permit.	§ 78-30.	General requirements for stormwater management.
§ 78-9.	Performance standards.	§ 78-31.	Permit requirements by other governmental entities.
§ 78-10.	Inspections; availability and inspection of as-built plans; issuance of occupancy permit.	§ 78-32.	Erosion and sediment control during regulated earth disturbance activities.
§ 78-11.	Payment of inspection costs by applicant; deposit of sum to cover costs required.	§ 78-33.	Nonstructural project design (sequencing to minimize stormwater impacts).
§ 78-12.	Violations and penalties.	§ 78-34.	Groundwater recharge.
		§ 78-35.	Water quality requirements.
		§ 78-36.	Streambank erosion requirements.
		§ 78-37.	Stormwater peak rate control and management districts.
		§ 78-38.	Calculation methodology.
	ARTICLE II	§ 78-39.	Other requirements.
	Stormwater Management	§ 78-40.	Inspections.
§ 78-13.	Short title.	§ 78-41.	Municipality drainage plan review and inspection fee.
§ 78-14.	Statement of findings.	§ 78-42.	Expenses covered by fees.
§ 78-15.	Purpose.	§ 78-43.	Performance guarantee.
§ 78-16.	Statutory Authority.	§ 78-44.	Responsibilities for operations and maintenance of stormwater controls and BMPs.
§ 78-17.	Applicability/regulated activities.	§ 78-45.	Municipal review of a stormwater control and BMP operations and maintenance plan.
§ 78-18.	Exemptions.		
§ 78-19.	Repealer.		
§ 78-20.	Severability.		
§ 78-21.	Compatibility with other ordinances or legal requirements.		
§ 78-22.	Word usage.		

HAVERFORD CODE

<b>§ 78-46.</b>	<b>Adherence to an approved stormwater control and BMP operations and maintenance plan.</b>	<b>§ 78-51.</b>	<b>Municipal Stormwater Control and BMP Operation and Maintenance Fund.</b>
<b>§ 78-47.</b>	<b>Operations and maintenance agreement for privately owned stormwater controls and BMPs.</b>	<b>§ 78-52.</b>	<b>Prohibited discharges.</b>
<b>§ 78-48.</b>	<b>Stormwater management easements.</b>	<b>§ 78-53.</b>	<b>Prohibited connections.</b>
<b>§ 78-49.</b>	<b>Maintenance agreement for privately owned stormwater facilities.</b>	<b>§ 78-54.</b>	<b>Roof drains.</b>
<b>§ 78-50.</b>	<b>Recording of an approved stormwater control and BMP operations and maintenance plan and related agreements.</b>	<b>§ 78-55.</b>	<b>Alteration of BMPs.</b>
		<b>§ 78-56.</b>	<b>Right-of-entry.</b>
		<b>§ 78-57.</b>	<b>Public nuisance.</b>
		<b>§ 78-58.</b>	<b>Enforcement generally.</b>
		<b>§ 78-59.</b>	<b>Suspension and revocation of permits and approvals.</b>
		<b>§ 78-60.</b>	<b>Violations and penalties.</b>
		<b>§ 78-61.</b>	<b>Notification.</b>
		<b>§ 78-62.</b>	<b>Enforcement.</b>
		<b>§ 78-63.</b>	<b>Appeals.</b>

**[HISTORY: Adopted by the Board of Commissioners of the Township of Haverford as indicated in article histories. Amendments noted where applicable.]**

GENERAL REFERENCES

Department of Code Enforcement — See Ch. 4, Part 4, Art. VI.

Property maintenance — See Ch. 138.

Planning Commission — See Ch. 4, Art. VI, Division 3.

Streets and sidewalks — See Ch. 157.

Environmental performance standards — See Ch. 76.

Subdivision and land development — See Ch. 160.

Floodplains — See Ch. 89.

Zoning — See Ch. 182.



ARTICLE I  
**Erosion and Sediment Control**  
**[Adopted 2-12-1973 by Ord. No. 1505 ]**

**§ 78-1. Short title.**

This chapter shall be known and may be cited as the "Township of Haverford Erosion and Sediment Control Ordinance."

**§ 78-2. Purpose and Scope.**

A. The purpose of this chapter is to regulate the modification of the natural terrain, the alteration of drainage, the maintenance of artificial structures and surfaces and to provide for certain erosion and sediment control measures within the Township of Haverford so as to assure and safeguard health, safety, ecology and general welfare in the Township of Haverford.

A.B. Scope of provisions. New grading, excavations and fills or changes, additions, repairs or alterations made to existing excavations and fills shall conform to the provisions of this chapter, except that this chapter shall not apply to work performed by the Township in a public street or on public property.

**§ 78-3. Erosion and sediment control plans required; ~~no-fee permits~~exceptions.**

A. A grading permit will not be required in the following situation, but in all other respects the provisions of this chapter shall apply:

B. An excavation which does not exceed three feet in vertical depth at its deepest point measured from the natural ground surface nor cover an area of more than 200 square feet. This exception shall not affect the applicability of this chapter nor the requirement of a grading permit for any fill or grading made with the material from such excavation.

~~A.~~ ~~Whenever the landscape or vegetation is to be disturbed, a plan showing how erosion and sediment shall be controlled is required.~~

~~B.~~ ~~As a minimum, a plan for the following will be required in all situations:~~

~~(1)~~ ~~The amount of site alteration proposed.~~

~~(2)~~ ~~Construction timing or sequence.~~

~~(3)~~ ~~Erosion and sediment control practices, both temporary and permanent.~~

~~(4)~~ ~~Operation and maintenance arrangements for the practices.~~

~~C.~~ ~~Whenever the landscape or vegetation is to be disturbed and the proposal involves an area less than 1/2 an acre, a no-fee permit shall be required.~~

**§ 78-4. Permit required.**

A. It shall be unlawful for any person, firm or corporation to pave, fill, strip, grade or regrade any land within the Township of Haverford without first securing a permit as hereunder provided, except as otherwise stated in 78-3.

B. It shall be unlawful for any person, firm or corporation to disturb, modify, block, divert or affect the

natural overland or subsurface flow of stormwater within the Township of Haverford without first securing a permit as hereunder provided.

- C. It shall be unlawful for any person, firm or corporation to construct, erect or install any drainage dam, ditch, culvert, drainpipe, bridge or any other structure or obstruction affecting the drainage of any premises in the Township of Haverford without first securing a permit as hereunder provided.

**§ 78-5. ~~Application for permit; fees.~~ Permit Application.**

A. Any person, firm or corporation proposing to engage in an activity requiring a permit hereunder shall apply for a permit by written application on a form furnished by the Township of Haverford.

~~A.~~ \_\_\_\_\_

~~B.~~ ~~Proof of application for permit shall be submitted to the Township of Haverford Planning Commission simultaneously with preliminary plans to be considered for subdivision/development review.<sup>1</sup>~~

~~C.~~ ~~The developer is encouraged to consult the general development plans and detailed plans of any unit of government that affect the tract to be developed and the area surrounding it before he submits a preliminary plan for review. He should also become acquainted with the Zoning Ordinance and other ordinances which regulate the development of land in the Township of Haverford.<sup>2</sup>~~

D.B. A separate application shall be required for each grading permit. ~~Three copies~~ Two hard copies and one digital copy of the proposed plan, including specifications and timing schedules, shall be submitted with each application for a permit. ~~One of the copies, at the discretion of the Director of Code Enforcement, shall be submitted to the Delaware County Conservation District for comment and review.~~ [Amended 6-30-1986 by Ord. No. 1960 ]

E.C. Applications for review required under this chapter shall be accompanied by a review fee as fixed by resolution of the Board of Commissioners, which may be amended from time to time. [Amended 2-8-1993 by Ord. No. 2168 ]

F.D. All applications for a permit involving an area of disturbance greater than ~~one acre~~ 500 square feet shall be accompanied by a ~~bond or~~ escrow deposit, to the benefit of the Township of Haverford in an amount as provided by Township resolution. ~~The form of the bond or escrow account shall first be approved by the Township Solicitor, which shall guarantee the full and complete compliance with this chapter.~~ [Amended 2-8-1993 by Ord. No. 2168 ]

**§ 78-6. Submission of property plan; information required.**

The application for a permit shall be accompanied by a plan of the property showing:

A. A boundary line survey of the site on which the work is to be performed, showing the existing and proposed contours of the land and the proposed contours after completion of proposed grading.

B. A description of the features, existing and proposed, surrounding the site which are of importance to the proposed development, including the nature of fill material and trees to be removed as a result of the proposed construction.

C. ~~A description of the general topographic and soil conditions, including drainage, on the site available through the Delaware County Conservation District.~~ Description of the type and classification of the soil.

D. Details and location of any proposed drainage structures and pipes.

E. The lowest floor elevation of any proposed building based upon North American Vertical Datum of 1988 and the elevation of the one-hundred-year flood.

D.F. The location and description of existing and future manmade features of importance to the proposed development, i.e., cuts and fills, buildings, roads, etc.

E.G. Plans and specifications of soil erosion and sediment control measures in accordance with standards and specifications of the Delaware County Conservation District or the Township of Haverford.

F.H. A time schedule indicating the anticipated starting and completion dates of the development sequence and the time of exposure of each area prior to the completion of effective erosion and sediment control measures.

I. All plans and specifications accompanying applications for permits shall include provisions for both interim (temporary) and ultimate (permanent) erosion and sediment control.

(1) The design, installation and maintenance of erosion and sediment control measures shall be accomplished in accordance with standards and specifications established by the Delaware County Conservation District as adapted from standards and specifications of the Soil Conservation Service, United States Department of Agriculture.

(2) Technical standards for the design and installation of erosion and sediment control measures are on file with the Township of Haverford office, the office of the Delaware, County Conservation District and other governmental agency offices.

(3) Standards and specifications adopted for the purposes of this chapter and by the Delaware County Conservation District include but are not limited to the following basic conservation measures:

(a) Temporary cover on critical areas.

(b) Permanent grass and cover on critical areas on prepared seedbed.

(c) Permanent grass and cover on critical areas on unprepared seedbed.

(d) Sodding.

(e) Mulching.

(f) Temporary diversion.

(g) Permanent diversion.

(h) Grassed waterway or outlet.

(i) Grade stabilization structure.

(j) Debris basin.

(k) Drain.

(l) Drainage, main or lateral.

**§ 78-7. Submission of drainage study; contents; disposal of stormwater runoff; soils investigation report. [Amended 2-15-2005 by Ord. No. 2439 ]**

A. Stormwater management plans shall be as required in this chapter.

(1) The application for a permit shall be accompanied by a plan of the property showing the location of all present and proposed ditches, streams, pipes and other drainage structures and proposed cuts and fills. In addition to showing present elevations and dimensions and location and extent of all proposed grading and/or drainage, the plan shall clearly indicate all buildings, parking areas and driveways. Further, the plan shall indicate the present and proposed sources, storage

and disposition of water being channeled through or across the premises, together with elevations, gradients and maximum flow rates. The application shall describe the work to be performed, the materials to be used and the manner or method of performance, including provisions for protecting and maintaining existing drainage facilities whether on public or private property. The applicant shall supply data supporting the plan developed by a registered professional civil engineer or an engineer qualified in hydrology.

(2) Stormwater management plans shall be prepared in accordance with this chapter.

B. The following provisions apply to the carrying and disposal of stormwater runoff:

(1) The applicant shall agree to the granting and recording of easements for drainage facilities, including acceptance of the discharge of water on the property of others, provisions for maintenance of slopes and swales and access for the maintenance of anti-erosion facilities.

C. If load-bearing fill is proposed, a soils investigation report shall be submitted, which shall consist of test borings, laboratory testings and engineering analysis to correlate surface and subsurface conditions with the proposed grading plan. The results of the investigation shall be presented in a report by a registered professional soils engineer or geologist, which shall include data regarding the nature, distribution and supporting ability of existing soils and rocks on the site, conclusions and recommendations to ensure stable soil conditions and groundwater control, as applicable. The Township of Haverford may require such supplemental reports and data as it deems necessary. Recommendations included in such reports and approved by the Township of Haverford shall be incorporated in the plan or specifications.

(1) Fills toeing out on natural slopes steeper than four horizontal to one vertical shall not be made unless approved by the Township of Haverford after receipt of a report, deemed acceptable by the Township of Haverford Engineer, by a registered professional soils engineer certifying that he has investigated the property, made soil tests and that, in his opinion, such steeper slopes will safely support the proposed fill.

(2) Natural and/or existing slopes exceeding five horizontal to one vertical shall be benched or continuously stepped into competent materials prior to placing all classes of fill.

#### **§ 78-8. Issuance of permit. [Amended 6-30-1986 by Ord. No. 1960 ]**

Upon the submission of an application which conforms to the provisions of this chapter, the Director of Code Enforcement or their designee, after consultation with the Township of Haverford Engineer, shall issue the necessary permit.

#### **§ 78-9. Performance standards.**

A. Notwithstanding any provision of this chapter or any condition of the permit, the permittee is responsible for the prevention of damage to other property or personal injury which may be affected by the activity requiring a permit.

B. No person, firm or corporation shall modify, fill, excavate, pave, grade or regrade land in any manner so close to a property line as to endanger or damage any adjoining street, sidewalk, alley or any other public or private property without supporting and protecting such property from settling, cracking, erosion, sediment or other physical damage or personal injury which might result.

C. No person, firm or corporation shall deposit or place any debris or any other material whatsoever or to cause such to be thrown or placed in any drainage ditch or drainage structure in such a manner as to obstruct free flow.

D. No person, firm or corporation shall fail to adequately maintain in good operating order any drainage facility on his premises. All drainage ditches, culverts, drainpipes and drainage structures shall be kept

open and free-flowing at all times.

- E. The owner of any property on which any work has been done pursuant to a permit granted under this chapter shall continuously maintain and repair all graded surfaces and antierosion devices, retaining walls, drainage structures or means and other protective devices, plantings and ground cover installed or completed.
- F. All graded surfaces shall be seeded, sodded and/or planted or otherwise protected from erosion within 60 days and shall be watered, tended and/or maintained until growth, in the case of vegetation, is well established. The disturbed area and duration of exposure shall be kept to a practical minimum.
- G. All trees in the area of extreme grade change shall be removed unless protected with suitable tree wells. However, extreme precautions shall be taken to prevent the unnecessary removal of trees.
- H. When required, adequate provisions shall be made for dust control measures as are deemed acceptable by the Township of Haverford.

~~I. All plans and specifications accompanying applications for permits shall include provisions for both interim (temporary) and ultimate (permanent) erosion and sediment control.~~

~~(1) The design, installation and maintenance of erosion and sediment control measures shall be accomplished in accordance with standards and specifications established by the Delaware County Conservation District as adapted from standards and specifications of the Soil Conservation Service, United States Department of Agriculture.~~

~~(2) Technical standards for the design and installation of erosion and sediment control measures are on file with the Township of Haverford office, the office of the Delaware County Conservation District and other governmental agency offices.~~

~~(3) Standards and specifications adopted for the purposes of this chapter and by the Delaware County Conservation District include but are not limited to the following basic conservation measures:~~

~~(a) Temporary cover on critical areas.~~

~~(b) Permanent grass and legume cover on critical areas on prepared seedbed.~~

~~(c) Permanent grass and legume cover on critical areas on unprepared seedbed.~~

~~(d) Sodding.~~

~~(e) Mulching.~~

~~(f) Temporary diversion.~~

~~(g) Permanent diversion.~~

~~(h) Grassed waterway or outlet.~~

~~(i) Grade stabilization structure.~~

~~(j) Debris basin.~~

~~(k) Drain.~~

~~(l) Drainage, main or lateral.~~

J.I. A quality control program is critical for fills, therefore, whenever fill material is to be used, each layer of compacted fill should be tested to determine its dry density as per ASTM D 1556. The density of each layer should not be less than 95% of maximum dry density as determined by ASTM D 1557.

- (1) Inspection procedure shall follow the general procedure as stated in § 78-10.
- (2) Compaction test reports shall be kept on file at the site and shall be subject to review at all times.
- (3) The degree of compaction required shall be determined by the Township of Haverford Engineer following the guidelines in Subsection J above.
- (4) Where the provisions of Subsection J are determined to be inapplicable, they may be waived by the Township of Haverford Engineer.

**§ 78-10. Inspections; availability and inspection of as-built plans; issuance of occupancy permit.**

A. The Township Engineer shall, when requested by the Director of Code Enforcement or their designee, make inspections hereinafter required and shall either approve that portion of the work which has been completed or notify the permit holder wherein the same fails to comply with the provisions of this chapter. Where it is found by inspection that the conditions are not as stated or shown in the application, the Township Engineer may refuse to approve further work until approval is obtained for a revised grading plan.

B. Plans for the grading work shall be approved by the Township Engineer and shall be maintained at the site during the progress of the grading work and until the work has been approved.

C. The permit holder shall notify the Township Engineer in order to obtain inspections, in accordance with the following schedule, at least 48 hours before the inspection is to be made:

(1) Initial inspection. When work on the excavation or fill is about to be commenced.

(2) Rough grading. When all rough grading has been completed.

(3) Drainage facilities. When drainage facilities are to be installed and before such facilities are backfilled.

(4) Special structures. When excavations are complete for retaining and crib walls, and when reinforcing steel is in place and before concrete is poured.

(5) Final inspection. When all work, including the installation of all drainage and other structures, has been completed.

D. If at any of the work the Township Engineer shall determine by inspection that the nature of the grading is not in accordance with the approved permit or is not functioning as designed and/or is likely to endanger property or streets or alleys or create hazardous conditions, the Township Engineer may require, as a condition to allowing the work to be done, that such reasonable safety precautions be taken as the Township Engineer considers advisable to avoid such likelihood of danger. Safety precautions may include but shall not be limited specifying a flatter exposed slope, construction or additional drainage facilities, berms, terracing, compaction or cribbing.

~~A. All inspections shall be the responsibility of the Director of Code Enforcement or his qualified designee. [Amended 6-30-1986 by Ord. No. 1960]~~

~~B. Inspections will be carried out on a random basis, except as stated in Subsection E of this section. However, a set of as-built plans shall be on file at the site and authenticated by a registered professional engineer. When it is deemed acceptable to the Director of Code Enforcement, a designated qualified person may authenticate the as-built plans and will assume full responsibility for quality of work. [Amended 6-30-1986 by Ord. No. 1960]~~

~~C.E. Any and all as-built plans shall be available on the site at all times and be subject to inspection and inquiry.~~

~~D. Engineering check notes shall accompany all as-built plans which involve structural or mechanical~~

~~measures and shall serve as supporting evidence that structures meet design standards and specifications.~~

~~E.F. A final inspection shall be conducted by the Director of Code Enforcement to certify compliance with this chapter.~~ Satisfactory compliance with this chapter shall be necessary before issuance of an occupancy permit. ~~[Amended 6-30-1986 by Ord. No. 1960]~~

**§ 78-11. Payment of inspection costs by applicant; deposit of sum to cover costs required. [Amended 6-30-1986 by Ord. No. 1960 ]**

All applicants shall bear all cost of inspections required hereunder and shall deposit with the Director of Finance such sum as the Director of Code Enforcement shall determine to be necessary to guarantee payment of the cost of such inspections.

**§ 78-12. Violations and penalties. [Amended 6-13-1988 by Ord. No. 2019 ; 3-12-2012 by Ord. No. 2660 ]**

Any person, firm or corporation violating any provision of this chapter shall, upon summary conviction before any District Justice of the Peace, pay a fine not exceeding \$1,000 and costs of prosecution; and in default of one payment of the fine and costs, the violator may be sentenced to the county jail for a term of not more than 90 days. Each and every day in which any person, firm or corporation shall be in violation of this chapter shall constitute a separate offense.



# Chapter 78

## Erosion and Sediment Control; Stormwater Management

### Article II Stormwater Management General Provisions

#### § 78-13 Short Title.

This Ordinance shall be known and may be cited as the “Township of Haverford Stormwater Management Ordinance.”

#### § 78-14 Statement of Findings.

The Board of Commissioners of Haverford Township finds that:

- A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases runoff volumes, 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 *upstream and* downstream communities, reduces ~~groundwater recharge~~ *infiltration*, threatens public health and safety, and increases nonpoint source pollution of water resources.
- B. Inadequate planning and management of stormwater runoff resulting from land development throughout a watershed can also harm surface water resources by changing the natural hydrologic patterns, accelerating stream flows (which increase scour and erosion of streambeds and streambanks, thereby elevating sedimentation), destroying aquatic habitat, and elevating aquatic pollutant concentrations and loadings such as sediments, nutrients, heavy metals, and pathogens. Groundwater resources are also impacted through loss of recharge.
- C. A comprehensive program of stormwater management (SWM), including *minimization of impacts of development, redevelopment*, ~~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.
- D. Stormwater is an important water resource that ~~provides groundwater recharge~~ *by providing infiltration* for water supplies and supports the base flow of streams, which also protects and maintains surface water quality.
- E. Impacts from stormwater runoff can be minimized by using project designs that maintain the natural hydrologic regime and sustain high water quality, *infiltration* ~~groundwater recharge~~, stream baseflow, and aquatic ecosystems. The most cost-effective and environmentally advantageous way to manage stormwater runoff is through nonstructural project design that minimizes impervious surfaces and sprawl, avoids sensitive areas (i.e., stream buffers, floodplains, steep slopes), and considers



topography and soils to maintain the natural hydrologic regime.

- F. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.
- G. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES) program.
- H. Nonstormwater discharges to municipal separate storm sewer systems can contribute to pollution of waters of the commonwealth by Haverford Township.

***I. The use of green infrastructure and low impact development (LID) are intended to address the root cause of water quality impairment by using systems and practices which use or mimic natural processes to: 1) infiltration and recharge, 2) evapotranspire, and/or 3) harvest and use precipitation near where it falls to earth. Green infrastructure practices, LID, and Cluster Development (CD) contribute to the restoration or maintenance of pre-development hydrology.***

**§ 78-15 Purpose.**

~~The purpose of this Ordinance is to promote public health, safety, and welfare within the Township of Haverford by maintaining the natural hydrologic regime and minimizing the impacts described in §78-14 of this article through provisions designed to;~~ ***The purpose of this ordinance is to promote the public health, safety, and general welfare, property, and water quality by implementing drainage and stormwater management practices, criteria, and provisions included herein for land development, construction, and Earth Disturbance Activities, to achieve the following throughout the Township:***

- A. Promote alternative project designs and layouts that minimize the impacts on surface and groundwater.
- B. Promote nonstructural best management practices (BMPs).
- C. Minimize increases in runoff stormwater volume.
- D. Minimize impervious surfaces.
- E. Manage accelerated stormwater runoff and erosion and sedimentation problems and stormwater runoff impacts at their source by regulating activities that cause these problems.
- F. Provide review procedures and performance standards for stormwater planning and management.
- G. Utilize and preserve existing natural drainage systems as much as possible.
- H. Manage stormwater impacts close to the runoff source, requiring a minimum of structures and relying on natural processes.
- I. Focus on infiltration of stormwater to maintain base flow, to prevent degradation of surface and groundwater quality, and to otherwise protect water resources.
- J. Protect base flows and quality of streams and watercourses, where possible.

- K. Meet legal water quality requirements under state law, including regulations at 25 Pennsylvania Code Chapter 93.4a ~~requiring protection and maintenance of “existing uses” and maintenance of the level of water quality to support those uses in all streams, and the protection and maintenance of water quality in “special protection” streams~~ ***to protect, maintain, reclaim, and restore the existing and designated uses of the Waters of the Commonwealth.***
- L. Address the quality and quantity of stormwater discharges from the development site.
- M. Provide a mechanism to identify stormwater controls necessary ***standards to meet certain*** NPDES ***MS4*** permit requirements.
- N. Implement an illicit discharge detection and elimination program that addresses non-stormwater discharges into the Municipality’s separate storm sewer system (***MS4***).
- O. Preserve the flood-carrying capacity of streams.
- P. ***Protect water quality by removing and/or treating pollutants prior to discharge to ground- and surface waters throughout Haverford Township, and to protect, restore, and maintain the chemical, physical, and biological quality of ground and surface waters.***
- Q. ***Reduce flooding impacts and prevent a significant increase in surface runoff rates and volumes, pre-development to post-development, which could worsen flooding downstream in the watershed, enlarge floodplains, erode stream banks, and create other flood-related health, welfare or property losses; in general, to preserve and restore the natural flood-carrying capacity of streams and their floodplains.***
- R. Prevent accelerated scour, erosion and sedimentation of stream channels.
- S. Provide performance standards and design criteria based on watershed-wide stormwater management planning.
- T. Provide proper operation and maintenance of all permanent stormwater management facilities and BMPs that are implemented within the Township.
- U. ***Implement the requirements of Total Maximum Daily Loads (TMDLs) where applicable to waters within or impacted by the Township.***

§ 78-16 **Statutory Authority.**

The Township is empowered or required to regulate land use activities that affect runoff and surface and groundwater quality and quantity by the authority of :

- A. Act of October 4, 1978, 32 P.S., P.L. 864 (Act 167) § 680.1 et seq., as amended, the "Stormwater Management Act" (hereinafter referred to as "the Act");
- B. Water Resources Management Act of 2002, as amended;
- C. ~~Second Class Township Code, 53 P.S. §§66501 et. Seq., as amended;~~

~~D. Pennsylvania Municipalities Planning Code, Act 247, as amended.~~

*E. First Class Township Code, 53, Section 55101 et seq;*

*F. Act of July 31, 1968, P.L. 805, No. 247, Pennsylvania Municipalities Planning Code, Act 247, as amended.*

§ 78-17 **Applicability/regulated activities.**

*All regulated activities and all activities that may affect stormwater runoff, including but not limited to land development, redevelopment, and earth disturbance activity located within the municipality, are subject to regulation by this Ordinance.*

- A. This article shall apply to all areas of Haverford Township.
- B. This article shall only apply to permanent structural and nonstructural stormwater management BMPs constructed as part of any of the regulated activities listed in this section.
- C. This article contains only the stormwater management performance standards and design criteria that are necessary or desirable from a watershed-wide perspective. Local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.) shall continue to be regulated by the applicable municipal ordinances and applicable state regulations.
- D. The following activities are defined as "regulated activities" and shall be regulated by this article unless exempted by § **78-18**:
  1. Land development.
  2. Subdivisions.
  3. Alteration of the natural hydrologic regime.
  4. Construction or reconstruction of or addition of new impervious surfaces (i.e., driveways, parking lots, roads, etc.).
  5. Construction of new buildings or additions to existing buildings.
  6. Redevelopment.
  7. Diversion piping or encroachments in any natural or man-made channel.
  8. Nonstructural and structural stormwater management BMPs or appurtenances thereto.

9. Earth disturbance activities of greater than 5,000 square feet.
10. Earth disturbances within 50 feet of other sensitive environmental features, such as streams, ponds, lakes and wetlands.
11. Any of the above regulated activities which were approved more than five years prior to the effective date of this article and resubmitted for municipal approval.

Table 105.1 summarizes the applicability requirements of the ordinance. "~~Proposed~~ **Regulated** impervious surface" in Table 105.1 includes new, additional, or replacement impervious surface/cover. Repaving existing surfaces without reconstruction does not constitute "replacement."

#### § 78-18 Exemptions.

*Exemptions for land use activities. An exemption shall not relieve the Applicant from implementing the requirements of the municipal Ordinance or from implementing such measures as are necessary to protect public health, safety, and property. An exemption shall not relieve the Applicant from complying with the special requirements for watersheds draining to identified high quality (HQ) or exceptional value (EV) waters or any other current or future state or municipal water quality protection requirements. If a drainage problem is documented or known to exist downstream of, or is expected from the proposed activity, then the Municipality may withdraw exemptions listed in Table 105.1 and require the Applicant to comply with all requirements of this Ordinance. Even though the Applicant is exempt, he is not relieved from complying with other municipal ordinances or regulations.*

*Table 105.1 summarizes the exemptions from certain provisions of this Ordinance. Exemptions are for the items noted in Table 105.1 only, and shall not relieve the Applicant from other applicable sections of this Ordinance.*

*Any regulated activity that is exempt from some provisions of the Ordinance is exempt only from those provisions. If development is to take place in phases, the developer is responsible for implementing the requirements of the Ordinance as the impervious cover/earth disturbance threshold is met. The date of the municipal Ordinance adoption shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area and earth disturbance computations shall be cumulatively considered. Exemption shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, and property. For example:*

*If a property owner proposed a 150 square foot shed after adoption of the municipal stormwater management ordinance, that property owner be exempted from the water quality and quantity requirements of the ordinance as noted in Table 105.1 of the ordinance. If, at a later date, the property owner proposes to construct a 499 square foot room addition, the applicant would be required to comply with the requirements for the Simplified Method for the full 649 square feet of impervious cover created since adoption of the municipal ordinance. If an additional 700 square*

*foot swimming pool/patio is proposed later, the property owner would be required implement the full stormwater quantity and quality control submission requirements of this ordinance for the total 1, 349 square feet of additional impervious surface added to the original property since adoption of the municipal ordinance.*

A. Exemptions for land use activities. The following land use activities are exempt from the drainage plan submission requirements of this article:

- (1) Use of land for gardening for home consumption.
- (2) Agriculture when operated in accordance with a conservation plan, nutrient management plan, or erosion and sedimentation control plan approved by the County Conservation District, including activities such as growing crops, rotating crops, tilling of soil, and grazing animals. Installation of new or expansion of existing farmsteads, animal housing, waste storage, and production areas having impervious surfaces that result in a net increase in earth disturbance of greater than 5,000 square feet shall be subject to the provisions of this article.
- (3) ***High Tunnel if:***
  - a. ***The High Tunnel or its flooring does not result in an impervious surface exceeding 25% of all structures located on the Landowner's total contiguous land area; and***
  - b. ***The High Tunnel meets one of the following:***
    - i. ***The High Tunnel is located at least 100 feet from any perennial stream or watercourse, public road, or neighboring property line.***
    - ii. ***The High Tunnel is located at least 35 feet from any perennial stream or watercourse, public road or neighboring property line and located on land with a slope not greater than 7%.***
    - iii. ***The High Tunnel is supported with a buffer or diversion system that does not directly drain into a stream or other watercourse by managing stormwater runoff in a manner consistent with the requirements of Pennsylvania Act 167.***
- (4) Forest management operations which are following the Department of Environmental Protection's (DEP) management practices contained in its publication "Soil Erosion and Sedimentation Control Guidelines for Forestry" and are operating under an approved erosion and sedimentation plan and must comply with the stream buffer requirements in § 78-42.
- (4) Road replacement, development, or redevelopment that has less than 1,000 square feet of new, additional, or replaced impervious surface/cover, or in the case of earth disturbance only, less than 5,000 square feet of disturbance, is exempt from this article.
- (5) ***Repaving without reconstruction.***

B. Exemptions for land development activities.

- (1) The following land development and earthmoving activities are exempt from the drainage plan

submission requirements of this article.

- (a) A maximum of ~~1,000~~ 500 square feet of new, additional, or replacement proposed impervious surface.
- (b) Up to a maximum of 5,000 square feet of disturbed earth.
- (2) These criteria shall apply to the total development even if the development is to take place in phases. The date of the municipal ordinance adoption shall be the starting point from which to consider tracts as "parent tracts" upon which future subdivisions and respective earth disturbance computations shall be cumulatively considered.

The activities exempted above are still encouraged to implement the stormwater management practices as indicated in Appendix B.

- (3) The developer should first determine if the proposed activity will result in the introduction of ~~1,000~~ 500 square feet or more of new, additional, or replacement impervious surface. If not, the developer should next determine if the proposed activity will involve earthmoving of over 5,000 square feet. If not, then the project is exempt from the drainage plan requirements. Examples:
  - (a) A project introducing ~~1,100~~ 500 square feet of impervious cover, but only 4,900 square feet of earthmoving is regulated by this article.
  - (b) A project involving 5,100 square feet of earthmoving, but resulting in ~~900~~ 400 square feet of impervious cover is regulated.
  - (c) A project introducing ~~900~~ 400 square feet of impervious cover and involving 4,900 square feet of earthmoving is exempt from the drainage plan requirements of this article.

C. Additional exemption criteria:

- (1) Exemption responsibilities. An exemption shall not relieve the applicant from implementing such measures as are necessary to protect public health, safety, and property.
- (2) HQ and EV streams. An exemption shall not relieve the applicant from meeting the special requirements for watersheds draining to identified high quality (HQ) or exceptional value (EV) waters and source water protection areas (SWPA) and requirements for nonstructural project design sequencing (§ 78-33).
- (3) Drainage problems. If a drainage problem is documented or known to exist downstream of or is expected from the proposed activity, then Haverford Township may require the applicant to comply with this article.
- (4) Emergency exemption. Emergency maintenance work performed for the protection of public health, safety, and welfare. A written description of the scope and extent of any emergency work performed shall be submitted to the Township of Haverford within two calendar days of the commencement of the activity. If the Township of Haverford finds that the work is not an emergency, then the work shall cease immediately, and the requirements of this article shall be addressed as applicable.

- (5) Maintenance exemption. Any maintenance to an existing stormwater management system made in accordance with plans and specifications approved by the municipal Engineer or the Township of Haverford.
- (6) Even though the developer is exempt, he/she is not relieved from complying with other regulations.

**§78-19 Repealer.**

Any other ordinance provision(s) or regulation of the municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

**§ 78-20 Severability.**

~~Any ordinance or ordinance provision of Haverford Township inconsistent with any of the provisions of this article is hereby repealed to the extent of the inconsistency only.~~ *In the event that a court of competent jurisdiction declares any section or provision of this ordinance invalid, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.*

**§ 78-21 Compatibility with other ordinances or legal requirements.**

- A. Approvals issued and actions taken under this Ordinance do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other code, law, regulation or ordinance.
- B. To the extent that this article imposes more rigorous or stringent requirements for stormwater management, the specific requirements contained in this article shall be followed.
- C. Nothing in this article shall be construed to affect any of Haverford Township's requirements regarding stormwater matters that do not conflict with the provisions of this article, such as local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.). Conflicting provisions in other municipal ordinances or regulations shall be construed to retain the requirements of this article addressing state water quality requirements. *The requirements of this ordinance shall supersede any conflicting requirements in other municipal ordinances or regulations.*

***§ 78-22 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 Township purporting to validate such a violation.*

***§ 78-23 Waivers.***

- A. *If the Township determines that any requirement under this Ordinance cannot be achieved for a particular regulated activity, the Township may, after an evaluation of alternatives, approve measures other than those in this Ordinance, subject to Section § 78-22, Waivers; paragraphs B and C.*



- B. Waivers or modifications of the requirements of this Ordinance may be approved by the Township if enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that the modifications will not be contrary to the public interest and that the purpose of the Ordinance is preserved. Cost or financial burden shall not be considered a hardship. Modification may be considered if an alternative standard or approach will provide equal or better achievement of the purpose of the Ordinance. A request for modifications shall be in writing and accompany the Stormwater Management Site Plan submission. The request shall provide the facts on which*
- C. the Stormwater Management Site Plan submission. The request shall provide the facts on which*
- D. mwater Management Site Plan submission. The request shall provide the facts on which*
- E. No waiver or modification of any regulated stormwater activity involving earth disturbance greater than or equal to one acre may be granted by the Township unless that action is approved in advance by the Department of Environmental Protection (DEP) or the Delaware County Conservation District.*

§ 78-24 **Word Usage.**

For the purposes of this article, certain terms and words used herein shall be interpreted as follows:

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.
- B. The word "includes" or "including" shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.
- C. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, unit of government, or any other similar entity.
- D. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.
- E. The words "used" or "occupied" include the words "intended, designed, maintained, or arranged to be used, occupied, or maintained."

As used in this article, the following terms shall have the meanings indicated:

**ACCELERATED EROSION**

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

**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.

## **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.

## **APPLICANT**

A landowner, developer, or other person who has filed an application to the municipality for approval to engage in any regulated activity at a project site in the municipality.

## **AS-BUILT DRAWINGS**

Engineering or site drawings maintained by the contractor as he constructs the project and upon which he documents the actual locations of the building components and changes to the original contract documents. These documents, or a copy of same, are turned over to the municipal Engineer at the completion of the project.

## **BANKFULL**

The channel at the top-of-bank or point from where water begins to overflow onto a floodplain.

## **BASEFLOW**

Portion of stream discharge derived from groundwater; the sustained discharge that does not result from direct runoff or from water diversions, reservoir releases, piped discharges, or other human activities.

## **BEST MANAGEMENT PRACTICES (BMP)**

~~Methods, measures, or practices used to prevent or reduce surface runoff and/or water pollution, including but not limited to structural and nonstructural stormwater management practices and operation and maintenance procedures. See also “nonstructural best management practices (BMPs)”.~~ *Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities, to meet state water quality requirements, to promote infiltration, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: “structural” or “nonstructural.” In this Ordinance, nonstructural BMPs or measures include certain low impact development practices used to minimize the contact of pollutants with stormwater runoff. These practices aim to limit the total volume of stormwater runoff and manage stormwater at its source by techniques such as protecting natural systems and incorporating existing landscape features. Nonstructural BMPs include, but are not limited to, low impact development practices such as the protection of sensitive and special value features such as wetlands and riparian areas, the preservation of open space while clustering and concentrating development, the reduction of impervious cover, and the disconnection of rooftops from storm sewers. Structural BMPs are those that consist of a physical to capture and treat stormwater 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, bioretention, wet ponds, permeable paving, grassed swales, riparian buffers, sand filters, detention basins, and manufactured devices. Structural and nonstructural stormwater BMPs are permanent appurtenances to the project site.*

## **BIORETENTION**

A stormwater retention area that utilizes woody and herbaceous plants and soils to remove pollutants before infiltration occurs.

## **BUFFER**

~~The area of land immediately adjacent to any stream, measures perpendicular to and horizontally from the top of bank on both sides of a stream (see “top of bank”)~~ *See “Riparian Buffer”.*

## **CHANNEL**

An open drainage feature through which stormwater flows. Channels include, but shall not be limited to, natural and man-made drainageways, swales, streams, ditches, canals, and pipes flowing partly full.

## **CHANNEL EROSION**

The widening, deepening, or headward cutting of channels and waterways caused by stormwater runoff or bankfull flows.

## **CISTERN**

An underground reservoir or tank for storing rainwater.

## **CONSERVATION DISTRICT**

~~A conservation district, as defined in Section 3© of the Conservation District Law (3 P. S. § 851(e)) 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.~~ *The Delaware County Conservation District.*

## **CONVEYANCE**

~~A facility or structure used for the transportation or transmission of something from one place to another.~~ *A natural or manmade, existing, or proposed Stormwater Management Facility, feature or channel used for the transportation or transmission of stormwater from one place to another. For the purposes of this Ordinance, Conveyance shall include pipes, drainage ditches, channels, and swales (vegetated and other), gutters, stream channels, and like facilities or features.*

## **CULVERT**

A structure with its appurtenant works which carries water under or through an embankment or fill.

## **DAM**

A man-made barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid. A dam may include a refuse bank, fill, or structure for highway, railroad, or other purposes which impounds or may impound water or another fluid or semifluid.

## **DEPARTMENT**

The Pennsylvania Department of Environmental Protection. *Also referred to as “DEP”, “PA DEP” or “PADEP”.*

#### **DESIGNEE**

The agent of the Delaware County Planning *Department*, Delaware County Conservation District, and/or agent of the governing body involved with the administration, review, or enforcement of any provisions of this article by contract or memorandum of understanding.

#### **DESIGN PROFESSIONAL (QUALIFIED)**

A Pennsylvania-registered professional engineer, registered landscape architect, or registered professional land surveyor trained to develop stormwater management plans, *or any person licensed by the Pennsylvania Department of State or qualified by law to perform the work required by the ordinance.*

#### **DESIGN STORM**

The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a five-year storm) and duration (e.g., 24 hours), used in the design and evaluation of stormwater management systems. Also see Return Period.

#### **DETENTION BASIN**

An impoundment designed to collect and retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate. Detention basins are designed to drain completely soon after a rainfall event and become dry until the next rainfall event.

#### **DETENTION VOLUME**

The volume of runoff that is captured and released into the waters of the Commonwealth at a controlled rate.

#### **DEVELOPER**

A person, *or company, or organization* who seeks to undertake any regulated earth disturbance activities at a project site in Haverford Township.

#### **DEVELOPMENT, LAND**

Any human-induced change to improved or unimproved real estate, whether public or private, including but not limited to land development, construction, installation, or expansion of a building or other structure, land division, street construction, drilling, and site alteration, such as embankments, dredging, grubbing, grading, paving, parking or storage facilities, excavation, filling, stockpiling, or clearing. As used in this article, development encompasses both new development and redevelopment.

#### **DEVELOPMENT SITE (SITE)**

See Project Site.

#### **DIAMETER AT BREAST HEIGHT (DBH)**

The outside bark diameter at breast height which is defined as 4.5 feet (1.37m) above the forest floor on

the uphill side of the tree.

**DIFFUSED DRAINAGE DISCHARGE**

Drainage discharge that is not confined to a single point location or channel, including sheet flow or shallow concentrated flow.

**DISCHARGE**

- A. (verb) To release water from a project, site, aquifer, drainage basin, or other point of interest;
- B. (noun) The rate and volume of flow of water such as in a stream, generally expressed in cubic feet per second (see "peak discharge").

**DISCHARGE POINT**

The point of discharge for a stormwater facility.

**DISTURBED AREAS**

An unstabilized land area where an earth disturbance activity is occurring or has occurred.

**DITCH**

A man-made waterway constructed for irrigation or stormwater conveyance purposes.

**DOWNSLOPE PROPERTY LINE**

That portion of the property line of the lot, tract, or parcels of land being developed, located such that overland or pipe flow from the project site would be directed towards it by gravity.

**DRAINAGE CONVEYANCE FACILITY**

A stormwater management facility designed to transport stormwater runoff that includes channels, swales, pipes, conduits, culverts, and storm sewers.

**DRAINAGE EASEMENT**

A right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

~~**DRAINAGE PERMIT**~~

~~A permit issued by Haverford Township after the drainage plan has been approved.~~

~~**DRAINAGE PLAN**~~

~~The documentation of the stormwater management system, if any, to be used for a given development site, the contents of which are established in § 78\_\_\_\_\_.~~

**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; road maintenance; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

## **EMERGENCY SPILLWAY**

A conveyance area that is used to pass peak discharge greater than the maximum design storm controlled by the stormwater facility.

## **ENCROACHMENT**

A structure or activity that changes, expands or diminishes the course, current, or cross-section of a watercourse, floodway or body of water.

## **EROSION**

The natural process by which the surface of the land is worn away by water, wind or chemical action.

## **EROSION AND SEDIMENT (*E&S*) CONTROL PLAN**

A plan that is designed to minimize accelerated erosion and sedimentation. Said plan must be submitted to and approved by the appropriate conservation district before construction can begin.

## ***EVAPOTRANSPIRATION (ET)***

*The combined processes of evaporation from the water or soil surface and transpiration of water by plants.*

## **EXCEPTIONAL VALUE WATERS**

Surface waters of high quality which satisfy Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, § 93.4b(b) (relating to anti-degradation).

## **EXISTING CONDITIONS**

The dominant land cover during the 5-year period immediately preceding a proposed regulated activity.

## **FEMA**

Federal Emergency Management Agency.

## ***FINANCIAL HARDSHIP***

*A situation where the greatest possible profit cannot be fully realized from development/redevelopment on a given parcel of land due to added costs or burdens associated with the design, construction, and/or maintenance of stormwater structures, facilities, buffers and/or setbacks.*

## **FLOOD**

A temporary condition of partial or complete inundation of land areas from the overflow of streams, rivers, and other waters of this commonwealth.

## **FLOODPLAIN**

Any land area susceptible to inundation by water from any natural source or delineated by applicable *Department of Housing and Urban Development, Federal Emergency Management Agency* (FEMA) maps and studies as being a special flood hazard area.

## **FLOODWAY**

The channel of the watercourse and those portions of the adjoining floodplains that are reasonably

required to carry and discharge the 100-year flood (*also called the base flood or one percent (1%) annual chance flood*). Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year floodway, it is assumed--absent evidence to the contrary--that the floodway extends from the stream to 50 feet from the top of the bank of the stream .

## **FLUVIAL GEOMORPHOLOGY**

The study of landforms associated with river channels and the processes that form them.

## **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.

## **FREEBOARD**

A vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, swale, or diversion berm. The space is required as a safety margin in a pond or basin.

## **GRADE**

- A. (noun) A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein.
- B. (verb) To finish the surface of a roadbed, the top of an embankment, or the bottom of an excavation.

## **GRASSED WATERWAY**

A natural or man-made waterway, usually broad and shallow, covered with erosion-resistant grasses used to convey surface water.

## ***GREEN INFRASTRUCTURE***

*Systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater on the site where it is generated. Also referred to as Green Stormwater Infrastructure (GSI).*

## **GROUNDWATER**

Water beneath the earth's surface that supplies wells and springs and is often between saturated soil and rock.

## **GROUNDWATER RECHARGE**

The replenishment of existing natural underground water supplies from rain or overland flow.

## **HEC-HMS**

The U.S. Army Corps Of Engineers, Hydrologic Engineering Center (HEC) – Hydrologic Modeling System (HMS). This model was used to model the Darby-Cobbs and Crum Creek watersheds during the

Act 167 plan development and was the basis for the standards and criteria of this article.

## **HIGH QUALITY WATERS**

Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, § 93.4b(a).

## **HIGH TUNNEL**

*A structure which meets the following:*

- 1. Is used for the production, processing, keeping, storing, sale or shelter of an agricultural commodity as defined in section 2 of the Act of December 19, 1974 (P.L. 973, No. 319), known as the “Pennsylvania Farmland and Forest Land Assessment Act of 1974,” or the storage of agricultural equipment or supplies; and*
- 2. Is constructed with all the following:*
  - a. has a metal, wood, or plastic frame;*
  - b. when covered, has a plastic, woven textile, or other flexible covering; and*
  - c. has a floor made of soil, crushed stone, matting, pavers, or a floating concrete slab.*

## **HOTSPOTS**

Areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

## **HYDROGRAPH**

A graph representing the discharge of water versus time for a selected point in the drainage system.

## **HYDROLOGIC REGIME**

The hydrologic cycle or balance that sustains quality and quantity of stormwater, baseflow, storage and groundwater supplies under natural conditions.

## **HYDROLOGIC SOIL GROUP (HGS)**

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 (NRCS1,2).

## **IMPERVIOUS SURFACE (IMPERVIOUS AREA)**

~~A surface that prevents the infiltration of water into the ground. Impervious surfaces include, but are not limited to, streets, sidewalks, pavements, driveway areas, or roofs. Any surface areas designed to be gravel or crushed stone shall be regarded as impervious surface.~~ *Impervious surfaces shall include, but are not limited to, streets, sidewalks, swimming pool surface, pavements, additional indoor living spaces, patios, garages, storage sheds, and similar structures, driveway areas, or roofs, tennis or other paved courts. For the purposes of determining compliance with this Ordinance, compacted soils or stone surfaces used for*

*vehicle parking and movement shall be considered impervious. Uncompacted gravel areas with no vehicular traffic shall be considered pervious per review by the Township Engineer. Surfaces that were designed to allow infiltration (i.e. pavers and areas of porous pavement) are not to be considered impervious surface if designed to function as a BMP per review by the Township Engineer. Additionally, for the purposes of determining compliance with this Ordinance, the total horizontal projection area of all ground-mounted and free-standing solar collectors, including solar photovoltaic cells, panels, and arrays, shall be considered pervious so long as the Township Engineer determines that the area underneath the solar photovoltaic cells, panels, and arrays is maintained as a vegetated pervious surface.*

## **IMPOUNDMENT**

A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

## **INFILL**

Development that occurs on smaller parcels that remain undeveloped but are within or in very close proximity to urban or densely developed areas. Infill development usually relies on existing infrastructure and does not require an extension of water, sewer, or other public utilities.

## **INFILTRATION**

Movement of surface water into the soil, where it is absorbed by plant roots, evaporated into the atmosphere, or percolated downward to recharge groundwater.

## **INFILTRATION STRUCTURES**

A structure designed to direct runoff into the underground water (e.g., French drains, seepage pits, or seepage trenches).

## **INFLOW**

The flow entering the stormwater management facility and/or BMP.

## **INLET**

The upstream end of any structure through which water may flow.

## **INTERMITTENT STREAM**

A stream that flows only part of the time. Flow generally occurs for several weeks or months in response to seasonal precipitation or groundwater discharge.

## **INVERT**

The lowest surface, the floor or bottom of a culvert, drain, sewer, channel, basin, BMP, or orifice.

## **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.

### **LAND DEVELOPMENT (DEVELOPMENT)**

Inclusive of any or all of the following meanings:

- i. 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;
- ii. Any subdivision of land;
- iii. Development in accordance with Section 503(1.1) of the PA Municipalities Planning Code

### **LIMITING ZONE**

A soil horizon or condition in the soil profile or underlying strata that includes one of the following:

- A. A seasonal high water table, whether perched or regional, determined by direct observation of the water table or indicated by soil mottling.
- B. A rock with open joints, fracture or solution channels, or masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.
- C. A rock formation, other stratum, or soil condition that is so slowly permeable that it effectively limits downward passage of water.

### **LOT**

A designated parcel, tract, or area of land established by a plat or otherwise as permitted by law and to be used, developed, or built upon as a unit.

### ***LOW IMPACT DEVELOPMENT (LID)***

*Site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. LID can be applied to new development, urban retrofits, and revitalization projects. LID utilizes design techniques that infiltrate, filter, evaporate, and store runoff close to its source. Rather than rely on costly large-scale conveyance and treatment systems, LID addresses stormwater through a variety of small, cost-effective landscape features located on-site.*

### **MAIN STEM (MAIN CHANNEL)**

Any stream segment or other runoff conveyance used as a reach in watershed-specific hydrologic models.

### ***MANAGED RELEASE CONCEPT (MRC)***

*A post-construction stormwater management (PCSM) strategy that comprises the collection, management, and filtration of captured runoff from the contributing drainage area through a best management practice (BMP) that is preferably vegetated and includes release of a portion of the captured runoff through an underdrain within the BMP. If the MRC BMP is not vegetated, then pretreatment is required to meet water quality requirements. MRC is intended to be used for project areas or subareas where infiltration is considered infeasible to meet regulatory requirements. Refer to the "Managed Release Concept" Version 1.2 (August 25, 2020) guidance document or latest guidance from PA DEP.*

#### **MANNING EQUATION (MANNING FORMULA)**

A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow, and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

#### **MAXIMUM DESIGN STORM**

The maximum (largest) design storm that is controlled by the stormwater facility.

#### **MUNICIPAL ENGINEER**

A professional engineer licensed as such in the Commonwealth of Pennsylvania, duly appointed as the Engineer for a municipality, planning agency, or joint planning commission.

#### **MUNICIPALITY**

Haverford Township, Delaware County, Pennsylvania.

#### **NATURAL CONDITION**

Predevelopment condition.

#### **NATURAL HYDROLOGIC REGIME**

See "Hydrologic Regime."

#### **NATURAL RECHARGE AREA**

Undisturbed surface area or depression where stormwater collects and a portion of which infiltrates and replenishes the underground and groundwater.

#### **NONPOINT SOURCE POLLUTION**

Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

#### **NONSTORMWATER DISCHARGES**

Water flowing in stormwater collection facilities, such as pipes or swales, which is not the result of a rainfall event or snowmelt.

#### **NONSTRUCTURAL BEST MANAGEMENT PRACTICES (BMPs)**

Methods of controlling stormwater runoff quantity and quality, such as innovative site planning,

impervious area and grading reduction, protection of natural depression areas, temporary ponding on site, and other techniques.

**NPDES**

National Pollutant Discharge Elimination System, the federal government's system for issuance of permits under the Clean Water Act, which is delegated to DEP in Pennsylvania.

**NRCS**

Natural Resource Conservation Service (previously SCS).

**OPEN CHANNEL**

A conveyance channel that is not enclosed.

**OUTFALL**

"Point source," as described in 40 CFR § 122.2, at the point where Haverford Township's storm sewer system discharges to surface waters of the commonwealth.

**OUTFLOW**

The flow exiting the stormwater management facility and/or BMP.

**OUTLET**

Points of water disposal to a stream, river, lake, tidewater, or artificial drain.

**PARENT TRACT**

The parcel of land from which a land development or subdivision originates, determined from the date of municipal adoption of this article.

**PARKING LOT STORAGE**

Involves the use of parking areas as temporary impoundments with controlled release rates during rainstorms.

**PEAK DISCHARGE**

The maximum rate of stormwater runoff from a specific storm event.

**PENN STATE RUNOFF MODEL**

The computer-based hydrologic model developed at Pennsylvania State University.

***PENNSYLVANIA STORMWATER BEST MANAGEMENT PRACTICES MANUAL***

*(Document Number 363-0300-002) (December 2006, and as subsequently amended) - The Best Management Practices Manual published by the Pennsylvania Department of Environmental Protection. The manual is to supplement federal and state regulations and the Department of Environmental Protection's Comprehensive Stormwater Management Policy that emphasizes effective site planning as the preferred method of managing runoff while also providing numerous examples of BMPs that can be employed in Pennsylvania to further avoid and minimize flooding and water resource problems.*

*ce problems.*

**PERVIOUS AREA**

Any area not defined as impervious.

**PIPE**

A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

**PLANNING COMMISSION**

The Planning Commission of Haverford Township.

**POINT SOURCE**

Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel or conduit from which stormwater is or may be discharged, as defined in state regulations at 25 Pennsylvania Code § 92.1.

**POSTCONSTRUCTION**

Period after construction during which disturbed areas are stabilized, stormwater controls are in place and functioning, and all proposed improvements in the approved land development plan are completed.

**PRECONSTRUCTION**

Prior to commencing construction activities.

**PREDEVELOPMENT CONDITION**

Undeveloped/natural condition.

**PRETREATMENT**

Techniques employed in stormwater BMPs to provide storage or filtering to trap coarse materials and other pollutants before they enter the system, but not necessarily designed to meet the water quality volume requirements of § 78-45.

**PROJECT SITE**

The specific area of land where any regulated activities in Haverford Township are planned, conducted or maintained.

**QUALIFIED PROFESSIONAL**

Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

**RATIONAL FORMULA**

A rainfall-runoff relation used to estimate peak flow.

**REACH**

Any stream segment or other runoff conveyance used in the watershed-specific hydrologic models.

## **RECHARGE**

The replenishment of groundwater through the infiltration of rainfall, other surface waters, or land application of water or treated wastewater.

## **RECONSTRUCTION**

Demolition and subsequent rebuilding of impervious surface.

## **RECORD DRAWINGS**

Original documents revised to suit the as-built conditions and subsequently provided by the engineer to the client. The engineer reviews the contractor's as-builts against his/her own records for completeness, then either turns these over to the client or transfers the information to a set of reproducible, in both cases for the client's permanent records.

## **REDEVELOPMENT**

Any development that requires demolition or removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding and repaving are not considered to be redevelopment. Interior remodeling projects and tenant improvements are also not considered to be redevelopment.

## **REGULATED ACTIVITIES**

Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff. Actions or proposed actions that have an impact on stormwater runoff quality or quantity and that are specified in § 78-17 of this article.

## **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. Defined under NPDES Phase II regulations as earth disturbance activity of one acre or more with a point source discharge to surface waters or Haverford Township's storm sewer system or five acres or more regardless of the planned runoff. This includes earth disturbance on any portion of, part, or during any stage of a larger common plan of development.

## ***REGULATED IMPERVIOUS SURFACE***

***Proposed impervious surface as part of a current proposed activity and all existing impervious surfaces installed after February 15, 2005 as part of a previous activity.***

## **RELEASE RATE**

The percentage of existing conditions' peak rate of runoff from a site or subarea to which the proposed conditions' peak rate of runoff must be reduced to protect downstream areas.

## **REPAVING**

Replacement of the impervious surface that does not involve reconstruction of an existing paved (impervious) surface.

## **REPLACEMENT PAVING**

Reconstruction of and full replacement of an existing paved (impervious) surface.

## **RETENTION BASIN**

A structure in which stormwater is stored and not released during the storm event. Retention basins are designed for infiltration purposes and do not have an outlet. The retention basin must infiltrate stored water in four days or less.

## **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.

## **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).

## ***RIPARIAN***

*Pertaining to anything connected with or immediately adjacent to the banks of a stream or other body of water.*

## ***RIPARIAN BUFFER***

*An area of land adjacent to a body of water and managed to maintain the integrity of stream channels and shorelines to 1) reduce the impact of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals, and 2) supply food, cover and thermal protection to fish and other wildlife.*

## **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.

## **ROAD MAINTENANCE**

Earth disturbance activities within the existing road cross section, such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches, and other similar activities.

## **ROOF DRAINS**

A drainage conduit or pipe that collects water runoff from a roof and leads it away from the structure.

## **ROOFTOP DETENTION**

The temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces using controlled-flow roof drains in building designs.

**RUNOFF**

Any part of precipitation that flows over the land surface.

**SALDO**

Subdivision and Land Development Ordinance.

**SEDIMENT**

Soils or other materials transported by surface water as a product of erosion.

**SEDIMENT BASIN**

A barrier, dam, or retention or detention basin located and designed in such a way as to retain rock, sand, gravel, silt, or other material transported by water during construction.

**SEDIMENT POLLUTION**

The placement, discharge, or any other introduction of sediment into the waters of the commonwealth.

**SEDIMENTATION**

The process by which mineral or organic matter is accumulated or deposited by the movement of water or air.

**SEEPAGE PIT/SEEPAGE TRENCH**

An area of excavated earth filled with loose stone or similar coarse material into which surface water is directed for infiltration into the underground water.

**SEPARATE STORM SEWER SYSTEM**

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) primarily used for collecting and conveying stormwater runoff.

**SHALLOW CONCENTRATED FLOW**

Stormwater runoff flowing in shallow, defined ruts prior to entering a defined channel or waterway.

**SHEET FLOW**

A flow process associated with broad, shallow water movement on sloping ground surfaces that is not channelized or concentrated.

**SOIL COVER COMPLEX METHOD**

A method of runoff computation developed by NRCS that is based on relating soil type and land use/cover to a runoff parameter called curve number (CN).

**SOURCE WATER PROTECTION AREAS (SWPA)**

The zone through which contaminants, if present, are likely to migrate and reach a drinking water well or surface water intake.

## **SPECIAL PROTECTION SUBWATERSHEDS**

Watersheds that have been designated by DEP as EV or HQ waters.

## **SPILLWAY**

A conveyance that is used to pass the peak discharge of the maximum design storm that is controlled by the stormwater facility.

## **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.

## **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.

## **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").

## **STORM SEWER**

A system of pipes and/or open channels that conveys intercepted runoff and stormwater from other sources but excludes domestic sewage and industrial wastes.

## **STORMWATER**

Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

## ***STORMWATER CONTROL MEASURE***

*Physical features used to effectively control, minimize, and treat stormwater runoff. Also may be referred to as Stormwater Management Practice (SMP). [See Best Management Practice (BMP)].*

## **STORMWATER MANAGEMENT DISTRICT**

Those subareas of a watershed in which some type of detention is required to meet the plan requirements and the goals of Act 167.

## **STORMWATER MANAGEMENT FACILITY**

Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff quality, rate, or quantity, ***including Best Management Practices and Stormwater Control Measures***. Typical stormwater management facilities include, but are not limited to: detention and retention basins, open channels, storm sewers, pipes, and infiltration facilities.

## **STORMWATER MANAGEMENT PLAN**

The watershed plan, known as the "Darby and Cobbs Creeks Watershed Act 167 Stormwater Management Plan," for managing those land use activities that will influence stormwater runoff quality and quantity and that would impact the Darby and Cobbs Creeks watershed adopted by Delaware



County, Chester County, Montgomery County and Philadelphia County as required by the Act of October 4, 1978, P.L. 864 (Act 167).

### **STORMWATER MANAGEMENT SITE PLAN**

The plan prepared by the developer or his representative indicating how stormwater runoff will be managed at the development site in accordance with this Ordinance. Stormwater Management Site Plan will be designated as SWM Site Plan throughout this Ordinance..

### **STREAM**

A natural watercourse.

### **STREAM BUFFER**

The land area adjacent to each side of a stream essential to maintaining water quality (see "buffer").

### **STREAM ENCLOSURE**

A bridge, culvert, or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of the commonwealth.

### **SUBAREA (SUBWATERSHED)**

The smallest drainage unit of a watershed for which stormwater management criteria have been established in the stormwater management plan.

### **SUBDIVISION**

As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247; 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, partition by the court for distribution to heirs or devisees, transfer of ownership, or building or lot development; provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres not involving any new street or easement of access or any residential dwelling shall be exempted.

### **SURFACE 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 waters, or parts thereof, whether natural or artificial, within or on the boundaries of the commonwealth.

### **SWALE**

A low-lying stretch of land that gathers or carries surface water runoff.

### **TIMBER OPERATIONS**

See "Forest Management."

### **TIME-OF-CONCENTRATION (T<sub>c</sub>)**

The time required for surface runoff to travel from the hydraulically most distant point of the watershed

to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

**TOP-OF-BANK**

Highest point of elevation in a stream channel cross section at which a rising water level just begins to flow out of the channel and over the floodplain.

**UNDEVELOPED CONDITION**

Natural condition (see also "predevelopment condition").

**USDA**

United States Department of Agriculture

**VERNAL POND**

Seasonal depressional wetlands that are covered by shallow water for variable periods from winter to spring but may be completely dry for most of the summer and fall.

**WATERCOURSE**

A channel or conveyance of surface water having a defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

**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.

**WATERSHED**

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

**WELLHEAD**

- A. A structure built over a well;
- B. The source of water for a well.

**WELLHEAD PROTECTION AREA**

The surface and subsurface area surrounding a water supply well, well field, or spring supplying a public water system through which contaminants are reasonably likely to move toward and reach the water source.

**WET BASIN**

Pond for urban runoff management that is designed to detain urban runoff and always contains water.

## **WETLAND**

Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

## **WOODS**

A natural ground cover with more than one viable tree of a DBH of six inches or greater per 1,500 square feet which existed within three years of application; a cover condition for which SCS curve numbers have been assigned or to which equivalent rational method runoff coefficients have been assigned.

### **§ 78-25 General Requirements.**

For any of the activities regulated by this article, the preliminary or final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any earth disturbance activity may not proceed until the property owner or applicant or his/her agent has received written approval of a drainage plan from Haverford Township and an adequate erosion and sediment control plan review by the Conservation District.

### **§ 78-26 ~~Drainage~~ *SWM site plan* contents.**

The drainage plan shall consist of a general description of the project including sequencing items described in § **78-35** [Nonstructural project design (sequencing to minimize stormwater impacts)], calculations, maps, and plans. A note on the maps shall refer to the associated computations and erosion and sediment control plan by title and date. The cover sheet of the computations and erosion and sediment control plan shall refer to the associated maps by title and date. All *SWM site plan* ~~drainage plan~~ materials shall be submitted to Haverford Township in a format that is clear, concise, legible, neat, and well organized; otherwise, the drainage plan shall not be accepted for review and shall be returned to the applicant. The following items shall be included in the drainage plan:

#### **A. General.**

1. General description of the project including those areas described in § **78-35** [Nonstructural project design (sequencing to minimize stormwater impacts)].
2. General description of proposed permanent stormwater management techniques, including construction specifications of the materials to be used for stormwater management facilities.
3. Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.
4. An erosion and sediment control plan, including all reviews and letters of adequacy from the Conservation District.
5. A general description of proposed nonpoint source pollution controls.

***6. A justification must be included in the SWM Site Plan if BMPs other than green infrastructure methods and LID practices are proposed to achieve the volume, rate, and water quality controls under this Ordinance.***

7. The Drainage Plan Application and completed fee schedule form and associated fee (Appendix C-1).

8. The Drainage Plan Checklist (Appendix C-2).

B. ~~Maps and site plans~~ ***or Plan Sheets***. Map(s) ***or plan sheets*** of the project area shall be submitted on twenty-four-inch by thirty-six-inch sheets and/or shall be prepared in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Delaware County. If the SALDO has more stringent criteria than this article, then the more stringent criteria shall apply. The contents of the map(s) shall include, but not be limited to:

1. The location of the project relative to highways, municipal boundaries, or other identifiable landmarks.
2. Existing contours at intervals of two feet.
3. Existing streams, lakes, ponds, or other waters of the commonwealth within the project area.
4. Other physical features including flood hazard boundaries, stream buffers, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the site.
5. The locations of all existing and proposed utilities, sanitary sewers, and water lines within 50 feet of property lines.
6. An overlay showing soil names and boundaries.
7. Limits of earth disturbance, including the type and amount of impervious area that would be added.
8. Proposed structures, roads, paved areas, and buildings.
9. Final contours at intervals of two feet.
10. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.
11. The date of submission.
12. A graphic and written scale of one inch equals no more than 50 feet; for tracts of 20 acres or more, the scale shall be one inch equals no more than 100 feet.

13. A north arrow.
14. The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.
15. Existing and proposed land use(s).
16. A key map showing all existing man-made features beyond the property boundary that would be affected by the project.
17. Location of all open channels.
18. Overland drainage patterns and swales.
19. A fifteen-foot-wide access easement around all stormwater management facilities that would provide ingress to and egress from a public right-of-way.
20. The location of all erosion and sediment control facilities.
21. A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off site. All off-site facilities shall meet the performance standards and design criteria specified in this article
22. A statement, signed by the applicant, acknowledging that any revision to the approved drainage plan must be approved by Haverford Township, and that a revised erosion and sediment control plan must be submitted to the Conservation District for a determination of adequacy.
- 23. ~~The following signature block for the design engineer.~~ *The following signature block signed and sealed by the qualified Licensed Professional responsible for the preparation of the SWM site plan:***

"I, (Licensed Professional), on this date (date of signature), hereby certify that the drainage plan meets all design standards and criteria of the Haverford Township Stormwater Management Code."

***24. The following signature block for the Municipality:***

***“On behalf of Haverford Township, (Municipal Official or Designee), on this date (date of signature), has reviewed and hereby certifies to the best of my knowledge that the SWM Site Plan meets all design standards and criteria of the Haverford Township Stormwater Management Ordinance.”***

C. Supplemental information to be submitted to Haverford Township.

1. A written description of the following information shall be submitted by the applicant and shall include:

- a. The overall stormwater management concept for the project designed in accordance with § 78-35, Nonstructural project design (sequencing to minimize stormwater impacts).
  - b. Stormwater runoff computations as specified in this article.
  - c. Stormwater management techniques to be applied both during and after development.
  - d. Expected project time schedule.
  - e. Development stages or project phases, if so proposed.
  - f. An operations and maintenance plan in accordance with § 78-48, Responsibilities for operations and maintenance of stormwater controls and BMPs of this article.
2. An erosion and sediment control plan.
  3. A description of the effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.
  4. A declaration of adequacy and highway occupancy permit from the Pennsylvania Department of Transportation (PennDOT) District office when utilization of a PennDOT storm drainage system is proposed.

D. Stormwater management facilities.

1. All stormwater management facilities must be located on a plan and described in detail.
2. ~~When infiltration measures such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown.~~ ***The locations of existing and proposed septic tank infiltration areas and wells must be shown.***
3. All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

§ 78-27 **Plan submission.**

Haverford Township shall require receipt of a complete drainage plan, as specified in this article.

- A. Proof of application or documentation of required permit(s) or approvals for the programs listed below shall be part of the plan:
  1. NPDES permit for stormwater discharges from construction activities.
  2. DEP joint permit application.
  3. PennDOT highway occupancy permit.

4. Chapter 105 (Dam Safety and Waterway Management).
  5. Chapter 106 (Floodplain Management).
  6. Any other permit under applicable state or federal regulations.
- B. The plan shall be coordinated with the state and federal permit process and the municipal SALDO review process. The process implementing the provisions in this article is illustrated in Appendixes D-1 and D-2.
  - C. For projects that require SALDO approval, the drainage plan shall be submitted by the applicant as part of the preliminary plan submission where applicable for the regulated activity.
  - D. For regulated activities that do not require SALDO approval, see **§ 78-26**, General drainage plan requirements.
  - E. Six (6) copies of the drainage plan shall be submitted and distributed as follows:
    1. Two copies to Haverford Township accompanied by the requisite municipal review fee, as specified in this article.
    2. Two copies to the County Conservation District.
    3. One copy to the municipal Engineer.
    4. One copy to the County Planning Commission/Department.
  - F. Any submissions to the agencies listed above that are found to be incomplete shall not be accepted for review and shall be returned to the applicant with a notification in writing of the specific manner in which the submission is incomplete.

**§ 78-28 ~~Drainage~~ *Stormwater Management (SWM) Site Plan Review.***

- A. The municipal Engineer shall review the drainage plan for consistency with this article and the respective Act 167 stormwater management plan. Any plan found incomplete shall not be accepted for review and shall be returned to the applicant.
- B. The municipal Engineer shall review the drainage plan for any subdivision or land development against the municipal SALDO provisions not otherwise superseded by this article.
- C. The Conservation District, in accordance with established criteria and procedures, shall review the drainage plan for consistency with stormwater management and erosion and sediment pollution control requirements and provide comments to Haverford Township. ~~Such comments shall be considered by Haverford Township prior to final approval of the drainage plan.~~ ***The applicant shall respond to the Conservation District comments on the SWM site plan prior to being considered for final approval by the Township.***

- D. For activities regulated by this article, the municipal Engineer shall notify the applicant and Haverford Township in writing whether the drainage *SWM site* plan is consistent with the stormwater management plan *ordinance*.
- (1) If the municipal Engineer determines that the drainage *SWM site* plan is consistent with the stormwater management plan *ordinance*, the municipal Engineer shall forward a letter of consistency to the ~~municipal Secretary~~ *Township* who will then forward a copy to the applicant.
- (2) If the municipal Engineer determines that the drainage plan is inconsistent or noncompliant with the stormwater management plan *ordinance*, the municipal Engineer shall forward a letter to the ~~municipal Secretary~~ *Township* with a copy to the applicant citing the reason(s) and specific Code sections for the inconsistency or noncompliance. Inconsistency or noncompliance may be due to inadequate information to make a reasonable judgment as to compliance with the stormwater management plan. Any drainage plans that are inconsistent or noncompliant may be revised by the applicant and resubmitted when consistent with this article.
- E. For regulated activities specified in § 78-17, Applicability and Regulated Activities of this article that require a building permit, the municipal Engineer shall notify the municipal Building Permit Officer in writing whether the drainage plan is consistent with the stormwater management plan. The municipal Building Permit Officer shall forward a copy of the consistency/inconsistency letter to the applicant. Any drainage plan deemed inconsistent may be revised by the applicant and resubmitted consistent with this article.
- F. For regulated activities under this article that require an NPDES permit application, the applicant shall forward a copy of the Township Engineer's letter stating that the drainage plan is consistent with the stormwater management plan to the Conservation District. DEP and the Conservation District may consider the Township Engineer's review comments in determining whether to issue a permit.
- G. Haverford Township shall not grant preliminary or final approval to any subdivision or land development for regulated activities specified in § 78-17, Applicability and Regulated Activities of this article if the drainage plan has been found by the Township Engineer to be inconsistent with the stormwater management plan. All required permits from DEP must be obtained prior to approval of any subdivision or land development.
- H. No building permits for any regulated activity specified in § 78-17, Applicability and Regulated Activities of this article shall be approved by Haverford Township if the drainage plan has been found to be inconsistent with the stormwater management plan, as determined by the Township Engineer and Conservation District, or without considering the comments of the Township Engineer and Conservation District. All required permits from DEP must be obtained prior to issuance of a building permit.
- I. The Applicant shall be responsible for completing record drawings of all stormwater management facilities included in the approved drainage plan. The record drawings and an explanation of any discrepancies with the design plans shall be submitted to the Township Engineer for final approval. In no case shall Haverford Township approve the record drawings until Haverford Township receives a copy of an approved declaration of adequacy and/or highway occupancy permit from the PennDOT



District office, NPDES permit, and any other applicable permits or approvals from DEP or the Conservation District. The above permits and approvals must be based on the record drawings.

- J. Haverford Township's approval of a drainage plan shall be valid for a period not to exceed five years commencing on the date that Haverford Township signs the approved drainage plan. If stormwater management facilities included in the approved drainage plan have not been constructed, or if constructed, record drawings of these facilities have not been approved within this five-year time period, then Haverford Township may consider the drainage plan inconsistent or noncompliant and may revoke any and all permits. Drainage plans that are determined to be inconsistent or noncompliant by Haverford Township shall be resubmitted in accordance with § 78-30, Resubmission of Inconsistent or Noncompliant Drainage Plans of this article.

§ 78-29 ~~Modification~~ **Revision of Plans.**

- A. A modification to a submitted drainage plan under review by Haverford Township for a development site that involves the following shall require a resubmission to Haverford Township of a modified drainage plan consistent with § 78-26 of this article and be subject to review as specified in § 78-28 of this article:

- (1) Change in stormwater management facilities or techniques;
- (2) Relocation or redesign of stormwater management facilities; or
- (3) Is necessary because soil or other conditions are not as stated on the drainage plan as determined by the municipal Engineer.

- B. A ~~modification~~ **revision** to an already approved or inconsistent or noncompliant drainage plan shall be submitted to Haverford Township, accompanied by the applicable municipal review and inspection fee. A ~~modification~~ **revision** to a drainage plan for which a formal action has not been taken by Haverford Township shall be submitted to Haverford Township accompanied by the applicable municipal review and inspection fee.

§ 78-30 **Resubmission of inconsistent or noncompliant drainage plans.**

An inconsistent or noncompliant drainage plan may be resubmitted with the revisions addressing the Township Engineer's concerns documented in writing. It must be addressed to Haverford Township in accordance with § 78-27 contents of this article, distributed accordingly, and be subject to review as specified in § 78-28 of this article. The applicable Township review and inspection fee must accompany a resubmission of an inconsistent or noncompliant ~~drainage~~ **SWM** plan.

§78-31 **General Requirements for stormwater management.**

- A. Applicants proposing regulated activities in Haverford Township which do not fall under the exemption criteria shown in §78-18 shall submit a ~~drainage plan~~ **stormwater management site plan** consistent with this article **ordinance** and the respective ~~stormwater management plan~~ and **the applicable watershed stormwater management plan** to Haverford Township for review. The stormwater management criteria of this Ordinance shall apply to the total proposed development even if development is to take place in stages.

- ~~B. The applicant is required to find practicable alternatives to the surface discharge of stormwater, the creation of impervious surfaces, and the degradation of Waters of the Commonwealth and must maintain as much as possible the natural hydrologic regime. ***The applicant is required to design the site to minimize surface discharge of stormwater and the creation of impervious surfaces in order to maintain, as much as possible, the natural hydrologic regime.***~~
- C. The SWM site plan must be designed consistent with the sequencing provisions of §78-35 to ensure maintenance of the natural hydrologic regime, to promote groundwater recharge ***infiltration***, and to protect groundwater and surface water quality and quantity. The ~~drainage plan designer~~ ***SWM site plan designer*** must proceed sequentially in accordance with this Ordinance.
- D. ~~Stormwater drainage systems shall be designed in order to permit unimpeded flow along natural watercourses, except as modified by stormwater management facilities or open channels consistent with this ordinance. ***Stormwater drainage systems shall be designed in order to preserve natural flow conditions to the maximum extent practicable.***~~
- E. ~~Existing points of concentrated discharge onto adjacent property shall not be altered in any manner which could cause property damage without permission of the affected property owner(s) and shall be subject to any applicable discharge criteria specified in this article. ***Alteration of existing drainage discharge onto adjacent property shall only be proposed in accordance with PADEP guidance document "Chapter 102 Off-Site Discharges of Stormwater to Non-Surface Waters – Frequently Asked Questions (FAQ)" dated January 2, 2019, or latest guidance document from PADEP. Such discharge shall be subject to any applicable discharge criteria specified in this Ordinance and still must meet the requirements of Act 167.***~~
- F. Areas of existing diffused drainage discharge, whether proposed to be concentrated or maintained as diffused drainage areas, shall be subject to any applicable discharge criteria in the general direction of existing discharge, except as otherwise provided by this Ordinance. If diffused drainage discharge is proposed to be concentrated and discharged onto adjacent property, the Applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge or otherwise prove that no erosion, sedimentation, flooding, or other impacts will result from the concentrated discharge.
- G. Where a development site is traversed by a stream, drainage easements shall be provided ~~conforming to the line of such streams~~ ***on either side of***, and conform to the line of such streams. The terms of the easement shall conform to the stream buffer requirements contained in §78-42.
- H. Any stormwater management facilities regulated by this article that would be located in or adjacent to waters of the commonwealth or delineated wetlands shall be subject to approval by DEP through the joint permit application or the environmental assessment approval process or, where deemed appropriate, by the DEP general permit process. When there is a question as to whether wetlands may be involved, it is the responsibility of the applicant or his agent to show that the land in question cannot be classified as wetlands; otherwise, approval to work in the area must be obtained from DEP
- I. Any proposed stormwater management facilities regulated by this article that would be located on state highway rights-of-way shall be subject to approval by PennDOT.
- J. Minimization of impervious surfaces and infiltration of runoff through seepage beds, infiltration trenches, etc., is encouraged where soil conditions permit in order to reduce the size or eliminate the need for detention facilities or other structural BMPs.

- K. All stormwater runoff from new development or redevelopment shall be pretreated for water quality prior to discharge to surface or groundwater. ***Rooftop runoff may go directly to an infiltration BMP or be evapotranspired.***
- L. All regulated activities within the Municipality shall be designed, implemented, operated, and maintained to meet the purposes of this Ordinance, through these two elements:
1. Erosion and sediment control during earth disturbance activities (e.g., during construction), and
  2. Water quality protection measures after completion of earth disturbance activities (i.e., after construction), including operations and maintenance.
- M. No regulated activity within the Municipality shall commence until the Municipality issues approval of a SWM plan, which demonstrates compliance with the requirements of this ordinance.
- N. The BMPs shall be designed, implemented, and maintained to meet state water quality requirements and any other more stringent requirements as determined by the Township. Applicants shall utilize the Pennsylvania Stormwater Best Management Practices Manual (PA BMP Manual), as amended, or other sources acceptable to the Township Engineer, for testing and design standards for BMPs, and where there is a conflict with the provisions of this Ordinance, the most restrictive applies.***
- O. Post-construction water quality protection shall be addressed as required by **§78-37**.
- P. Operations and maintenance of permanent stormwater BMPs shall be addressed as required by this article.
- Q. All BMPs used to meet the requirements of this Ordinance shall conform to the state water quality requirements and any more stringent requirements as set forth by Haverford Township.
- R. Techniques described in Appendix E (Low Impact Development) of this Ordinance shall be considered because they reduce the costs of complying with the requirements of this Ordinance and the state water quality requirements.
- S. In selecting the appropriate BMPs or combinations thereof, the Applicant shall consider the following:
1. Total contributing drainage area.
  2. Permeability and infiltration rate of the site's soils.
  3. Slope and depth to bedrock.
  4. Seasonal high water table.
  5. Proximity to building foundations and wellheads.
  6. Erodibility of soils.
  7. Land availability and configuration of the topography.
  8. Peak discharge and required volume control.
  9. Stream bank erosion.
  10. Efficiency of the BMPs to mitigate potential water quality problems.
  11. The volume of runoff that will be effectively treated.
  12. The nature of the pollutant being removed.
  13. Maintenance requirements.
  14. Creation/protection of aquatic and wildlife habitat.

15. Recreational value.

**16. Enhancement of aesthetic and property values.**

- R. *The design of all stormwater management facilities shall incorporate sound engineering principles and practices in a manner that does not aggravate existing stormwater problems. The Township reserves the right to disapprove any design that would result in construction in or continuation of a stormwater problem area.***
- S. The applicant may meet the stormwater management criteria through off-site stormwater management measures as long as the proposed measures are in the same subwatershed as shown in Ordinance Appendix A.
- U. *The following standards for protection of adjacent and downgradient properties from off-site conveyance must be accomplished:***

***For any location where a new concentrated discharge of stormwater from any frequency rainfall event, up to and including the 100-year storm and the volume of runoff up to and including the 2-year storm onto or through adjacent property(ies) or downgradient property(ies), the following are required:***

- 1. A drainage easement (or other legal agreement/approval) must be obtained for conveyance of discharges onto or through adjacent properties per the PADEP guidance document "Chapter 102 Off-Site Discharges of Stormwater to Non-Surface Wasters – Frequently Asked Questions (FAQ)" dated January 2, 2019, or latest guidance document from PADEP.***
- 2. The conveyance must be designed to avoid erosion, flooding, or other damage to the properties through which it is being conveyed.***

***§ 78-32 Authorization to Construct and Term of Validity.***

***Haverford Township's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Township may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section § 78-33, Permit requirements by other governmental entities; As-Built Plans, Completion Certificate, and Final inspection, within the term of validity, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section § 78-30 of this Ordinance.***

**§ 78-33 Permit requirements by other governmental entities.**

The following permit requirements may apply to certain regulated earth disturbance activities and must be met prior to commencement of regulated earth disturbance activities, as applicable:

- A. All regulated earth disturbance activities subject to permit requirements by DEP under regulations at 25 Pennsylvania Code Chapter 102.
- B. Work within natural drainageways subject to permit by DEP under 25 Pennsylvania Code Chapter 105.
- C. Any stormwater management facility that would be located in or adjacent to surface waters of the commonwealth, including wetlands, subject to permit by DEP under 25 Pennsylvania Code Chapter 105.
- D. Any stormwater management facility that would be located on a state highway right-of-way or require access from a state highway shall be subject to approval by PennDOT.
- E. Culverts, bridges, storm sewers, or any other facilities which must pass or convey flows from the tributary area and any facility which may constitute a dam, subject to permit by DEP under 25 Pennsylvania Code Chapter 105.

**§ 78-34 Erosion and sediment control during regulated earth disturbance activities.**

- A. No regulated earth disturbance activities within Haverford Township shall commence until Haverford Township receives an approval from the Conservation District of an erosion and sediment control plan for construction activities.
- B. DEP has regulations that require an erosion and sediment control plan for any earth disturbance activity of 5,000 square feet or more, under 25 Pennsylvania Code § 102.4(b).
- C. In addition, under 25 Pennsylvania Code Chapter 92, a DEP "NPDES construction activities" permit is required for regulated earth disturbance activities. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate DEP regional office or County Conservation District

must be provided to Haverford Township.

- D. *Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate PA DEP regional office or County Conservation District must be provided to the Township. The issuance of an NPDES construction permit (or permit coverage under the statewide General Permit (PAG-2)) satisfies the requirements of §78-33.*
- E. A copy of the erosion and sediment control plan and any required permit, as required by DEP regulations, shall be available on the project site at all times.
- F. Additional erosion and sediment control design standards and criteria are recommended to be applied where infiltration BMPs are proposed. They shall include the following:
  - (1) Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum infiltration capacity.
  - (2) Infiltration BMPs shall not be constructed nor receive runoff until the entire drainage area contributory to the infiltration BMP has achieved final stabilization.

**§ 78-35 Nonstructural project design (sequencing to minimize stormwater impacts).**

- A. The design of all regulated activities shall include the following to minimize stormwater impacts.
  - (1) The applicant shall find practicable alternatives to the surface discharge of stormwater, such as those listed in Appendix F, Table F-5, the creation of impervious surfaces, and the degradation of waters of the commonwealth and must maintain as much as possible the natural hydrologic regime of the site.
  - (2) *The applicant shall apply Low Impact Development (LID) methods such as those listed in Appendix \_\_\_\_, provided that use of this method does not conflict with other local codes.*
  - (3) An alternative is practicable if it is available and capable of implementation after taking into consideration existing technology and logistics in light of overall project purposes and other municipal requirements.
  - (4) All practicable alternatives to the discharge of stormwater are presumed to have less adverse impact on quantity and quality of waters of the commonwealth unless otherwise demonstrated.
- B. The applicant shall demonstrate that the regulated activities were designed in the following sequence. The goal of the sequence is to minimize the increases in stormwater runoff and impacts to water quality resulting from the proposed regulated activity:
  - (1) Prepare an existing resource and site analysis map (ERSAM) showing environmentally sensitive areas, including but not limited to, steep slopes, ponds, lakes, streams, wetlands, hydric soils, vernal pools, stream buffers and hydrologic soil groups. Land development, any existing recharge areas, and other requirements outlined in the municipal SALDO shall also be included.

- (2) Establish a stream buffer according to § **78-42**.
- (3) Prepare a draft project layout avoiding sensitive areas identified in Subsection **B(1)**.
- (4) Identify site-specific existing conditions drainage areas, discharge points, recharge areas, and hydrologic soil groups A and B (areas conducive to infiltration).
- (5) Evaluate nonstructural stormwater management alternatives:
  - (a) Minimize earth disturbance.
  - (b) Minimize impervious surfaces.
  - (c) Break up large impervious surfaces.
- (6) Satisfy the groundwater recharge (infiltration) objective (§ **78-36**) and provide for stormwater pretreatment prior to infiltration.
- (7) Provide for water quality protection in accordance with § **78-37** water quality requirements.
- (8) Provide streambank erosion protection in accordance with § **78-38** streambank erosion requirements.
- (9) Determine into what management district the site falls (Appendix A) and conduct an existing conditions runoff analysis.
- (10) Prepare final project design to maintain existing conditions drainage areas and discharge points, to minimize earth disturbance and impervious surfaces and, to the maximum extent possible, to ensure that the remaining site development has no surface or point discharge.
- (11) Conduct a proposed conditions runoff analysis based on the final design that meets the management district requirements (§ **78-39**).
- (12) Manage any remaining runoff prior to discharge through detention, bioretention, direct discharge or other structural control.

§ 78-36 **Groundwater recharge.**

~~Maximizing the groundwater recharge capacity of the area being developed is required.~~ **Providing for infiltration consistent with the natural hydrologic regime is required.** Design of the infiltration facilities shall consider infiltration to compensate for the reduction in the recharge that occurs when the ground surface is disturbed or impervious surface is created. It is recommended that roof runoff be directed to infiltration BMPs that may be designed to compensate for the runoff from parking areas. These measures are required to be consistent with § **78-\_\_\_** and to take advantage of utilizing any existing recharge areas. Infiltration may not be feasible on every site due to site-specific limitations such as soil type. ~~If it cannot be physically accomplished, then the design professional shall be responsible to show that this cannot be physically accomplished. If it can be physically accomplished, then the volume of runoff to be infiltrated shall be~~



determined from ~~§ 78-34A(2)~~ depending on demonstrated site conditions and shall be the greater of the volumes.

*If it cannot be physically accomplished, then the design professional shall be responsible for demonstrating to the satisfaction of the municipality that this cannot be physically accomplished on the site (e.g., shallow depth to bedrock or limiting zone, open voids, steep slopes, etc. per the PA BMP Manual. A financial hardship as defined in §78-24 is not acceptable to avoid implementing infiltration facilities. If infiltration can be physically accomplished, the volume of runoff to be infiltrated shall be determined from §78-\_\_\_ depending on demonstrated site conditions, and shall be the greatest volume that can be physically infiltrated or alternative methods consistent with the PA BMP Manual (as amended) or other PADEP guidance, such as the Managed Release Concept, may be used to manage this volume with approval from the Municipal Engineer. For example:*

- *Any applicant (developer or redeveloper) shall first attempt to infiltrate the volume required in §78-36.A(2)[a].*
- *If the §78-36.A(2)[a] requirement cannot be physically accomplished, then the applicant is required to attempt to infiltrate the volume required in §78-36.A(2)[b].*
- *Finally, if the §78-36.A(2)[b] infiltration volume cannot be physically accomplished, the applicant must, at a minimum, infiltrate the volume required in §78-36.A(2)[c].*

A. Infiltration BMPs shall meet the following minimum requirements:

1. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:
  - a. A minimum depth of 24 inches between the bottom of the BMP and the top of the limiting zone **unless bioretention is used.**
  - b. An infiltration rate sufficient to accept the additional stormwater load and dewater completely as determined by field tests conducted by the applicant's design professional.
  - c. The infiltration facility shall be capable of completely infiltrating the retention (infiltration) volume (Rev) below grade within four days (96 hours).
  - d. Pretreatment shall be provided prior to infiltration.
2. The size of the infiltration facility shall be based upon the following volume criteria:

~~B. Net two-year volume approach. In HQ/EV watersheds, the retention (infiltration) volume (Rev) to be captured and infiltrated shall be the net two-year volume. The net two-year volume shall be determined by plotting the two-year project site postdevelopment hydrograph, drawing a straight line from the point of inflection of the rising limb of the hydrograph to the predevelopment two-year storm, and measuring the volume under the curve as shown in Figure 405.1.~~

~~C. e shall be determined by plotting the two-year project site postdevelopment hydrograph, drawing a straight line from the point of inflection of the rising limb of the hydrograph to the predevelopment~~



two-year storm, and measuring the volume under the curve as shown in Figure 405.1.

~~[Image]~~

- D. (b) — One inch from impervious surface. In other portions of the watershed that are not classified as HQ/EV, the retention (infiltration) volume (Rev) will be equal to capturing one inch of rainfall over all proposed impervious surfaces.

$$\text{Rev} = I * \text{impervious area square feet} @ 12 \text{ (inches)} = \text{cubic feet (cf)}$$

An asterisk (\*) in equations denotes multiplication.

- E. (c) — Obtaining the Rev volume in § 78-34A(2)(a), above, may not be feasible on every site due to site specific limitations such as soil type. If it cannot be physically accomplished, then the design professional shall be responsible for showing that this cannot be physically accomplished. If it cannot be physically accomplished, then the retention (infiltration) volume Rev required shall be as much as can be physically accomplished with a minimum of 0.50 inch depending on demonstrated site conditions. It has been determined that capturing and infiltrating 0.50 inch of runoff from the impervious areas will aid in maintaining the hydrologic regime (baseflow) of the watershed. If the goals of § 78-34A(2)(a) or (b) cannot be achieved, then 0.50 inch of rainfall shall be retained and infiltrated from all impervious areas.

The minimum recharge volume (Rev) required would, therefore, be computed as:

$$\text{Rev} * \text{impervious area (square feet)} @ 12 \text{ (inches)} = \text{cubic feet (cf)}$$

An asterisk (\*) in equations denotes multiplication.

Where:

- I = The maximum equivalent infiltration amount (inches) that the site can physically accept or 0.50 inch, whichever is greater.

The retention volume values derived from the methods in § 78-34A(2)(a), is the minimum volume the applicant must control through an infiltration BMP facility. However, if a site has areas of soils where additional volume of retention can be achieved, the applicant is encouraged to infiltrate as much of the stormwater runoff from the site as possible.

If the minimum of 0.50 inch of infiltration requirement cannot be achieved, a waiver from Section 405, Groundwater Recharge, would be required from Haverford Township.

- a. Modified Control Guideline One (MCG-1) of the PA BMP Manual – The retention (infiltration) volume (Rev) to be captured and infiltrated shall be the net 2-year 24-hour volume. The net volume is the difference between the post-development runoff volume and the pre-development runoff volume. The post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation shall not be increased. For modeling purposes, existing (pre-development) non-forested pervious areas must be considered meadow in good condition or its equivalent, and twenty (20) percent of existing impervious area, when present, shall be considered meadow in good condition.*

- b. *Infiltrating the entire  $Re_v$  volume in Section §78-36.A(2)[a] (above) may not be feasible on every site due to site-specific limitations such as shallow depth to bedrock or the water table. If it cannot be physically accomplished, then the following criteria from Modified Control Guideline Two (MCG-2) of the PA BMP Manual must be satisfied:*

*At least the first one-inch (1.0") of runoff from new or replacement impervious surfaces shall be infiltrated.*

$$Re_v = 1 \text{ (inch)} * \text{impervious area (square feet)} \div 12 \text{ (inches)} = \text{cubic feet (cf)}$$

*An asterisk (\*) in equations denotes multiplication.*

- c. *Only if infiltrating the entire  $Re_v$  volume in §78-36.A(2)[b] cannot be physically accomplished, then the following minimum criteria from Modified Control Guideline Two (MCG-2) of the PA BMP Manual must be satisfied:*

*Wherever possible, infiltration facilities should be designed to accommodate infiltration of the entire water quality volume ( $WQ_v$ ) in §78-36.A(2)[a]; however, in all cases at least the first one-half inch (0.5") of the  $WQ_v$  shall be infiltrated. The minimum infiltration volume ( $Re_v$ ) required would, therefore, be computed as:*

$$Re_v = I * \text{impervious area (square feet)} \div 12 \text{ (inches)} = \text{cubic feet (cf)}$$

*An asterisk (\*) in equations denotes multiplication.*

*Where:*

*I = The maximum equivalent infiltration amount (inches) that the site can physically accept or 0.50 inch, whichever is greater.*

*The retention volume values derived from the methods in §78-36.A(2)[a], §78-36.A(2)[b], or §78-36.A(2)[c] is the minimum volume the Applicant must control through an infiltration BMP facility. If site conditions preclude capture of runoff from portions of the impervious area, the infiltration volume for the remaining area should be increased an equivalent amount to offset the loss.*

*Only if the minimum of 0.50 inch of infiltration requirement cannot be physically accomplished, a waiver from §78-36 Infiltration Volume Requirements is required from the Municipality.*

- F. Soils. A detailed soils evaluation of the project site shall be required to determine the suitability of infiltration facilities. The evaluation shall be performed by a qualified design professional and at a minimum address soil permeability, depth to bedrock, and subgrade stability. The general process for designing the infiltration BMP shall be:

1. Analyze hydrologic soil groups as well as natural and man-made features within the site to

determine general areas of suitability for infiltration practices. In areas where development on fill material is under consideration, conduct geotechnical investigations of subgrade stability; infiltration may not be ruled out without conducting these tests.

- ~~2. Provide field tests such as double ring infiltrometer or hydraulic conductivity tests (at the level of the proposed infiltration surface) to determine the appropriate hydraulic conductivity rate. If approved, percolation tests may be used for design purposes.~~ ***Provide field tests such as required in the PA BMP Manual.***
3. Design the infiltration structure for the required retention (Rev) volume based on field-determined capacity at the level of the proposed infiltration surface.
4. If on-lot infiltration structures are proposed by the applicant's design professional, it must be demonstrated to Haverford Township that the soils are conducive to infiltrate on the lots identified.

C. Stormwater hotspots.

- (1) Below is a list of examples of designated hotspots. If a site is designated as a hotspot, it has important implications for how stormwater is managed. First and foremost, untreated stormwater runoff from hotspots shall not be allowed to recharge into groundwater where it may contaminate water supplies. Therefore, the ~~Rev~~ ***groundwater recharge*** requirement shall NOT be applied to development sites that fit into the hotspot category (the entire WQv must still be treated). Second, a greater level of stormwater treatment shall be considered at hotspot sites to prevent pollutant wash off after construction. The Environmental Protection Agency's (EPA) NPDES stormwater program requires some industrial sites to prepare and implement a stormwater pollution prevention plan. ***Stormwater runoff from hotspots shall be pretreated prior to surface or groundwater infiltration to prevent pollutant runoff. Industrial sites referenced in 40 CFR 125 are examples of hotspots.***

(a) Examples of hotspots:

Vehicle salvage yards and recycling facilities  
Vehicle fueling stations  
Vehicle service and maintenance facilities  
Vehicle and equipment cleaning facilities  
Fleet storage areas (bus, truck, etc.)  
Industrial sites based on Standard Industrial Codes  
Marinas (service and maintenance)  
Outdoor liquid container storage  
Outdoor loading/unloading facilities  
Public works storage areas  
Facilities that generate or store hazardous materials  
Commercial container nursery  
***Contaminated sites/brownfields***

Other land uses and activities as designated by an appropriate review authority

(b) The following land uses and activities are not normally considered hotspots:

Residential streets and rural highways

Residential development

Institutional development

Office developments

Nonindustrial rooftops

Pervious areas, except golf courses and nurseries [which may need an integrated pest management (IPM) plan].

(2) While large highways [average daily traffic volume (ADT) greater than 30,000] are not designated as stormwater hotspots, it is important to ensure that highway stormwater management plans adequately protect groundwater.

(3) *The Environmental Protection Agency's (EPA) NPDES stormwater program requires some industrial sites to prepare and implement a stormwater pollution prevention plan.*

*G. Infiltration facilities should, to the greatest extent practicable, be located to avoid introducing contaminants via groundwater, and be in conformance with an approved source water protection assessment or source water protection plan.*

*H. Roadway drainage systems should provide an opportunity to capture accidental spills. Road de-icing material storage facilities shall be designed to avoid salt and chloride runoff from entering waterways and infiltration facilities. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration facility and perform a hydrologic justification study if possible.*

I. Extreme caution shall be exercised where infiltration is proposed in SWPAs as defined by the local municipality or water authority.

J. Infiltration facilities shall be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

K. Extreme caution shall be exercised where salt or chloride (municipal salt storage) would be a pollutant since soils do little to filter this pollutant, and it may contaminate the groundwater. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration facility and perform a hydrogeologic justification study if necessary.

L. The antidegradation analysis found in Chapter 93 shall be applied in HQ or EV streams.

M. An impermeable liner will be required in detention basins where the possibility of groundwater contamination exists. A detailed hydrogeologic investigation may be required by Haverford Township.

N. Haverford Township shall require the applicant to provide safeguards against groundwater contamination for land uses that may cause groundwater contamination should there be a mishap or spill.

**§ 78-37 Water quality requirements.**

The applicant shall comply with the following water quality requirements of this article.

- A. No regulated earth disturbance activities within Haverford Township shall commence until approval by Haverford Township of a plan which demonstrates compliance with postconstruction state water quality requirements.
- B. The BMPs shall be designed, implemented, and maintained to meet state water quality requirements and any other more stringent requirements as determined by Haverford Township.
- C. ~~To control postconstruction stormwater impacts from regulated earth disturbance activities, state water quality requirements can be met by BMPs, including site design, which provide for replication of preconstruction stormwater infiltration and runoff conditions so that postconstruction stormwater discharges do not degrade the physical, chemical, or biological characteristics of the receiving waters. As described in the DEP Comprehensive Stormwater Management Policy (No. 392-0300-002, September 28, 2002), this may be achieved by the following~~ ***To control post-construction stormwater impacts from regulated activities and conform to state water quality requirements, BMPs which replicate pre-development stormwater infiltration and runoff conditions must be provided in the site design such that post-construction stormwater discharges do not degrade the physical, chemical, or biological characteristics of the receiving waters. The green infrastructure and Low Impact Development (LID) practices provided in the PA BMP Manual, as well as the guidance on green infrastructure and LID provided in Appendix E shall be utilized for all regulated activities wherever possible. This may be achieved by the following:***
- (1) Infiltration: replication of preconstruction stormwater infiltration conditions;
  - (2) Treatment: use of water quality treatment BMPs to ensure filtering out of the chemical and physical pollutants from the stormwater runoff; and
  - (3) Streambank and streambed protection: management of volume and rate of postconstruction stormwater discharges to prevent physical degradation of receiving waters (e.g., from scouring).
- D. Developed areas shall provide adequate storage and treatment facilities necessary to capture and treat stormwater runoff. The ~~retention~~ ***infiltration*** volume computed under **§ 78-36** may be a component of the water quality volume if the applicant chooses to manage both components in a single facility. If the ~~retention~~ ***infiltration*** volume is less than the water quality volume, the remaining water quality volume may be captured and treated by methods other than infiltration BMPs. The required water quality volume (WQv) is the storage capacity needed to capture and treat a portion of stormwater runoff from the developed areas of the site.
- (1) To achieve this goal, the following criterion is established:

The following calculation formula is to be used to determine the water quality storage volume (WQv) in acre-feet of storage required by this article:

of storage required by this article:

this article:

$$WQv = [(P)(Rv)(A)] @ 12$$

WHERE:

WQv = Water quality volume (acre-feet)

P = 1-inch

A = Area of the project contributing to the water quality BMP (acres)

Rv =  $0.05 + 0.009(I)$  where I is the percent of the area that is impervious surface (impervious area/A)\*100

- (b) This volume requirement can be accomplished by the permanent volume of a wet basin or the detained volume from other BMPs. Where appropriate, wet basins shall be utilized for water quality control and shall follow the guidelines of the BMP manuals referenced in Appendix G.
- (2) Release of water can begin at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility). The design of the facility shall provide for protection from clogging and unwanted sedimentation.

on.

*The Post-construction total runoff volume shall not exceed the Predevelopment total runoff volume for all storms equal to or less than the two-year, 24-hour duration precipitation (design storm). If the Township Engineer concurs that this criterion cannot be met, a minimum of one half (0.5)-inches of runoff from all Regulated Impervious Surfaces shall be managed. For modeling purposes, existing (pre-development) non-forested pervious areas must be considered meadow in good condition or its equivalent, and twenty (20) percent of existing impervious area, when present, shall be considered meadow in good condition.*

*This volume requirement can be managed by the permanent volume of a wet basin or the detained volume from other BMPs. Where appropriate, wet basins shall be utilized for water quality control and shall follow the guidelines of the PA BMP Manual referenced in Appendix G.*

*Release of water can begin at the the start of the storm (i.e. the invert of the water quality orifice is at the inver of the facility). The design of the facility shall provide for protection from clogging and unwanted sedimentation.*

- E. For areas within defined special protection subwatersheds that include EV and HQ waters, the temperature and quality of water and streams shall be maintained through the use of temperature-sensitive BMPs and stormwater conveyance systems.
- F. To accomplish the above, the applicant shall submit original and innovative designs to the Township engineer for review and approval. Such designs may achieve the water quality objectives through a combination of different BMPs.
- G. ~~If a perennial or intermittent stream passes through the site, the applicant shall create a stream buffer extending a minimum of 50 feet to either side of the top of bank of the channel. The buffer area shall be maintained with and encouraged to use appropriate native vegetation (refer to Appendix H of the Pennsylvania Handbook of Best Management Practices for Developing Areas for plant lists). If the applicable rear or side yard setback is less than 50 feet, the buffer width may be reduced to 25% of the setback to a minimum of 10 feet. If an existing buffer is legally prescribed (i.e., deed, covenant, easement, etc.) and it exceeds the requirements of this article, the existing buffer shall be maintained. This does not include lakes or wetlands.~~
- H. *Evapotranspiration may be quantified and credited towards meeting volume requirements according to the PADEP Post Construction Stormwater Management (PCSM) Spreadsheet and Instructions (December 2020) or the most recent guidance from PADEP.*
- I. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate DEP regional office must be provided to Haverford Township.

**§ 78-38 Streambank erosion requirements.**

- A. In addition to the control of water quality volume (in order to minimize the impact of stormwater runoff on downstream streambank erosion), the primary requirement is to design a BMP to detain the proposed conditions two-year, twenty-four-hour design storm to the existing conditions one-year flow using the SCS Type II distribution. Additionally, provisions shall be made (such as adding a small orifice at the bottom of the outlet structure) so that the proposed conditions one-year storm takes a minimum of 24 hours to drain from the facility from a point where the maximum volume of water from the one-year storm is captured (i.e., the maximum water surface elevation is achieved in the facility). Release of water can begin at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility).
- B. The minimum orifice size in the outlet structure to the BMP shall be three inches in diameter where possible, and a trash rack shall be installed to prevent clogging. On sites with small drainage areas contributing to this BMP that do not provide enough runoff volume to allow a twenty-four-hour attenuation with the three-inch orifice, the calculations shall be submitted showing this condition. Orifice sizes less than three inches can be utilized, provided that the design will prevent clogging of the intake.
- C. In "Conditional Direct Discharge Districts" (District C) only (see § 78-39), the objective is not to attenuate the storms greater than the two-year recurrence interval. This can be accomplished by configuring the outlet structure not to control the larger storms or by a bypass channel that diverts only

the two-year stormwater runoff into the basin or conversely, diverts flows in excess of the two-year storm away from the basin.

**§ 78-39 Stormwater peak rate control and management districts.**

- A. The Darby and Cobbs Creeks watershed has been divided into stormwater management districts as shown on the Management District Map in Appendix A. In addition to the requirements specified in Table 408.1 below, the erosion and sedimentation control (§ 78-34), the nonstructural project design (§ 78-35), the groundwater recharge (§ 78-36), the water quality (§ 78-37), and the streambank erosion (§ 78-38) requirements shall be implemented.
- (1) Standards for managing runoff from each subarea in the Darby and Cobbs Creeks watershed for the two-, five-, ten-, twenty-five-, fifty-, and one-hundred-year design storms are shown in Table 408.1. Development sites located in each of the management districts must control proposed conditions runoff rates to existing conditions runoff rates for the design storms in accordance with Table 408.1.

**TABLE 408.1  
PEAK RATE CONTROL STANDARDS BY STORMWATER  
MANAGEMENT DISTRICT IN THE  
DARBY-COBBS CREEK WATERSHED**

<b>District</b>	<b>Proposed Condition Design Storm</b>	<b>Existing Condition Design Storm</b>
A	2 – year	1 – year
	5 – year	5 – year
	10 – year	10 – year
	25 – year	25 – year
	100 – year	100 – year
B-1	2 – year	1 – year
	10 – year	5 – year
	25 – year	10 – year
	50 – year	25 – year
	100 – year	100 – year
B-2	2 – year	1 – year
	5 – year	2 – year
	25 – year	5 – year
	50 – year	10 – year
	100 – year	100 – year
C	Conditional Direct Discharge District	

- (2) In District C, development sites that can discharge directly to the Darby-Cobbs Creek main channel, major tributaries, or indirectly to the main channel through an existing stormwater drainage system (i.e., storm sewer or tributary) may do so without control of the proposed conditions peak rate of runoff greater than the five-year storm. Sites in District C will still have to comply with the groundwater



recharge criteria, the water quality criteria, and streambank erosion criteria. If the proposed conditions runoff is intended to be conveyed by an existing stormwater drainage system to the main channel, assurance must be provided that such system has adequate capacity to convey the flows greater than the two-year existing conditions peak flow or will be provided with improvements to furnish the required capacity. When adequate capacity in the downstream system does not exist and will not be provided through improvements, the proposed conditions peak rate of runoff must be controlled to the existing conditions peak rate as required in District A provisions (i.e., ten-year proposed conditions flows to ten-year existing conditions flows) for the specified design storms.

- B. General. Proposed conditions rates of runoff from any regulated activity shall not exceed the peak release rates of runoff from existing conditions for the design storms specified on the Stormwater Management District Watershed Map (Appendix A) and this section of the article.
- C. District boundaries. The boundaries of the stormwater management districts are shown on an official map that is available for inspection at the municipal and County Planning offices. A copy of the official map at a reduced scale is included in Appendix A. The exact location of the stormwater management district boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours (or most accurate data required) provided as part of the drainage plan.
- D. Sites located in more than one district. For a proposed development site located within two or more stormwater management district category subareas, the peak discharge rate from any subarea shall meet the management district criteria for which the discharge is located. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea. An exception to the above may be granted if discharges from multiple subareas recombine in proximity to the discharge site. In this case, peak discharge in any direction may follow Management District A criteria, provided that the overall site discharge meets the management district criteria for which the discharge is located.
- E. Off-site areas. Off-site areas that drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site.
- F. Site areas. Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area utilizing stormwater management measures shall be subject to the management district criteria. In other words, unimpacted areas bypassing the stormwater management facilities would not be subject to the management district criteria.
- G. "No harm" option. For any proposed development site not located in a Conditional Direct Discharge District, the applicant has the option of using a less-restrictive runoff control (including no detention) if the applicant can prove that "no harm" would be caused by discharging at a higher runoff rate than that specified by the stormwater management plan. The "no harm" option is used when an Applicant can prove that the proposed conditions hydrographs can match existing conditions hydrographs and if it can be proved that the proposed conditions will not cause increases in peaks at all points downstream. Proof of "no harm" must be shown based upon the following downstream impact evaluation which shall

include a downstream hydraulic capacity analysis consistent with Subsection **H** to determine if adequate hydraulic capacity exists. The applicant shall submit to Haverford Township this evaluation of the impacts due to increased downstream stormwater flows in the watershed.

- (1) The hydrologic regime of the site must be maintained.
  - (2) The downstream impact evaluation shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications due to the proposed development upon a dam, highway, structure, natural point of restricted streamflow, or any stream channel section established with the concurrence of the municipality.
  - (3) The evaluation shall continue downstream until the increase in flow diminishes due to additional flow from tributaries and/or stream attenuation.
  - (4) The peak flow values to be used for downstream areas for the design return period storms (two-, five-, ten-, fifty-, and one-hundred-year) shall be the values from the calibrated model for the respective watershed. These flow values can be obtained from the original Act 167 watershed stormwater management plans.
  - (5) Applicant-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no-harm," except in conjunction with proposed capacity improvements for the problem areas consistent with Subsection **H**.
  - (6) Financial distress shall not constitute grounds for the municipality to approve the use of the "no-harm" option.
  - (7) Capacity improvements to conveyance facilities or obstructions may be provided as necessary to implement the "no harm" option as long as it can be demonstrated through the downstream hydraulic capacity analysis that the improvements would not create any harm downstream.
  - (8) Any "no harm" justifications shall be submitted by the applicant as part of the drainage plan submission per this article.
- H. Downstream hydraulic capacity analysis. Any downstream hydraulic capacity analysis conducted in accordance with this article shall use the following criteria for determining adequacy for accepting increased peak flow rates:
- (1) Natural or man-made channels or swales must be able to convey the increased runoff associated with a two-year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP Erosion and Sediment Pollution Control Program Manual.
  - (2) Natural or man-made channels or swales must be able to convey increased twenty-five-year return period runoff without creating any hazard to persons or property.

- (3) Culverts, bridges, storm sewers, or any other facilities which need to pass or convey flows from the tributary area must be designed in accordance with DEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased twenty-five-year return period runoff.
- (4) **Water quality requirements as defined in §78-37.**

**(5) Post-construction peak rates shall not exceed the existing peak rates for the respective sub-area.**

- I. Alternate criteria for redevelopment sites. For redevelopment sites, one of the following minimum design parameters shall be accomplished, whichever is most appropriate for the given site conditions as determined by Haverford Township;
  - (1) Meet the full requirements specified by Table 408.1 and Stormwater peak rate control and management districts, § 78-39 ; or
  - (2) Reduce the total **pre-development** impervious surface on the site by at least 20% based upon a comparison of existing impervious surface to ~~proposed~~ **regulated** impervious surface. **In this case, calculations must be provided that show the peak rate has not increased.**

**§ 78-40 Calculation Methodology.**

- A. Stormwater runoff from all development sites with a drainage area of greater than ~~200~~ **five (5)** acres shall be calculated using a generally accepted calculation technique that is based on the NRCS soil cover complex method. Table 409.1 summarizes acceptable computation methods, and the method selected by the design professional shall be based on the individual limitations and suitability of each method for a particular site.

Credits providing an automatic reduction in impervious area and a corresponding reduction in stormwater impacts for the reduction of design volume, peak rate, and channel protection are available for protecting existing trees as well as revegetating and reforestation as outlined in the PA DEP BMP Manual, for sites with earth disturbance of one (1) acre or greater. No more than 25% of the Volume Reduction may be met through Nonstructural BMP credits.

Haverford Township may allow the use of the Rational Method to estimate peak discharges from drainage areas that contain less than **five (5)** acres. ~~The soil cover complex method shall be used for drainage areas greater than 200 acres.~~ The use of the Rational **Method to estimate peak discharges for drainage areas greater than five (5) acres shall be permitted only upon approval of the Township engineer.**

**TABLE 409.1  
ACCEPTABLE COMPUTATION METHODOLOGIES  
FOR STORMWATER MANAGEMENT PLANS**

<b>Method</b>	<b>Developed By</b>	<b>Applicability</b>
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**TABLE 409.1**

TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans where limitations described in TR-55.
HEC-1/HEC-HMS	US Army Corps of Engineers	Applicable where use of a full hydrologic computer is desirable or necessary.
PSRM	Penn State University	Applicable where use of a hydrologic model is desirable or necessary; simpler than TR-20 or HEC-1.
<del>Rational method (or commercial computer package based on rational method)</del>	<del>Emil Kuichling (1889)</del>	<del>For sites less than 200 acres, or as approved by the municipality and/or municipal Engineer.</del>
Other methods	Varies	Other computation methodologies approved by the municipality and/or municipal Engineer.
HEC RAS	US Army Corp of Engineers	"No harm" option

- B. All calculations consistent with this article using the soil cover complex method shall use the appropriate design rainfall depths for the various return period storms. ~~according to the region in which they are located as presented in Table F-1 in Appendix F of this article. If a hydrologic computer model such as PSRM or HEC-1/HEC-HMS is used for stormwater runoff calculations, then the duration of rainfall shall be 24 hours. The alternating block method shown in Figure F-1 or the SCS Type II S-Curve, Figure F-3 in Appendix F, shall be used for the rainfall distribution.~~ **Rainfall depths shall be according to NOAA Atlas 14 values consistent with a partial duration series. When stormwater calculations are performed for routing procedures or water quality functions, the duration of rainfall shall be twenty-four (24) hours.**
- C. The following criteria shall be used for runoff calculations:
- (1) For development sites not considered redevelopment, the ground cover used in determining the existing conditions flow rates shall be as follows:
    - (a) Wooded sites shall use a ground cover of "woods in good condition." Portions of a site having more than one viable tree of a DBH of six inches or greater per 1,500 square feet shall be considered "wooded" where such trees existed within three years of application.
    - (b) The undeveloped portion of the site including agriculture, bare earth and fallow ground, shall be considered as "meadow in good condition," unless the natural ground cover generates a lower curve (CN) number or Rational "c" value (i.e., woods) as listed in Tables F-2 or F-3 in Appendix F of this article.

- (2) For ~~development and~~ redevelopment sites, the ground cover used in determining the existing conditions flow rates for the developed portion of the site shall be based upon actual land cover conditions.
- D. ~~All calculations using the rational method shall use rainfall intensities consistent with appropriate times of concentration for overland flow and return periods presented in the Region 5 Curves from the PennDOT Storm Duration Frequency Chart (Figure F 4). Times of concentration for overland flow shall be calculated using the methodology presented in Chapter 3 of Urban Hydrology for Small Watersheds, NRCS, TR-55 (as amended or replaced from time to time by NRCS). Times of concentration for channel and pipe flow shall be computed using a minimum of 5 minutes.~~ ***All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration (duration) and storm events with rainfall intensities obtained from NOAA Atlas 14 partial duration series estimates, or the latest version of the PennDOT Drainage Manual (PDM Publication 584). Times of concentration shall be calculated based on the methodology recommended in the respective model used. Times of concentration for channel and pipe flow shall be computed using a minimum of five (5) minutes.***
- E. Runoff curve numbers (CN) for both existing and proposed conditions to be used in the soil cover complex method shall be obtained from Table F-2 in Appendix F of this article.
- F. Runoff coefficients (c) for both existing and proposed conditions for use in the rational method shall be obtained from Table F-3 in Appendix F of this article.
- G. ~~Where uniform flow is anticipated, the Manning equation shall be used for hydraulic computations and to determine the capacity of open channels, pipes, and storm sewers.~~ ***Hydraulic computations to determine the capacity of pipes, culverts, and storm sewers shall be consistent with methods and computations contained in the Federal Highway Administration Hydraulic Design Series Number 5 (Publication No. FHWA-NHI-01-020 HDS No. 5). Hydraulic computations to determine the capacity of open channels shall be consistent with methods and computations contained in the Federal Highway Administration Hydraulic Engineering Circular Number 15 (Publication No. FHWA-BHI-05-114 HEC 15).*** Values for Manning's roughness coefficient (n) shall be consistent with Table F-4 in Appendix F.
- H. Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this article using any generally accepted hydraulic analysis technique or method.
- I. The design of any stormwater detention facilities intended to meet the performance standards of this article shall be verified by routing the design storm hydrograph through these facilities using the storage-indication method. The design storm hydrograph shall be computed using a calculation method that produces a full hydrograph. Haverford Township may approve the use of any generally accepted full hydrograph approximation technique that shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.

#### § 78-41 **Other requirements.**

- A. Any stormwater facility located on state highway rights-of-way shall be subject to approval by PennDOT.

- B. All wet basin designs shall incorporate biologic controls consistent with the West Nile Guidance found in Appendix H, *PADEP document 363-0300-001 “Design Criteria – Wetlands Replacement/Monitoring,”* or *contact the Pennsylvania State Cooperative Wetland Center (www.wetlands.psu.edu/) or the Penn State Cooperative Extension Office (www.extension.psu.edu/extmap.html).*
- C. Any stormwater management facility (i.e., detention basin) required or regulated by this article designed to store runoff and requiring a berm or earthen embankment shall be designed to provide an emergency spillway to handle flow up to and including the one-hundred-year proposed conditions. The height of embankment must provide a minimum 1.0 foot of freeboard above the maximum pool elevation computed when the facility functions for the one-hundred-year proposed conditions inflow. Should any stormwater management facility require a dam safety permit under DEP Chapter 105, the facility shall be designed in accordance with Chapter 105 and meet the regulations of Chapter 105 concerning dam safety. Chapter 105 may be required to pass storms larger than the one-hundred-year event.
- D. Any facilities that constitute water obstructions (e.g., culverts, bridges, outfalls, or stream enclosures) and any work involving wetlands governed by DEP Chapter 105 regulations (as amended or replaced from time to time by DEP) shall be designed in accordance with Chapter 105 and will require a permit from DEP.
- E. Any other drainage conveyance facility that does not fall under Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the twenty-five-year design storm with a minimum 1.0 foot of freeboard measured below the lowest point along the top of the roadway. Any facility that constitutes a dam as defined in DEP Chapter 105 regulations may require a permit under dam safety regulations. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements. *The larger events (50 year and 100 year) must also be safely conveyed in the direction of natural flow without creating additional damage to any drainage structures, nearby structures, or roadways.*
- F. Any drainage conveyance facility and/or channel not governed by Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the twenty-five-year design storm. Conveyance facilities to or exiting from stormwater management facilities (i.e., detention basins) shall be designed to convey the design flow to or from that structure. Roadway crossings located within designated floodplain areas must be able to convey runoff from a one-hundred-year design storm. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.
- G. *Conveyance facilities transporting flow to or exiting from stormwater management facilities (i.e. detention basins) shall be designed to convey the 100-year frequency storm.*
- H. *Roadway crossings or structures located within designated floodplain areas must be able to convey runoff from a 100-year design storm consistent with FEMA Floodplain Management requirements.*
- I. Adequate erosion protection shall be provided along all open channels and at all points of discharge.

- J. The design of all stormwater management facilities shall incorporate sound engineering principles and practices. Haverford Township reserves the right to disapprove any design that would result in construction in or continuation of a stormwater problem area.

**§78-42 Riparian Buffers**

- A. *Except as required by Chapter 102, if a perennial or intermittent stream passes through, or a waterbody (i.e., lake, pond, wetland) is present on the site, the Applicant shall create a Riparian Buffer extending a minimum of 50 feet, to either side of the top-of-bank of the channel, lake, or wetland*
- B. *The Riparian Buffer shall be planted with native vegetation and maintained in a vegetated state (Refer to Appendix B, Pennsylvania Native Plant List, contained in the PA BMP Manual or latest guidance document from PADEP).*
1. *The following provisions also apply to Riparian Buffers on lots in existence at the time of adoption of this Ordinance:*
    - a. *If the applicable rear or side yard setback is less than 50 feet, the buffer width may be reduced to twenty-five (25) percent of the setback or twenty-five (25) feet, whichever is greater.*
    - b. *If a stream traverses a site in a manner that significantly reduces the use of the site, the buffer may be either:*
      - i. *Reduced to twenty-five (25) feet on either side, with municipal approval, or*
      - ii. *Reduced to ten (10) feet with municipal waiver*
  2. *Permitted uses within the Riparian Buffer include the following, subject to municipal approval and provided that they comply with all federal, state, and local regulations:*
    - a. *Recreational trails. See Ordinance Appendix J Riparian Buffer Trail Guidelines.*
    - b. *Utility rights-of-way*
    - c. *Bridges*
    - d. *Other uses subject to Township approval.*
  3. *If an existing buffer is legally prescribed (i.e., deed, covenant, easement, etc.) and it exceeds the requirements of this Ordinance, the existing buffer shall be maintained.*

**§ 78-43 Inspections.**

- A. The municipal Engineer or his municipal designee shall inspect all phases of the installation of the permanent BMPs and/or stormwater management facilities as deemed appropriate by the municipal Engineer.
- B. During any stage of the work, if the municipal Engineer or his municipal designee determines that the permanent BMPs and/or stormwater management facilities are not being installed in accordance with the approved stormwater management plan, the municipality shall revoke any existing permits or other



approvals and issue a cease and desist order until a revised drainage plan is submitted and approved, as specified in this article, and until the deficiencies are corrected.

- C. A final inspection of all BMPs and/or stormwater management facilities shall be conducted by the municipal Engineer or his municipal designee to confirm compliance with the approved drainage plan prior to the issuance of any occupancy permit.

***§78-44 As-Built Plans, Completion Certificate, and Final Inspection***

- A. The developer shall be responsible for providing as-built plans of all SWM BMPs included in the approved SWM site plan for activities involving regulated impervious surfaces 1,000 sq. ft. or greater and for earth disturbances 5,000 sq. ft. or greater. The as-built plans and all explanation of any discrepancies with the construction plans shall be submitted to the Municipality within three (3) months of the completion of construction of the SWM BMPs.***
- B. As-built plans shall show the location (including latitude and longitude coordinates) and as-built conditions of all SWM BMPs and include the following information: impervious surfaces included in the approved SWM site plan; topographic contours; and existing, proposed, and built impervious surfaces shown in the as-built drawings.***
- C. The as-built submission shall include a certification of completion signed by a Design Professional verifying that all permanent SWM BMPs have been constructed according to the approved plans and specifications.***
- D. The municipality will review the as-built submission for consistency with the approved SWM site plan as well as actual conditions at the project site. After receipt of the completion certification by the Municipality, the Municipality may conduct a final inspection.***
- E. If an NPDES Permit for Stormwater Discharges Associated with Construction Activities was required for the Regulated Activity, a Notice of Termination (NOT) approval must be obtained upon completion of construction prior to final approval of the project by the Municipality.***

**§ 78-45 Municipality drainage plan review and inspection fee.**

Fees shall be established by Haverford Township to defray plan review and construction inspection costs incurred by the municipality. All fees shall be paid by the applicant at the time of drainage plan submission. A review and inspection fee schedule shall be established by resolution of the Board of Commissioners based on the size of the regulated activity and based on the municipality's costs for reviewing drainage plans and conducting inspections pursuant to § 78-43 Haverford Township shall periodically update the review and inspection fee schedule to ensure that review costs are adequately reimbursed.

**§ 78-46 Expenses covered by fees.**

- A. The fees required by this article shall at a minimum cover:
- a. Administrative costs.
  - b. ***The review of the SWM site plan by Haverford Township and the Township Engineer.***



- c. *The inspection of stormwater management facilities and drainage improvements during construction.*
- d. The site inspections.
- e. *The inspection of stormwater management facilities and drainage improvements during construction.*
- f. *Attendance at meetings.*
- g. *The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the SWM site plan*
- h. Any additional work required to enforce any permit provisions regulated by this article, correct violations, and assure proper completion of stipulated remedial actions.
- i. In addition, any and all costs for the review of plans and the inspection of stormwater management facilities and drainage improvements during construction by the municipal engineer, shall be deducted from the applicant's escrow account.

§ 78-47 **Performance guarantee.**

A. For SWM Site Plans that involve subdivision and land development, the applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as

(1) required by the approved ~~drainage~~ *SWM site* plan equal to or greater than the full construction cost of the required controls; or

(2) The amount and method of payment provided for in the SALDO.

B. For other regulated activities, Haverford Township may require a financial guarantee from the applicant.

§ 78-48 **Responsibilities for operations and maintenance (O&M) of stormwater controls and BMPs.**

A. No regulated earth disturbance activities within Haverford Township shall commence until approval by the municipality of a stormwater control and BMP operations and maintenance plan that describes how the permanent (e.g., postconstruction) stormwater controls and BMPs will be properly operated and maintained.

*B. The Township shall make the final determination on the continuing maintenance responsibilities prior to final approval of the SWM Site Plan. The municipality may require a dedication of such facilities as part of the requirements for approval of the SWM Site Plan. Such a requirement is not an indication that the municipality will accept the facilities. The Township reserves the right to accept or reject the ownership and operating responsibility for any portion of the stormwater management controls.*

***C. Facilities, areas, or structures used as SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.***

***Facilities, areas, or structures used as SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.***

***A. The O&M Plan shall be recorded as a restrictive deed covenant that runs with the land.***

***B. The Municipality may take enforcement actions against an owner for any failure to satisfy the provisions of this Article.***

D. The following items shall be included in the stormwater control and BMP operations and maintenance plan:

- (1) Map(s) of the project area, in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Delaware County. The contents of the maps(s) shall include, but not be limited to:
  - (a) Clear identification of the location and nature of permanent stormwater controls and BMPs;
  - (b) The location of the project site relative to highways, municipal boundaries, or other identifiable landmarks;
  - (c) Existing and final contours at intervals of two feet, or others as appropriate;
  - (d) Existing streams, lakes, ponds, or other bodies of water within the project site area;
  - (e) Other physical features, including flood hazard boundaries, sinkholes, streams, existing drainage courses, and areas of natural vegetation to be preserved;
  - (f) The locations of all existing and proposed utilities, sanitary sewers, and waterlines within 50 feet of property lines of the project site;
  - (g) Proposed final changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added;
  - (h) Proposed final structures, roads, paved areas, and buildings; and
  - (i) A fifteen-foot-wide access easement around all stormwater controls and BMPs that would provide ingress to and egress from a public right-of-way.
- (2) A description of how each permanent stormwater control and BMP will be operated and maintained, and the identity and contact information associated with the person(s) responsible for operations and maintenance.
- (3) The name of the project site, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.

- (4) A statement, signed by the landowner, acknowledging that the stormwater controls and BMPs are fixtures that can be altered or removed only after approval by Haverford Township.
- C. The stormwater control and BMP operations and maintenance plan for the project site shall establish responsibilities for the continuing operation and maintenance of all permanent stormwater controls and BMPs, as follows:
  - (1) If a plan includes structures or lots which are to be separately owned and in which streets, sewers, and other public improvements are to be dedicated to Haverford Township, stormwater controls and BMPs may also be dedicated to and maintained by the municipality;
  - (2) If a plan includes operations and maintenance by a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the operation and maintenance of stormwater controls and BMPs shall be the responsibility of the owner or private management entity.
- D. ~~Haverford Township shall make the final determination on the continuing operations and maintenance responsibilities. The municipality reserves the right to accept or reject the operations and maintenance responsibility for any or all of the stormwater controls and BMPs.~~

~~stormwater controls and BMPs.~~

**§ 78-49 Municipal review of a stormwater control and BMP operations and maintenance plan.**

- A. The municipality shall review the stormwater control and BMP operations and maintenance plan for consistency with the purposes and requirements of this article and any permits issued by DEP.
- B. The municipality shall notify the applicant in writing whether or not the stormwater control and BMP operations and maintenance plan is approved.
- C. The municipality ~~may require a "record drawing"~~ ***will require an as-built plan showing all constructed stormwater controls and BMPs and an explanation of any discrepancies with the approved operations and maintenance plan.***

**§ 78-50 Adherence to an approved stormwater control and BMP operations and maintenance plan.**

It shall be unlawful to alter or remove any permanent stormwater control and BMP required by an approved stormwater control and BMP operations and maintenance plan or to allow the property to remain in a condition which does not conform to an approved stormwater control and BMP operations and maintenance plan.

**§ 78-51 Operation and Maintenance Agreements for privately owned stormwater controls and BMPs.**

- A. ~~The applicant shall sign an operations and maintenance agreement with Haverford Township covering all stormwater controls and BMPs that are to be privately owned. The maintenance agreement shall be transferred with transfer of ownership. The agreement shall be substantially the same as the agreement in Appendix I of this article.~~ ***Prior to final approval of the SWM Site Plan, the property owner shall sign and record an Operation and Maintenance (O&M) Agreement (see Appendix \_\_) covering all stormwater control facilities which are to be privately owned.*** The maintenance

agreement shall be transferred with transfer of ownership *in perpetuity*.

- a. The owner, successor and assigns shall maintain all facilities in accordance with the approved maintenance schedule in the O&M Agreement.*
- b. The owner shall convey to the Township conservation easements to assure access for periodic inspections by the Township and maintenance, as necessary.*
- c. The owner shall keep on file with the Township the name, address, and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information shall be submitted by the owner to the Municipality within ten (10) working days of the change.*

*B. The owner is responsible for operation and maintenance (O&M) of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the Township may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.*

C. Other items may be included in the agreement where determined necessary to guarantee the satisfactory operation and maintenance of all permanent stormwater controls and BMPs. The agreement shall be subject to the review and approval of the Township.

**§ 78-52 Stormwater management easements.**

- A. Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the ~~municipal Engineer~~ **Township**.
- B. Stormwater management easements shall be provided by the applicant or property owner if necessary for access for inspections and maintenance or the preservation of stormwater runoff conveyance, infiltration, and detention areas and other stormwater controls and BMPs by persons other than the property owner. The purpose of the easement shall be specified in any agreement under § 78-51.

**§ 78-53 Maintenance agreement for privately owned stormwater facilities.**

- A. Prior to final approval of the site's drainage plan, the applicant shall sign and record the maintenance agreement contained in Appendix I, which is attached and made part hereof, covering all stormwater control facilities that are to be privately owned.
- B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The maintenance agreement shall be subject to the review and approval of the municipal Solicitor and Board of Commissioners.

**§ 78-54 Recording of an approved stormwater control and BMP operations and maintenance plan and related agreements.**

- A. The owner of any land upon which permanent stormwater controls and BMPs will be placed, constructed, or implemented, as described in the stormwater control and BMP operations and maintenance plan, shall record the following documents in the Office of the Recorder of Deeds for Delaware County within 15 days of approval of the stormwater control and BMP operations and maintenance plan by the municipality:

- (1) The operations and maintenance plan, or a summary thereof,

- (2) Operations and Maintenance Agreement for Privately Owned Stormwater Controls and BMPs under § 78-51; and
  - (3) Stormwater Management Easements under § 78-52.
- B. The municipality may suspend or revoke any approvals granted for the project site upon discovery of failure on the part of the owner to comply with this section.

**§ 78-55 Municipal Stormwater Control and BMP Operation and Maintenance Fund.**

A. *The Township shall inspect SWM BMPs, facilities, and/or structures installed under this Ordinance according to the following frequencies, at a minimum, to ensure the BMPs, facilities and/or structures continue to function as intended.* Persons installing stormwater controls or BMPs shall be required to pay a specified amount to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:

- (1) If the stormwater control or BMP is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by Haverford Township for a period of 10 years, as estimated by the municipal Engineer. After that period of time, inspections will be performed at the expense of the municipality. *The following minimum inspection frequencies are required:*
  - 1) *Annually for the first 5 years.*
  - 2) *Once every 3 years thereafter*
  - 3) *During or immediately after the cessation of a 25-year or greater storm, as determined by the Municipal Engineer.*
  - 4) *The Township Engineer may request that the landowners or landowner's designee submit an inspection report after the cessation of a 10-year or greater storm event if there is reason to believe that a BMP has sustained damage that impacts its ability to function as designed and if the BMP's failure would result in damage to downgradient properties.*
- (2) If the stormwater control or BMP is to be owned and maintained by Haverford Township, the deposit shall cover the estimated costs for maintenance and inspections for 10 years. The municipal Engineer will establish the estimated costs utilizing information submitted by the applicant. *The following minimum inspection frequencies are required:*
  - 1) *Annually for the first 5 years.*
  - 2) *Once every 3 years thereafter*
  - 3) *During or immediately after the cessation of a 25-year or greater storm, as determined by the Municipal Engineer.*
- (3) *The above referenced inspections shall be conducted during or immediately following precipitation events or in dry weather conditions if the BMP design parameters include dewatering with a specified period of time. A written inspection report shall be created to document each inspection. The inspection report shall contain the date and time of the inspection, the individual(s) who completed*

*the inspection, the location of the BMP, Stormwater Management Facility or structure inspected, observations on performance, and recommendations for improving performance, if applicable.*

- (4) The amount of the deposit to the fund shall be converted to present worth of the annual series values. The municipal Engineer shall determine the present worth equivalents, which shall be subject to the approval of the governing body.
- B. If a stormwater control or BMP is proposed that also serves as a recreational facility (e.g., ball field or lake), Haverford Township may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreational purpose.
- C. If at some future time a stormwater control or BMP (whether publicly or privately owned) is eliminated due to the installation of storm sewers or other storage facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.
- D. If stormwater controls or BMPs are accepted by Haverford Township for dedication, the municipality may require persons installing stormwater controls or BMPs to pay a specified amount to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to help defray costs of operations and maintenance activities. The amount may be determined as follows:
  - (1) The amount shall cover the estimated costs for operations and maintenance for 10 years, as determined by Haverford Township.
  - (2) The amount shall then be converted to present worth of the annual series values.
- E. If a stormwater control or BMP is proposed that also serves as a recreational facility (e.g., ball field or lake), Haverford Township may adjust the amount due accordingly.
- F. Haverford Township shall require applicants to pay a fee to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to cover long-term maintenance of stormwater controls and BMPs.
- G. Haverford Township may require applicants to pay a fee to the Municipal Stormwater Control and BMP Operation and Maintenance Fund to cover *inspections, long term maintenance of stormwater BMPs and conveyances, and stormwater related problems which may arise from the land development and earth disturbance.*

§ 78-56 **Prohibited Discharges and Connections.**

- A. *Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter the Township's separate storm sewer system, riparian buffers, wetlands, or other waters of this Commonwealth, and any connections to the storm drain system from indoor drains and sinks, is prohibited.*
- B. No person in Haverford Township shall allow, or cause to allow, stormwater discharges into ~~the Township's separate storm sewer system~~ *a regulated small MS4, or discharges into waters of this*

**Commonwealth**, which are not composed entirely of stormwater, except (1) ~~as provided in paragraph C below~~ and (2) **as provided in subsection C below, and** discharges authorized under a state or federal permit.

- C. Discharges that may be allowed based on a finding by the Township that the discharge(s) do not significantly contribute to pollution to surface waters of the Commonwealth, are: **The following discharges are authorized unless they are determined to be significant contributors to pollution to a regulated small MS4 or to the waters of this Commonwealth:**
- a. Discharges from firefighting activities.
  - b. ~~Potable water sources including the dechlorinated waterline and fire hydrant flushings.~~  
**Discharges from potable water sources including water line flushing and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).**
  - c. ~~Irrigation drainage.~~ **Non-contaminated irrigation drainage water.**
  - d. Routine external building washdown (which does not use detergents or other compounds).
  - e. ~~Air conditioning condensate.~~ **Non-contaminated HVAC condensation and water from geothermal systems.-**
  - f. ~~Water from individual residential car washing.~~ **Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.**
  - g. Springs and water from crawl space pumps.
  - h. Uncontaminated water from foundation or from footing drains.
  - i. Flows from riparian habitats and wetlands.
  - j. Lawn watering.
  - k. Pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used.
  - l. Dechlorinated swimming pool discharges.
  - m. Uncontaminated groundwater
  - n. Non-contaminated hydrostatic test water discharges if such discharges do not contain detectable concentrations of TRC.**
  - o. Diverted stream flows.**
- D. In the event that the municipality determines that any of the discharges identified in Subsection C significantly contribute pollutants to a regulated small MS4 or to the waters of this Commonwealth, **or is so notified by DEP**, the Township will notify the responsible person(s) to cease the discharge.
- E. Upon notice provided by the Township under **§78-56.D** the discharger will have a reasonable time, as determined by the Township, to cease the discharge consistent with the degree of pollution caused by the discharge.



F. Nothing in this section shall affect a discharger's responsibilities under state law.

**§ 78-57 Roof Drains and Sump Pumps.**

A. ~~Roof drains shall not be connected to streets, sanitary or storm sewers, or roadside ditches in order to promote overland flow and infiltration/percolation of stormwater where advantageous to do so.~~ ***Roof drains and sump pumps shall not be connected to sanitary sewers.***

B. ~~When it is more advantageous to connect directly to streets or storm sewers, connections of roof drains to streets or roadside ditches may be permitted on a case by case basis as determined by Haverford Township.~~ ***Roof drains and sump pumps shall not be connected to streets, storm sewers, or roadside ditches except on a case by case basis as determined by the Township.***

C. Roof drains and sump pumps shall discharge to infiltration areas or vegetative BMPs to the maximum extent practicable where advantageous to do so.

**§ 78-58 Prohibited connections.**

The following connections are prohibited, except as provided in § 78-56.C above:

A. Any drain or conveyance, whether on the surface or subsurface, which allows any non-stormwater 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.

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

C. ***Any drain or conveyance that delivers non-stormwater discharges directly into wetlands, riparian buffers, or other waters of the Commonwealth is prohibited.***

**§ 78-59 Alteration of *SWM* BMPs**

A. No person shall modify, remove, fill, landscape, or alter any existing stormwater control or BMP unless it is part of an approved maintenance program without the written approval of Haverford Township.

B. No person shall place any structure, fill, landscaping, or vegetation into a stormwater control or BMP or within a drainage easement which would limit or alter the functioning of the stormwater control or BMP without the written approval of Haverford Township.

**§ 78-60 Right-of-entry.**

A. Upon presentation of proper credentials, the Township or its designated agent may enter at reasonable times upon any property within the municipality to inspect the condition, implementation, or operation and maintenance of ***all erosion and sediment controls*** and ***permanent*** stormwater BMPs, ***conveyances, or other stormwater management facilities both during and after the completion of the regulated activity, or for compliance with any requirement of the stormwater structures and facilities*** in regard to any aspect regulated by this Ordinance.



- B. Stormwater control and BMP owners and operators shall allow persons working on behalf of Haverford Township ready access to all parts of the premises for the purposes of determining compliance with this article.
- C. Persons working on behalf of Haverford Township shall have the right to temporarily locate on any stormwater control or BMP in the municipality such devices as are necessary to conduct monitoring and/or sampling of the discharges from such stormwater control or BMP.
- D. Unreasonable delays in allowing the municipality access to a stormwater control or BMP is a violation of this article.
- E. *If the property owner or representative does not grant access to the Municipality within 24 hours of the notification, it will be a violation of this Ordinance.*

§ 78-61 **Public nuisance.**

- A. The violation of any provision of this article is hereby deemed a public nuisance.
- B. Each day that a violation continues shall constitute a separate violation.

§ 78-62 **Enforcement generally.**

- A. Whenever Haverford Township finds that a person has violated a prohibition or failed to meet a requirement of this article, the municipality may order compliance by written notice to the responsible person. Such notice may, without limitation, require the following remedies:
  - a. Performance of monitoring, analyses, and reporting;
  - b. Elimination of prohibited connections or discharges;
  - c. Cessation of any violating discharges, practices, or operations;
  - d. Abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
  - e. Payment of a fine to cover administrative and remediation costs;
  - f. Implementation of stormwater controls and BMPs; and
  - g. Operation and maintenance of stormwater controls and BMPs.
- B. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violations(s). Said notice may further advise that, if applicable, should the violator fail to take the required action within the established deadline, the work will be done by Haverford Township or designee, and the expense thereof shall be charged to the violator.
- C. Failure to comply within the time specified shall also subject such person to the penalty provisions of this article. All such penalties shall be deemed cumulative and shall not prevent the municipality from pursuing any and all other remedies available in law or equity.

§ 78-63 **Suspension and revocation of permits and approvals.**

- A. Any building, land development, or other permit or approval issued by the Township pursuant to this Ordinance may be suspended or revoked for:
- a. Non-compliance with or failure to implement any provision of the permit.
  - b. A violation of any provision of this Ordinance *or any other applicable law, ordinance, rule, or regulation relating to the regulated activity.*
  - c. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard, nuisance, pollution, or endangers the life or property of others.
- B. A suspended permit or approval may be reinstated by the Municipality when:
- a. The Township *Township engineer or designee* has inspected and approved the corrections to the stormwater controls and BMPs or the elimination of the hazard or nuisance.
  - b. The Township is satisfied that the violation or the article, law, or rule and regulations has been corrected.
- C. A permit or approval that has been revoked by the Township cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.
- D. Prior to revocation or suspension of a permit and at the request of the applicant, the governing body shall schedule a hearing to discuss the noncompliance if there is no immediate danger to life, public health, or property. The expense of a hearing shall be the applicant's responsibility.*

§ 78-64 **Violations and penalties.**

- A. Any person violating the provisions of this article shall be guilty of a misdemeanor and upon conviction shall be subject to a fine of not more than \$1,000 for each violation, recoverable with costs, or imprisonment of not more than 90 days, or both. Each day that the violation continues shall be a separate offense.
- B. In addition, the Township, through its Solicitor, may institute injunctive, mandamus, or any other appropriate action or proceeding at law or in equity for the enforcement of this article. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.

§ 78-65 **Notification**

In the event that a person fails to comply with the requirements of this article or fails to conform to the requirements of any permit issued hereunder, the Township shall provide written notification of the violation. Such notification shall state the nature of the violation(s) and establish a time limit for correction of these violation(s). Failure to comply within the time specified shall subject such person to the penalty provisions of this article. All such penalties shall be deemed cumulative and shall not prevent the Township from pursuing any and all remedies. It shall be the responsibility of the owner of the real property on which any regulated activity is proposed to occur, is occurring, or has occurred to comply with the terms and conditions of this article.

## §78- 66 **Enforcement**

The Board of Commissioners is hereby authorized and directed to enforce all of the provisions of this article. All inspections regarding compliance with the ~~drainage~~ **SWM site** plan shall be the responsibility of the Township Engineer or other qualified persons designated by the Board of Commissioners.

- A. A set of design plans approved by the Township shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made by the Township or designee during construction.
- B. It shall be unlawful for any person, firm, or corporation to undertake any regulated activity under § 78-17 on any property except as provided for in the approved ~~drainage~~ **SWM site** plan and pursuant to the requirements of this article. It shall be unlawful to alter or remove any control structure required by the ~~drainage~~ **SWM site** plan pursuant to this article or to allow the property to remain in a condition which does not conform to the approved ~~drainage~~ **SWM site** plan.
- C. At the completion of the project and as a prerequisite for the release of the performance guarantee, the owner or his representatives shall:
- (1) Provide a certification 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 as-built (record) drawings.
- D. After receipt of the certification by Haverford Township, a final inspection shall be conducted by the municipal Engineer or designated representative to certify compliance with this article.
- E. Occupancy permit. An occupancy permit shall not be issued unless the certification of completion pursuant to § 78-66.C(1) has been secured. The occupancy permit shall be required for each lot owner and/or applicant for all subdivisions and land developments in Haverford Township.

## § 78-67 **Appeals.**

- A. Any person aggrieved by any action of the Township or its designee may appeal to the Board of Commissioners of Haverford Township within 30 days of that action.
- B. Any person aggrieved by any decision of the Board of Commissioners of Haverford Township may appeal to the County Court of Common Pleas in the County where the activity has taken place within 30 days of the municipal decision.

## **Attachments:**

Appendix A- Darby-Cobbs Map- no change

Appendix B- Simplified Method- replaced existing appendix B with appendix from Crum Creek model ordinance

Appendix C- Drainage Plan App/Drainage Plan Checklist- no changes

Appendix D- Flow Chart- no change

Appendix E- Low Impact Development- no change

Appendix F- Design Criteria- deleted rainfall charts, depths, etc.

Appendix G- West Nile- replaced existing with updated language from Crum Creek model ordinance  
Appendix H- References- replaced existing with updated list of references from Crum Creek model ordinance  
Appendix I- O&M Agreement- no change  
Appendix J- Riparian Buffer Trail Guidelines- new appendix for Haverford

# Ordinance No. P13-2024

## Traffic

An ordinance of the Township of Haverford, County of Delaware, Commonwealth of Pennsylvania, further amending and supplementing Ordinance no. 1960, adopted June 30, 1986, and known as "General laws of the Township of Haverford" chapter 175, vehicles and traffic.

Be it enacted and ordained by the Board of Commissioners of the Township of Haverford, County of Delaware, Commonwealth of Pennsylvania, and it is hereby enacted and ordained by the authority of the same:

Section 1. § 175-83 Schedule VIII: Stop Intersections

on Woodbine Road, north, at the intersection of Washington Avenue

on Paddock Road at the intersection of Merrybrook Drive

Section 2. § 175-95 Schedule XX: Special Purpose Parking Zones

in front of 606 Darby Road, 1<sup>st</sup> Floor

Section 3. Upon effective date of this ordinance, the Highway Department shall install appropriate signs in the designated section or zones giving notice of the regulations aforesaid.

Section 4. Any ordinance or part of an ordinance to the extent that it is inconsistent herewith is hereby repealed.

Adopted this      day of                      , 2024.

Township of Haverford

By: C. Lawrence Holmes  
President

Attest: David R. Burman  
Township Manager

Township of Haverford

Resolution Number 2402-2024

American Rescue Plan Act Coronavirus Local Fiscal Recovery Fund  
Public Works Heavy Equipment, Paving at Public Works Yard and Sidewalk Project

Whereas, Haverford Township's direct allocation from the Coronavirus State and Local Fiscal Recovery Fund was \$19.8 million;

Whereas, on April 1, 2022, the U.S. Department of Treasury released the Final Rule covering the Coronavirus State and Local Fiscal Recovery Fund, as created and directed by the American Rescue Plan Act authorizing recipients to use funds to invest in public health improvements, economic recovery and development, services to disproportionately affected communities, and general government services, among other allowable purposes; and,

Whereas, the Board of Commissioners desires to make improvements and financial investments in several Township projects and initiatives in accordance with the allowable spending structure as described by the U.S. Department of Treasury's Final Rule, as follows:

- One (1) Roll-Off Truck in the amount of \$218,534.15
- Repaving of Public Works Yard located at 1 Hilltop Road, Haverford Township in the amount of \$458,519.75 including design, engineering, pre and post construction administration
- Installation of sidewalks, aprons and ADA ramps on the north side of City Avenue from Farwood Road west approximately 450 feet in the amount of \$79,985.00 including design, engineering, pre and post construction administration
- Emergency Sewer Replacement – Landover Road in the amount of \$100,000.00

Now, Therefore, be it Resolved, that the Board of Commissioners of Haverford Township hereby approves the use of funds from the Township's American Rescue Plan Fund allocation for the above referenced projects and initiatives.

Resolved this 15<sup>th</sup> day of October, 2024.

Township of Haverford

By: C. Lawrence Holmes, Esq., President

Attest: David R. Burman, Township Manager/Secretary

# Township of Haverford

Resolution No. 2403-2024

American Rescue Plan Act Coronavirus Local Fiscal Recovery Fund  
Recreation Facilities

Whereas, Haverford Township's direct allocation from the Coronavirus State and Local Fiscal Recovery Fund was \$19.8 million;

Whereas, on April 1, 2022 the US Department of Treasury released the Final Rule covering the Coronavirus State and Local Fiscal Recovery Fund, as created and directed by the American Rescue Plan Act authorizing recipients to use funds to invest in public health improvements, economic recovery and development, services to disproportionately affected communities, and general government services, among other allowable purposes: and,

Whereas, the Board of Commissioners desires to make improvements and financial investments in several Township projects and initiatives in accordance with the allowable spending structure as described by the U.S. Department of Treasury's Final rule as follows:

Merry Place tennis court and skate park fencing, removal of old fencing, supply and install new fencing - \$48,120.00

Elwell Field replace and install new baseball cage and sideline fencing - \$68,350.00

Paddock Park replace and install new baseball cage and sideline fencing - \$46,980.00

Jack McDonald Field reinstall soccer and football light poles - \$20,600.00

Jack McDonald Field install new baseball field lights - \$237,000.00

Lynnewood Path removal of old path and replacement with five-foot-wide path - \$9,875.00

Brookline Park removal of current basketball court - \$16,280.00

Brookline Park new circular half-court basketball court, including other playground games - \$39,880.00

Bailey Park replacement playground equipment - \$16,592.00

Chatham Glen replacement playground equipment - \$16,593.00

Various parks preschool playground equipment - \$30,004.00

Brookline Park fencing in an amount not to exceed - \$50,000.00

Park pavilion repairs at pavilions throughout Haverford Township, in an amount not to exceed - \$25,000.00

Brookline Park trees in an amount not to exceed - \$25,000.00

Autism Spectrum classes and camps not to exceed - \$15,000.00

Resolved this 15<sup>th</sup> day of October, 2024.

Township of Haverford

By: C. Lawrence Holmes, Esq., President

Attest: David R. Burman, Township Manager



# Township of Haverford

Resolution Number 2404-2024

## American Rescue Plan Act Coronavirus Local Fiscal Recovery Fund Infrastructure Projects

Whereas, Haverford Township's direct allocation from the Coronavirus State and Local Fiscal Recovery Fund was \$19.8 million;

Whereas, on April 1, 2022, the U.S. Department of Treasury released the Final Rule covering the Coronavirus State and Local Fiscal Recovery Fund, as created and directed by the American Rescue Plan Act authorizing recipients to use funds to invest in public health improvements, economic recovery and development, services to disproportionately affected communities, and general government services, among other allowable purposes; and,

Whereas, the Board of Commissioners desires to make improvements and financial investments in several Township projects and initiatives in accordance with the allowable spending structure as described by the U.S. Department of Treasury's Final Rule, as follows:

Horticultural maintenance services for planters throughout the business districts of Haverford Township for the purpose of continuing our efforts in promoting economic development and recovery in an amount not to exceed \$36,650.00

Now, Therefore, be it Resolved, that the Board of Commissioners of Haverford Township hereby approves the use of funds from the Township's American Rescue Plan Fund allocation for the above referenced projects and initiatives.

Resolved this 15th day of October, 2024.

Township of Haverford

By: C. Lawrence Holmes, Esq., President

Attest: David R. Burman, Township Manager/Secretary

Resolution No. 2405-2024

American Rescue Plan Act Parking Study

Whereas, Haverford Township's direct allocation from the Coronavirus State and Local Fiscal Recovery Fund was \$19.8 million; and

Whereas, on April 1, 2022, the U.S. Department of Treasury released the Final Rule covering the Coronavirus State and Local Fiscal Recovery Fund, as created and directed by the American Rescue Plan Act authorizing recipients to use funds to support the public's response to the COVID-19 pandemic; and

Whereas, the Board of Commissioners desires to provide financial support to efforts relating to our parking issues within the township's business districts; and

Now, therefore be it resolved, that the Board of Commissioners of Haverford Township hereby approves an additional amount of \$3,000.00 for the continuation of the Comprehensive Parking Study, in the business district, with CH Planning.

Resolved this 15th day of October, 2024.

Township of Haverford

By C. Lawrence Holmes

President

Attest David R. Burman, Township Manager

# Township of Haverford

Resolution Number 2406-2024

American Rescue Plan Act Coronavirus Local Fiscal Recovery Fund

Police Department EVC Station Purchase

Whereas, Haverford Township's direct allocation from the Coronavirus State and Local Fiscal Recovery Fund was \$19.8 million;

Whereas, on April 1, 2022, the U.S. Department of Treasury released the Final Rule covering the Coronavirus State and Local Fiscal Recovery Fund, as created and directed by the American Rescue Plan Act authorizing recipients to use funds to invest in public health improvements, economic recovery and development, services to disproportionately affected communities, sanitary/storm sewer infrastructure, and general government services, among other allowable purposes; and,

Whereas, the Board of Commissioners desires to make improvements and financial investments in Township projects and initiatives in accordance with the allowable spending structure as described by the U.S. Department of Treasury's Final Rule, as follows:

\$25,637 for purchasing five (5) dual port electric vehicle charging stations for the Police Department parking lot from Hobbs and Company, Inc. (Co-Stars Contract #: 0000184556).

Now, therefore, be it resolved, that the Board of Commissioners of Haverford Township hereby approves the use of funds from the Township's American Rescue Plan Fund allocation for the above referenced projects and initiatives.

Resolved this 15<sup>th</sup> day of October, 2024.

Township of Haverford

By:

C. Lawrence Holmes, Esq., President, Board of Commissioners

Attest:

David R. Burman, Township Manager/Secretary

# Township of Haverford

Resolution No. 2407-2024

Commitment to Safe Streets for All

Whereas, the Board of Commissioners of the Township of Haverford is committed to keeping residents and visitors travelling through Haverford Township safe; and

Whereas, motor vehicle related crashes in Haverford Township resulted in 7 fatal crashes and 27 serious injuries reported in the (2017 – 2022); and

Whereas, death and serious injury are preventable and should not be tolerated; and

Whereas, historically streets have been designed and constructed to maximize the level of service for motor vehicles, rather than to safely move people utilizing all modes of transportation; and

Whereas, the Safe Systems Approach takes a proactive approach and prioritizes safer roads, safer people, safer vehicles and safer speeds, and encourages design of transportation systems that can accommodate inevitable human mistakes; and

Whereas, Haverford Township has developed a Township Wide Safety Action Plan (“Safety Action Plan”) using the Safe Systems Framework.

Now, therefore be it resolved, that the Board of Commissioners of the Township of Haverford adopts the Township Wide Safety Action Plan using the Safe Systems Approach with the goal of reducing deaths and serious injuries by 50% before 2030 and achieving zero fatalities and serious injuries by 2040; and

Be it further resolve that the Board of Commissioners directs the Township Manager to implement demonstration projects set forth in the Safety Action Plan to test safety interventions on selected Township roads.

Resolved this 15<sup>th</sup> day of October, 2024.

Township of Haverford

By: C. Lawrence Holmes, Esq., President

Attest: David R. Burman, Township Manager

# Township of Haverford

Resolution No. 2408-2024

American Rescue Plan Act Coronavirus Local Fiscal Recovery Fund  
Police Electric Vehicles

Whereas, Haverford Township's direct allocation from the Coronavirus State and Local Fiscal Recovery Fund was \$19.8 million;

Whereas, on April 1, 2022, the U.S. Department of Treasury released the Final Rule covering the Coronavirus State and Local Fiscal Recovery Fund, as created and directed by the American Rescue Plan Act authorizing recipients to use funds to invest in public health improvements, economic recovery and development, services to disproportionately affected communities, and general government services, among other allowable purposes; and,

Whereas, the Board of Commissioners desires to make improvements and financial investments in several Township projects and initiatives in accordance with the allowable spending structure as described by the U.S. Department of Treasury's Final Rule, as follows:

Purchase (2) 2024 Chevrolet Blazer Police Package electric vehicles for a total funding allocation of \$119,800

Now, therefore be it resolved, that the Board of Commissioners of Haverford Township hereby approves the use of funds from the Township's American Rescue Plan Fund allocation for the above referenced projects and initiatives.

Resolved this 15th day of October, 2024.

Township of Haverford

By:

C. Lawrence Holmes, Esq.  
President

Attest:

David R. Burman  
Township Manager/Secretary

## Township of Haverford

Resolution Number 2409-2024

Authorizing Application to the 2024 PECO Green Region Open Space Program for the Beautification of Lawrence Road Park and Brookline Park Project

Whereas, the Township of Haverford desires to undertake the Beautification of Lawrence Road Park and Brookline Park project; and

Whereas, the Township desires to apply to the PECO Green Region Open Space Program for a grant for the purpose of carrying out this project; and

Whereas, the Township has received and understands the 2024 PECO Green Region Open Space Program Guidelines.

Now, therefore, be it resolved, that the Board of Commissioners of Haverford Township hereby approves this project and authorizes application to the PECO Green Region Open Space Program in the amount of \$2,477.00; and, if the application is granted, the Township commits to the expenditure of matching funds in the amount of \$2,477.00 necessary for the project's success.

Resolved this 15<sup>th</sup> day of October, 2024.

Township of Haverford

By: C. Lawrence Holmes, Esq., President, Board of Commissioners

Attest: David R. Burman, Township Manager/Secretary

# Township of Haverford

## Resolution No. 2410-2024

Amending Resolution No. 2012-1841 to Include the Sale of Ready-to-Drink Cocktails at the Giant Store Located in the Township of Haverford

Whereas, Act 141 of 2000 ("the Act") authorizes the Pennsylvania Liquor Control Board to approve, in certain instances, the transfer of restaurant liquor licenses across municipal boundaries within the same county regardless of the quota limitations provided for in Section 461 of the Liquor Code if, as in Haverford Township the sales of liquor and malt or brewed beverages are legal in the municipality receiving the license; and

Whereas, the Act requires the applicant to obtain from the receiving municipality a resolution approving the inter-municipal transfer of the liquor license prior to an applicant's submission of an application to the Pennsylvania Liquor Control Board; and

Whereas, the Liquor Code stipulates that, prior to adoption of a resolution by the receiving municipality, at least one hearing be held for the purpose of permitting individuals residing within the municipality to make comments and recommendations regarding applicant's intent to transfer a liquor license into the receiving municipality; and

Whereas, the Township of Haverford Board of Commission held a properly advertised public hearing pursuant to the notice provisions of Section 102 of the Liquor Code to receive comments on the proposed liquor license transfer; and

Whereas, on February 13, 2012, the Township of Haverford Board of Commissioners approved Resolution No. 1841-2012, authorizing the inter-municipal transfer of Restaurant Liquor License No. R-2524 into the Township of Haverford for the sales of beer only with no hard liquor sales to Giant Food Stores, LLC, and which license transfer was subsequently approved by the Liquor Control Board; and

Whereas, the Liquor Control Board now issues Ready-To-Drink (RTDs) Cocktail permits to qualified restaurant and hotel licenses, including grocery store-based restaurants, permitting them to sell ready-to-drink cocktails for off-premise consumption; and

Whereas, the Board of Commissioners have approved that beer, wine and RTDs may be sold from 7am to 10pm – Monday through Saturday and 9am to 10pm on Sunday; and

Whereas, the Board of Commissioners have approved that Giant Food Stores, LLC may allow customers to consume a maximum of two (2) RTD Cocktails on the licensed premises in the seating area in a single day; and

Now, therefore, be it resolved, that Giant Food Stores, LLC., is now permitted to sell RTD Cocktails at the Giant located at Township Line Road, Route 1, Haverford Township, Delaware County, Pennsylvania.

Be it further resolved, that transfers, designations and assignments of licenses hereunder are subject to approval by the Pennsylvania Liquor Control Board.

Resolved this 15th day of October, 2024.

Township of Haverford

By: C. Lawrence Holmes, Esq., President

Attest: David R. Burman, Township Manager





September 30, 2024

**HAVT 132.02**  
**HAVT 204.00**

**Haverford Township**

**Attn:** Aimee Cuthbertson, Assistant Township Manager  
1014 Darby Road  
Havertown, PA 19083

**RE: ARPA FUNDED PROJECTS**  
**2025/2026 ENGINEERING SERVICES**

**Dear Aimee:**

As requested, please consider this letter as our proposal to provide professional engineering services for various existing ARPA funded projects that are expected to extend into next year (2025).

**SCOPE OF SERVICES**

Provide design, permitting, construction administration, and construction observation services as needed for the below projects.

1. The following projects are anticipated to be Substantially Complete in 2024, with final inspections, punch list inspections and project close-out tasks scheduled for 2025.

- ▶ Crescent Hill/Francis Drive Sanitary Sewer Lining..... Fee \$5,000
- ▶ Cobbs Creek Interceptor Buttressing..... Fee \$15,000
- ▶ Leachate Trench Replacement..... Fee \$10,000
- ▶ Dill Road Storm Sewer Lining ..... Fee \$15,000
- ▶ Township Building Electric Vehicle Charging Stations..... Fee \$20,000
- ▶ Township Line Sidewalk ..... Fee \$5,000
- ▶ Darby Road Streetscape Lighting.....Fee \$5,000

2. The following projects are scheduled to be awarded in 2024. Construction is scheduled for 2025.

- ▶ McDonald Field Lighting ..... Fee \$15,000
- ▶ Public Works Yard Paving ..... Fee \$25,000
- ▶ Brookline Park Stormwater Management System ..... Fee \$35,000

**SCHEDULE**

This work is scheduled to be completed in 2025, dependent upon construction schedules.

**FEE**

Pennoni will complete the professional services as identified above for a lump sum fee of **\$150,000**.

**BILLING AND PAYMENT**

These services will be billed monthly.

**TERMS AND CONDITIONS**

Per the existing Terms and Conditions as the appointed Township Engineer.

Thank you for affording us the opportunity to work with you on this project. If you have any questions, please feel free to call us.

Sincerely,

**PENNONI ASSOCIATES INC.**



David Pennoni, PE  
Chief Operating Officer

cc: David R. Burman, Township Manager – Haverford Township

Please indicate your acceptance of this proposal by signing and returning a copy as our authorization to proceed. In signing this proposal, the Client authorizes Pennoni to complete the professional services outlined in this proposal.

**ACCEPTED BY:**

---

**(Authorized Representative of the Client)**

---

**(Print Name & Title)**

---

**(Date)**

# Township of Haverford

## Finance Department Memorandum

Date: October 7, 2024

To: David R. Burman, Township Manager

From: Aimee Cuthbertson, Director of Finance/Asst Township Manager

Subject: Electricity & Natural Gas Procurement

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The Township is approaching the end of its current two year procurement contract for wind-sourced electricity generation with Constellation thru a PML purchasing program (Pennsylvania Municipal League). As you know, there are two prongs to energy procurement – generation (consumer’s choice) and distribution (Constellation).

For natural gas, we are not currently under any purchasing contract and instead paying market rates.

The Township solicited pricing for both wind-powered electricity and natural gas supply thru PML as well as through Aspen Energy, the results of which are below:

### ELECTRIC CONTRACT PRICING (2 Year Pricing)

	<i>2023-2024 Rate for Wind Powered Electricity Generation</i>	<i>2025-2026 Rate for Wind Powered Electricity Generation</i>	<i>Expected Energy Usage per Year (kWh)</i>	<i>Expected Budget Impact per Year</i>
<i>Current Rate with Constellation (PA Municipal League)</i>	<i>\$.07650</i>	<i>n/a</i>	<i>4,185,696</i>	
<i>Constellation (PA Municipal League)</i>		<i>\$.06975</i>	<i>4,185,696</i>	<i>(\$28,253) savings</i>
<i>Aspen Energy</i>		<i>\$.07338</i>	<i>4,185,696</i>	<i>(\$13,059)</i>

				savings
--	--	--	--	---------

NATURAL GAS CONTRACT PRICING (2 Year Pricing)

	<i>2023-2024 Average Rate Paid for Natural Gas Supply</i>	<i>2025-2026 Rate for Natural Gas Supply</i>	<i>Expected Natural Gas Usage per Year (Dth aka dexatherm)</i>	<i>Expected Budget Impact per Year</i>
<i>Current Market Rate with Constellation</i>	\$4.550	n/a	7,300.0	
<i>Constellation (PA Municipal League)</i>		\$4.259	7,300.0	(\$2,124) savings
<i>Aspen Energy</i>		\$4.760	7,300.0	\$1,533

While the above pricing is indicative of the current market, actual rates change daily. However, using indicative pricing as the base for comparison, staff recommends to continue with a two (2) year contract for wind powered electricity generation at all Township facilities with Constellation through a purchasing program with the Pennsylvania Municipal League and a two (2) year purchasing contract for natural gas supply at all Township facilities also with Constellation.

This recommendation is subject to any material price changes between Friday, September 27, 2024 and Tuesday, October 15, 2024. As such, an update will be provided at the October 15, 2024 meeting.



TOWNSHIP OF  
**HAVERFORD**

DELAWARE COUNTY  
1014 DARBY ROAD  
HAVERTOWN, PA 19083-2551  
(610) 446-1000

LARRY HOLMES, ESQ, PRESIDENT  
JUDY TROMBETTA, VICE PRESIDENT  
DAVID R. BURMAN, TWP MANAGER/SECRETARY  
AIMEE CUTHBERTSON, ASS'T TWP. MANAGER  
JOHN F. WALKO ESQ., SOLICITOR  
PENNONI ASSOCIATES INC., ENGINEER

WARD COMMISSIONERS  
1ST WARD BRIAN D. GONDEK, ESQ  
2ND WARD SHERYL FORSTE-GRUPP, PH.D  
3RD WARD KEVIN MCCLOSKEY, ESQ  
4TH WARD JUDY TROMBETTA  
5TH WARD LAURA CAVENDER  
6TH WARD LARRY HOLMES, ESQ  
7TH WARD CONOR QUINN  
8TH WARD GERARD T. HART, MD  
9TH WARD MICHAEL MCCOLLUM

Manager 610-446-1000 ext. 2208  
Human Resources 610-446-1000 ext. 2233

HAVTT 18806

October 4, 2024

David R. Burman, Township Manager  
Haverford Township  
1014 Darby Road  
Havertown, PA 19083-2251

**RE: Public Works Complex Paving  
Contract No. MY-7**

Dear Mr. Burman:

Attached herewith is a tabulation of the bids received on Wednesday, October 2, 2024, at 10:00 a.m. for the above referenced contract. The low bidder for both the Base Bid and Base Bid with all Add Alternates was Innovative Construction Services Inc. of Folcroft, PA with a Base Bid of \$224,724.50 and Base Bid with all Add Alternates totaling \$396,254.50. However, Innovative Construction Services does not meet the requirements of the Township's Responsible Contractors Ordinance.

The second bidder, T. Schiefer Contractors Inc. of Doylestown, Pa does meet the Township's Responsible Contractors Ordinance. They submitted a Base Bid of \$241,222.50 and a Base Bid with all Add Alternates totaling \$458,519.75.

We have worked with T. Schiefer Contractors Inc. in the past and have found their work to be satisfactory. We therefore recommend the Township award the Base Bid with all Add Alternates to T. Schiefer Contractors Inc. in low bid amount of \$458,519.75 contingent upon their execution of the contract and supply of the required bonds and insurance.

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Sincerely,  
**PENNONI**

David Pennoni, PE  
Township Engineer

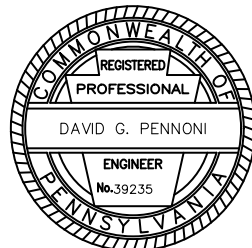
CF/rg

cc: Aimee Cuthbertson, Assistant Township Manager

**CONTRACT NO. MY-7  
 PUBLIC WORKS COMPLEX PAVING**

ITEM NO.	ESTIMATED QUANTITY/UNIT		DESCRIPTION	Innovative Construction Services, Inc. PO Box 262, Folcroft, PA 19032		T. Schiefer Contractors, Inc. 3864 Old Easton Road, Doylestown, PA 18902		Gorecon, Inc. 3240 Bristol Road, Chalfont, PA 18914		General Asphalt Paving 9301 Krewstown Road, Philadelphia, PA 19115		Marino Corporation 1400 Cressman Road, PO Boc 1209, Skippack, PA 19474		Haines & Kibblehouse, Inc. 4747 S. Broad St., Building 101, Suite110, Philadelphia, PA 19112	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
<b>Base Bid</b>															
1	3,170	SY	Variable Depth Mill	\$5.75	\$18,227.50	\$5.50	\$17,435.00	\$6.16	\$19,527.20	\$7.89	\$25,011.30	\$8.30	\$26,311.00	\$8.05	\$25,518.50
2	17,050	SY	1.5-inch Overlay	\$10.00	\$170,500.00	\$10.35	\$176,467.50	\$11.50	\$196,075.00	\$9.76	\$166,408.00	\$12.00	\$204,600.00	\$11.25	\$191,812.50
3	845	SY	Base Repair Allocation	\$42.60	\$35,997.00	\$56.00	\$47,320.00	\$50.00	\$42,250.00	\$62.99	\$53,226.55	\$66.00	\$55,770.00	\$61.00	\$51,545.00
<b>TOTAL BASE BID FOR CONTRACT NO. MY-7</b>				<b>\$224,724.50</b>		<b>\$241,222.50</b>		<b>\$257,852.20</b>		<b>\$244,645.85</b>		<b>\$286,681.00</b>		<b>\$268,876.00</b>	
<b>Acknowledged Addednum No. 1</b>				Yes		Yes		Yes		Yes		Yes		Yes	
<b>Acknowledged Addednum No. 2</b>				Yes		Yes		Yes		Yes		Yes		Yes	
<b>Bid Security</b>				10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond	
<b>Add Alternate Area A1</b>															
A1-1	735	SY	Variable Depth Mill - Area A1	\$5.00	\$3,675.00	\$5.50	\$4,042.50	\$9.00	\$6,615.00	\$7.89	\$5,799.15	\$10.00	\$7,350.00	\$8.05	\$5,916.75
A1-2	2335	SY	1.5-inch Overlay - Area A1	\$9.00	\$21,015.00	\$10.35	\$24,167.25	\$13.00	\$30,355.00	\$9.76	\$22,789.60	\$12.20	\$28,487.00	\$11.25	\$26,268.75
<b>TOTAL ADD ALTERNATE - AREA A1</b>				<b>\$24,690.00</b>		<b>\$28,209.75</b>		<b>\$36,970.00</b>		<b>\$28,588.75</b>		<b>\$35,837.00</b>		<b>\$32,185.50</b>	
<b>Add Alternate Area A2</b>															
A2-1	430	SY	Variable Depth Mill - Area A2	\$5.00	\$2,150.00	\$5.50	\$2,365.00	\$9.00	\$3,870.00	\$7.89	\$3,392.70	\$10.00	\$4,300.00	\$8.05	\$3,461.50
A2-2	2350	SY	1.5-inch Overlay - Area A2	\$9.00	\$21,150.00	\$10.35	\$24,322.50	\$13.00	\$30,550.00	\$9.76	\$22,936.00	\$12.20	\$28,670.00	\$11.25	\$26,437.50
<b>TOTAL ADD ALTERNATE - AREA A2</b>				<b>\$23,300.00</b>		<b>\$26,687.50</b>		<b>\$34,420.00</b>		<b>\$26,328.70</b>		<b>\$32,970.00</b>		<b>\$29,899.00</b>	
<b>Add Alternate Area A3</b>															
A3-1	1660	SY	Base Repair Allocation - Area A3	\$42.60	\$70,716.00	\$56.00	\$92,960.00	\$52.00	\$86,320.00	\$65.00	\$107,900.00	\$46.00	\$76,360.00	\$61.00	\$101,260.00
<b>TOTAL ADD ALTERNATE - AREA A3</b>				<b>\$70,716.00</b>		<b>\$92,960.00</b>		<b>\$86,320.00</b>		<b>\$107,900.00</b>		<b>\$76,360.00</b>		<b>\$101,260.00</b>	
<b>Add Alternate Area A4</b>															
A4-1	1240	SY	Base Repair Allocation - Area A4	\$42.60	\$52,824.00	\$56.00	\$69,440.00	\$56.00	\$69,440.00	\$65.00	\$80,600.00	\$46.00	\$57,040.00	\$61.00	\$75,640.00
<b>TOTAL ADD ALTERNATE - AREA A4</b>				<b>\$52,824.00</b>		<b>\$69,440.00</b>		<b>\$69,440.00</b>		<b>\$80,600.00</b>		<b>\$57,040.00</b>		<b>\$75,640.00</b>	
<b>TOTAL BASE BID + ALL ADD ALTERNATES</b>				<b>\$396,254.50</b>		<b>\$458,519.75</b>		<b>\$485,002.20</b>		<b>\$488,063.30</b>		<b>\$488,888.00</b>		<b>\$507,860.50</b>	

ITEM NO.	ESTIMATED QUANTITY/UNIT		DESCRIPTION	Glasgow, Inc. 104 Willow Grove Avenue, Glenside, PA 19038		Frania, Inc. 2101 Mount Road, Aston, PA 19014		G & B Construction 415 W Bristol Rd Feasterville Trevose, PA 19053		Joseph J Danielle LLC 710 Trainer St, Chester, PA 19013		ABC Construction Co., Inc. 714 Dunksferry Road, Bensalem, PA 19020		Moore Brothers Enterprises Ltd 1511 Keystone Road, Chester, PA 19013	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
<b>Base Bid</b>															
1	3,170	SY	Variable Depth Mill	\$5.50	\$17,435.00	\$3.00	\$9,510.00	\$8.00	\$25,360.00	\$14.26	\$45,204.20	\$9.75	\$30,907.50	\$6.00	\$19,020.00
2	17,050	SY	1.5-inch Overlay	\$10.60	\$180,730.00	\$13.00	\$221,650.00	\$14.00	\$238,700.00	\$13.93	\$237,506.50	\$11.90	\$202,895.00	\$12.75	\$217,387.50
3	845	SY	Base Repair Allocation	\$60.00	\$50,700.00	\$60.00	\$50,700.00	\$64.00	\$54,080.00	\$55.00	\$46,475.00	\$90.00	\$76,050.00	\$14.00	\$11,830.00
<b>TOTAL BASE BID FOR CONTRACT NO. MY-7</b>				<b>\$248,865.00</b>		<b>\$281,860.00</b>		<b>\$318,140.00</b>		<b>\$329,185.70</b>		<b>\$309,852.50</b>		<b>\$248,237.50</b>	
<b>Acknowledged Addednum No. 1</b>				Yes		Yes		Yes		No		Yes		Yes	
<b>Acknowledged Addednum No. 2</b>				Yes		Yes		Yes		No		Yes		Yes	
<b>Bid Security</b>				10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond	
<b>Add Alternate Area A1</b>															
A1-1	735	SY	Variable Depth Mill - Area A1	\$9.00	\$6,615.00	\$3.00	\$2,205.00	\$8.00	\$5,880.00	\$17.98	\$13,215.30	\$20.00	\$14,700.00	-	-
A1-2	2335	SY	1.5-inch Overlay - Area A1	\$10.75	\$25,101.25	\$13.00	\$30,355.00	\$14.00	\$32,690.00	\$16.41	\$38,317.35	\$15.00	\$35,025.00	-	-
<b>TOTAL ADD ALTERNATE - AREA A1</b>				<b>\$31,716.25</b>		<b>\$32,560.00</b>		<b>\$38,570.00</b>		<b>\$51,532.65</b>		<b>\$49,725.00</b>		<b>Did Not Bid</b>	
<b>Add Alternate Area A2</b>															
A2-1	430	SY	Variable Depth Mill - Area A2	\$12.00	\$5,160.00	\$3.00	\$1,290.00	\$8.00	\$3,440.00	\$27.86	\$11,979.80	\$34.00	\$14,620.00	-	-
A2-2	2350	SY	1.5-inch Overlay - Area A2	\$11.45	\$26,907.50	\$13.00	\$30,550.00	\$14.00	\$32,900.00	\$16.40	\$38,540.00	\$15.00	\$35,250.00	-	-
<b>TOTAL ADD ALTERNATE - AREA A2</b>				<b>\$32,067.50</b>		<b>\$31,840.00</b>		<b>\$36,340.00</b>		<b>\$50,519.80</b>		<b>\$49,870.00</b>		<b>Did Not Bid</b>	
<b>Add Alternate Area A3</b>															
A3-1	1660	SY	Base Repair Allocation - Area A3	\$68.40	\$113,544.00	\$60.00	\$99,600.00	\$64.00	\$106,240.00	\$55.00	\$91,300.00	\$90.00	\$149,400.00	-	-
<b>TOTAL ADD ALTERNATE - AREA A3</b>				<b>\$113,544.00</b>		<b>\$99,600.00</b>		<b>\$106,240.00</b>		<b>\$91,300.00</b>		<b>\$149,400.00</b>		<b>Did Not Bid</b>	
<b>Add Alternate Area A4</b>															
A4-1	1240	SY	Base Repair Allocation - Area A4	\$69.30	\$85,932.00	\$60.00	\$74,400.00	\$64.00	\$79,360.00	\$55.00	\$68,200.00	\$94.00	\$116,560.00	-	-
<b>TOTAL ADD ALTERNATE - AREA A4</b>				<b>\$85,932.00</b>		<b>\$74,400.00</b>		<b>\$79,360.00</b>		<b>\$68,200.00</b>		<b>\$116,560.00</b>		<b>Did Not Bid</b>	
<b>TOTAL BASE BID + ALL ADD ALTERNATES</b>				<b>\$512,124.75</b>		<b>\$520,260.00</b>		<b>\$578,650.00</b>		<b>\$590,738.15</b>		<b>\$675,407.50</b>		<b>\$248,237.50</b>	



We Declare this to be a true Tabulation of Bids  
 Received on October 2, 2024 by the Township of Haverford  
 for Contract No. MY-7: Public Works Complex Paving

PENNONI ASSOCIATES INC.  
*David Pennoni* /CF  
 David Pennoni, P.E., PENNA.REG.NO. 039235-E



TOWNSHIP OF  
**HAVERFORD**

DELAWARE COUNTY  
1014 DARBY ROAD  
HAVERTOWN, PA 19083-2551  
(610) 446-1000

LARRY HOLMES, ESQ, PRESIDENT  
JUDY TROMBETTA, VICE PRESIDENT  
DAVID R. BURMAN, TWP MANAGER/SECRETARY  
AIMEE CUTHBERTSON, ASS'T TWP. MANAGER  
JOHN F. WALKO ESQ., SOLICITOR  
PENNONI ASSOCIATES INC., ENGINEER

WARD COMMISSIONERS  
1ST WARD BRIAN D. GONDEK, ESQ  
2ND WARD SHERYL FORSTE-GRUPP, PH.D  
3RD WARD KEVIN MCCLOSKEY, ESQ  
4TH WARD JUDY TROMBETTA  
5TH WARD LAURA CAVENDER  
6TH WARD LARRY HOLMES, ESQ  
7TH WARD CONOR QUINN  
8TH WARD GERARD T. HART, MD  
9TH WARD MICHAEL MCCOLLUM

Manager 610-446-1000 ext. 2208  
Human Resources 610-446-1000 ext. 2233

October 4, 2024

HAVTT 09872

David R. Burman, Township Manager  
Haverford Township  
1014 Darby Road  
Havertown, PA 19083-2251

**RE: City Avenue Sidewalk  
Contract No. R-32**


Dear Mr. Burman:

Attached herewith is a tabulation of the bids received on Wednesday, October 2, 2024, at 10:00 a.m. for the above referenced contract. The low bidder was Delaware Environmental Construction Services of Newark, DE in the amount of \$79,985.00. We have worked with Delaware Environmental Construction Services in the past and have found their work to be satisfactory.

We recommend the Township award the contract to Delaware Environmental Construction Services in the low bid amount of \$79,985.00 contingent upon execution of the contract and supply of the required bonds and insurance.

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Sincerely,  
**PENNONI**

  
David Pennoni, PE  
Township Engineer

CF/djd

cc: Aimee Cuthbertson, Assistant Township Manager

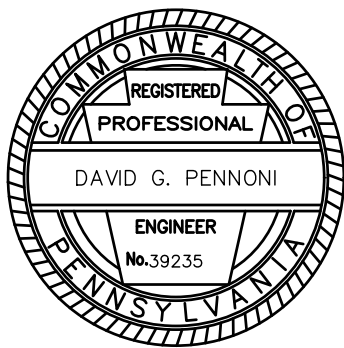
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Haverford Township  
Tabulation of Bids Received Until 10:00 a.m.  
Prevailing time on October 2, 2024

**CONTRACT NO. R-32**  
**CITY AVENUE SIDEWALK**

			Delaware Environmental Construction Services 935 Rahway Drive, Newark, DE 19711		Ocean Construction, LLC 822 Glassboro Road, Williamstown, NJ 08094		Premier Concrete, Inc. 2327 W. Chester Pike, Broomall, PA 19008		MOR Construction Services, Inc. 139 SchoolHouse Lane Glen Mills, PA 19342		G&B Construction Group 415 W Bristol Road, Feasterville-Treose, PA 19053		DePaul and Company Inc. 1000 Germantown Pike, Suite D-4, Plymouth Meeting, PA 19462		
ITEM NO.	ESTIMATED QUANTITY/UNIT		DESCRIPTION	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
32-1	85	LF	18" Upright Concrete Curb	\$199.00	\$16,915.00	\$115.00	\$9,775.00	\$100.00	\$8,500.00	\$80.00	\$6,800.00	\$125.00	\$10,625.00	\$175.00	\$14,875.00
32-2	35	LF	6" Cheek Wall	\$237.00	\$8,295.00	\$85.00	\$2,975.00	\$100.00	\$3,500.00	\$100.00	\$3,500.00	\$125.00	\$4,375.00	\$95.00	\$3,325.00
32-3	1,600	SF	4-inch Plain Concrete Sidewalk	\$15.00	\$24,000.00	\$24.00	\$38,400.00	\$20.00	\$32,000.00	\$22.00	\$35,200.00	\$25.00	\$40,000.00	\$25.00	\$40,000.00
32-4	375	SF	6-inch Concrete Driveway Aprons	\$23.00	\$8,625.00	\$26.00	\$9,750.00	\$20.00	\$7,500.00	\$35.00	\$13,125.00	\$35.00	\$13,125.00	\$22.00	\$8,250.00
32-5	2	EA	Handicap Ramps	\$5,500.00	\$11,000.00	\$4,800.00	\$9,600.00	\$10,000.00	\$20,000.00	\$5,500.00	\$11,000.00	\$6,500.00	\$13,000.00	\$6,234.00	\$12,468.00
32-6	1	LS	Paving Restoration	\$3,000.00	\$3,000.00	\$3,700.00	\$3,700.00	\$5,750.00	\$5,750.00	\$6,000.00	\$6,000.00	\$1,200.00	\$1,200.00	\$4,500.00	\$4,500.00
32-7	1	LS	Pavement Markings	\$3,900.00	\$3,900.00	\$2,800.00	\$2,800.00	\$4,750.00	\$4,750.00	\$1,950.00	\$1,950.00	\$4,500.00	\$4,500.00	\$1,200.00	\$1,200.00
32-8	50	CY	Miscellaneous Excavation and Backfill with PennDOT 2A or AASHTO No. 57 Stone	\$85.00	\$4,250.00	\$65.00	\$3,250.00	\$65.00	\$3,250.00	\$150.00	\$7,500.00	\$120.00	\$6,000.00	\$200.00	\$10,000.00
<b>TOTAL BASE BID FOR CONTRACT NO. R-32</b>				<b>\$79,985.00</b>		<b>\$80,250.00</b>		<b>\$85,250.00</b>		<b>\$85,075.00</b>		<b>\$92,825.00</b>		<b>\$94,618.00</b>	
<b>Bid Security</b>				10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond	

			Gorecon, Inc. 3240 Bristol Road, Chalfont, PA 18914		Joseph J Danielle LLC 710 Trainer St Trainer, PA 19013		T. Schiefer Contractors, Inc. 3864 Old Easton Road Doylestown, PA 18902		Associated Paving Contractors, Inc. 1525 Campus Drive, Warminster, PA 18974		Marino Corporation 1400 Cressman Road, PO Box 1209 Skippack, PA 19474		
ITEM NO.	ESTIMATED QUANTITY/UNIT		DESCRIPTION	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
32-1	85	LF	18" Upright Concrete Curb	\$95.17	\$8,089.45	\$155.21	\$13,192.85	\$225.00	\$19,125.00	\$215.00	\$18,275.00	\$168.00	\$14,280.00
32-2	35	LF	6" Cheek Wall	\$119.94	\$4,197.90	\$178.41	\$6,244.35	\$125.00	\$4,375.00	\$195.00	\$6,825.00	\$388.00	\$13,580.00
32-3	1,600	SF	4-inch Plain Concrete Sidewalk	\$29.99	\$47,984.00	\$23.33	\$37,328.00	\$26.00	\$41,600.00	\$25.00	\$40,000.00	\$31.00	\$49,600.00
32-4	375	SF	6-inch Concrete Driveway Aprons	\$26.52	\$9,945.00	\$47.24	\$17,715.00	\$36.00	\$13,500.00	\$36.00	\$13,500.00	\$54.00	\$20,250.00
32-5	2	EA	Handicap Ramps	\$8,564.61	\$17,129.22	\$3,532.90	\$7,065.80	\$10,900.00	\$21,800.00	\$4,750.00	\$9,500.00	\$7,600.00	\$15,200.00
32-6	1	LS	Paving Restoration	\$3,694.28	\$3,694.28	\$10,573.00	\$10,573.00	\$2,500.00	\$2,500.00	\$10,450.00	\$10,450.00	\$5,200.00	\$5,200.00
32-7	1	LS	Pavement Markings	\$2,157.65	\$2,157.65	\$1,494.58	\$1,494.58	\$2,800.00	\$2,800.00	\$2,200.00	\$2,200.00	\$3,250.00	\$3,250.00
32-8	50	CY	Miscellaneous Excavation and Backfill with PennDOT 2A or AASHTO No. 57 Stone	\$134.23	\$6,711.50	\$214.86	\$10,743.00	\$100.00	\$5,000.00	\$200.00	\$10,000.00	\$200.00	\$10,000.00
<b>TOTAL BASE BID FOR CONTRACT NO. R-32</b>				<b>\$99,909.00</b>		<b>\$104,356.58</b>		<b>\$110,700.00</b>		<b>\$110,750.00</b>		<b>\$131,360.00</b>	
<b>Bid Security</b>				10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond		10% Bid Bond	



We Declare this to be a true Tabulation of Bids  
Received on October 2, 2024 by the Township of Haverford  
for Contract No. R-32: City Avenue Sidewalk

PENNONI ASSOCIATES INC.  
*David Pennoni* ICF  
David Pennoni, P.E., PENNA.REG.NO. 039235-E



# GranTurk equipment co., inc.

home office:  
one schuylkill parkway  
building b  
bridgeport, pa 19405-1069  
phone (610) 239-9800  
fax (610) 239-9806

branch office:  
1415 bush street  
baltimore, md 21230  
phone (410) 837-5570  
fax (410) 837-1024

## QUOTATION

September 13, 2024

Haverford Township  
2325 Darby Road  
Havertown, PA 19083  
Attn: Mr. Gary Pasetti, Superintendent

As per the request of our sales representative Joel Chernin we are pleased to offer the following for your consideration. **In accordance with the COSTARS 025-E22-471 Municipal Work Vehicle contract, we are pleased to offer the following for your consideration.**

### **One (1) Galfab Hoist Roll-Off, Mounted on Customer Supplied Chassis**

Install-Mount Cable Hoist  
Muncie PTO Allison 4000Series S  
Hydraulic Pump 39 GPM  
Hydraulic Valve 2 Spool  
Hose Kit Tarp Mount  
Hydraulic Tank 48 Gal-Side Mount  
Hoist Control 2 Spool Air  
Light Bumper Split  
DOT Bumper Light Kit  
ICC Bumper Auto Foldup  
Steel Fender Kit Tandem Axle  
Rear Container Hold-Down Ratchet Strap  
Tool Box-48 Steel Front Load  
Tarping System Pioneer RP4500  
Hoist Finish Mounted Black  
Standard Body and Hydraulics Warranty

Price for Galfab Hoist Roll-Off.....	\$ 73,527.53
Less 5% PA Costars Discount.....	<del>\$ 3,676.38</del>
Total Galfab Roll-Off PA-Costars Price.....	\$ 69,851.15
Freight.....	\$ 2,850.00
Prep, Delivery and Training.....	\$ 3,500.00
<b>Total Galfab Hoist Roll-Off.....</b>	<b>\$ 76,201.15</b>

**PRICE FIRM UNTIL OCTOBER 11, 2024**

Important Notice: The price quoted does not include re-routing of exhaust pipes, removing or relocating fuel tanks, battery boxes or air tanks, or any other chassis modifications. If any of the above is required an extra charge will be made on a time and material basis.

DATE OF ACCEPTANCE \_\_\_\_\_

By \_\_\_\_\_

GranTurk equipment co., inc.

*Anne C. Ritchie*

ANNE C. RITCHIE - PRESIDENT

Quotation Valid Only if Approved By An Officer of GranTurk equipment co., inc.

**Prepared For:**  
TOWNSHIP OF HAVERFORD  
DAN MARIANI  
2325 Darby Rd.  
Havertown, PA 19083-2201  
(610)446 - 1000  
Reference ID: CS **25-E23-577**

**Presented By:**  
ASCENDANCE TRUCK CENTERS  
Tom Grogan  
1810 S 19TH ST.  
HARRISBURG PA 171043205  
856-241-8890

Thank you for the opportunity to provide you with the following quotation on a new International truck. I am sure the following detailed specification will meet your operational requirements, and I look forward to serving your business needs.

**Model Profile**  
**2026 HV607 SBA (HV607)**

<b>AXLE CONFIG:</b>	6X4
<b>APPLICATION:</b>	Roll-On/Roll-off
<b>MISSION:</b>	Requested GVWR: 66000. Calc. GVWR: 64000. Calc. GCWR: 80000 Calc. Start / Grade Ability: 15.04% / 1.73% @ 55 MPH Calc. Geared Speed: 73.3 MPH
<b>DIMENSION:</b>	Wheelbase: 254.00, CA: 186.90, Axle to Frame: 91.00
<b>ENGINE, DIESEL:</b>	{Cummins L9 350} EPA 2024, 350HP @ 2200 RPM, 1050 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, 350 Peak HP (Max)
<b>TRANSMISSION, AUTOMATIC:</b>	{Allison 3000 RDS} 6th Generation Controls, Close Ratio, 5-Speed with Overdrive, with PTO Provision, Less Retarder, Includes Oil Level Sensor, with 80,000-lb GVW and GCW Max, On/Off Highway
<b>CLUTCH:</b>	Omit Item (Clutch & Control)
<b>AXLE, FRONT NON-DRIVING:</b>	{Meritor MFS-18-133A} Wide Track, I-Beam Type, 18,000-lb Capacity
<b>AXLE, REAR, TANDEM:</b>	{Meritor RT-46-160} Single Reduction, 46,000-lb Capacity, 200 Wheel Ends Gear Ratio: 4.89
<b>CAB:</b>	Conventional, Day Cab
<b>TIRE, FRONT:</b>	(2) 315/80R22.5 Load Range L HAU 3 WT (CONTINENTAL), 480 rev/mile, 68 MPH, All-Position
<b>TIRE, REAR:</b>	(8) 11R22.5 Load Range G HDR2+ (CONTINENTAL), 491 rev/mile, 75 MPH, Drive
<b>SUSPENSION, REAR, TANDEM:</b>	{Hendrickson HMX EX 460} Walking Beam, 46,000-lb Capacity, 54" Axle Spacing, Rubber Springs, with Transverse Torque Rods, Rubber End Bushings
<b>FRAME REINFORCEMENT:</b>	Full Outer C-Channel, Heat Treated Alloy Steel (120,000 PSI Yield), 10.813" x 3.892" x 0.312" (274.6mm x 98.8mm x 7.9mm), 480.0" (12192mm) OAL
<b>PAINT:</b>	Cab schematic 100WL Location 1: 9219, Winter White (Std) Chassis schematic N/A

**Description**

Base Chassis, Model HV607 SBA with 254.00 Wheelbase, 186.90 CA, and 91.00 Axle to Frame.

AXLE CONFIGURATION {Navistar} 6x4

**Notes**

: Pricing may change if axle configuration is changed.

ENGINE, DIESEL {Cummins L9 350} EPA 2024, 350HP @ 2200 RPM, 1050 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, 350 Peak HP (Max)

EMISSION, CALENDAR YEAR {Cummins L9} EPA, OBD and GHG Certified for Calendar Year 2024

CARB EMISSION WARR COMPLIANCE for Cummins L9 Engines

CARB IDLE COMPLIANCE Low NOx Idle Engine, Complies with California Clean Air Regulations; Includes "Certified Clean Idle" Decal located on Driver Door

EPA IDLE COMPLIANCE Low NOx Idle Engine, Complies with EPA Clean Air Regulations; Includes "Certified Clean Idle" Decal on Hood

VEHICLE REGISTRATION IDENTITY ID for the State of Pennsylvania

RADIATOR Aluminum, Cross Flow, Front to Back System, 1228 Ssqln, with 1167 Ssqln Charge Air Cooler

**Includes**

: DEAERATION SYSTEM with Surge Tank

: HOSE CLAMPS, RADIATOR HOSES Gates Shrink Band Type; Thermoplastic Coolant Hose Clamps

: RADIATOR HOSES Premium, Rubber

FAN DRIVE {Horton Drivemaster} Two-Speed Type, Direct Drive, with Residual Torque Device for Disengaged Fan Speed

**Includes**

: FAN Nylon

AIR CLEANER Single Element

ANTI-FREEZE Red, Extended Life Coolant; To -40 Degrees F/ -40 Degrees C, Freeze Protection

ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls and Starter Lockout, with Ignition Switch Control, for Cummins B6.7 and L9 Engines

THROTTLE, HAND CONTROL Engine Speed Control for PTO; Electronic, Stationary Pre-Set, Two Speed Settings; Mounted on Steering Wheel

TRANSMISSION, AUTOMATIC {Allison 3000 RDS} 6th Generation Controls, Close Ratio, 5-Speed with Overdrive, with PTO Provision, Less Retarder, Includes Oil Level Sensor, with 80,000-lb GVW and GCW Max, On/Off Highway

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS) and Regional Haul Series (RHS), General Purpose Trucks, Construction, Package Number 223

NEUTRAL AT STOP Allison Transmission Shifts to Neutral When Service Brake is Depressed and Vehicle is at Stop; Remains in Neutral Until Service Brake is Released

OIL COOLER, TRANSMISSION {Modine} Water to Oil Type

PTO LOCATION Customer Intends to Install PTO at Left Side of Transmission

SHIFT CONTROL PARAMETERS {Allison} 3000 or 4000 Series Transmissions, Performance Programming

TRANSMISSION OIL Synthetic; 29 thru 42 Pints

TRANSMISSION SHIFT CONTROL Column Mounted Stalk Shifter, Not for Use with Allison 1000 & 2000 Series Transmission

CLUTCH Omit Item (Clutch & Control)

AXLE, REAR, TANDEM {Meritor RT-46-160} Single Reduction, 46,000-lb Capacity, 200 Wheel Ends . Gear Ratio: 4.89

**Description**

SUSPENSION, REAR, TANDEM {Hendrickson HMX EX 460} Walking Beam, 46,000-lb Capacity, 54" Axle Spacing, Rubber Springs, with Transverse Torque Rods, Rubber End Bushings

TRANSVERSE TORQUE RODS {Hendrickson} TRAAX Rod, Transverse Only

AXLE, FRONT NON-DRIVING {Meritor MFS-18-133A} Wide Track, I-Beam Type, 18,000-lb Capacity

SUSPENSION, FRONT, SPRING Multileaf, Shackle Type, 18,000-lb Capacity, Less Shock Absorbers

SHOCK ABSORBERS, FRONT

SPRINGS, FRONT AUXILIARY Rubber

CAB Conventional, Day Cab

ACCESS, CAB Steel, Driver & Passenger Sides, Two Steps per Door, for use with Day Cab and Extended Cab

AIR CONDITIONER with Integral Heater and Defroster

CAB INTERIOR TRIM Classic, for Day Cab

**Includes**

: CONSOLE, OVERHEAD Molded Plastic with Dual Storage Pockets, Retainer Nets and CB Radio Pocket; Located Above Driver and Passenger

: DOME LIGHT, CAB Door Activated and Push On-Off at Light Lens, Timed Theater Dimming, Integral to Overhead Console, Center Mounted

: SUN VISOR (2) Padded Vinyl; 2 Moveable (Front-to-Side) Primary Visors, Driver Side with Toll Ticket Strap

CAB REAR SUSPENSION Air Bag Type

GAUGE CLUSTER Base Level; English with English Electronic Speedometer

**Includes**

: GAUGE CLUSTER DISPLAY: Base Level (3" Monochromatic Display), Premium Level (5" LCD Color Display); Odometer, Voltmeter, Diagnostic Messages, Gear Indicator, Trip Odometer, Total Engine Hours, Trip Hours, MPG, Distance to Empty/Refill for

: GAUGE CLUSTER Speedometer, Tachometer, Engine Coolant Temp, Fuel Gauge, DEF Gauge, Oil Pressure Gauge, Primary and Secondary Air Pressure

: WARNING SYSTEM Low Fuel, Low DEF, Low Oil Pressure, High Engine Coolant Temp, Low Battery Voltage (Visual and Audible), Low Air Pressure (Primary and Secondary)

GAUGE, OIL TEMP, AUTO TRANS for Allison Transmission

GAUGE, OIL TEMP, REAR AXLE

INSTRUMENT PANEL Flat Panel

IP CLUSTER DISPLAY On Board Diagnostics Display of Fault Codes in Gauge Cluster

MIRRORS (2) C-Loop, Power Adjust, Heated, Black Heads and Arms, 7.5" x 14" Flat Glass, Includes 7.5" x 7" Convex Mirrors, for 102" Load Width

**Notes**

: Mirror Dimensions are Rounded to the Nearest 0.5"

MIRROR, CONVEX, HOOD MOUNTED {Lang Mekra} (2) Right and Left Sides, Black 7.5" Sq.

MONITOR, TIRE PRESSURE Omit

SEAT, DRIVER {National 2000} Air Suspension, High Back with Integral Headrest, Vinyl, Isolator, 1 Chamber Lumbar, with 2 Position Front Cushion Adjust, -3 to +14 Degree Angle Back Adjust

SEAT, PASSENGER {National} Non Suspension, High Back, Fixed Back, Integral Headrest, Vinyl

WINDOW, POWER (2) and Power Door Locks, Left and Right Doors, Includes Express Down Feature

FRAME RAILS Heat Treated Alloy Steel (120,000 PSI Yield); 10.125" x 3.580" x 0.312" (257.2mm x 90.9mm x 8.0mm); 480.0" (12192) Maximum OAL

**Description**

FRAME REINFORCEMENT Full Outer C-Channel, Heat Treated Alloy Steel (120,000 PSI Yield), 10.813" x 3.892" x 0.312" (274.6mm x 98.8mm x 7.9mm), 480.0" (12192mm) OAL

BUMPER, FRONT Swept Back, Steel, Heavy Duty

FRAME DIMPLE Dimple on Left and Right Top Flange of Frame Rail to Reference Rear Axle Centerline

TOW HOOK, FRONT (2) Frame Mounted

WHEELBASE RANGE 221" (560cm) Through and Including 262" (665cm)

BRAKE SYSTEM, AIR Dual System for Straight Truck Applications

**Includes**

: BRAKE LINES Color and Size Coded Nylon

: DRAIN VALVE Twist-Type

: GAUGE, AIR PRESSURE (2) Air 1 and Air 2 Gauges; Located in Instrument Cluster

: PARKING BRAKE CONTROL Yellow Knob, Located on Instrument Panel

: PARKING BRAKE VALVE For Truck

: QUICK RELEASE VALVE On Rear Axle for Spring Brake Release: 1 for 4x2, 2 for 6x4

: SPRING BRAKE MODULATOR VALVE R-7 for 4x2, SR-7 with relay valve for 6x4/8x6

AIR BRAKE ABS {Bendix AntiLock Brake System} 4-Channel (4 Sensor/4 Modulator) Full Vehicle Wheel Control System

BRAKE, PARKING Manual Push-Pull Pneumatic Parking Brake

BRAKES, FRONT {Meritor 16.5X6 Q-PLUS CAST} Air S-Cam Type, Cast Spider, Fabricated Shoe, Double Anchor Pin, Size 16.5" X 6", 23,000-lb Capacity

BRAKE CHAMBERS, FRONT AXLE {Bendix} 24 Sqli

SLACK ADJUSTERS, FRONT {Haldex} Automatic

DUST SHIELDS, FRONT BRAKE for Air Cam Brakes

BRAKES, REAR {Meritor 16.5X8.625 Q-PLUS CAST} Air S-Cam Type, Cast Spider, Fabricated Shoe, Double Anchor Pin, Size 16.5" X 8.625", 23,000-lb Capacity per Axle

BRAKE CHAMBERS, REAR AXLE {Bendix EverSure} 30/30 Sqli Spring Brake

SLACK ADJUSTERS, REAR {Haldex} Automatic

DUST SHIELDS, REAR BRAKE for Air Cam Brakes

PARK BRAKE CHAMBERS, ADDITIONAL (2) Spring Brake Type

AIR COMPRESSOR {Cummins} 18.7 CFM

AIR DRYER {Bendix AD-9} with Heater

AIR DRYER LOCATION Mounted Inside Left Rail, Back of Cab

AIR TANK LOCATION (2) : One Mounted Under Each Rail, Front of Rear Suspension, Parallel to Rail

DRAIN VALVE {Berg} with Pull Chain, for Air Tank

STEERING GEAR (2) {Sheppard M100/M80} Dual Power

STEERING COLUMN Tilting

STEERING WHEEL 4-Spoke; 18" Dia., Black

DRIVELINE SYSTEM {Dana Spicer} SPL170 Main Driveline with SPL170 Interaxle Shaft, for 6x4

EXHAUST SYSTEM Horizontal Aftertreatment System, Frame Mounted Right Side Under Cab, for Single Vertical Tail Pipe, Frame Mounted Right Side Back of Cab

AFTERTREATMENT COVER Aluminum

**Description**

EXHAUST HEIGHT 10' 11"

MUFFLER/TAIL PIPE GUARD (1) Aluminum

RAIN CAP with Single Exhaust, Non-Bright Finish

TAIL PIPE (1) Straight Type

ELECTRICAL SYSTEM 12-Volt, Standard Equipment

**Includes**

: DATA LINK CONNECTOR For Vehicle Programming and Diagnostics In Cab

: HAZARD SWITCH Push On/Push Off, Located on Instrument Panel to Right of Steering Wheel

: HEADLIGHT DIMMER SWITCH Integral with Turn Signal Lever

: PARKING LIGHT Integral with Front Turn Signal and Rear Tail Light

: STARTER SWITCH Electric, Key Operated

: STOP, TURN, TAIL & B/U LIGHTS Dual, Rear, Combination with Reflector

: TURN SIGNAL SWITCH Self-Cancelling for Trucks, Manual Cancelling for Tractors, with Lane Change Feature

: WINDSHIELD WIPER SWITCH 2-Speed with Wash and Intermittent Feature (5 Pre-Set Delays), Integral with Turn Signal Lever

: WINDSHIELD WIPERS Single Motor, Electric, Cowl Mounted

: WIRING, CHASSIS Color Coded and Continuously Numbered

ALTERNATOR {Leece-Neville AVI160P2013} Brush Type, 12 Volt, 160 Amp Capacity, Pad Mount, with Remote Sense

ANTENNA Shark Fin, Roof Mounted

BACK-UP ALARM Electric, 102 dBA

BATTERY BOX Steel, with Aluminum Cover, 14" Wide, 2-3 Battery Capacity, Mounted Left Side Under Cab

BATTERY SYSTEM {JCI} Maintenance-Free, (3) 12-Volt 2100CCA Total, Top Threaded Stud

BODY BUILDER WIRING Back of Day Cab at Left Frame or Under Sleeper, Extended or Crew Cab at Left Frame; Includes Sealed Connectors for Tail/Amber Turn/Marker/ Backup/Accessory Power/Ground and Sealed Connector for Stop/Turn

CIRCUIT BREAKERS Manual-Reset (Main Panel) SAE Type III with Trip Indicators, Replaces All Fuses

CIGAR LIGHTER Includes Ash Cup

CLEARANCE/MARKER LIGHTS (5) {Truck Lite} Amber LED Lights, Flush Mounted on Cab or Sunshade

HEADLIGHTS Halogen

HORN, AIR Single Trumpet, Black, with Lanyard Pull Cord

HORN, ELECTRIC (2) Disc Style

INDICATOR, LOW COOLANT LEVEL with Audible Alarm

RADIO AM/FM/WB/Clock/Bluetooth/USB Input/Auxiliary Input

SPEAKERS (2) 6.5" Dual Cone Mounted in Doors

STARTING MOTOR {Delco Remy 39MT} 12 Volt, Gear Reduced, with Thermal Over-Crank Protection

SWITCH, AUXILIARY Accessory Control; for Wiring in Roof, with Maximum of 20 amp Load with Switches In Instrument Panel

TAIL LIGHT WIRING MODIFIED Includes: Wiring for Standard Lt & Rt Tail Lights; Separate 8.0' of Extra Cable Wiring for Lt & Rt Body Mounted Tail Lights

TURN SIGNALS, FRONT Includes LED Side Turn Lights Mounted on Fender

FRONT END Tilting, Fiberglass, with Three Piece Construction, for WorkStar/HV

GRILLE Stationary, Chrome

INSULATION, SPLASH PANELS for Sound Abatement

**Description**

INSULATION, UNDER HOOD for Sound Abatement

LOGOS EXTERIOR Model Badges

LOGOS EXTERIOR, ENGINE Badges

COMMUNICATIONS MODULE Telematics Device with Over the Air Programming; Includes Five Year Data Plan and International 360

DUAL DRIVE Customer Does Not Intend to Convert to In-Cab Dual Drive Positions

PAINT SCHEMATIC, PT-1 Single Color, Design 100

**Includes**

: PAINT SCHEMATIC ID LETTERS "WL"

PAINT TYPE Base Coat/Clear Coat, 1-2 Tone

FUEL TANK Top Draw, Non-Polished Aluminum, 24" Dia, 50 US Gal (189L), Mounted Left Side, Under Cab

DEF TANK 5 US Gal (19L) Capacity, Frame Mounted Outside Left Rail, Under Cab

FUEL/WATER SEPARATOR {Racor 400 Series} with Primer Pump, Includes Water-in-Fuel Sensor, Mounted on Engine

WHEELS, FRONT {Accuride 29039} DISC; 22.5x9.00 Rims, Powder Coat Steel, 5-Hand Hole, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs, Non-Standard Offset, with .5" Thick Disc

(2) TIRE, FRONT 315/80R22.5 Load Range L HAU 3 WT (CONTINENTAL), 480 rev/mile, 68 MPH, All-Position

WHEELS, REAR {Maxion 91541} DUAL DISC; 22.5x8.25 Rims, Painted Steel, 2-Hand Hole, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs

(8) TIRE, REAR 11R22.5 Load Range G HDR2+ (CONTINENTAL), 491 rev/mile, 75 MPH, Drive

WHEEL, SPARE, DISC {Accuride 29039} 22.5x9.00 Rims, Powder Coat Steel, 10-Stud, 285.75mm BC, Hub-Piloted, for Front Application Only

PAINT IDENTITY, REAR WHEELS Disc Rear Wheels; with Vendor Applied White Powder Coat Paint

**Services Section:**

WARRANTY Standard for HV507, HV50B, HV607 Models, Effective with Vehicles Built July 1, 2017 or Later, CTS-2025A

CARB COMPANION PLAN {Navistar} for CARB B6.7 and L9 Engines

SERVICES, TOWING {Navistar} Service Call to 60-Month/Unlimited Mileage to the Nearest Navistar Dealer for Navistar Warrantable Failure as Contract Defined; Includes Engine Failure if Supplier Declines Tow Coverage & ESC Supplied thru Navistar; \$1100 (USA) Maximum Benefit per Incident

SRV CONTRACT, EXT CMS ENG/AFTR {Cummins} To 60-Month/200,000 Miles (320,000 km), Extended Cummins L9 Engine Coverage, Protection Plan 1 and Aftertreatment, (Truck Application Only) << For Use with CARB Emission Warranty >>

PDI, DOT, PA STATE INSPECTION, FIRE EXT AND TRIANGLE KIT

FLOOR PLAN TO INSTALL EQUIPMENT

<u>Description</u>	<u>(US DOLLAR)</u>	<u>Price</u>
Factory List Prices:		
Product Items	\$177,852.00	
Service Items	\$9,330.00	
Total Factory List Price Including Options:		\$187,182.00
Total Goods Purchased:		\$3,850.00
Freight Charge	\$3,400.00	
Total Freight:		\$3,400.00
Total Factory List Price Including Freight:		\$194,432.00
Less Customer Allowance:		(\$52,099.00)
Total Vehicle Price:		\$142,333.00
Total Sale Price:		\$142,333.00
Total Per Vehicle Sales Price:		\$142,333.00
Net Sales Price:		\$142,333.00

Please feel free to contact me regarding these specifications should your interests or needs change. I am confident you will be pleased with the quality and service of an International vehicle.

**Approved by Seller:**

**Accepted by Purchaser:**

\_\_\_\_\_  
Official Title and Date

\_\_\_\_\_  
Firm or Business Name

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Authorized Signature and Date

**This proposal is not binding upon the seller without Seller's Authorized Signature**

\_\_\_\_\_  
Official Title and Date

**The TOPS FET calculation is an estimate for reference purposes only. The seller or retailer is responsible for calculating and reporting/paying appropriate FET to the IRS.**

**The limited warranties applicable to the vehicles described herein are Navistar, Inc.'s standard printed warranties which are incorporated herein by reference and to which you have been provided a copy and hereby agree to their terms and conditions.**



# Township of Haverford

Haverford Township Parks and Recreation Department

Date: September 30, 2024

To: David R. Burman, Township Manager

From: Brian Barrett, Director of Parks and Recreation

Subject: Park Fencing, Ballfield Lighting, Basketball Court Work, Playground Equipment

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Attached are the following quotes received:

Replacement fencing around the tennis court and skate park at Merry Place. The quote is for \$48,120.00 and work will be done by Miller Sports Construction under Costars #008-E22-184

Replacement sideline fencing and new baseball cages at Paddock and Elwell Park. Both jobs will be done by Millers Sports Construction Costars #008-E22-184. Paddock is \$46,980.00 and Elwell is \$68,350.00.

For baseball field lighting from NGU at Jack McDonald Field. Quote in the amount of \$237,000.00, under Sourcewell Contract #: 041123-CPL.

From Top A Court for the removal of Brookline Basketball Court. The quote is for \$16,280.00, under Sourcewell #031022-AST.

From Top A Court for new circular half court basketball court at Brookline Park. The quote is for \$39,880.00, under Sourcewell #031022-AST

For new playground equipment at Bailey Park. The quotes are for \$16,592.00, Chatham Glen quote is for \$16,593.00 and various parks \$30,004.00, under Recreation Resource CoStars #014-E22-249.

If there are any questions I will be on hand for the Board of Commissioner Work Session on October 7, 2024.



# COSTARS PROPOSAL

SPORTS CONSTRUCTION DIVISION  
Athletic Surfaces & Equipment

TO: BRIAN BARRETT - HAVERFORD TOWNSHIP

FROM: KEVIN CUNNINGHAM

JOB: MERRYS PLACE PARK FENCE PROJECT

DATE: AUGUST 24, 2024

The following proposal has been prepared to replace the existing tennis court and skate park fences at Merry's Place Park on Glendale Road in Havertown, PA. Miller Sports Construction (MSC) proposes to supply all materials, and proposes equipment necessary to complete the work as further specified:

**COSTARS Contract Pricing:** The following pricing is based on CoStars pricing structure. Costars is a Pennsylvania State approved cooperative purchasing platform. Miller Sports Construction, West Chester, PA is authorized under CoStars contract number 008-E22-184 (Maintenance, Repair & Operation (MRO)). Costars is a procurement cooperative which provide predetermined preferential pricing. The products/resources contained with the program inventory have been bid, vetted, and approved by the buying cooperative, allowing the purchasing facility/customer to use in lieu of a formal bid process.

**Costars: Contract #: 008-E22-184 – Maintenance, Repair & Operation (MRO)**

### SCOPE OF WORK - Merry's Place Park Fence Project

1. Supply and install fencing to replace the existing tennis court and skate park fences.
2. The new fence around the tennis courts would be approximately 60' by 120' (four sided) and would be 10' high. The fence around the skate park would be approximately 60' by 120' (three sided) and would be 8' high. Three gates would be installed in the fence. All materials would be black and three 4' wide single swing gates would be installed in these fences.
3. We would remove the existing fabric and rail, and cut the existing posts off at ground level. New 2-1/2" OD and 3" OD black powder coated posts would be sleeved into the existing post footings. A top rail, bottom rail and brace rails would then be installed, along with new 10' high, #8 gauge, 1-3/4" black vinyl mesh fabric (tennis court) and 8' high, #8 gauge, 2" black vinyl mesh for the skate park. The fittings for the bottom rail would be installed over the welds on the posts. The fabric would be a heavy duty (#8 gauge) fabric. Any existing materials would be removed from the job site.
4. The posts would be ss40, 2-1/2" OD and ss40, 3" OD powder coated pipe that would be sleeved into the existing post footings. The top rail, bottom rail and braces would be a ss20, 1-5/8" OD powder coated pipe and the fabric would be either a 10' high, #8 gauge (#9 gauge core), fused, 1-3/4" black vinyl mesh fabric or an 8' high, #8 gauge (#9 gauge core), 2" black vinyl fabric. The gates would be fabricated using ss20, 1-5/8" OD powder coated pipe and hang on box hinges. All fittings would be steel and all materials would be black.

**Scope Cost .....\$ 48,120.00**



800.821.8611

Corporate Office  
827 Lincoln Avenue Suite 15  
West Chester, PA 19380  
Tel: 610.626.1000 Fax: 610.626.3000



Virginia Office  
5715 South Laburnum Avenue  
Richmond, VA 23231  
Tel: 804.405.4884 Fax: 610.626.3000

www.millersports.com



## COSTARS PROPOSAL

**SPORTS CONSTRUCTION DIVISION**  
Athletic Surfaces & Equipment

### Notes-

1. Please note that this price is based on prevailing wage labor rates.
2. A visit to the job site before start of work would be needed to confirm this price.
3. Any permits would be the responsibility of the customer.
4. If needed, an insurance certificate can be provided.
5. A lift would be used to remove and then install the cages and fence, some remedial work on the ground of the cages may need to be done by others.

**TERMS & CONDITIONS:** In accepting this proposal, the Owner/Customer agrees and accepts the following:

- Customer/Owner responsible for:
  - Removal of all equipment prior to MSC arrival/site mobilization
  - Proper lighting, electric supply, as applicable to the scope of work, water supply
  - Access to and use of project site restrooms
  - Security of the project site/space during work period, including appropriate signage, as applicable
  - 24/7 access to project site, as needed
  - Tax exempt certificate
  - Permits, as applicable
  - Underground lines need to be marked out by the participating utilities
  - All clearing of brush or trees from the fence line
  - Any completion date given is subject to change because of adverse weather conditions, site conditions/and or any condition, not controlled by MSC that might alter MSC's ability to perform its work. MSC will not be responsible for delays due to these conditions.



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# COSTARS PROPOSAL

SPORTS CONSTRUCTION DIVISION  
Athletic Surfaces & Equipment

- This proposal is based on current material, rental, and labor pricing as of the date of this proposal. If the project is delayed or our work under this proposal is pushed into another calendar year, MSC will be entitled to a price increase matching any increase in Labor (PW rates as well as base rate) and increase in material costs as posted by approved system supplier.
- Any union labor required due to the general contractor's contractual union agreements. Project Labor Agreements, or job specific apprenticeship requirements, will be provided at no cost to MSC.
- An extra charge may be incurred if "hard digging" is encountered.
- Payment Terms:
  - Project to be invoiced 50% to initiate order; balance due upon delivery
  - Installation/labor services to be billed monthly based on scope completion-Net 30
  - 1.5% per month late fee for any unpaid balance
  - Applicable service charges will be added for credit card payment(s)
- Quote is based on 2024 installation and includes all Contractor and Manufacturer Qualifications.
- Pricing is valid for 30 days

### ACCEPTED

The above pricing, specifications and conditions are satisfactory and are hereby accepted:

Haverford Township Representative

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

### CONFIRMED

*Miller Sports Construction*

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

To process this proposal/order please sign and fax to (610) 626-3000 or email to [cmartin@millersports.com](mailto:cmartin@millersports.com). Please follow with a purchase order, as applicable.

Thank you for your consideration. *Kevin Cunningham*

Haverford Township - Merry's Place Park Fencing Project  
Contact - Brian Barrett Director of Parks and Recreation (610-446-9397) [bbarrett@havtwp.org](mailto:bbarrett@havtwp.org)  
Haverford Township 1014 Darby Road Havertown, PA. 19083



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# COSTARS PROPOSAL

SPORTS CONSTRUCTION DIVISION  
Athletic Surfaces & Equipment

TO: BRIAN BARRETT - HAVERFORD TOWNSHIP

FROM: KEVIN CUNNINGHAM

JOB: PADDOCK PARK FENCE PROJECT

DATE: JULY 25, 2024

The following proposal has been prepared to replace the existing baseball cage and sideline fences at the Paddock Park baseball field in Havertown, PA Miller Sports Construction (MSC) proposes to supply all materials, and proposes equipment necessary to complete the work as further specified:

**COSTARS Contract Pricing:** The following pricing is based on CoStars pricing structure. Costars is a Pennsylvania State approved cooperative purchasing platform. Miller Sports Construction, West Chester, PA is authorized under CoStars contract number 008-E22-184 (Maintenance, Repair & Operation (MRO)). Costars is a procurement cooperative which provide predetermined preferential pricing. The products/resources contained with the program inventory have been bid, vetted, and approved by the buying cooperative, allowing the purchasing facility/customer to use in lieu of a formal bid process.

**Costars: Contract #: 008-E22-184 – Maintenance, Repair & Operation (MRO)**

### SCOPE OF WORK - Paddock Park Fence Project

1. Supply and install fencing to replace the existing baseball cage and sideline fences at the Paddock Park baseball field in Havertown, PA.
2. The baseball cage is 17' across the back, 17' on the two sides, and 26' wide across the front with the front of the cage 20' high and the back of the cage 12' high. A 40' long section of 8' high fence would be installed off of the front of each side of the cage along with 35' of 6' high chain link fence on the 1st base side and 70' of 4' chain link fence on the 3rd base side. The existing batting areas would be removed, with the new 8', 6' and 4' fences to be installed in approximately the same location as the existing fences.
3. We would remove the existing posts, wire and rail from the existing baseball cage and remove the existing 4', 6' and 8' fence completely. With the cage, new posts would then be welded and installed in the existing post footings, with new rail, wire and fittings installed on the fence and cage. The cage would have two trusses across the roof for support, and would have the same layout and look as the existing cage. The sideline fences would be set in approximately 36" of concrete, with the 6' and 8' fence to have a bottom rail along with a top rail and braces, the 4' high fence would have only top rail. All new materials would be black (either powder coated or vinyl).
4. The 4' and 6' high fences the posts would be ss40, 2-1/2" OD line and terminal posts that would be set in approximately 36" of concrete. The top rail (bottom rail and braces - 6' fence) would be a ss20, 1-5/8" OD powder coated pipe with the fabric to be either a 4' or 6' high, #8 gauge (#9 gauge core), 2" fused black vinyl mesh fabric. All materials would be black (either vinyl or powder coated) and all fittings would be steel.
5. The 8' high fence the posts would be ss40, 2-1/2" OD line and ss40, 3" OD terminal posts that would be set in approximately 36" of concrete. The top rail, bottom rail and braces would be a ss20, 1-5/8" OD powder coated pipe with the fabric to be an 8' high, #8 gauge (#9 gauge core), 2" fused black vinyl mesh fabric. All materials would be black (either vinyl or powder coated) and all fittings would be steel.
6. The posts for the baseball cage would be ss40, 3" OD line and ss40, 4" OD terminal posts that would be welded and sleeved into the existing post footings. The top, middle and bottom rails along with the roof rail and the trusses would be a ss20, 1-5/8" OD powder coated pipe, with the trusses to be welded and all roof pipe to have the fittings tech screwed in place. The fabric on the bottom of the cage would be a 12' high, #5 gauge (#6 gauge core), with the rest of the fabric to be an #8 gauge (#9 gauge core), 2" fused black vinyl mesh fabric. All materials would be black (either vinyl or powder coated) and all fittings would be steel.

**Scope Cost .....\$ 46,980.00**



800.821.8611

Corporate Office  
827 Lincoln Avenue Suite 15  
West Chester, PA 19380  
Tel: 610.626.1000 Fax: 610.626.3000



Virginia Office  
5715 South Laburnum Avenue  
Richmond, VA 23231  
Tel: 804.405.4884 Fax: 610.626.3000

www.millersports.com



## COSTARS PROPOSAL

**SPORTS CONSTRUCTION DIVISION**  
Athletic Surfaces & Equipment

### Notes-

1. Please note that this price is based on prevailing wage labor rates.
2. A visit to the job site before start of work would be needed to confirm this price.
3. Any permits would be the responsibility of the customer.
4. If needed, an insurance certificate can be provided.
5. A lift would be used to remove and then install the cages and fence, some remedial work on the ground of the cages may need to be done by others.

**TERMS & CONDITIONS:** In accepting this proposal, the Owner/Customer agrees and accepts the following:

- Customer/Owner responsible for:
  - Removal of all equipment prior to MSC arrival/site mobilization
  - Proper lighting, electric supply, as applicable to the scope of work, water supply
  - Access to and use of project site restrooms
  - Security of the project site/space during work period, including appropriate signage, as applicable
  - 24/7 access to project site, as needed
  - Tax exempt certificate
  - Permits, as applicable
  - Underground lines need to be marked out by the participating utilities
  - All clearing of brush or trees from the fence line
  - Any completion date given is subject to change because of adverse weather conditions, site conditions/and or any condition, not controlled by MSC that might alter MSC's ability to perform its work. MSC will not be responsible for delays due to these conditions.



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Tel: 804.405.4884 Fax: 610.626.3000



# COSTARS PROPOSAL

SPORTS CONSTRUCTION DIVISION  
Athletic Surfaces & Equipment

- This proposal is based on current material, rental, and labor pricing as of the date of this proposal. If the project is delayed or our work under this proposal is pushed into another calendar year, MSC will be entitled to a price increase matching any increase in Labor (PW rates as well as base rate) and increase in material costs as posted by approved system supplier.
- Any union labor required due to the general contractor's contractual union agreements. Project Labor Agreements, or job specific apprenticeship requirements, will be provided at no cost to MSC.
- An extra charge may be incurred if "hard digging" is encountered.
- Payment Terms:
  - Project to be invoiced 50% to initiate order; balance due upon delivery
  - Installation/labor services to be billed monthly based on scope completion-Net 30
  - 1.5% per month late fee for any unpaid balance
  - Applicable service charges will be added for credit card payment(s)
- Quote is based on 2024 installation and includes all Contractor and Manufacturer Qualifications.
- Pricing is valid for 30 days

### ACCEPTED

The above pricing, specifications and conditions are satisfactory and are hereby accepted:

Haverford Township Representative

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

### CONFIRMED

*Miller Sports Construction*

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

To process this proposal/order please sign and fax to (610) 626-3000 or email to [cmartin@millersports.com](mailto:cmartin@millersports.com). Please follow with a purchase order, as applicable.

Thank you for your consideration. *Kevin Cunningham*

Haverford Township - Paddock Park Fencing Project  
Contact - Brian Barrett Director of Parks and Recreation (610-446-9397) [bbarrett@havtwp.org](mailto:bbarrett@havtwp.org)  
Haverford Township 1014 Darby Road Havertown, PA. 19083



Corporate Office  
827 Lincoln Avenue Suite 15  
West Chester, PA 19380  
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Virginia Office  
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Richmond, VA 23231  
Tel: 804.405.4884 Fax: 610.626.3000





# COSTARS PROPOSAL

SPORTS CONSTRUCTION DIVISION  
Athletic Surfaces & Equipment

TO: BRIAN BARRETT - HAVERFORD TOWNSHIP

FROM: KEVIN CUNNINGHAM

JOB: ELWELL FIELD FENCE PROJECT

DATE: JULY 25, 2024

The following proposal the replace the existing baseball cage and sideline fences at the Elwell Field baseball field in Ardmore, PA. Miller Sports Construction (MSC) proposes to supply all materials, and proposes equipment necessary to complete the work as further specified:

**COSTARS Contract Pricing:** The following pricing is based on CoStars pricing structure. Costars is a Pennsylvania State approved cooperative purchasing platform. Miller Sports Construction, West Chester, PA is authorized under CoStars contract number 008-E22-184 (Maintenance, Repair & Operation (MRO)). Costars is a procurement cooperative which provide predetermined preferential pricing. The products/resources contained with the program inventory have been bid, vetted, and approved by the buying cooperative, allowing the purchasing facility/customer to use in lieu of a formal bid process.

**Costars: Contract #: 008-E22-184 – Maintenance, Repair & Operation (MRO)**

### SCOPE OF WORK - Elwell Field Fence Project

1. Supply and install fencing to replace the existing baseball cage and sideline fences at the Elwell Field baseball field in Ardmore, PA.
2. The baseball cage is 20' across the back, 20' on the two sides, and 26' wide across the front with the front of the cage 20' high and the back of the cage 12' high. The field has two 65' long by 20' high side line fences (one on each side of the field) and two 40' long sections of 12' high fence that start at the end of each section of 20' high fence.
3. We would remove the existing wire and rail from the existing baseball cage, the two 65' long by 20' high two sideline fences along with the two 40' long by 12' high extended sideline fences. New posts would then be welded and sleeved into the existing post footings, with new rail, wire and fittings installed of the fence and cage. The cage would have two trusses across the roof for support, and would have the same layout and look as the existing cage. All new materials would be black (either powder coated or vinyl).
4. The posts for the baseball cage would be ss40, 3" OD line and ss40, 4" OD terminal posts that would be welded and sleeved into the existing post footings. The top, middle and bottom rails along with the roof rail and the trusses would be a ss20, 1-5/8" OD powder coated pipe, with the trusses to be welded and all roof pipe to have the fittings tech screwed in place. The fabric on the bottom of the cage would be a 12' high, #5 gauge (#6 gauge core), with the rest of the fabric to be an #8 gauge (#9 gauge core), 2" fused black vinyl mesh fabric. All materials would be black (either vinyl or powder coated) and all fittings would be steel.
5. The 12' high fence the posts would be ss40, 2-1/2" OD line and ss40, 3" OD terminal posts that would be welded and sleeved into the existing post footings. The top rail, bottom rail and braces would be a ss20, 1-5/8" OD powder coated pipe with the fabric to be a 12' high, #8 gauge (#9 gauge core), 2" fused black vinyl mesh fabric. All materials would be black (either vinyl or powder coated) and all fittings would be steel.
6. The 20' high fence the posts would be ss40, 3" OD line and ss40, 4" OD terminal posts that would be welded and sleeved into the existing post footings. The top rail, bottom rail and braces would be a ss20, 1-5/8" OD powder coated pipe with the fabric to be an #8 gauge (#9 gauge core), 2" fused black vinyl mesh fabric. The swing gates would be fabricated using ss20, 1-5/8" OD powder coated pipe and hang on box hinges All materials would be black (either vinyl or powder coated) and all fittings would be steel.

**Scope Cost .....\$ 68,350.00**



Corporate Office  
827 Lincoln Avenue Suite 15  
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Tel: 610.626.1000 Fax: 610.626.3000

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Tel: 804.405.4884 Fax: 610.626.3000





## COSTARS PROPOSAL

**SPORTS CONSTRUCTION DIVISION**  
Athletic Surfaces & Equipment

### Notes-

1. Please note that this price is based on prevailing wage labor rates.
2. A visit to the job site before start of work would be needed to confirm this price.
3. Any permits would be the responsibility of the customer.
4. If needed, an insurance certificate can be provided.
5. A lift would be used to remove and then install the cages and fence, some remedial work on the ground of the cages may need to be done by others.

**TERMS & CONDITIONS:** In accepting this proposal, the Owner/Customer agrees and accepts the following:

- Customer/Owner responsible for:
  - Removal of all equipment prior to MSC arrival/site mobilization
  - Proper lighting, electric supply, as applicable to the scope of work, water supply
  - Access to and use of project site restrooms
  - Security of the project site/space during work period, including appropriate signage, as applicable
  - 24/7 access to project site, as needed
  - Tax exempt certificate
  - Permits, as applicable
  - Underground lines need to be marked out by the participating utilities
  - All clearing of brush or trees from the fence line
  - Any completion date given is subject to change because of adverse weather conditions, site conditions/and or any condition, not controlled by MSC that might alter MSC's ability to perform its work. MSC will not be responsible for delays due to these conditions.



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# COSTARS PROPOSAL

SPORTS CONSTRUCTION DIVISION  
Athletic Surfaces & Equipment

- This proposal is based on current material, rental, and labor pricing as of the date of this proposal. If the project is delayed or our work under this proposal is pushed into another calendar year, MSC will be entitled to a price increase matching any increase in Labor (PW rates as well as base rate) and increase in material costs as posted by approved system supplier.
- Any union labor required due to the general contractor's contractual union agreements. Project Labor Agreements, or job specific apprenticeship requirements, will be provided at no cost to MSC.
- An extra charge may be incurred if "hard digging" is encountered.
- Payment Terms:
  - Project to be invoiced 50% to initiate order; balance due upon delivery
  - Installation/labor services to be billed monthly based on scope completion-Net 30
  - 1.5% per month late fee for any unpaid balance
  - Applicable service charges will be added for credit card payment(s)
- Quote is based on 2024 installation and includes all Contractor and Manufacturer Qualifications.
- Pricing is valid for 30 days

### ACCEPTED

The above pricing, specifications and conditions are satisfactory and are hereby accepted:

Haverford Township Representative

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

### CONFIRMED

*Miller Sports Construction*

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

To process this proposal/order please sign and fax to (610) 626-3000 or email to [cmartin@millersports.com](mailto:cmartin@millersports.com). Please follow with a purchase order, as applicable.

Thank you for your consideration. *Kevin Cunningham*

Haverford Township - Elwell Field Fencing Project  
Contact - Brian Barrett Director of Parks and Recreation (610-446-9397) [bbarrett@havtwp.org](mailto:bbarrett@havtwp.org)  
Haverford Township 1014 Darby Road Havertown, PA. 19083



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Tel: 804.405.4884 Fax: 610.626.3000

WE ARE PASSIONATE ABOUT TAKING YOUR VENUE  
AND FAN EXPERIENCE TO THE NEXT LEVEL

**YOUR SUCCESS IS OUR GOAL**

NGU Sports Lighting, LLC  
2401 PGA Blvd., Suite 110  
Palm Beach Gardens, FL 33410  
[www.ngusportslighting.com](http://www.ngusportslighting.com)  
1-855-NGU-LEDS



# Offer of Business

McDonald Field

[Document.SeqNumber]

Prepared For:  
Brian Barrett  
Parks & Recreation

Date Issued:  
2024-09-25

Expiration Date:  
[Document.ExpirationDate]

# INDEX

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## **Offer of Business**

INDEX

OUR COMMITMENT

SYSTEM BENEFITS

RECREATIONAL EXPERIENCE

PROJECT DETAILS

PROJECT DETAILS CONTINUED

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## OUR COMMITMENT

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NGU Sports Lighting is a leading provider of high-quality sports lighting solutions. With a strong focus on innovation and cutting-edge technology, NGU Sports Lighting specializes in optimizing customer experience. This is done by defining current needs, designing a customized solution, and installing a state-of-the-art lighting systems for a verity sports facilities.

Our company is committed to enhancing the visibility, safety, and overall experience of athletes, spectators, and officials during any type of event. NGU Sports Lighting offers a comprehensive range of lighting solutions tailored to meet your specific requirements and expectations. Our team of experts work closely with clients to assess their needs, taking into account factors such as field size, sport-specific lighting standards, energy efficiency, and budget constraints. By leveraging our **extensive industry knowledge and expertise**; we are able to deliver customized lighting solutions that optimize visibility, minimize glare and spill, while providing uniform illumination across any surface.

In addition to our commitment to performance and quality, NGU Sports Lighting also prioritizes **energy efficiency and sustainability**. We utilize advanced lighting technologies, such as LED, to minimize energy consumption and reduce environmental impact. Our lighting solutions are designed to provide long-lasting performance, requiring minimal maintenance and offering significant cost savings over time.

NGU Sports Lighting takes pride in our ability to deliver turnkey lighting solutions, from initial design and engineering to installation and ongoing support. We recognize that creating a brand-new lighting strategy for any venue is a significant task, especially when you are busy overseeing other critical matters. As a company that helped introduce LED Sports Lighting to the industry over a decade ago and with over 100 years of combined experience; our team of professionals are dedicated to providing exceptional customer service and **ensuring complete satisfaction throughout the entire project lifecycle**.

---

**Your project experience is our top priority.**

Your conversion project will be executed in 3-steps:



**Evaluate. Design. Implement.**

A proof positive process to give you the very best experience.

---

## SYSTEM BENEFITS



### **LOWER OPERATIONAL COSTS**

Operational Efficiency - The Ephesus Sports Lighting System is on average 45% more energy efficient than other solid-state lighting systems. Making the Ephesus solution the most efficient sports system in the marketplace.

### **HIGHER PERFORMANCE AND RELIABILITY**

System Reliability – Designed and manufactured to the highest reliability standards in the marketplace. The system uses chip on board innovation; which has a much higher performance reliability than the soldered LED chip method used by other manufacturers.

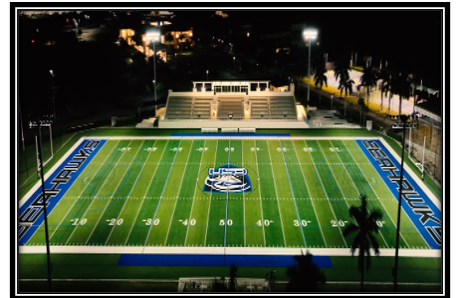
### **SUPERIOR OPERATIONAL FLEXIBILITY**

Enhanced System Control – The new system provides individual fixture control with full dimming capabilities. The system can be controlled wirelessly from any handheld device, PC or LAN connected device. It's simple to use and provides the owner with the most user flexible system on the market.



# RECREATIONAL EXPERIENCE

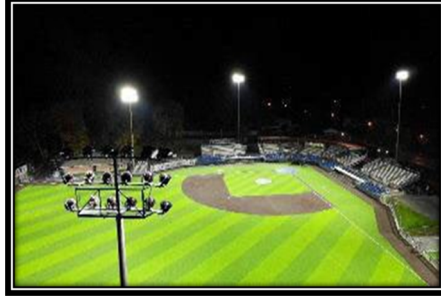
TOTAL CONTROL OF POLES & ZONES





**INGU**  
SPORTS LIGHTING

**NEVER GIVE UP.**



# PROJECT DETAILS

*From start to finish, we take your ideas and turn them into reality...*

**PROJECT NAME:** McDonald Field

Sourcewell Contract #: 041123-CPL

## **PROJECT OVERVIEW**

We are pleased to provide you with an Offer of Business for your Baseball Field. NGU will provide you with light levels that are sufficient with your needs related to design #: LD24963

### **[McDonald Field:]**

Scope Summary:

We are pleased to provide you with an Offer of Business for your Baseball Field. The light levels will be in accordance with lighting design LD24963, meeting an average of 50/30 foot-candles.

NGU will provide all necessary labor and materials for the installation of the Ephesus solid-state LED sports lighting system. This system can be controlled with our wireless communication system, which includes remote programming for up to eight dynamic lighting scenes and user training.

The new system will include the following materials and services:

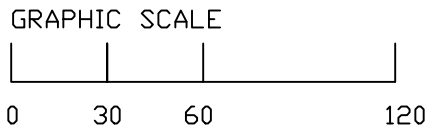
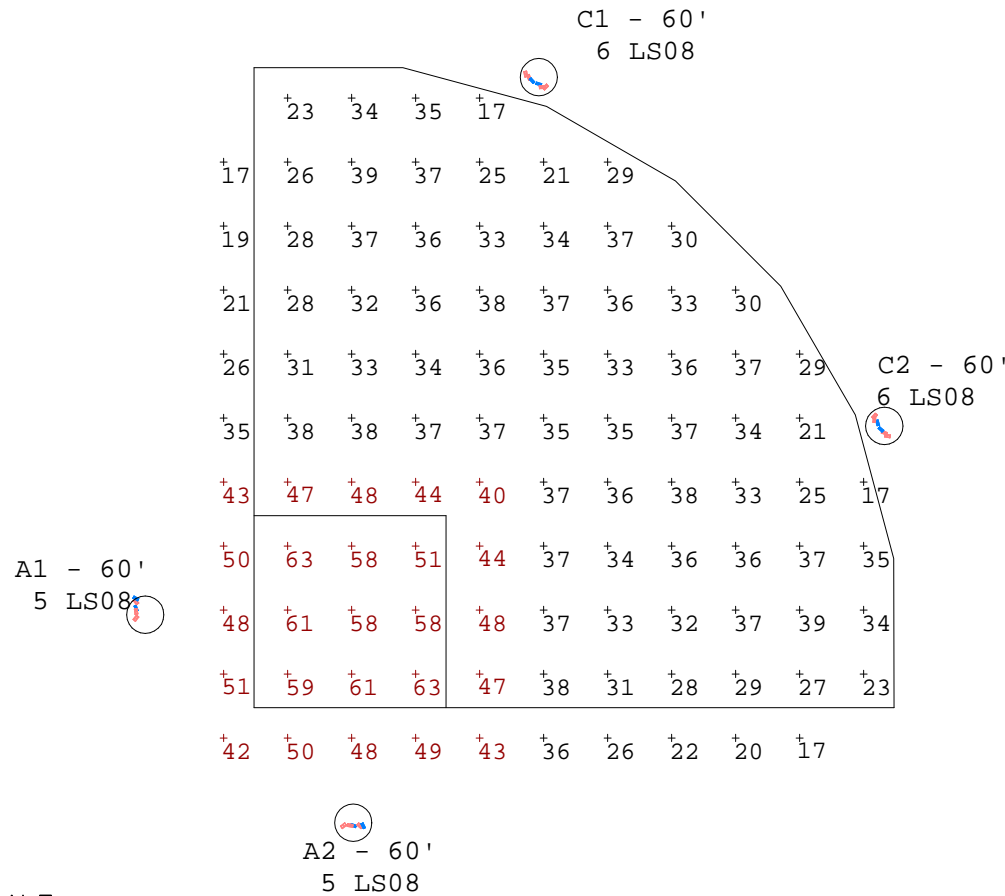
- Ephesus Solid-State LED Sports Lighting Lumasport 8 Fixtures
- New cross arms
- New poles
- Lighting design
- AirMesh wireless control system
- Installation of the new LED fixtures, cross arms, poles and control system
- Fixture aiming, control commissioning and user training
- 10-year material manufacturer warranty (labor warranty available upon request)

**TOTAL: \$237,000.00**

**Does not include sales tax**

Luminaire Schedule							
Scene: game							
Symbol	Qty	Label	Lum. Lumens	LLF	Description	Lum. Watts	Total Watts
	8	680N-4S	109784	0.950	EPH-08-680N-57-70-4S-HEG	697.2	5577.6
	14	680N-5S	110013	0.950	EPH-08-680N-57-70-5S-HEG	697.2	9760.8

Calculation Summary									
Scene: game									
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min	CV	UG
Infield	Illuminance	Fc	50.96	63	40	1.27	1.58	0.14	1.34
Outfield	Illuminance	Fc	31.62	39	17	1.86	2.29	0.20	2.06



**THIS IS NOT A CONSTRUCTION DOCUMENT**

NOTICE: THIS DRAWING IS THE EXCLUSIVE PROPERTY OF NGU SPORTS LIGHTING LLC. ITS ACCEPTANCE CONSTITUTES AGREEMENT THAT THE DRAWING WILL BE TREATED AS CONFIDENTIAL. IT IS TO BE RETURNED UPON REQUEST AND IS NOT TO BE COMMUNICATED, DISCLOSED, OR COPIED EXCEPT AS EXPRESSLY AUTHORIZED BY NGU.

THE INTENT OF THIS LIGHTING LAYOUT IS TO SUGGEST THE BEST UTILIZATION AND THE PERFORMANCE OF EPHEBUS LUMINAIRES REPRESENTED HERE. IT WAS BASED UPON INFORMATION PROVIDED TO NGU SPORTS LIGHTING, LLC AND ANY VARIATION FROM DESIGN TO INSTALLATION MAY AFFECT THE EXPECTED RESULTS.

<p><b>NEVER GIVE UP.</b></p>	2401 PGA Blvd, Suite 110 Palm Beach Gardens, FL 33410 www.NGUsportlighting.com Phone: 1-855-NGU-LEDS		
	Passion and Commitment exclusively for Ephesus LED Sports Lighting		
<p><b>MCDONALD FIELD, HAVERFORD TWSP</b>  <b>200' RADIUS LITTLE LEAGUE</b>  <b>60' MOUNTING HEIGHT POLES</b>  <b>50/30 FOOTCANDLE AVERAGE MAINTAINED</b></p>			
DESIGNED BY <b>H. JOHNSON</b>	DATE <b>4/4/2024</b>	SCALE <b>1" = 60'</b>	DRAWING NUMBER <b>LD24963</b>

## PROJECT DETAILS CONTINUED

Does not include sales tax

**PROJECT NAME:** McDonald Field

Sourcewell Contract #: 041123-CPL

### **NGU Terms and Conditions:**

1. Payment: Our standard terms are 25% non-refunded due upon receipt, net 10, 25% when materials ship Net 10, 35% when lighting system is installed Net 10. and 15% when the final check list is signed off on. Due to multiple party scheduling, system commissioning and controls training will fall outside installation timeline.
2. All other standard terms and conditions apply - please see website for details.
3. Price is valid for 30 days, unless stated otherwise.

**ACCEPTANCE SIGNATURE:** \_\_\_\_\_

# ESTIMATE

TOP-A-COURT LLC  
1274 GEORGIA LN.  
HATFIELD,, PA 19440

TOPACOURT@VERIZON.NET  
+1 (215) 393-8009  
WWW.TOPACOURT.COM

<b>Bill to</b> Haverford Township Eileen Mottola Asst. Dir. Haverford Township Parks & Recreation Dep 1014 Darby Road Havertown, PA 19083	<b>Ship to</b> Haverford Township Eileen Mottola Asst. Dir. Haverford Township Parks & Recreation Dep 1014 Darby Road Havertown, PA 19083
--	--

**Estimate details** P.O. Number: Brookline Park  
Estimate no.: 2104  
Estimate date: 10/01/2024

#	Date	Product or service	Description	Qty	Rate	Amount
1.	1		BUILING ONE BASKETBALL BALL COURT CIRCLE HAVING ONE BASKETBALL UNIT (DOMINATOR ADJUSTABLE ALL ALUMINUM) HAVING 25" RADIUS, EXCACATION OF SITE, STONE IN 12" OF 2A MODIFIED STONE, LASER GRADE, LASER PAVE 2" BINDER 1.5" TOP, COLOR COAT AND LINE STRIPE FOR BASKETBALL LANE, 2-3 OTHER ACTIVITY AREAS BASED ON YOUR SKETCH OF PARK	1	\$39,880.00	\$39,880.00
<b>Total</b>						<b>\$39,880.00</b>

Accepted date Accepted by

# ESTIMATE

TOP-A-COURT LLC  
1274 GEORGIA LN.  
HATFIELD,, PA 19440

TOPACOURT@VERIZON.NET  
+1 (215) 393-8009  
WWW.TOPACOURT.COM

## Bill to

Haverford Township  
Eileen Mottola Asst. Dir.  
Haverford Township Parks & Recreation Dep  
1014 Darby Road  
Havertown, PA 19083

## Ship to

Haverford Township  
Eileen Mottola Asst. Dir.  
Haverford Township Parks & Recreation Dep  
1014 Darby Road  
Havertown, PA 19083

## Estimate details

Estimate no.: 2103  
Estimate date: 10/01/2024

P.O. Number: Brookline Park  
Sales Rep: john coll

#	Date	Product or service	Description	Qty	Rate	Amount
1.		1	REMOVAL OF TOTAL BASKETBALL COURT AT BROOKLINE PARK, EXCAVATE OUT ASPHALT AND AVERAGE OF 4-5" STONE BASE, TAKE OUT 120 FEET OF 4' FENCE AND DISCARD	1	\$16,280.00	\$16,280.00

**Total** **\$16,280.00**

Accepted date

Accepted by



503 N. Walnut Road Bldg 200  
 Kennett Square, PA 19348  
 610-444-4402 1-800-220-4402  
 FAX: 610-444-3359

E-mail: info@recreation-resource.com  
 Website: www.recreation-resource.com



# Quote

DATE	Quote No.
10/1/2024	Q24-524

CONDITIONS: The prices and terms on this quotation are not subject to verbal changes or other agreements unless approved in writing by the Home Office of the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and all other causes beyond our control. Prices are based on costs and conditions existing on date of quotation and are subject to change by the Seller before final acceptance.

Typographical and stenographic errors subject to corrections. Purchaser agrees to accept either overage or shortage not in excess of ten percent to be charged for pro-rata. Purchaser assumes liability for patent and copyright infringement when goods are made to Purchaser's specifications. When quotation specifies material to be furnished by the Purchaser, ample allowance must be made for reasonable spoilage and material must be of suitable quality to facilitate efficient production.

Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein which may appear on Purchaser's formal order will not be binding on the Seller.

TO:  
 Haverford Township  
 1017 Darby Road  
 Havertown, PA 19083  
 Eileen Mottola  
 emottola@havtwp.org

Appropriate State Sales Tax Will Be Added Upon Ordering If Applicable

REP
Kevin

Quote valid for 30 days. If past 30 days, contact us to verify pricing.

ITEM	DESCRIPTION	QTY	UOM	UNIT	TOTAL
	RE: Bailey Park				
BCI	Burke SY-3431 Play Structure			22,958.00	22,958.00
BCI	Burke 2024 Fall In Love With Play Sale *Must order by December 20, 2024 and ship by April 11, 2025			-8,035.00	-8,035.00
Ship-PA	Estimated Freight			1,669.00	1,669.00
	Does not include unloading, assembly, or installation. COSTARS 014-E22-249				

To Accept Order, Sign: \_\_\_\_\_ Date: \_\_\_\_\_  
 Quote is based upon shipment of all items to a single destination, unless noted.  
 Changes subject to price adjustment. Your signature here accepts all of our terms & conditions.  
 A deposit or payment in full may be required to place your order.

<b>TOTAL</b>	<b>\$16,592.00</b>
--------------	--------------------

**PLEASE NOTE-OUR ADDRESS HAS CHANGED TO 503 N. WALNUT ROAD, SUITE 200, KENNETT SQUARE, PA 19348. PLEASE CHANGE YOUR DATABASE.**





503 N. Walnut Road Bldg 200  
 Kennett Square, PA 19348  
 610-444-4402 1-800-220-4402  
 FAX: 610-444-3359

E-mail: info@recreation-resource.com  
 Website: www.recreation-resource.com



# Quote

DATE	Quote No.
9/12/2024	Q24-485

CONDITIONS: The prices and terms on this quotation are not subject to verbal changes or other agreements unless approved in writing by the Home Office of the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and all other causes beyond our control. Prices are based on costs and conditions existing on date of quotation and are subject to change by the Seller before final acceptance.

Typographical and stenographic errors subject to corrections. Purchaser agrees to accept either overage or shortage not in excess of ten percent to be charged for pro-rata. Purchaser assumes liability for patent and copyright infringement when goods are made to Purchaser's specifications. When quotation specifies material to be furnished by the Purchaser, ample allowance must be made for reasonable spoilage and material must be of suitable quality to facilitate efficient production.

Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein which may appear on Purchaser's formal order will not be binding on the Seller.

TO:  
 Haverford Township  
 Eileen Mottola  
 emottola@havtwp.org

Appropriate State Sales Tax Will Be Added Upon Ordering If Applicable

Quote valid for 30 days. If past 30 days, contact us to verify pricing.

REP
Kevin

ITEM	DESCRIPTION	QTY	UOM	UNIT	TOTAL
	RE: Chatham Glen				
BCI	Burke SY-3431 Play Structure Sky posts Lime accessories Blue HDPE Blue-White 2 color HDPE Granite Rotomold plastic (slides, climber)			22,958.00	22,958.00
BCI	Burke 2024 Fall In Love With Play Sale Discount *MUST order by December 20, 2024 and ship by April 11, 2025			-8,035.00	-8,035.00
Ship-PA	Estimated Freight			1,670.00	1,670.00

Does not include unloading, assembly, or installation.

COSTARS 014-E22-249

To Accept Order, Sign: \_\_\_\_\_ Date: \_\_\_\_\_

Quote is based upon shipment of all items to a single destination, unless noted.

Changes subject to price adjustment. Your signature here accepts all of our terms & conditions.

A deposit or payment in full may be required to place your order.

<b>TOTAL</b>	<b>\$16,593.00</b>
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**PLEASE NOTE-OUR ADDRESS HAS CHANGED TO 503 N. WALNUT ROAD, SUITE 200, KENNETT SQUARE, PA 19348. PLEASE CHANGE YOUR DATABASE.**







503 N. Walnut Road Bldg 200  
 Kennett Square, PA 19348  
 610-444-4402 1-800-220-4402  
 FAX: 610-444-3359

E-mail: info@recreation-resource.com  
 Website: www.recreation-resource.com



# Quote

DATE	Quote No.
10/1/2024	Q24-525

CONDITIONS: The prices and terms on this quotation are not subject to verbal changes or other agreements unless approved in writing by the Home Office of the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and all other causes beyond our control. Prices are based on costs and conditions existing on date of quotation and are subject to change by the Seller before final acceptance.

Typographical and stenographic errors subject to corrections. Purchaser agrees to accept either overage or shortage not in excess of ten percent to be charged for pro-rata. Purchaser assumes liability for patent and copyright infringement when goods are made to Purchaser's specifications. When quotation specifies material to be furnished by the Purchaser, ample allowance must be made for reasonable spoilage and material must be of suitable quality to facilitate efficient production.

Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein which may appear on Purchaser's formal order will not be binding on the Seller.

TO:  
 Haverford Township  
 1017 Darby Road  
 Havertown, PA 19083  
 Eileen Mottola  
 emottola@havtwp.org

Appropriate State Sales Tax Will Be Added Upon Ordering If Applicable

Quote valid for 30 days. If past 30 days, contact us to verify pricing.

REP
Kevin

ITEM	DESCRIPTION	QTY	UOM	UNIT	TOTAL
	RE: Various Parks				
BCI	Burke BB-3532, Eko Serpentine	3	ea	7,022.00	21,066.00
BCI	Burke 2024 Fall In Love With Play Sale *Must order by December 20, 2024 and ship by April 11, 2025	3	ea	-702.00	-2,106.00
BCI	Burke BB-3295, StemPlay	1	ea	10,226.00	10,226.00
BCI	Burke 2024 Fall In Love With Play Sale *Must order by December 20, 2024 and ship by April 11, 2025	1	ea	-1,023.00	-1,023.00
Ship-PA	Estimated Freight  Does not include unloading, assembly, or installation.  COSTARS 014-E22-249			1,841.00	1,841.00

To Accept Order, Sign: \_\_\_\_\_ Date: \_\_\_\_\_

<b>TOTAL</b>	<b>\$30,004.00</b>
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Quote is based upon shipment of all items to a single destination, unless noted.  
 Changes subject to price adjustment. Your signature here accepts all of our terms & conditions.  
 A deposit or payment in full may be required to place your order.

**PLEASE NOTE-OUR ADDRESS HAS CHANGED TO 503 N. WALNUT ROAD, SUITE 200, KENNETT SQUARE, PA 19348. PLEASE CHANGE YOUR DATABASE.**





# Hobbs & Company, Inc.

Electrical Construction  
Since 1940

September 25, 2024

Haverford Township

Attention: Alexis De Santi  
Special Projects Coordinator  
Haverford Township  
1014 Darby Road  
Havertown, PA 19083

RE: Haverford Township EV Charging Stations

Hobbs & Company, Inc. is pleased to provide you with our proposal for ChargePoint Charging Stations. Hobbs and Company Co-Stars Contract# 0000184556

1. Qty: 5 CPF50-L18-PEDMNT-CMK6DUALGWUSA	\$3,168 EA
2. Qty: 1 CPCLD-POWER-1	\$302 EA
3. Qty: 5 CPF-ACTIVE	\$121 EA
4. Qty: 1 Shipping and Handling	\$1,890 EA
5. Qty: 10 CPF-ASSURE-5	\$700 EA

Total amount of project: \$25,637

Feel free to contact me if you have any questions regarding this proposal at 610-780-3579

Sincerely,

Matt Koch  
mattkoch@hobbsandco.com  
610-780-3579 (c)  
1012 Meetinghouse Road  
Boothwyn, PA 19061

HAVERFORD TOWNSHIP POLICE DEPT.  
Memorandum

Date: October 15, 2024

To: Dave Burman

From: John Viola

Subject: New Vehicles

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Whitmoyer Auto Group 1001 East Main Street Mount Joy, PA 17552  
meets the requirements under COSTARS Contract #013-E22-264  
for the purchase of the following Police vehicles:

Two, 2024 Chevrolet Blazer Police vehicles, electric 1MF26	\$119,800
Total	\$119,800

October 2, 2024

Dave Burman- Township Manager  
Haverford Township  
1014 Darby Rd.  
Haverford, PA 19083

RE: Haverford Township Free Library Renovation & Addition Project- Construction Change Orders

Mr. Burman,

Below is a summary of change orders we have reviewed and are recommending for approval by the Board of Commissioners. There is an explanation of each change as well as the detailed back-up for the costs.

For **Rycon Construction** contract these change order requests total a credit of **(\$17,362.50) (Seventeen thousand three hundred sixty-two dollars & fifty cents)** and will be part of a change order to their contract.

For **Dolan Mechanical (HVAC)** contract these change order requests total an add of **\$5,217.10 (Five thousand two hundred seventeen dollars & ten cents)** and will be part of a change order to their contract.

For **AJM Electric (Electrical)** contract these change order requests total an add of **\$16,887.63 (Sixteen thousand eight hundred eighty-seven dollars & sixty-three cents)** and will be part of a change order to their contract.

The remaining project contingency is currently at \$197,098.00.

Please let us know if you have any questions or comments.

Sincerely,

*Kenneth C. Matthews*

Kenneth C. Matthews  
C.B. Development Services, Inc.

CC: Aimee Cuthbertson, Sukrit Goswami

**Rycon Construction Change Request #15 for an add of \$8,567.40.**

The cost included is for work associated with Bulletin #7 which added a drywall chase at the first and second floors to accommodate the new lower-level oven range exhaust to the exterior and a new stormwater pipe needed for the old bank building roof drains. The cost submitted and attached for reference is fair and reasonable.

**Rycon Construction Change Request #37 for a credit of (\$54,744.90).**

The cost included is for work associated with removing the spray foam insulation called out in the contract documents for the underside of the roof decking at the 1979 addition to achieve the necessary thermal rating needed per design. As reviewed with the Library/design team/Roofing Consultant, in lieu of this spray foam it was determined to remove the existing epdm rubber membrane roofing, install additional insulation, and new epdm roof. The recommendation letter for the cost of this new roof is being presented under a separate recommendation letter this month to the Board of Commissioners. The cost submitted and attached for reference is fair and reasonable.

**Rycon Construction Change Request #49 for a credit of (\$42,185.00).**

The cost included is for work associated with the G19 allowance for floor patching built into the contract. Upon review in field and confirmation on the scope of work with Rycon and their flooring subcontractor a cost was provided for what is needed to prepare the existing concrete to receive the new flooring. The remaining allowance funds are thus not needed so they are being credited back to the owner. The cost submitted and attached for reference is fair and reasonable.

**Rycon Construction Change Request #50 for a Not To Exceed add of \$71,000.00.**

The cost included is for work associated with Bulletin #11 which is requiring additional metal framing and metal decking at the original bank building roof. In review by the project structural engineer, it was determined that the existing roof structure material did not provide the necessary strength and reinforcing was needed. The cost submitted and attached for reference is fair and reasonable.

**Dolan Mechanical (HVAC) Construction Change Request #5 for an add of \$5,217.10.**

The cost included is for work associated with Bulletin #10 in which new ductwork was added at the Innovation Zone to accommodate the laser and 3D printers. The contract documents called out exhaust fans in the Innovation Zone but no ductwork was shown as the extent of the equipment to be installed was not known at bid time. The costs submitted and attached for reference are fair and reasonable.

**AJM Construction Change Request #10 for an add of \$4,254.00.**

The cost included is for work associated with Bulletin #10 which combined the Janitor/Storage Rooms at the first and second levels. In review with the Library/design team it was determined that combining the rooms would make for more usable storage space that is really needed. This cost is to relocate conduit previously installed and add conduit to accommodate the rooms being combined. The cost submitted and attached for reference is fair and reasonable.

**AJM Construction Change Request #12 for an add of \$12,633.63.**

The cost included is for work associated with Bulletin #10. This cost is to wire all the building sump pumps to an exterior plug-in receptacle so a temporary generator can be hooked up to run them should the back-up sump pumps ever fail. The cost submitted and attached for reference is fair and reasonable.