DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERSHED MANAGEMENT

DOCUMENT NUMBER: 363-0300-003

TITLE: Pennsylvania Model Stormwater Management Ordinance

EFFECTIVE DATE: Upon notice of final publication in the Pennsylvania Bulletin.

AUTHORITY: Stormwater Management Act, October 4, 1978, P.L. 864 (Act 167), 32 P.S. Section 680.1, et. seq., as amended.

POLICY: The Stormwater Management Program, and other DEP staff, will recommend to counties that they use this model ordinance as a template for developing municipal stormwater management ordinances when preparing Act 167 Stormwater Management Plans, to municipalities without an otherwise suitable stormwater management ordinance that they adapt and enact this model ordinance to meet NPDES MS4 permitting requirements, and that other municipalities may adapt and enact this model ordinance.

PURPOSE: The purposes of this ordinance are to combine and supersede previous model municipal ordinances for stormwater management published by DEP in documents 392-0300-001 and 392-0300-003. This Model Ordinance will be used in the following ways: as a template for developing municipal stormwater management ordinances in watershed stormwater management plans prepared under the Pennsylvania Stormwater Management Act (1978 Act 167); as a model ordinance for enactment or amendment of ordinances by municipalities designated as urbanized under the federal NPDES Phase II rule (i.e. MS4 Municipalities); and as a template by any other municipality engaged in preparation and enactment or amendment of a stormwater management ordinance. Enactment of the Model Ordinance establishes municipal authority to administer, regulate, and enforce proper implementation and maintenance of stormwater management Best Management Practices (BMPs) and design standards such as the ones presented in the draft Pennsylvania Stormwater Best Management Practices Manual (Draft Manual).

APPLICABILITY: This policy applies to any staff of the Department of Environmental Protection (DEP) involved with the Stormwater Management Act, the Stormwater Planning and Management Program, or the NPDES MS4 Permitting Program.

DISCLAIMER: The policies and procedures outlined in the guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory or statutory requirements.

The policies and procedures herein are not adjudication or a regulation. There is no intent on the part of the DEP to give these policies and procedures weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement.

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LOCATION: Volume 34, Tab 25

INSTRUCTIONS FOR MUNICIPALITIES IMPLEMENTING A STORMWATER ORDINANCE WITHOUT A STORMWATER MANAGEMENT PLAN PURSUANT TO 1978 ACT 167

When the Model Stormwater Management Ordinance is implemented other than through an approved Act 167 Storm Water Management Plan, the following suggestions apply:

A. Section 104, Statutory Authority. The primary authority is not applicable and should be deleted. The secondary authority should be cited as the authority for implementing the ordinance requirements. In addition, this section should cite the applicable municipal class code for enforcement purposes.

B. Article III- Stormwater Management Standards should be retained verbatim. These requirements will assist the municipality in properly managing stormwater runoff, and assist the municipality in meeting state water quality requirements plus state and federal requirement involving anti-degradation, impaired waters, TMDL's, and special protection designated watersheds.

C. The municipal solicitor should review Article VIII-Enforcement And Penalties, and make any additions necessary to ensure effective enforcement is provided commensurate with the applicable municipal code.

D. The municipality may revise other articles or sections of this ordinance as it deems appropriate.

INSTRUCTIONS FOR MUNICIPALITIES IMPLEMENTING STORMWATER PLANS PURSUANT TO 1978 ACT 167

When the Model Stormwater Management Ordinance is enacted as part of the implementation of an approved Act 167 Storm Water Management Plan, the following suggestions apply:

A. The municipal solicitor should review Article VIII-Enforcement And Penalties, and make any additions as necessary to ensure that effective enforcement can be provided commensurate with the applicable municipal code.

STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. _____

MUNICIPALITY OF

_____

_____ COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

_____, 20___

ARTICLE I -GENERAL PROVISIONS

Section 101. Short Title

This Ordinance shall be known and may be cited as the " _____ Stormwater Management Ordinance."

Section 102. Statement of Findings

The governing body of the Municipality finds that:

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

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

C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

D.
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).

Section 103. Purpose

The purpose of this Ordinance is to promote health, safety, and welfare within the Municipality and its watershed by minimizing the harms and maximizing the benefits described in Section 102 of this Ordinance, through provisions designed to:

A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code Chapter 93 to protect, maintain, reclaim and restore the existing and designated uses.

B. Preserve the natural drainage systems as much as possible.

C. Manage stormwater runoff close to the source.

D. Provide procedures and performance standards for stormwater planning and management.

E. Maintain groundwater recharge, to prevent degradation of surface and groundwater quality and to otherwise protect water resources.

F. Prevent scour and erosion of stream banks and streambeds.

G. Provide proper operations and maintenance of all permanent SWM BMPs that are implemented within the Municipality.

H. Provide standards to meet NPDES permit requirements.

Section 104. Statutory Authority

A. Primary Authority:

The municipality is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), 32 P.S. Section 680.1, et seq., as amended, the "Stormwater Management Act" and the (appropriate municipal code).

B. Secondary Authority:

The Municipality also is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1968, P.L. 805, No. 247, The Pennsylvania Municipalities Planning Code, as amended.

Section 105. Applicability

All Regulated Activities and all activities that may affect stormwater runoff, including land development or earth disturbance, are subject to regulation by this Ordinance.

Section 106. 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.

Section 107. 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.

Section 108. Compatibility with Other Requirements

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.

ARTICLE II -DEFINITIONS

For the purposes of this Ordinance, 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 words "shall" and "must" are mandatory; the words "may" and "should" are permissive.

Agricultural Activity - 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.

Applicant - A landowner, developer or other person who has filed an application for approval to engage in any Regulated Earth Disturbance activity at a project site in the Municipality.

BMP (Best Management Practice) - Activities, facilities, designs, measures or procedures used to manage stormwater impacts from Regulated Activities, to meet State Water Quality Requirements, to promote groundwater recharge and to otherwise meet the purposes of this Ordinance. BMPs include but are not limited to infiltration, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, forested buffers, sand filters and detention basins. Structural SWM BMPs are permanent appurtenances to the project site.

Conservation District - A conservation district, as defined in section 3(c) of the Conservation District Law (3 P. S. § 851(c)), which has the authority under a delegation agreement executed with the Department to administer and enforce all or a portion of the erosion and sediment control program in this Commonwealth.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g. a 5-year storm) and duration (e.g. 24-hours), used in the design and evaluation of stormwater management systems.

Detention - the volume of runoff that is captured and released into the Waters of this Commonwealth at a controlled rate.

DEP - The Pennsylvania Department of Environmental Protection.

Development Site (Site) - See Project Site.

Disturbed Area – An un-stabilized land area where an earth disturbance activity is occurring or has occurred.

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.

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

Extended Detention Volume (EDV)- Release of detained runoff — i.e. runoff in excess of **Permanently Removed Volume (PRV)** — over a period of time not less than 48 and not more than 96 hours from the start of the design storm.

Existing Condition – The dominant land cover during the five (5) year period immediately preceding a proposed Regulated Activity.

Floodplain - Any land area susceptible to inundation by water from any natural source or delineated by applicable Federal Emergency Management Agency (FEMA) maps and studies as being a special flood hazard area. Also included are areas that comprise Group 13 Soils, as listed in Appendix A of the Pennsylvania Department of Environmental Protection (PADEP) Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by PADEP).

Floodway - The channel of the watercourse and those portions of the adjoining floodplains that is reasonably required to carry and discharge the 100-year 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.

Forest Management / Timber Operations - Planning and activities necessary for the management of forestland. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

Hydrologic Soil Group (HSG) - Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSG's (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The Natural Resources Conservation Service (NRCS) of the US Department of Agriculture 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.

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

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.

Municipality -_____, _____ County, Pennsylvania.

NRCS - Natural Resources Conservation Service (previously SCS).

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

Permanently Removed Volume (PRV) – The volume of runoff that is permanently removed from the runoff and not released into surface Waters of this Commonwealth during or after a storm event.

Pervious Area – Any area not defined as impervious.

Project Site - The specific area of land where any Regulated Activities in the Municipality 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 the Ordinance.

Regulated Activities- Any earth disturbances or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff.

Retention / Removed - 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 twenty-five years.

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

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

State Water Quality Requirements - The regulatory requirements to protect, maintain, reclaim, and restore water quality under Pennsylvania Code Title 25 and the Clean Streams Law.

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

Stormwater Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

Stormwater Management Plan - The plan for managing storm water runoff adopted by the County of _____ for the _____ Watershed as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the "Stormwater Management Act".

Stormwater Management BMPs- Is abbreviated as **SWM BMPs** throughout this Ordinance.

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

Subdivision – As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247.

Waters of this Commonwealth - Rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs and 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 body of water, whether natural or artificial.

Wetland - Those areas that are inundated or saturated by surface or ground water 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, fens, and similar areas.

ARTICLE III-STORMWATER MANAGEMENT STANDARDS

Section 301. General Requirements

A. No Regulated Activities shall commence until the municipality approves a plan, which demonstrates compliance with the requirements of this Ordinance.

B. Plans approved by the Municipality shall be on site throughout the duration of the Regulated Activity.

C. The Municipality may, after consultation with DEP, approve methods for meeting the State Water Quality Requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, State law including but not limited to the Clean Streams Law.

D. For all Regulated Activities, implementation of water quality controls are required.

E. For all Regulated Activities equal to or greater than 1000 sq. ft. in area, implementation of peak rate controls and preparation of a SWM Site Plan are required.

F. Impervious Areas:

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

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

3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this ordinance.

G. Discharges onto adjacent property shall not be created, increased, decreased, or relocated, or otherwise altered without permission of the adjacent property owner(s). Such discharges shall be subject to the requirements of this Ordinance.

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

1. Protect health, safety, and property;

2. Meet State Water Quality Requirements as defined in Article II;

3. Meet the water quality goals of this ordinance by implementing measures to:

a. Minimize disturbance to floodplains, wetlands, natural slopes over 15%, and existing native vegetation.

b. Preserve and maintain trees and woodlands. Maintain or extend riparian buffers and protect existing forested buffer. Provide trees and woodlands adjacent to impervious areas whenever feasible.

c. Establish and maintain non-erosive flow conditions in natural flow pathways.

d. Minimize soil disturbance and soil compaction. Cover disturbed areas with topsoil having a minimum depth of 4 inches. Use tracked equipment for grading when feasible.

e. Disconnect impervious surfaces by directing runoff to pervious areas.

4. Incorporate the techniques described in Appendix A of this Ordinance (Low Impact Development Practices) whenever practical.

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

J. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland, 20910. NOAA's Atlas 14 can be accessed at Internet address: http://hdsc.nws.noaa.gov/hdsc/pfds/.

Section 302. Exemptions

A. Regulated Activities that create less than 1000 sq. ft. of new impervious area and that meet the Area of Influence (A) requirements shown in Table 1A are exempt from the peak rate control and the SWM Site Plan preparation requirement of this Ordinance.

B. Regulated Activities that create less than 1000 sq. ft. of new impervious area and that meet the Area of Influence (A) requirements shown in Table 1B are exempt from the rate control requirements of this Ordinance.

C. Use the Guidelines in Appendix D to determine the Area of Influence, A, in acres and the total impervious area, a, in sq. ft. to determine if an exemption is applicable for regulated activities less than 1000 sq. ft.

D. After the date of the Ordinance adoption, if a subdivision and land development plan is submitted that addresses peak rate control and includes a SWM Site Plan, then the

impervious exemption is calculated from the date of approval of that plan, based upon the impervious area shown on the subdivision and land development plan.

E. Agricultural plowing and tilling are exempt from the rate control and SWM Site Plan preparation requirements of this ordinance provided the activities are performed according to the requirements of 25 Pa.Code Chapter 102.

F. Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Sections 301.F, G and H.

TABLE 1A: SWM exemptions from Peak Rate Controls and SWM Site Plan preparation for Area of Influence, A, less than 3 acres.

Area of Influence, A (acres)	**Total Impervious Area, a, Exempt from Peak Rate Controls and from SWM Site Plan Preparation (sq. ft.)**
< 0.125 acre	1000
0.2	1400
0.3	1900
0.4	2300
0.5	2700
0.6	3100
0.7	3500
0.8	3900
0.9	4200
1.0	4600
1.1	4900
1.2	5200
1.3	5500
1.4	5900
1.5	6200
1.6	6500
1.7	6800
1.8	7100
1.9	7300
2.0	7600
2.1	7900
2.2	8200
2.3	8400
2.4	8700
2.5	9000
2.6	9200
2.7	9500
2.8	9800
2.9	10000

TABLE 1B: SWM exemptions from peak rate controls (ONLY) for Area of Influence, A, 3.0 acres and greater

Area of Influence, A (acres)	**Total Impervious Area a, Exempt from Peak Rate Controls ONLY (sq. ft.)**
3	10300
3.1	10500
3.2	10800
3.3	11000
3.4	11300
3.5	11500
3.6	11700
3.7	12000
3.8	12200
3.9	12500
4	12700
4.1	12900
4.2	13200
4.3	13400
4.4	13600
4.5	13800
4.6	14100
4.7	14300
4.8	14500
4.9	14700
5	15000
> 5	15000

Notes: The area of influence, A in acres and the total impervious area a in sq. ft. are calculated using the guidelines provided in Appendix D.

Section 303. Water Quality

Low Impact Development practices (Appendix A) are encouraged for all Regulated Activities.

Water quality control shall be implemented using the methodologies in Subsections A and B below:

A. The Simplified Method is independent of site conditions.

1. Retention and detention facilities shall be sized to capture the first two inches (2") of runoff from all impervious surfaces.

2. The first **one inch** (1.0") of runoff shall be permanently removed and shall not be released into the surface Waters of this Commonwealth. This is the Permanently Removed Volume (PRV). Removal options include reuse, evaporation, transpiration, and infiltration.

3. For projects that meet the exemption criteria in Table 1A of Section 302, the subsequent **one inch** (1.0") of runoff shall be detained. This is the Extended Detention Volume (EDV).

4. For projects that do not meet the exemption criteria in Table 1A of Section 302, the 1-year 24-hour runoff volume shall be detained.

5. Infiltration of the first **one-half inch** (0.5") of the PRV is encouraged. This portion of the PRV is the Groundwater Recharge Volume (GRV).

6. The Permanently Removed Volume (PRV) requirement for land areas with existing cover consisting of meadow, brush, wood-grass combination, or woods proposed for conversion to any other non-equivalent type of pervious cover shall be one-fourth (1/4) inch of runoff.

7. Retention and detention facilities should be designed to drain both the PRV and EDV completely within 48 to 96 hours from the start of the storm.

8. Retention facilities should be designed to accommodate infiltration of the PRV. Infiltration areas should be spread out and located in the sections of the site that are most suitable for infiltration.

B. The Design Storm Method requires detailed modeling based on site conditions.

1. Do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration rainfall.

2. Do not increase peak rate of runoff for (1-, 2-, 10-, 25-, 100-year storms (at minimum), pre-development to post-development; as necessary, provide additional peak rate control as required by Act 167 planning.

3. Existing (pre-development) non-forested pervious areas must be considered meadow or its equivalent.

4. Twenty (20) percent of existing impervious area, when present, shall be considered meadow in the model for existing conditions.

C. In all cases, retention and detention facilities should be designed to completely drain water quality volumes (in the case of the Simplified Method this includes both the PRV and EDV) over a period of time not less than 48 and not more than 96 hours from the start of the design storm.

The Pennsylvania Stormwater Best Management Practices Manual (1) provides guidance on selection and application of both water quality control methodologies.

Section 304. Rate Controls

A. Areas not covered by a Release Rate Map from an approved Act 167 Stormwater Management Plan:

Post-development discharge rates shall not exceed the predevelopment discharge rates for the 2-, 5-, 10-, 25-, 50-, and 100-year storms. If it is shown, that the peak rates of discharge indicated by the post-development analysis are less than or equal to the peak rates of discharge indicated by the pre-development analysis for 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour storms, then the requirements of this section have been met. Otherwise, the applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.

B. Areas covered by a Release Rate Map from an approved Act 167 Stormwater Management Plan:

For the 2-, 5-, 10-, 25-, 50-, and 100-year storms, the post-development discharge rates will follow the release rate maps in this Ordinance. For any areas not shown on the release rate maps, the post-development discharge rates shall not exceed the predevelopment discharge rates.

ARTICLE IV-STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS

Section 401. Plan Contents

The following items shall be included in the SWM Site Plan:

A. Appropriate sections from the Municipal Subdivision and Land Development Ordinance shall be followed in preparing the SWM Site Plans. In instances where the Municipality lacks Subdivision and Land Development regulations, the County Subdivision and Land Development Ordinance shall be followed.

B. The SWM Site Plan shall provide the following supplemental information:

1. The overall stormwater management concept for the project.

2. A determination of Site Conditions in accordance with Appendix B. A detailed site evaluation shall be completed for projects proposed in karst topography.

3. Stormwater runoff computations as specified in this Ordinance.

4. Expected project time schedule.

5. A soil erosion and sedimentation control plan, where applicable, as prepared for and submitted to the approval authority.

6. 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.

7. Plan and profile drawings of all SWM BMPs including open channel and swales. Drawings shall indicate hydraulic facility.

8. SWM Site Plan shall show the locations of existing and proposed septic tank infiltration areas and wells.

9. A permanent fifteen-foot wide pathway for use by vehicles shall be provided around all SWM BMPs, such as ponds and infiltration structures. The pathways shall connect to a public thoroughfare.

10. The following signature block for the Municipality:

"_____, on this date (date of signature), has reviewed and hereby certify that the SWM Site Plan meets all design standards and criteria of the Municipal Ordinance."

Section 402. Plan Submission

A. Five (5) copies of the SWM Site Plan shall be submitted as follows:

1. Two (2) copies to the Municipality.

2. One copy to the Municipal Engineer (when applicable)

3. One (1) copy to the County Conservation District.

4. One (1) copy to the County Planning Commission/Office

B. Additional copies shall be submitted as requested by the Municipality or DEP.

Section 403. Plan Review

A. The SWM Site Plan shall be reviewed by a qualified professional for the Municipality for consistency with the provisions of this ordinance. After review, the qualified professional shall provide a written recommendation for the municipality to approve or disapprove the SWM Site Plan. If it is recommended to disapprove the SWM Site Plan, the qualified professional shall state the reasons for the disapproval in writing. The qualified professional also may recommend approval of the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing. The SWM Site Plan review and recommendations shall be completed within the time allowed by the Municipalities Planning Code for reviewing subdivision plans.

B. The Municipality shall notify the applicant in writing within 45 calendar days whether the SWM Site Plan is approved or disapproved. If disapproved, the Municipality shall cite the reasons for disapproval.

C. The Municipality's approval of a SWM Site Plan shall be valid for a period not to exceed _____ years. This ____-year time period shall commence on the date that the Municipality signs the approved SWM Site Plan. If stormwater management facilities included in the approved SWM Site Plan have not been constructed, or if an As-Built Survey of these facilities has not been approved within this _____-year time period, 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 405 of this Ordinance.

Section 404. Modification of Plans

A modification to a submitted SWM Site Plan that involves a change in SWM BMPs or techniques, or that involves the relocation or re-design of SWM BMPs, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the Municipality, shall require a resubmission of the modified SWM Site Plan in accordance with this Article.

Section 405. Resubmission of Disapproved SWM Site Plans

A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the Municipality's concerns, to the Municipality in accordance with this Article. The applicable Review Fee must accompany a resubmission of a disapproved SWM Site Plan.

Section 406. As Built Surveys, Completion Certificate and Final Inspection

A. The Developer shall be responsible for completing an "As-Built Survey" of all SWM BMPs included in the approved SWM Site Plan. The As-Built Survey and an explanation of any discrepancies with the design plans shall be submitted to the Municipality.

B. The submission shall include a certification of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent SWM BMPs have been constructed according to the plans and specifications and approved revisions thereto.

C. After receipt of the completion certification by the Municipality, the Municipality may conduct a final inspection.

ARTICLE V- OPERATION AND MAINTENANCE

Section 501. Responsibilities

A. The Municipality 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 Municipality reserves the right to accept the ownership and operating responsibility for any or the entire stormwater management controls.

B. Structural SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions.

Section 502. Operation and Maintenance Agreements

The owner is responsible for Operation and Maintenance of the SWM BMPs. If the owner fails to adhere to the Operation and Maintenance Agreement, the Municipality may perform the services required and charge the owner appropriate fees. Non-payment of fees may result in a lien against the property.

ARTICLE VI-FEES AND EXPENSES

Section 601. General

The Municipality may include all costs incurred in the Review Fee charged to an Applicant.

The Review Fee may include but not be limited to costs for the following:

A. Administrative/clerical processing.

B. Review of the SWM Site Plan.

C. Attendance at Meetings.

D. Inspections.

ARTICLE VII-PROHIBITIONS

Section 701. Prohibited Discharges

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 Waters of this Commonwealth is prohibited.

B. Discharges, which may be allowed, if they do not significantly contribute to pollution to the Waters of this Commonwealth, are:

-Discharges from fire fighting activities	-Flows from riparian habitats and wetlands
-Potable water sources including dechlorinated water line and fire hydrant flushings	-Uncontaminated water from foundations or from footing drains
-Irrigation drainage	-Lawn watering
-Air conditioning condensate	-Dechlorinated swimming pool discharges
-Springs	-Uncontaminated groundwater
-Water from crawl space pumps	-Water from individual residential car washing
-Pavement wash waters 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	-Routine external building wash down (which does not use detergents or other compounds)

C. In the event that the Municipality or DEP determines that any of the discharges identified in Subsection 701.B, significantly contribute to pollution of the Waters of this Commonwealth, the Municipality or DEP will notify the responsible person(s) to cease the discharge.

Section 702. Roof Drains

Roof drains and sump pumps shall discharge to infiltration or vegetative BMPs to the maximum extent practicable.

Section 703. Alteration of BMPs

No person shall modify, remove, fill, landscape, or alter any SWM BMPs without the written approval of the Municipality.

ARTICLE VIII-ENFORCEMENT AND PENALTIES

Section 801. Right-of-Entry

Upon presentation of proper credentials, the Municipality may enter at reasonable times upon any property within the Municipality to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

Section 802. Inspection

SWM BMPs should be inspected by the land owner/developer (including Municipality for dedicated facilities) according to the following list of frequencies:

1. Annually for the first 5 years.

2. Once every 3 years thereafter,

3. During or immediately after the cessation of a 10-year or greater storm.

Section 803. Enforcement

A. It shall be unlawful for a person to undertake any Regulated Activity except as provided in an approved SWM Site Plan.

B. It shall be unlawful to alter or remove any control structure required by the SWM Site Plan.

C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the Municipality.

804. Suspension and Revocation

A. Any approval for a Regulated Activity issued may be suspended or revoked by the Municipality for:

1. Non-compliance with, or failure to implement any provision of the approval.

2. A violation of any provision of this Ordinance or any other applicable law, Ordinance, rule or regulation relating to the Regulated Activity.

3. The creation of any condition or the commission of any act during the Regulated Activity which constitutes or creates a hazard or nuisance, pollution, or which endangers the life or property of others.

B. A suspended approval may be reinstated by the Municipality when:

1. The Municipality has inspected and approved the corrections to the violations that caused the suspension.

2. The Municipality is satisfied that the violation has been corrected.

C. An approval that has been revoked by the Municipality cannot be reinstated. The Applicant may apply for a new approval under the provisions of this Ordinance.

D. Prior to revocation or suspension of a permit, if there is no immediate danger to life, public health, or property the Municipality may notify the land owner/ developer to discuss the non-compliance.

Section 805. Penalties

[Municipalities should ask their solicitors to provide appropriate wording for this section.]

A. Anyone violating the provisions of this Ordinance shall be guilty of a summary offense, and upon conviction shall be subject to a fine of not more than $ _____ for each violation, recoverable with costs. Each day that the violation continues shall be a separate offense and penalties shall be cumulative.

B. In addition, the Municipality, may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. 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.

Section 806. Appeals

A. Any person aggrieved by any action of the Municipality or its designee, relevant to the provisions of this Ordinance, may appeal to the Municipality within thirty (30) days of that action.

B. Any person aggrieved by any decision of the Municipality, relevant to the provisions of this Ordinance, may appeal to the County Court Of Common Pleas in the county where the activity has taken place within thirty (30) days of the Municipality's decision.

ARTICLE IX - REFERENCES

1. Pennsylvania Department of Environmental Protection. 2006. *Draft Pennsylvania Stormwater Best Management Practices Manual.* Harrisburg, PA.

ENACTED and ORDAINED at a regular meeting of the

_____

on this _____ day of _____, 20__.

This Ordinance shall take effect immediately.

_____
[Name] [Title]

_____
[Name] [Title]

_____
[Name] [Title]

ATTEST:

_____
Secretary

APPENDIX A

LOW IMPACT DEVELOPMENT PRACTICES ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF

Natural hydrologic conditions may be altered by development practices, which may create impervious surfaces, destroy drainage swales, construct storm sewers, and change local topography. A traditional approach to drainage has been to remove runoff from sites as quickly as possible and capture it in downstream detention basins. This approach leads to the degradation of water quality as well as additional expenditures for detaining and managing concentrated runoff.

The recommended approach is to promote practices that will minimize post-development runoff rates and volumes and minimize needs for artificial conveyance and storage facilities. To simulate pre-development hydrologic conditions, increased infiltration often is helpful to offset the effects of increasing the area of impervious surfaces. The ability to increase infiltration depends upon the soil types and land use.

Preserving natural hydrologic conditions requires careful site design that includes preservation of natural drainage features, minimization of impervious surfaces, reduction of hydraulic connectivity of impervious surfaces, and protection of natural depression storage areas. A well-designed site will contain a mix of all these features. The following describes various techniques to achieve this:

A. **Preserve Drainage Features**. Protect natural drainage features, particularly vegetated drainage swales and channels. Locate streets and adjacent storm sewers away from valleys and swales.

B. **Protect Natural Depression Storage Areas**. Depression storage areas have no surface outlet, or they drain very slowly. Depressions should be protected and the storage capacity should be incorporated into required detention facilities.

C. **Avoid Creating Impervious Surfaces.** Reduce impervious surfaces to the maximum extent possible. Building footprints, sidewalks, driveways and other features should be minimized.

D. **Avoid Connecting Impervious Surfaces**. Route roof runoff over lawns and avoid using storm sewers. Grade sites to increase the travel time of stormwater runoff. Avoid concentrating runoff.

E. **Use Pervious-Paving Materials**. Use pervious materials for driveways, parking lots,

access roads, sidewalks, bike trails and hiking trails. Provide pervious strips between streets and sidewalks.

F. **Reduce Setbacks**. Reduce setbacks for buildings to shorten the driveways and entry walks.

G. **Construct Cluster Developments**. Construct Cluster Developments to reduce street length per lot.

APPENDIX B

A. LIST OF SITE CONDITIONS SUITABLE FOR INFILTRATION

1. Depth of bedrock below the invert of infiltration BMPs should be greater than or equal to 2 feet.

2. Depth of seasonal high water table below the invert of infiltration BMPs should be greater than or equal to 2 feet.

3. Soil permeability tests should be greater than or equal to 0.10 inches / hour and less than or equal to 10 inches per hour.

4. Setback distances or buffers of infiltration BMPs should be a minimum of:

   a. 50 feet from individual water supply wells and 100 feet from community or municipal water supply wells.

   b. 20 feet from building foundations.

   c. 50 feet from septic system drain fields.

   d. 50 feet from karst geologic contacts such as sinkholes, closed depressions, fracture traces, faults, and pinnacles.

   e. 20 feet from the property line unless documentation is provided to show that all setbacks from wells, foundations and drain fields on neighboring properties will be met

B. EFFECTIVE BMPs FOR INFILTRATION

1. Infiltration trench

2. Infiltration Basin

3. Biofilters, rain gardens, bioinfiltration, bio swales

4. Filters for pre-treatment.

C. EFFECTIVE BMPs FOR RATE CONTROL

1. Wet ponds
2. Stormwater wetlands
3. Extended detention (dry) ponds
4. Swales
5. Runoff volume reduction BMPs listed and B and C above such as retention, infiltration and re-vegetation.

D. EFFECTIVE BMPs FOR EVAPOTRANSPIRATION

1. Rain gardens
2. Green roofs

APPENDIX C

OPERATION AND MAINTENANCE AGREEMENT STORMWATER BEST MANAGEMENT PRACTICES

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 management 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, as approved by the Municipality, 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 Best Management Practices be constructed and maintained on the Property; and

WHEREAS, the Municipality requires, through the implementation of the SWM Site Plan, that stormwater management BMP's 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 Landowner shall construct the BMPs in accordance with the plans and specifications identified in the SWM Site Plan.

2. The Landowner shall operate and maintain the BMPs as shown on the Plan in good working order accordance with the specific maintenance requirements noted on the approved SWM Site 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 credentials, to inspect the BMPs whenever necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.

4. In the event the Landowner fails to operate and maintain the BMPs per paragraph 2, 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 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 invoice from the Municipality.

6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMPs by the Landowner; provided, however, that this Agreement shall not be deemed to create or effect 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, and other successors in interests, shall release the Municipality 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.

8. The Municipality shall inspect the BMPs 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 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)**

APPENDIX D

EXAMPLE CALCULATIONS TO DETERMINE EXEMPTION FROM SWM SITE PLAN PREPARATION REQUIREMENTS

Example 1

1. The proposed new impervious area B of a garage is 900 sq. ft which is next to the house and a driveway which are 1920 and 700 sq. ft respectively.

2. Determine the longest dimension of the area by connecting the out to out points of the area (the diagonal D). This measures 102 ft. (the driveway is 32 ft by 30 ft and the house is 60 ft by 32 ft)

3. Extend the area of the house and driveway (60 ft. by 82 ft) in every direction by 102 ft and draw a rectangle. This is a 264 ft. by 286 ft. rectangle. The area of this rectangle is designated as the Area of influence A and is equal to 75,504 sq. ft, which is 1.7 acres.

4. Now, calculate the total impervious area, a, inside this area of Influence, A, which is designated as a = Area of the existing house +area of the new garage+ Area of the driveway+ portion of neighbor's house on the right + Area of hickory lane on the bottom.

5. a= 1920+900+700+1200+ 264*10= 7360 sq. ft.

6. According to Table 1A, maximum exemption for 1.7 Acres is 6800 sq. ft. 7360 sq. ft. is larger than 6800 sq. ft.

7. So, construction of this new garage requires preparation of SWM Site Plan that includes Peak Rate Control.

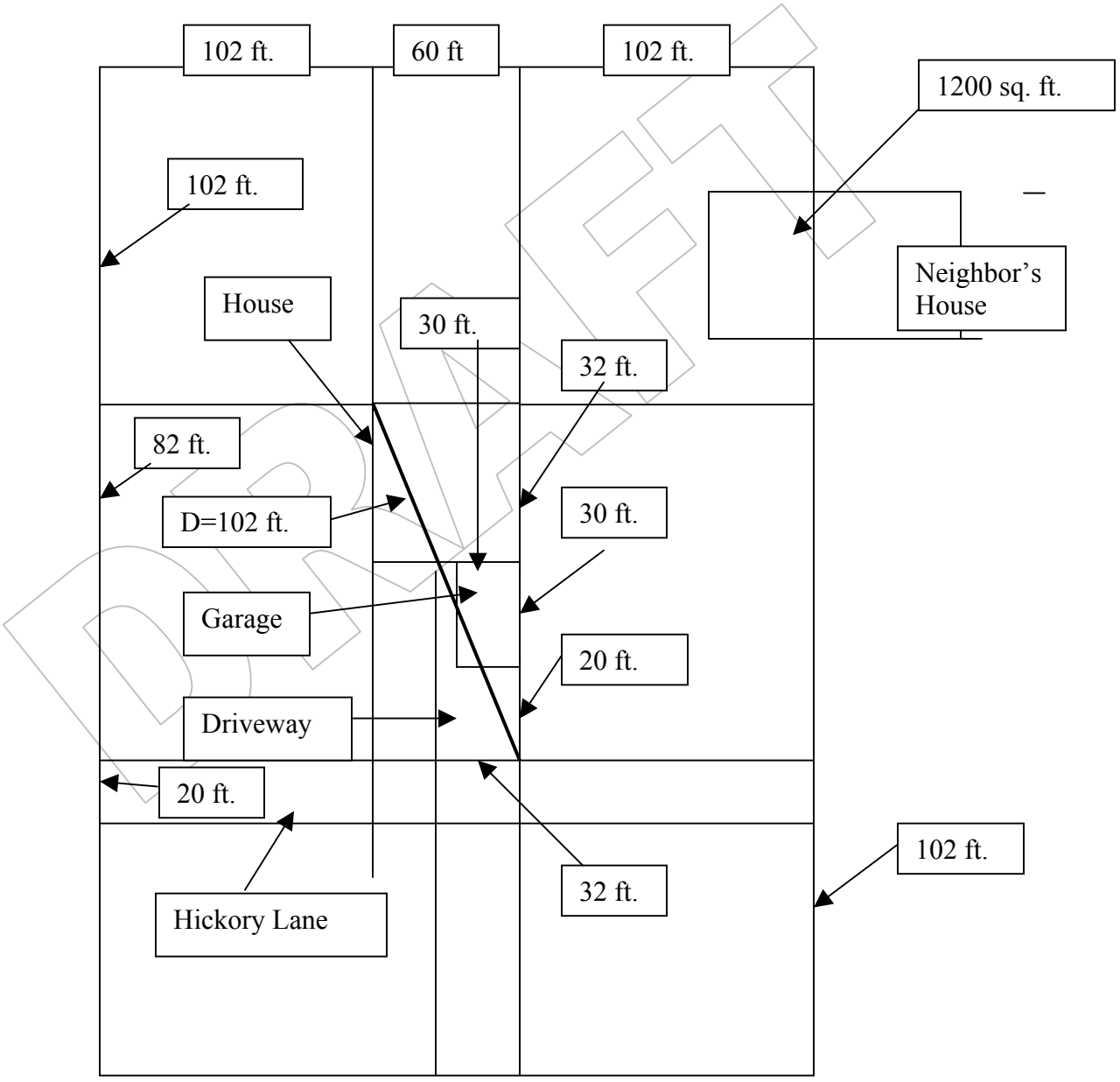
102 ft.
60 ft
102 ft.
1200 sq. ft.
102 ft.
Neighbor's House
House
30 ft.
32 ft.
82 ft.
D=102 ft.
30 ft.
Garage
20 ft.
Driveway
20 ft.
102 ft.
32 ft.
Hickory Lane

Figure D.1.

Example 2

1. Proposed new impervious area, B= Area of the garage = 600

2. Total impervious area, a, within the area of Influence, A is
a = Area of the house+ area of the garage+ area of the driveway+ Area of the Rhubarb's lane

=50*30+600+30*5+20*25+(94*2+50)*10
=5130 sq. ft

3. Area of influence, A=(94*2+50)*(94+30+50+94)
=(238*268) sq. ft
=63784 sq. ft.
=1.5 acres

4. From Table 1A, total impervious area allowed from Peak Rate Control and SWM Site Plan preparation is 6200 sq. ft., corresponding to the Area of Influence, A, is 1.5 acres. The total impervious area 5130 sq. ft. within the area of influence A is less than 6200 sq. ft.; therefore, construction of the 600 sq. ft. garage is exempt from preparation of the SWM Site Plan (and from peak rate control) requirement.

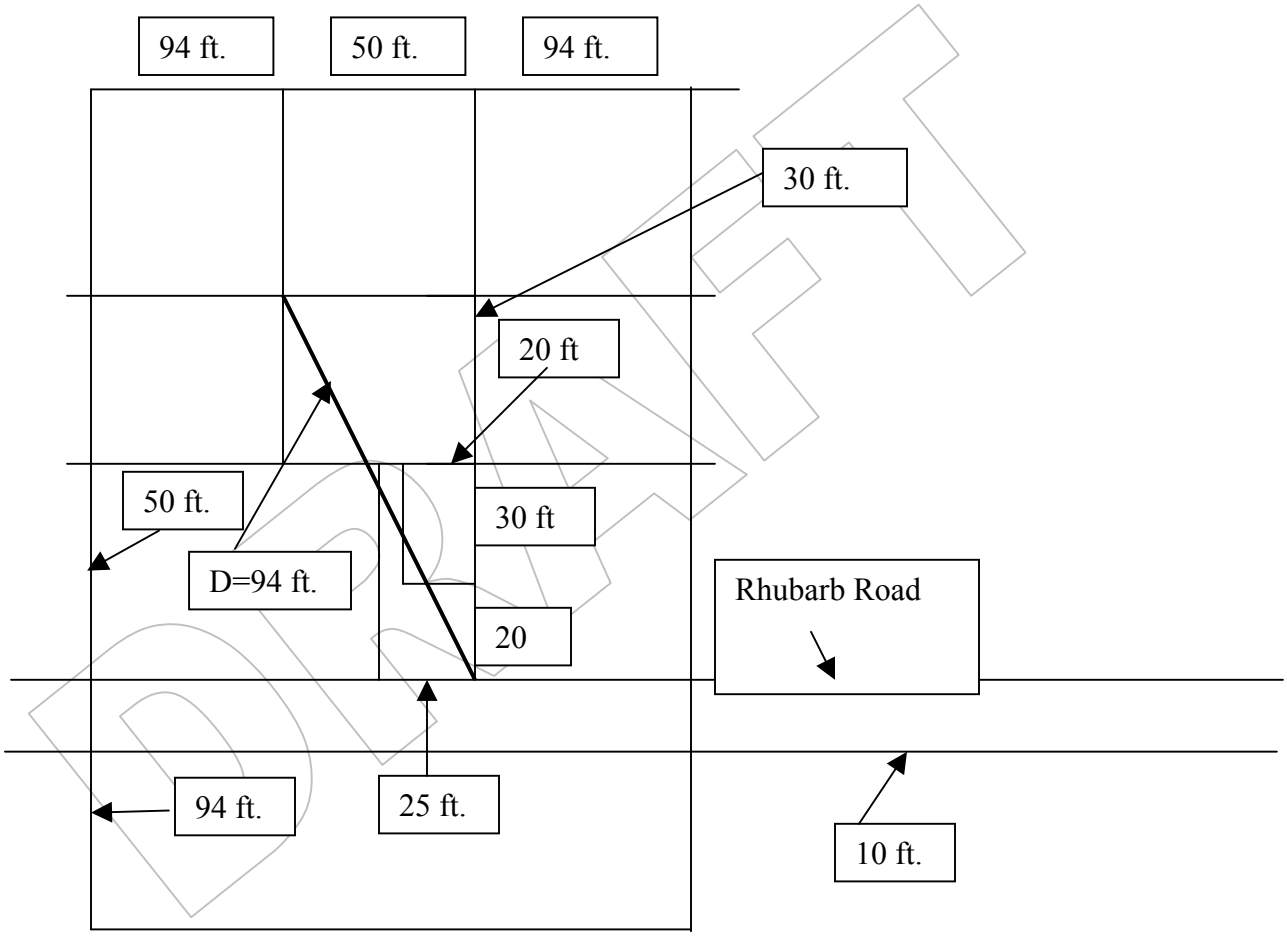
94 ft.
50 ft.
94 ft.
30 ft.
20 ft
50 ft.
30 ft
D=94 ft.
Rhubarb Road
20
94 ft.
25 ft.
10 ft.

Figure D.2.