

STORMWATER MANAGEMENT DESIGN ASSISTANCE MANUAL FOR SMALL PROJECTS



**Application &
Small Projects Worksheets**
Revised: 6/10/2014

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I. Introduction:

This design manual has been created as a tool to help property owners manage stormwater on their property and streamline the process of designing on-site stormwater management facilities for residential homes, additions and accessory structure projects from 1,000 sq. ft. to 2,500 sq. ft. In Warwick Township, Stormwater Management is regulated under Chapter 270 of the Code of Ordinances.

Stormwater is the runoff produced by precipitation, snow melt, or ice melt. When land is developed or changed, the flow patterns of water and quality of water are also changed. Land development activities can affect characteristics of stormwater runoff, including the rate of runoff, volume of runoff, and quality of runoff. When runoff is not managed, the increased volume may aggravate flooding. The objective of stormwater management is to prevent or mitigate the adverse impacts of the increase in rate and volume of stormwater runoff, while also protecting health, safety, and property.

Stormwater Best Management Practices (Stormwater BMPs) aim to maintain water quality, encourage infiltration in appropriate areas, promote groundwater recharge, maintain the natural drainage characteristics of the site to the maximum extent practicable, and protect stream banks and beds. The Stormwater BMPs listed in this manual should be used as a guide and are not a comprehensive list of options.

II. Standard Terms Used in the Manual:

Best Management Practice (BMP) – Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from Regulated Activities, to provide water quality treatment, infiltration, volume reduction, and/or peak rate control, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into 1 of 2 broad categories or measures: “structural” or “nonstructural.” In this Manual, nonstructural BMPs or measures refer to operational and/o behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff whereas structural BMPs or measures are those that consist of a physical device or practice that is installed 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, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the Site.

Disconnected Impervious Area (DIA) – An impervious or impermeable surface that is disconnected from any stormwater drainage or conveyance system and is redirected or directed to a pervious area, which allows for infiltration, filtration, and increased time of concentration.

Disturbed Area – A land area where an earth disturbance activity is occurring or has occurred.

Earth Disturbance (or Earth Disturbance Activity) – A construction or other human activity which disturbs the surface of the land, including, but not limited to: clearing and grubbing; grading; excavations; embankments; land development; agricultural plowing or tilling; operation of animal heavy use areas; timber harvesting activities; road maintenance activities; oil and gas activities; well drilling; mineral extraction; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

Flow Path – The path that stormwater follows from the discharge point to the nearest property line or channelized flow (i.e. stream, drainage ditch, etc.). The length of the path is measured along the ground slope.

Impervious Surface (Impervious Area) – Surfaces which prevent the infiltration of water into the ground. All structures, buildings, parking areas, driveways, roads, streets, sidewalks, decks, and any areas of concrete, asphalt, packed stone, and compacted soil shall be considered impervious surface if they 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.

Regulated Activities – Any earth disturbing activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff. Regulated activities shall include, but not be limited to:

- Land Development subject to the requirements of the Warwick Township Subdivision and Land Development Ordinance;
- Removal of ground cover, grading, filling or excavation;
- Construction of new or additional impervious or semi-impervious surfaces (driveways, parking lots, etc.), and associated improvements;
- Construction of new buildings or additions to existing buildings;
- Installation or alteration of stormwater management facilities and appurtenances thereto;
- Diversion or piping of any watercourse; and,
- Any other regulated activities where the Municipality determines that said activities may affect any existing watercourse's stormwater management facilities, or stormwater drainage patterns.

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

Small Project – Regulated activities that, measured on a cumulative basis from June 21, 2006, create additional impervious areas of more than 1,000 sq. ft. and less than 2,500 sq. ft. or involve Earth Disturbance Activity of an area less than 5,000 sq. ft. and do not involve the alteration of stormwater facilities or watercourses.

Small Project Stormwater Site Plan – A site plan prepared and submitted for Regulated Activities which meet the Small Project and Minor Stormwater Site Plan criteria. The plan depicts existing conditions on the property, proposed impervious areas, and, if required, the location of proposed Stormwater BMPs.

SWM – Stormwater Management

III. Determining What Type of Stormwater Management Submission is Needed:

This manual is designed to assist those projects that qualify as a Small Project (more than 1,000 square feet but less than 2,500 square feet of impervious area). Projects that will create no more than 1,000 square feet collectively since June 21, 2006 may be exempt from Storm Water Management Ordinance requirements, but an Exemption Application must be filed with Warwick Township.

Through the use of this manual, residents or their builder/designer have the ability to determine the appropriate facilities for their property, project and budget. These design methods are not intended to be used for commercial projects, or large-scale subdivision/land development projects that may or may not include infrastructure such as roadways. These types of projects require submittal of a formal Stormwater Management Plan in accordance with the Township's Storm Water Management Ordinance.

Residents or their builder/designer, have the following options: 1) you may hire a design professional to complete the application and worksheets and design your system. This may expedite the Township's review process; or 2) you may complete the application and worksheets and submit them, along with any additional design criteria to Warwick Township. Both of these processes require an application and associated review fees.

The following chart provides a guide to determine what type of stormwater submission is needed.

Stormwater Management Ordinance Status	Proposed New Impervious Area	Next Steps
Eligible for Exemption	Up to 1,000 ft ² (collectively since 6/21/2006)	File an Exemption Application with Warwick Township
Small Project (per Definition)	1,000 ft ² to ≤ 2,500 ft ²	File a Small Project Application and Worksheets with Warwick Township (along with applicable fees)
Non-Exempt	Greater than 2,500 ft ²	Prepare a Storm Water Management Plan in accordance with Warwick Township's Storm Water Management Ordinance

IV. Using the Stormwater Management Worksheets:

Determining the new impervious area of a proposed project is the first step in using this Manual. Completing the attached Warwick Township Stormwater Management Worksheets will assist the property owner, or applicant, and Warwick Township in determining the impervious area of a proposed project and providing guidance through ensuing steps.

Step 1: Step 1 of the Warwick Township Stormwater Management Worksheet provides a table and directions on how to figure out the new impervious area proposed to be created. If the total new impervious area is less than or equal to 1,000 square feet, the project may qualify as an exemption. The owner will sign the Acknowledgement Statement on the application and file it with Warwick Township. Warwick Township will use this as a record of exempt projects and keep a running total of proposed impervious area since June 21, 2006.

Warwick Township will use this as a record of exempt projects and keep a running total of proposed impervious area since the adoption of the Warwick Township Stormwater Management Ordinance. After exceeding 1,000 square feet of impervious area since the adoption of the Warwick Township Stormwater Management Ordinance, a property owner will need to prepare a Minor Stormwater Site Plan or a Stormwater Management Site Plan in accordance with Article III

However, applicants shall note that Regulated Activities that meet the exemption criteria may be required to manage stormwater runoff and provide plans and/or calculations as required in this ordinance should Warwick Township determine that there is a potential for stormwater runoff associated with the proposed Regulated Activity to adversely affect adjacent or downstream public or private properties.

If the total new impervious area is 1,000 square feet and less than 2,500 square feet, the applicant will go on to Step 2. If the Regulated Activity involves only Earth Disturbance less than 5,000 square feet, the applicant shall contact Warwick Township for additional guidance.

Step 2: Step 2 of the Warwick Township Stormwater Management Worksheet provides a process to determine the Disconnected Impervious Area (DIA). If the total new impervious area can be disconnected in accordance with the standards expressed in this Manual, projects of this size may be exempt from providing additional stormwater management controls. The owner will sign the Acknowledgement statement on the application and file it with Warwick Township. Warwick Township will use this as a record of exempt projects and keep a running total of proposed impervious area since June 21, 2006.

If the total new impervious area is greater than 1,000 square feet and less than or equal to 2,500 square feet, and if DIA requirements cannot be met for all the new impervious area, projects of this size may not be exempt from the volume and rate requirements of the Warwick Township Stormwater Management Ordinance. In these cases, applicants will continue to Step 3.

Step 3: Step 3 of the Warwick Township Stormwater Management Worksheet provides guidance to determine the total volume of stormwater from new impervious surfaces that must be controlled using stormwater BMPs. This step involves calculating the volume of stormwater that can be controlled by planting new deciduous and / or evergreen trees, and the volume of stormwater that must be controlled using other BMP measures. Upon completion of these calculations, continue to Step 4.

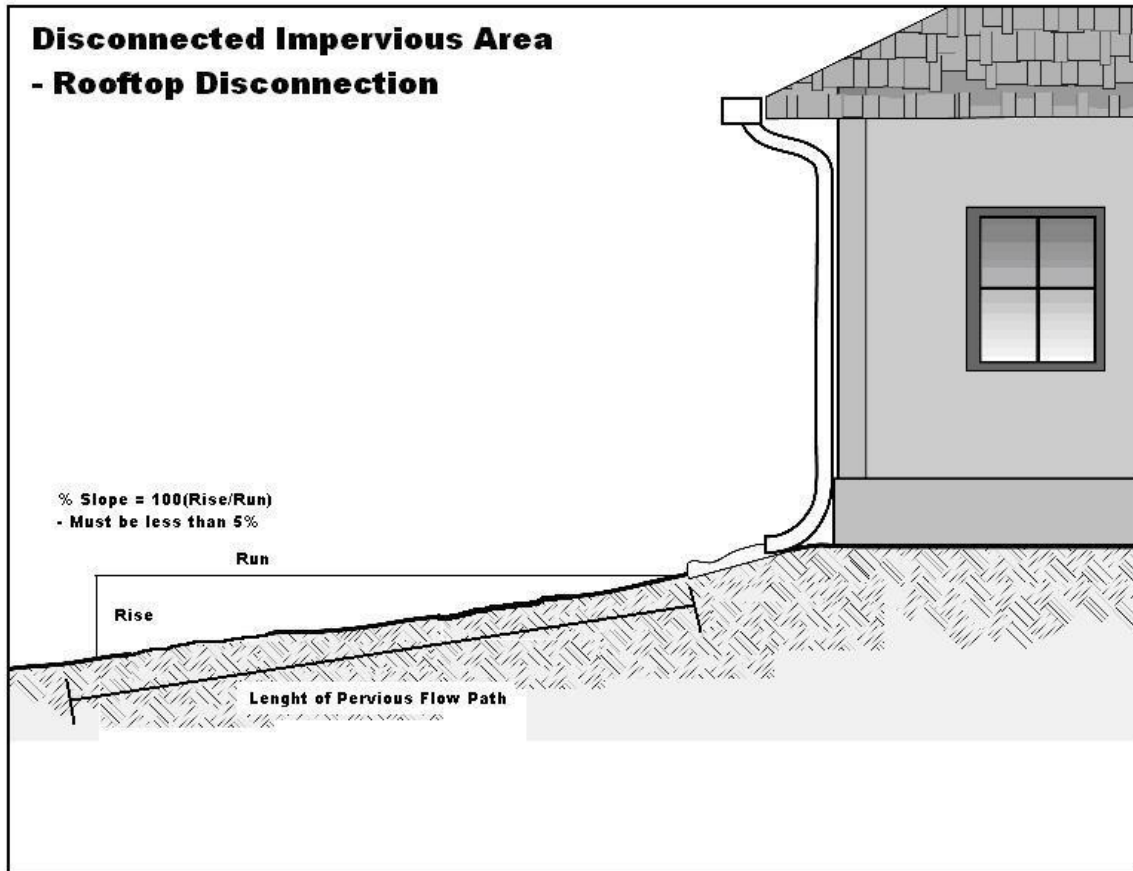
Step 4: Step 4 of the Warwick Township Stormwater Management Worksheet provides guidance regarding the preparation of a Minor Stormwater Site Plan, as outlined in this Design Manual, for approval by Warwick Township. This includes determining the types, sizes, and location of proposed Stormwater BMPs to be used for a given project. The worksheets, Minor Stormwater Site Plan, and Owner Acknowledgement will be brought to Warwick Township for approval. Warwick Township will use this submission as a record to keep a running total of proposed impervious area since the adoption of the Warwick Township Stormwater Management Ordinance, and to monitor the installation of the required Stormwater BMPs necessary to support the project.

V. DISCONNECTED IMPERVIOUS AREA (DIA):

When impervious surface areas like rooftops and paved areas are directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, the impervious surface areas may qualify to be treated as Disconnected Impervious Area (DIAs).

Rooftop Disconnection: A rooftop is considered to be completely disconnected if it meets the requirements listed below.

- The overland flow path from roof runoff discharge point has a positive slope of five percent (5%) or less.
- The length of the overland flow path is greater than 75 feet.
- Soils along the overland flow path are not classified as wetlands, i.e. infiltration is at least 1 inch per 24-hour day.
- The receiving pervious area shall not include another person's property.



Note: Downspout not required.

Determining Status of Rooftop DIA:

Step 1: Determine contributing area of the roof to each disconnected discharge (downspout).

Step 2: Determine the length of down slope pervious flow path available for each disconnected discharge.

Step 3: Determine the % slope of the pervious flow path, % slope = (rise/ run) x 100. Must be 5% or less.

Step 4: See the Partial Rooftop Disconnection table to determine the percentage of the area that can be treated as disconnected. If the available length of the flow path is equal to or greater than 75 ft, the discharge qualifies as entirely disconnected.

Partial Rooftop Disconnection		
Length of Pervious Flow Path* (ft) Lots 10,000 ft ² and Under	Length of Pervious Flow Path* (ft)	Roof Area Treated as Disconnected
0 – 7.9	0 – 14	0%
8 – 15.9	15 – 29	20%
16 – 22.9	30 – 44	40%
23 – 29.9	45 – 59	60%
30 – 34.9	60 – 74	80%
35 or more	75 or more	100%

*Pervious flow path must be at least 15 feet from any impervious surface and cannot include impervious surfaces.

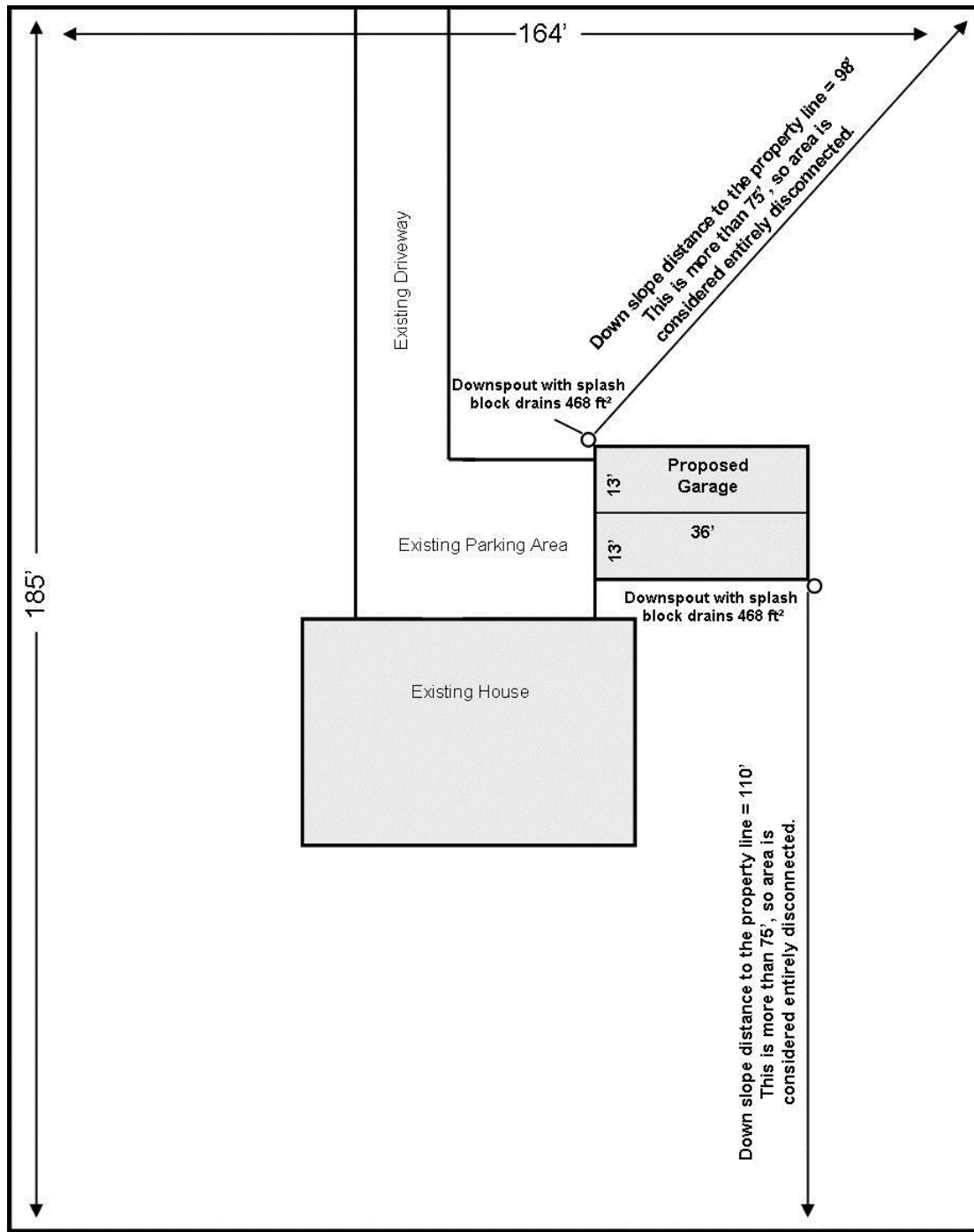
Other Impervious Surface Disconnection: When runoff from other impervious surfaces is directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, the contributing impervious surface may qualify as disconnected. Other impervious surfaces include all non-rooftop surfaces, including but not limited to driveways, parking areas, walkways, porches, and decks. With regard to driveways, parking areas, and walkways, this analysis applies to only small or narrow facilities. Features such as commercial parking lots or commercial entrance / circulation drives shall not be included in this analysis. Other impervious surfaces can be considered disconnected if they, or the adjacent areas, meet the following requirements:

- The contributing flow path over the impervious area is not more than 75 feet.
- The length of overland flow is greater than or equal to the maximum length of flow over the impervious area.
- The slope of the contributing impervious area is five percent (5%) or less.
- The slope of the overland flow path is five percent (5%) or less.
- If discharge is concentrated at one or more discrete points, no more than 1,000 ft² may discharge to any one point. In addition, a gravel strip or other spreading device is required for concentrated discharges. For non-concentrated discharges along the entire edge of paved surface, a level spreader is not required; however, there must be provisions for the establishment of vegetation along the paved edge and temporary stabilization of the area until the vegetation is established.

REFERENCE: Philadelphia Water Department. 2006 & 2011. Stormwater Management Guidance Manual. Section 4: Integrated Site Design. Philadelphia, PA.

Example Project: The following example determines the status of DIA for a proposed 936 ft² garage.

This example meets the Disconnected Impervious Area criteria. to be exempted from the volume, rate, and SWM Site Plan requirements of the Warwick Township Stormwater Management Ordinance.



Step 1: Determine the area to each disconnected discharge. The area draining to each downspout is 468 ft².

Step 2: The discharge on the north side of the garage has a 98 ft pervious flow path available. The south discharge has 110 ft pervious flow path available.

Step 3: The rise of the north discharge is 2 ft and the run is 75 ft for a slope of 2.6%. This is 5% or less so it qualifies. For the south discharge the rise is 4 ft and the run is 100 ft equaling a slope of 4%. This is 5% or less, so it qualifies.

Step 4: Both of these discharges have pervious flow paths greater than 75 ft, so they qualify as entirely disconnected.

VI. Small Project Stormwater Site Plan Requirements

A Small Project Stormwater Site Plan depicts the existing conditions of a property and the location of proposed impervious surfaces. Depicting the relationship between the proposed activities and distances to things like property lines, streams, and vegetated areas will help determine if the stormwater runoff created by the proposed project can be managed naturally within the property or if additional Stormwater BMPs are needed to accommodate the stormwater runoff.

If a project requires the submission of a Small Project Stormwater Site Plan, the applicant may prepare and submit to Warwick Township a Small Project Stormwater Site Plan and the Warwick Township Stormwater Management Worksheet. The Lancaster County GIS Office can provide assistance to applicants to obtain property maps of existing features. A Small Project Stormwater Site Plan depicting the key features of the site must be drawn to scale and show the following:

- Property owner name, address, email and phone number
- Property address (if different from owner address)
- Name address, email, and phone number of plan preparer (if not the owner)
- Property boundary.
- Site conditions (grassed areas, agricultural fields, direction of slope and stormwater flow on the property).
- Location of all existing and proposed structures (house, shed, addition, etc.) and any proposed downspouts. Include the dimensions of proposed structures.
- Distance from proposed downspouts to property line.
- All existing and proposed driveways and other impervious areas (stone and gravel driveways are considered impervious).
- Natural features such as streams, wetlands, tree lines and other vegetation on the property and within 50 feet of the property line for lots smaller than 5 acres.
- Distance from proposed structures or downspouts along the stormwater flow path to any stream or wooded area.

- Any other pertinent information that may be significant to the project site (existing drainage ways, steep slopes, etc.).
- Wells and on-site septic systems.
- Existing and proposed easements (gas, electric, stormwater, water, sewer, etc.)

If Stormwater BMPs are required, the following information must also be shown on the plan:

- Location and size of proposed Stormwater BMPs.
- Details of BMPs as necessary for construction

Other Considerations for Small Project Stormwater Management Plans:

- For Small Project Stormwater Management Plans, soil testing is highly recommended to select and apply the appropriate Stormwater BMPs. The use of soil maps, infiltration tests, and/ or perc tests may provide the applicant basic information about soil characteristics.
- Proposed stormwater management facilities must be designed to handle flows from the contributing area.
- The site shall not have any pre-existing stormwater drainage-related problems (as verified by Warwick Township), at the discretion of Warwick Township.
- Water quality shall be protected per Chapter 93 of PA Code.
- Warwick Township may inspect all Stormwater BMPs during and after construction / installation.
- Infiltration BMPs should not be constructed nor receive runoff until the entire contributory drainage area has achieved final stabilization.
- Ensure that infiltration in geologically susceptible areas such as, but not limited to, carbonate geology / karst topography do not cause adverse effects. The Small Project Stormwater Site Plan should incorporate steps to ensure that salt or chloride will not contaminate the groundwater.
- Selected Stormwater BMPs shall be designed, constructed, and maintained in accordance with the manufacturer's recommendation, the *PA Stormwater Management BMP Manual*, or other written guidance acceptable to Warwick Township.
- Proposed sump pumps shall discharge to infiltration or vegetative Stormwater BMPs to the maximum extent practicable.

VII. Selecting Stormwater BMPs

If the submission of a Small Project Stormwater Management Plan including the use of Stormwater BMPs is required, the applicant should review the compiled information in the *PA Handbook of Best Management Practices for Developing Areas* and the *PA Stormwater Management BMP Manual*. These documents identify Stormwater BMPs that have been deemed to be of a nature and cost that will accomplish the goals of the Warwick Township Stormwater Ordinance, while not unduly burdening the residents. It will then be the Owner's responsibility to select a facility, determine the

appropriate size and agree to construct and maintain that facility or facilities. The property owner is encouraged to utilize both multiple and hybrid versions of the facilities, as outlined in the documents mentioned above.

The Applicant may choose to install a Stormwater BMP facility as shown in the Stormwater Management Worksheets. The Stormwater BMP facility shall be constructed in accordance with the associated construction details, requirements and notes.

VIII. Warwick Township Exemption & Small Project Application

Property Address _____

Parcel ID # _____

Property Owner's Name _____

Property Owner's Address (if different from Property Address) _____

Property Owner's Phone # _____

Applicant's Name (if different from Property Owner) _____

Applicant's Address _____

Applicant's Phone # _____

Stormwater Management Submission Type: ☐ Exempt
☐ Small Project / Minor Stormwater Management Plan

For an Exempt Project submission:

Proposed Impervious Area _____ sq. ft.

Prior Impervious Area Installed
Since June 21, 2006* _____ sq. ft.

Total _____ sq. ft.
(must not exceed 1,000 sq. ft.)

For a Small Project submission:

Proposed Impervious Area _____ sq. ft.
(include Stormwater Management Worksheets)

Prior Impervious Area installed through
other Small Projects* _____ sq. ft.

Total _____ sq. ft.
(must not exceed 2,500 sq. ft.)

* Information may be obtained from the Warwick Township Administration office.

Acknowledgement - I declare that I am the property owner, or representative of the owner, or authorized representative of the owner, and that the information provided is true and accurate to the best of my knowledge. I understand that stormwater may not adversely affect adjacent properties or be directed onto another property without written permission. I also understand that false information may result in a stop work order or revocation of permits. Municipal representatives are also granted reasonable access to the property for review and/or inspection of this project if necessary.

Applicant's Signature _____ Date _____

Warwick Township Receipt

Date Received _____ By: _____

Comments: _____

IX. Warwick Township Stormwater Management Worksheets

Step 1: Determine the amount of new impervious surface area created by the proposed project. This includes any new impervious surface area that prevents infiltration of stormwater into the ground. New stone and gravel areas are considered impervious. Impervious surface areas existing before June 21, 2006 are not included in this calculation. Use additional sheets if necessary.

Calculate new impervious area by completing this table.

Surface	Length (ft)	x	Width (ft)	=	Impervious Area (ft ²)
Buildings		x		=	
Driveway		x		=	
Parking Areas		x		=	
Patios/ walkways		x		=	
Other		x		=	
Total Proposed Impervious Surface Area (Sum of all impervious areas)					

- If the total new impervious surface area is **less than or equal to 1,000 ft²**, the project is eligible to be exempted from the requirement to submit a Small Project Stormwater Site Plan or a SWM Site Plan. Sign Acknowledgement and file this sheet with Warwick Township.
- Applicants shall note that Regulated Activities that meet the exemption criteria may be required to manage stormwater runoff and provide plans and/or calculations as required in this ordinance should the Municipality determine that there is a potential for stormwater runoff associated with the proposed Regulated Activity to adversely affect adjacent or downstream public or private properties.
- If total new impervious surface area is **greater than 1,000 ft², and less than or equal to 2,500 ft²**, continue to Step 2.
- If the total new impervious surface area is **greater than 2,500 ft²** then a Stormwater Management Plan shall be submitted in accordance with the Warwick Township Stormwater Management Ordinance.

Step 2: Determine Disconnected Impervious Area (DIA). All or parts of new impervious surfaces may qualify as Disconnected Impervious Area if runoff is directed to a pervious area that allows for infiltration, filtration, and increased time of concentration. The volume of stormwater that needs to be managed could be reduced through DIA.

Rooftop Disconnection Criteria

- Overland flow path from the discharge area or impervious area has a positive slope of 5% or less.
- Soils are not classified as wetlands
- The receiving pervious area shall not include another person's property.

Paved Disconnection Criteria: Other impervious surfaces (driveways, walkways, porches, decks, etc.) and gravel can be considered disconnected if it meets the criteria above and:

- Runoff does not flow over impervious area for more than 75 feet.
- The length of overland flow is greater than or equal to the contributing flow path.
- The slope of the contributing impervious areas is 5% or less.

Partial Rooftop Disconnection		
Length of Pervious Flow Path (ft) Lots ≤ 10,000 ft ²	Length of Pervious Flow Path (ft)	DIA Credit Factor
35 or more	75 or more	0
30 – 34.9	60 – 74	0.2
23 – 29.9	45 – 59	0.4
16 – 22.9	30 – 44	0.6
8 – 15.9	15 – 29	0.8
0 – 7.9	0 - 14	1.0
Pervious flow path must be at least 15 feet from any impervious surface		

- If discharge is concentrated at one or more discrete points, no more than 1,000 ft² may discharge to any one point. In addition, a gravel strip or other spreading device is required for concentrated discharges. Non-concentrated discharges along the entire edge of paved surface must include provisions for the establishment of vegetation along the paved edge and temporary stabilization of the area until the vegetation is established.
- If these criteria can be met, the DIA credit = 0.

Using the calculations from Step 1, complete the table below. This will determine the impervious area that may be excluded from the area that needs to be managed through stormwater BMPs. If the total impervious area to be managed = 0, the area can be considered entirely disconnected.

Surface	Proposed Impervious Area	x	DIA Credit	=	Impervious Area (ft ²) to be Managed
Buildings (area to each downspout)		x		=	
Driveway		x		=	
Parking Areas		x		=	
Patios/ walkways		x		=	
Other		x		=	
Total Proposed Impervious Surface Area to be managed (Sum of all impervious areas)					

- If the total new impervious surface area can be entirely disconnected, sign Acknowledgement and file worksheets with Warwick Township.
- If the total new impervious surface area is **greater than 1,000 ft² and less than or equal to 2,500 ft²** and can not be entirely disconnected, continue to Step 3.
- If the total new impervious surface area is **greater than 2,500 ft²** and cannot be disconnected, the project may not be submitted with a Small Project Stormwater Site Plan. Discontinue this worksheet and prepare a SWM Site Plan in accordance with Article IV of the Warwick Township Stormwater Management Ordinance.

Step 3: Calculate the volume of stormwater runoff created by new impervious surfaces. Use the following chart to determine this volume.

Impervious Area (ft ²) to be Managed (Sum of Step 2)	x	1.0 in/12 in = 0.083	=	Amount of Stormwater to be Managed (ft ³)
	x	0.083	=	

Where permitted by Warwick Township, planting of new trees may be used to manage a portion of the proposed stormwater volume. First, calculate the cubic feet of stormwater that can be managed by planting new trees. If the criteria below can be met, planting of new trees can be used to manage a portion of the proposed stormwater volume:

Deciduous Trees = 6 ft³ per tree

Evergreen Trees = 10 ft³ per tree

Criteria:

- Trees must be PA native species (See PA Stormwater BMP Manual for a list)
- Trees shall be a minimum 1" caliper tree and 3 feet tall shrub (min)
- Trees shall be adequately protected during construction

- No more than 25% of the required capture volume can be mitigated through the use of trees
- Dead trees shall be replaced by the property owner within 12 months
- Please consider the specifications for each tree species when determining location and spacing

Amount of Stormwater to be Managed (ft ³) (from above)	-	Tree Planting Credit (ft ³)	=	Amount of Stormwater to be Managed (ft ³)
	-		=	

Subtract the stormwater volume that can be managed by tree planting from the overall stormwater volume. The remaining stormwater must be managed through the installation of properly sized Stormwater BMPs. Select BMPs and size according to the volume of stormwater that needs to be managed.

Step 4: Determine the techniques to be used to manage the stormwater volume calculated in Step 3 and prepare the Small Project Stormwater Management Plan. Use the following information to determine the BMPs to be used to manage the proposed stormwater volume.

Alternatively, stormwater BMPs may be sized using the following Simple BMP Sizing table, below. To use this sizing table, convert the cubic square feet of stormwater from Step 3, to square feet using the conversion table below:

Impervious Area (ft ²) to be Managed (Sum of Step 3)	÷	1.0 in/12 in = 0.083	=	Amount of Stormwater to be Managed (ft ³)
	÷	0.083	=	

BMP Type		Simple BMP Sizing - Amount New Impervious Area to be Managed (ft ²)											
		250	500	750	1000	1500	2000	2500	3000	3500	4000	4500	5000
Bioretention	Ex. Rain garden, Vegetated swale	21 ft ³ or	42 ft ³ or	62 ft ³ or	83 ft ³ or	125 ft ³ or	166 ft ³ or	208 ft ³ or	249 ft ³ or	291 ft ³ or	332 ft ³ or	374 ft ³ or	415 ft ³ or
Infiltration	Ex. Dry well, Infiltration trench	53 ft ³	105 ft ³	155 ft ³	208 ft ³	313 ft ³	415 ft ³	520 ft ³	623 ft ³	728 ft ³	830 ft ³	935 ft ³	1,038 ft ³

(Source: Lycoming County Planning Commission)

The Simple BMP Sizing table is used as follows. After subtracting the stormwater volume that can be managed through the planting of new trees, match the remaining stormwater volume to the “Amount of New Impervious Area to be Managed” in white boxes in the table (rounding **up** to the next value if the number is between two values). Then look in the light grey box to determine the required size of the type of Stormwater BMP (bioretention or infiltration) being considered. For example, 1,000 square foot of new impervious surface area could be accommodated by an 83 cubic foot bioretention system. Bioretention systems such as a 13’x 13’x 1.5’ rain garden or a 36’x 2’x 3.5’ vegetated swale could be used to achieve this storage volume.

Once the sizing of necessary stormwater BMPs has been determined, prepare the necessary information required Small Project Stormwater Site Plan and submit to Warwick Township for review and approval. Bring the worksheets, BMP information (size, location, etc.), Owner Acknowledgement, and BMP Facilities and Maintenance Agreement (if applicable) to Warwick Township.

If an area greater than 5,000 square feet of earth is disturbed, an erosion and sedimentation (E & S) control plan must be prepared. Warwick Township may require that the E&S plan be submitted to, reviewed, and approved by the Lancaster County Conservation District prior to approval of the Small Project Stormwater Site Plan

Stormwater Management Certification (if applicable):

I hereby certify that, to the best of my knowledge, the stormwater management facilities shown and described hereon are designed in conformance with Chapter 270, Stormwater Management, of the Code of the Township of Warwick.

Date _____

[seal]

By: _____

Printed Name

Signature

Certificate for Review by the Township Engineer:

Reviewed by the Warwick Township Engineer this _____ day of _____, 2014.

By: _____

Printed Name

Signature

Decision by Warwick Township:

☐ Approved

☐ Denied

if Denied; reason: _____

Date _____

By: _____

Printed Name / Title

Signature

If a Small Projects Application is denied, the Applicant may seek an appeal of the decision to the Board of Supervisors within 45 days of the date of denial.

APPENDICES:

Owner Acknowledgment for Small Project Stormwater Site Plan

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Attachment 6 – Rain Garden

Rain Garden Native Planting List

Small Projects Guide – Sample Operation & Maintenance Plan

Storm Water Management Agreement and Declaration of Easement

**OWNER ACKNOWLEDGMENT
FOR
SMALL PROJECT STORMWATER SITE PLAN**

- Development activities shall begin only after Warwick Township approves the Small Project Stormwater Site Plan.
- The installed Stormwater BMPs will not adversely affect any property, septic systems, or drinking water wells on this or any other property.
- If, after approval of the Small Project by Warwick Township, the applicant wishes to pursue alternative stormwater management measures in support of the project, the applicant will submit revised Small Project information and worksheets to Warwick Township for approval. If a site requires a more complex system or if problems arise, the applicant may need the assistance of a licensed professional engineer, landscape architect or surveyor.
- The applicant acknowledges that the proposed Disconnected Impervious Area and/or Stormwater BMPs will be a permanent fixture of the property that can not be altered or removed without approval by Warwick Township.

I (we) _____, hereby acknowledge the above statements and agree to assume full responsibility for the implementation, construction, operation, and maintenance of the proposed stormwater management facilities. Furthermore, I (we) also acknowledge that the steps, assumptions, and guidelines provided in this submission, including but not limited to the Small Project Stormwater Site Plan, the Warwick Township Stormwater Worksheet, and the Stormwater Management / BMP Facilities and Maintenance Agreement (if applicable) will be adhered to.

Applicant Acknowledgement of Submission

Signature: _____

Date: _____

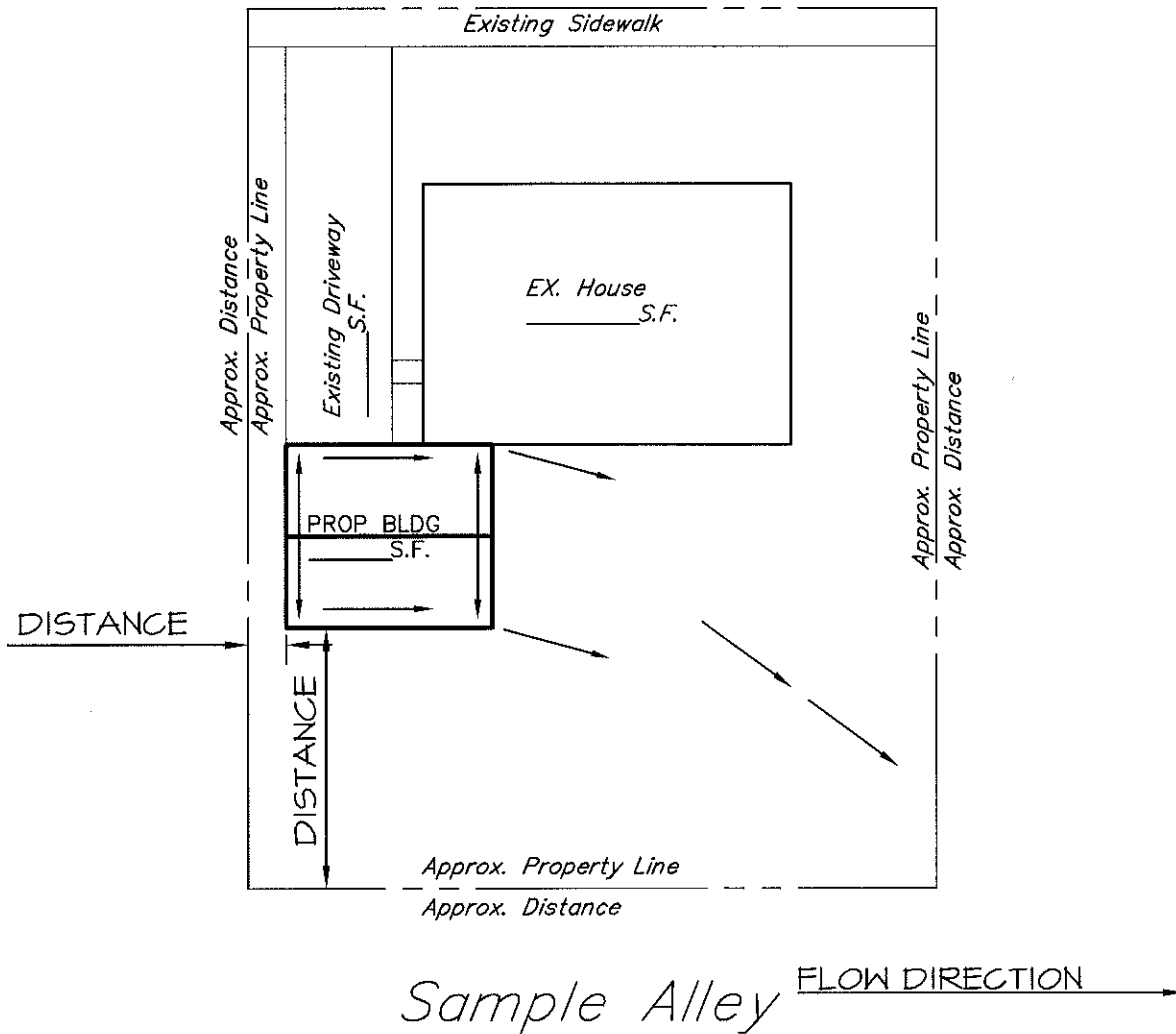
Warwick Township Acknowledgement of Receipt

Signature: _____

Date: _____

Title

Main Street



WARWICK TOWNSHIP
ATTACHMENT I SAMPLE SKETCH/SITE PLAN

JOB NUMBER:

DRAWING:

N/A

SKETCH:

1 OF 1



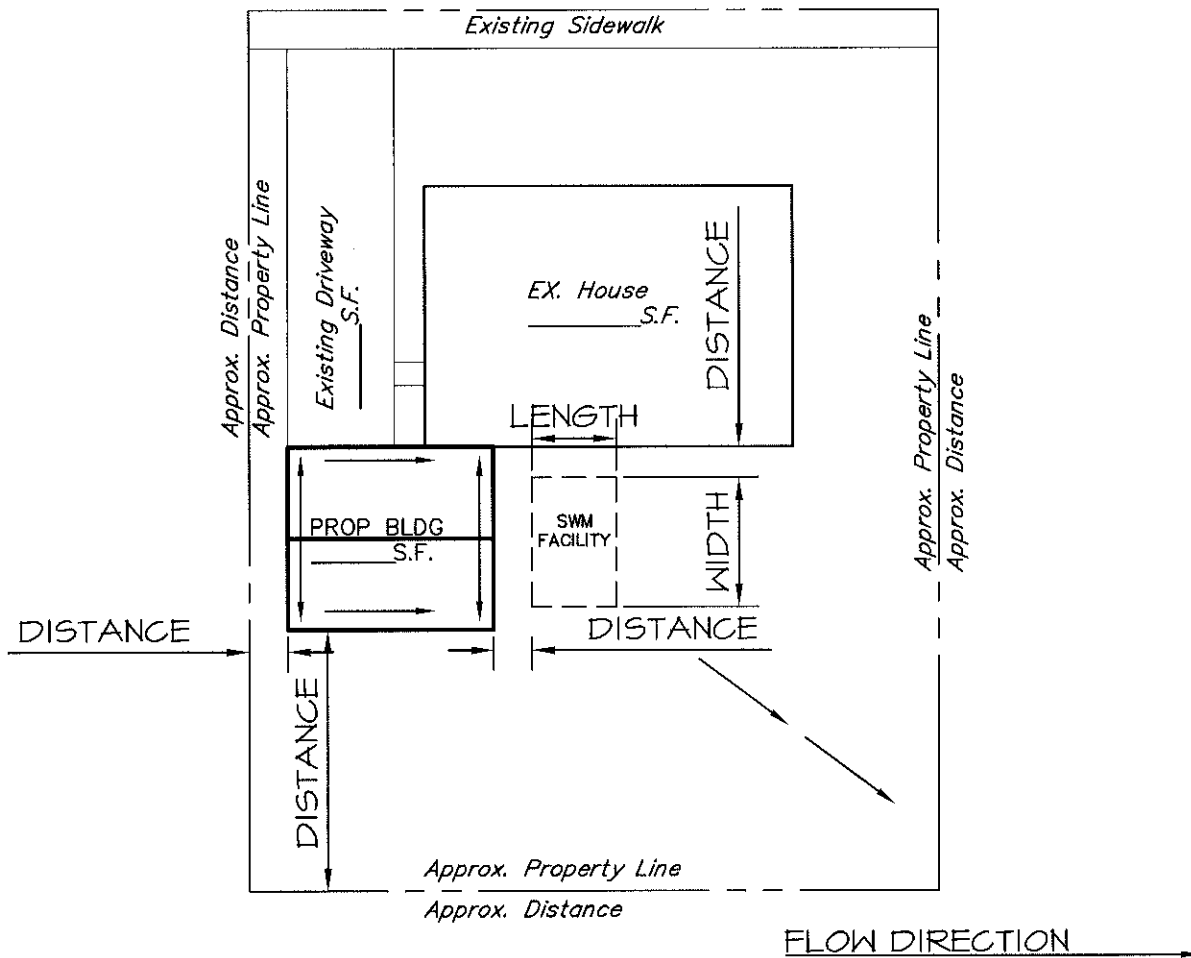
743 SOUTH BROAD STREET
LITITZ, PA 17543
(717) 626-1211 FAX (717) 626-1040
www.eagroup.com

SCALE: N.T.S.

DRAWN BY:

DATE: 2014

Main Street



DRAWING: W:\95\135-419\Details\Details.dwg - PLOTTED: Feb 04, 2014 4:09 pm

WARWICK TOWNSHIP
ATTACHMENT 2 SAMPLE SWM SITE PLAN

JOB NUMBER:

EA
group, inc.
ENGINEERS & LANDSCAPE ARCHITECTS
143 SOUTH BROAD STREET
LITITZ, PA 17543
(717) 626-7271 FAX (717) 626-7040
www.eagroup.com

SCALE: N.T.S.

DRAWN BY:

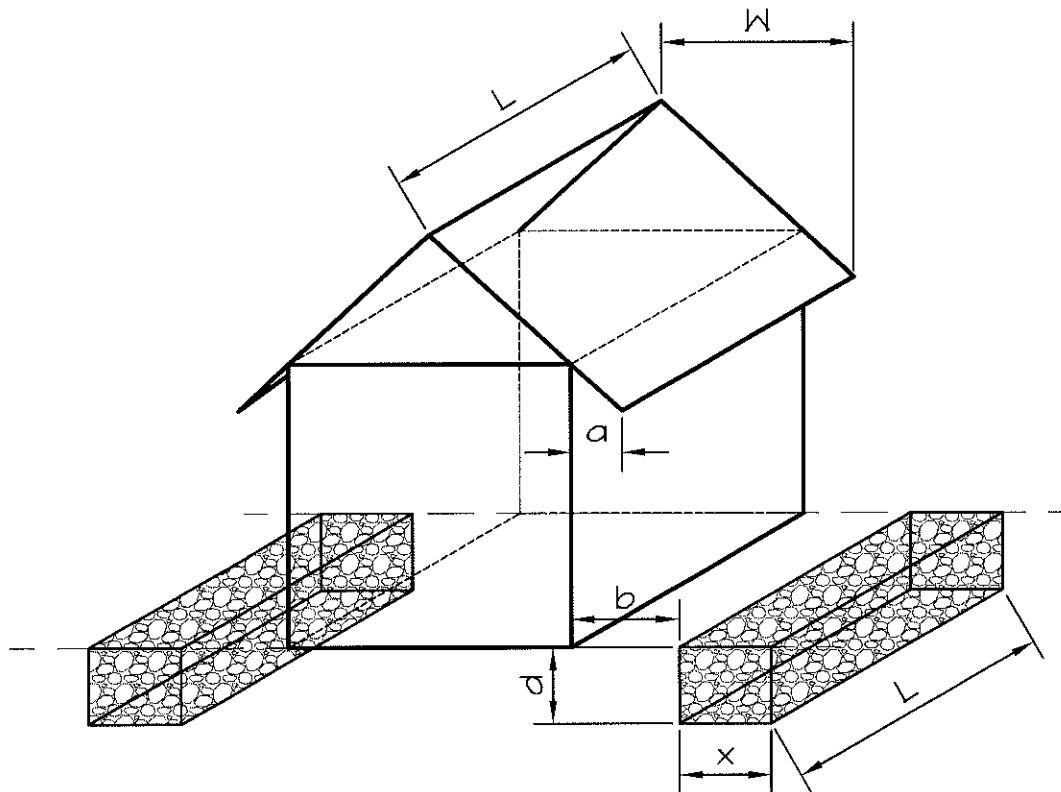
DATE: 2014

DRAWING:

N/A

SKETCH:

1 OF 1



KEY

- L = LENGTH OF STRUCTURE ROOF = LENGTH OF SEEPAGE TRENCH (FT.)
 W = WIDTH OF ONE SIDE OF THE ROOF (FT)
 a = EAVE/OVERHANG (FT)
 b = DISTANCE FROM STRUCTURE WALL TO SEEPAGE TRENCH (FT)
 = a + 1 FT => PLACE FROM EDGE OF TRENCH ONE FOOT PAST EAVES
 x = WIDTH OF SEEPAGE TRENCH (FT)
 d = DEPTH OF SEEPAGE TRENCH (FT)

REQUIRED VOLUME OF TRENCH $\Rightarrow L \cdot W \cdot 1/12 = L \cdot x \cdot d \cdot 0.4 \Rightarrow x = 0.14W$ for $d = 1.5'$

Ratio: 3.6 to 1
(IMPERVIOUS TO INFILTRATION)

NOTES

- 1.) TRENCH MUST BE PROVIDED ON EACH SIDE OF STRUCTURE.
- 2.) SIDE AND BOTTOM OF TRENCH TO BE WRAPPED IN CLASS 1 GEOTEXTILE.
- 3.) TRENCH TO BE FILLED WITH CLEAN STONE (3/4" MIN. SIZE).
- 4.) TRENCH TO BE CONSTRUCTED AT 0% SLOPE ON UNDISTURBED SOIL.
- 5.) TRENCH TO BE CHECKED REGULARLY TO MAINTAIN PROPER OPERATION

WARWICK TOWNSHIP

ATTACHMENT 3 STORMWATER MANAGEMENT STRUCTURES WITHOUT GUTTERS

JOB NUMBER:

-



743 SOUTH BROAD STREET
LITITZ, PA 17543
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www.eagroup.com

ENGINEERS & LANDSCAPE ARCHITECTS

SCALE: N.T.S.

DRAWN BY:

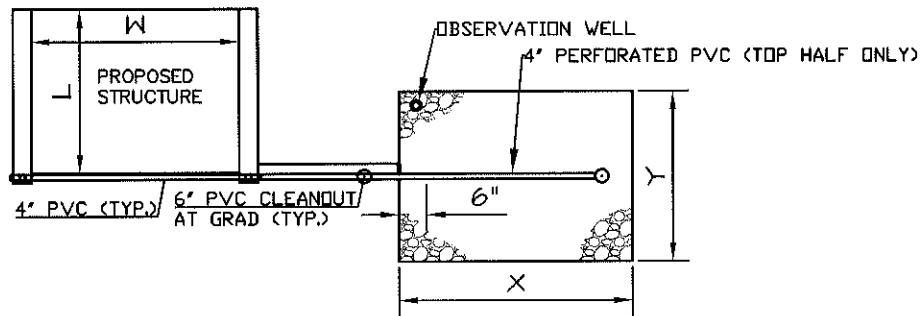
DATE: 2014

DRAWING:

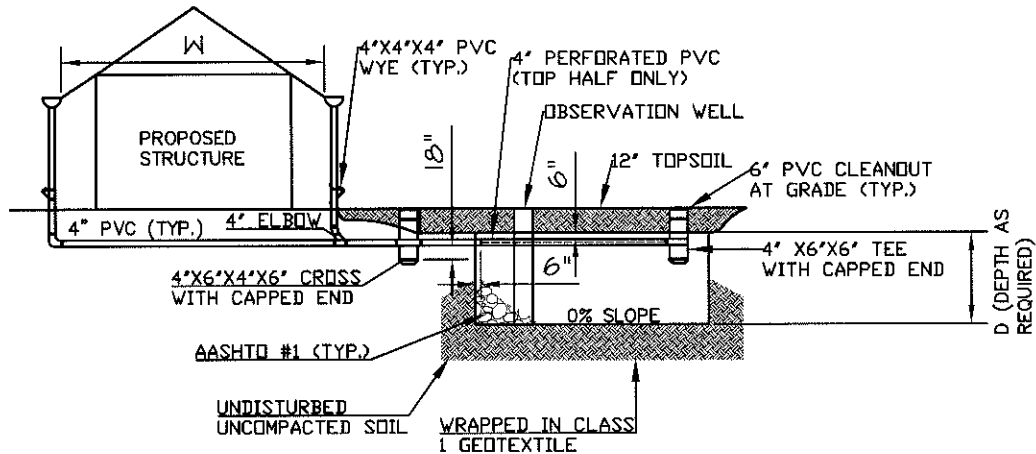
N/A

SKETCH:

1 OF 1



PLAN VIEW



SECTION VIEW

KEY

L = LENGTH OF STRUCTURE ROOF (FT)
W = WIDTH OF ENTIRE ROOF (FT)
X = WIDTH OF INFILTRATION BED (FT)
Y = LENGTH OF INFILTRATION BED (FT)

REQUIRED VOLUME OF BED = $L \cdot W \cdot 1/12 = X \cdot Y \cdot D \cdot 0.4$ [ASSUME $X=W$ $D=2'$]
 $Y=0.11L$
RATIO 4.76 TO 1
(IMPERVIOUS TO INFILTRATION)

NOTES

- 1.) BOTTOM OF BED TO BE D+1' BELOW GRADE TO ACCOUNT FOR 1' OF TOPSOIL.
- 2.) PIPING AND CLEANOUTS TO BE CENTERED WITHIN INFILTRATION BED.
- 3.) BED TO BE CHECKED REGULARLY TO MAINTAIN PROPER OPERATION.
- 4.) SEE SHEET 2 OF 2 FOR ADDITIONAL DETAILS

WARWICK TOWNSHIP

ATTACHMENT 4 STORMWATER MANAGEMENT SAMPLE STRUCTURE WITH GUTTERS

JOB NUMBER:

-

EA group, inc.
743 SOUTH BROAD STREET
LITITZ, PA 17543
(717) 626-1271 FAX (717) 626-1040
www.eagroup.com
ENGINEERS & LANDSCAPE ARCHITECTS

SCALE: N.T.S.

DRAWN BY:

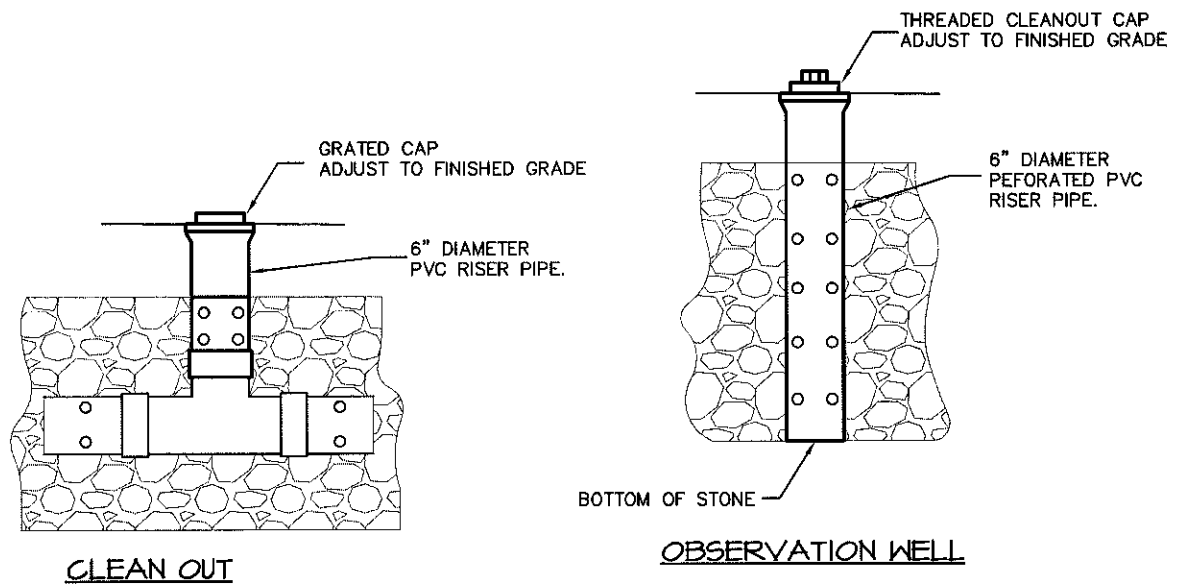
DATE: 2014

DRAWING:

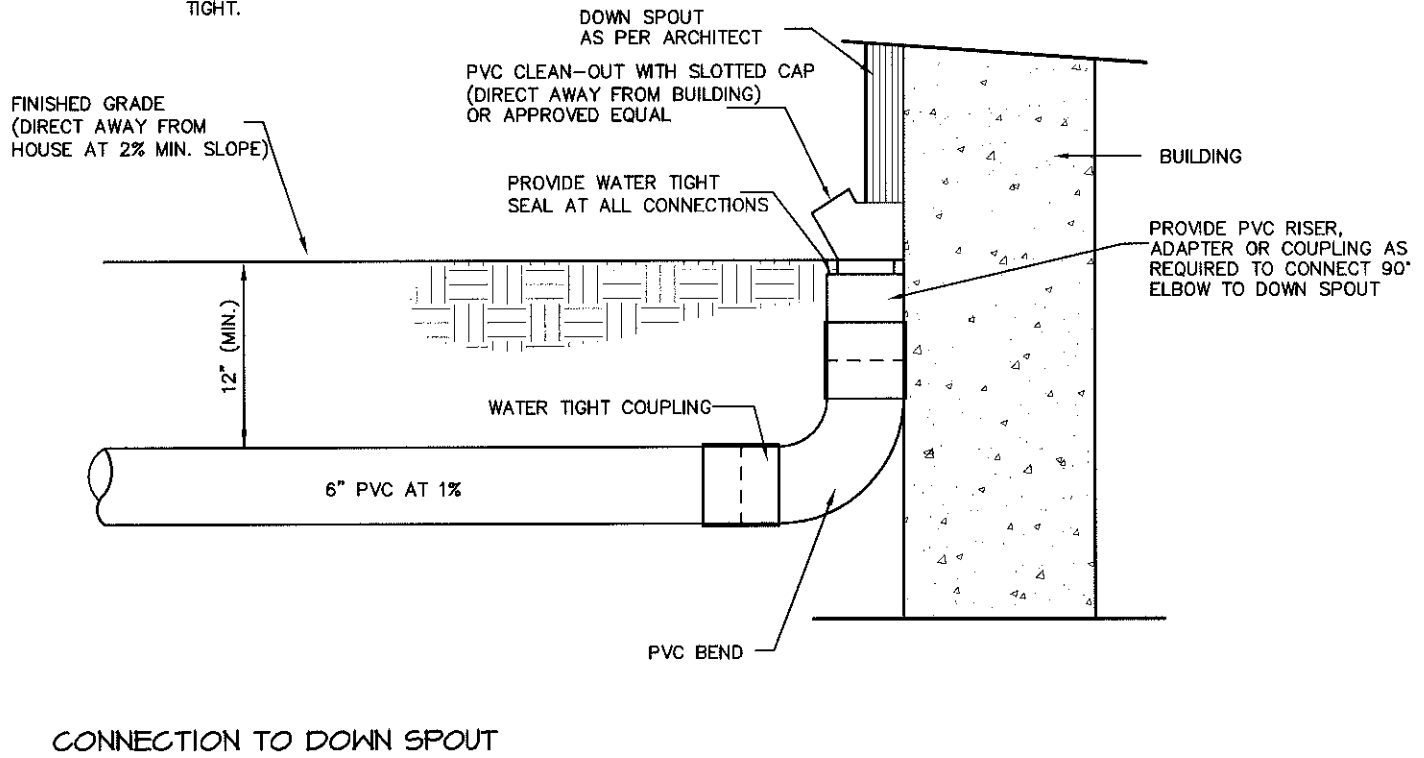
N/A

SKETCH:

1 OF 2



NOTE:
CONTRACTOR SHALL PROVIDE ALL
FITTINGS, ADAPTERS, COUPLINGS AND
OTHER APPURTENANCES AS REQUIRED TO
CONNECT STORM CONVEYANCE SYSTEM.
ALL CONNECTIONS SHALL BE WATER
TIGHT.



WARWICK TOWNSHIP

ATTACHMENT 4-IDOWNSPOUT/CLEAN OUT/OBSERVATION WELL DETAILS

JOB NUMBER:

-

SCALE: N.T.S.

DRAWN BY:

DATE: 2014

DRAWING:

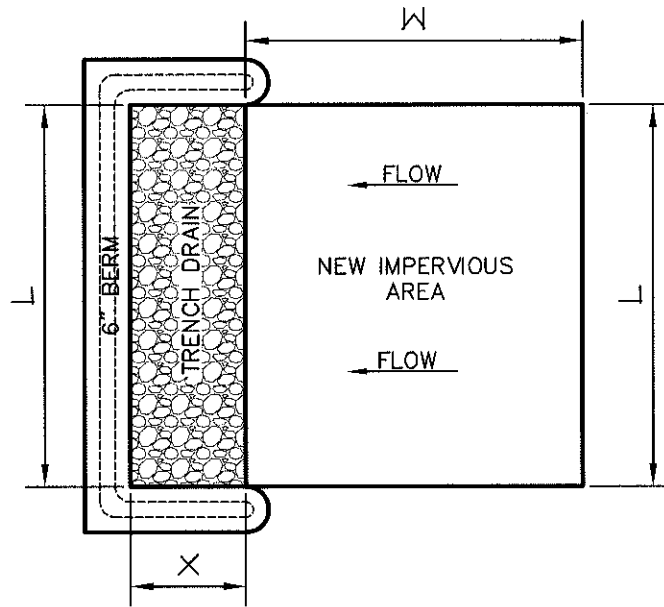
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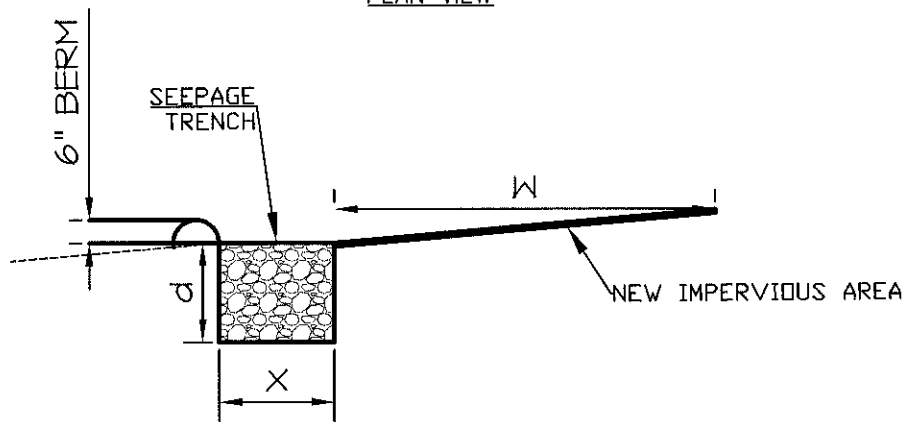
2 OF 2

EA
group, inc.
ENGINEERS & LANDSCAPE ARCHITECTS

743 SOUTH BROAD STREET
LITITZ, PA 17543
(717) 626-1271 FAX (717) 626-1040
www.eagroup.com



PLAN VIEW



SECTION VIEW

KEY

- L = LENGTH OF NEW IMPERVIOUS SURFACE (FT) =LENGTH OF SEEPAGE TRENCH
W = WIDTH OF NEW IMPERVIOUS SURFACE --MAY NOT EXCEED 75'
X = WIDTH OF SEEPAGE TRENCH (FT)
d = DEPTH OF SEEPAGE TRENCH (FT)

REQUIRED VOLUME OF TRENCH $\Rightarrow L*W*1/12=X*L*d*0.4 \Rightarrow X=0.14W$ FOR $d=1.5'$

NOTES

- 1.) SIDE AND BOTTOM OF TRENCH TO BE WRAPPED IN CLASS 1 GEOTEXTILE
- 2.) TRENCH TO BE FILLED WITH CLEAN STONE (3/4" MIN. SIZE).
- 3.) TRENCH TO BE CONSTRUCTED AT 0% SLOPE ON UNDISTURBED SOIL.
- 4.) TRENCH TO BE CHECKED REGULARLY TO MAINTAIN PROPER OPERATION.

WARWICK TOWNSHIP

ATTACHMENT 5 STORMWATER MANAGEMENT AT GRADE IMPERVIOUS

JOB NUMBER:

BA group, inc.
743 SOUTH BROAD STREET
LITITZ, PA 17543
(717) 626-1271 FAX (717) 626-1040
www.bagroup.com
ENGINEERS & LANDSCAPE ARCHITECTS

SCALE: N.T.S.

DRAWN BY:

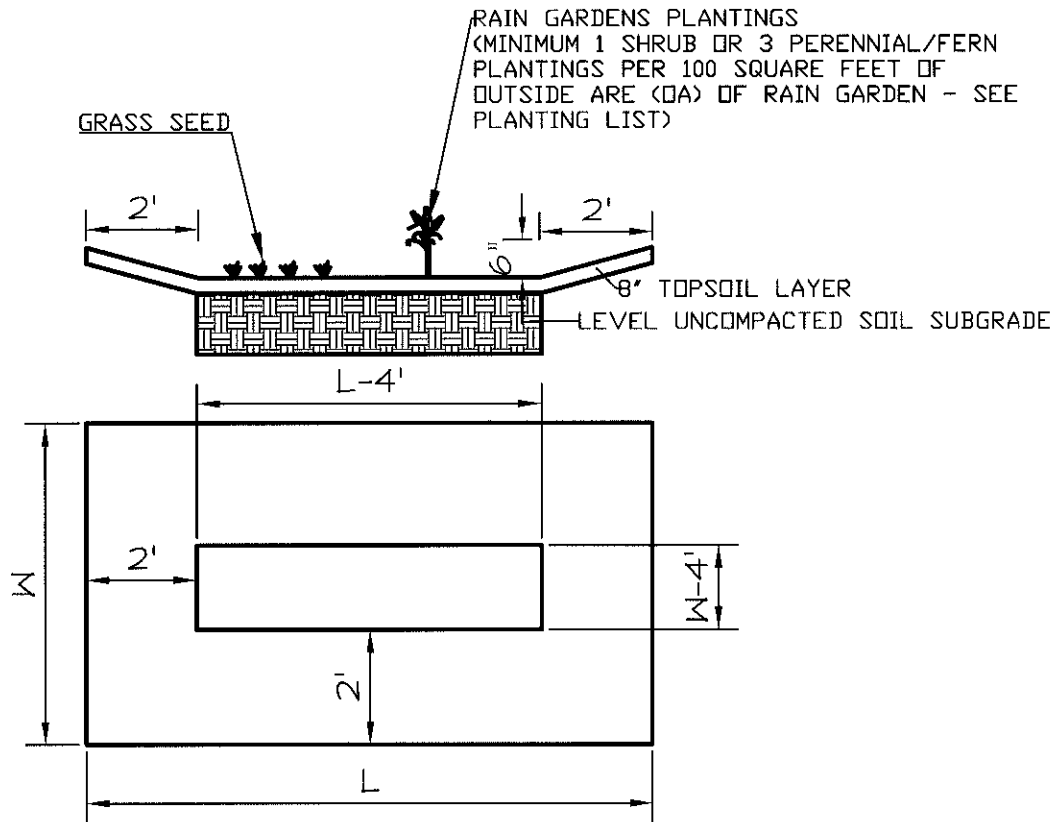
DATE: 2014

DRAWING:

N/A

SKETCH:

1 OF 1



- 1.) CALCULATE REQUIRED RAIN GARDEN VOLUME (V)
 $(RV) = \text{SQUARE FEET OF NEW IMPERVIOUS AREA} \times (0.085')$
RV= _____ FT3
- 2.) CALCULATE OUTSIDE AREA OF RAIN GARDEN (OA)
 $(OA) = \text{LENGTH (L)} \times \text{WIDTH (W)}$
OA= _____ FT2
- 3.) CALCULATE INSIDE AREA OF RAIN GARDEN (IA)
 $(IA) = [(L)-4'] \times [(W)-4']$
IA= _____ FT2
- 4.) CALCULATE AVERAGE AREA OF RAIN GARDEN (AA)
 $(AA) = (OA)/2 + (IA)/2$
AA= _____ FT2
- 5.) CALCULATE STORAGE VOLUME (SV)
 $(SV) = (AA) \times 0.5'$
SV= _____ FT3
- 6.) CHECK FOR ADEQUATE STORAGE
 STORAGE VOLUME (SV) MUST BE GREATER THAN REQUIRED VOLUME (RV)
 $RV = \text{_____ FT3} > SV = \text{_____ FT3}$
- 7.) ADJUST RAIN GARDEN SIZE
 IF STORAGE VOLUME (SV) IS NOT GREATER THAN REQUIRED VOLUME (RV), INCREASE THE SIZE
 OF THE RAIN GARDEN AND REPEAT STEPS 2-6.

WARWICK TOWNSHIP
ATTACHMENT 6 RAIN GARDEN

JOB NUMBER:

EA 743 SOUTH BROAD STREET
 LITITZ, PA 17543
 (717) 626-1271 FAX (717) 626-1040
 www.eagroup.com
group, inc.
 ENGINEERS & LANDSCAPE ARCHITECTS

SCALE: N.T.S.

DRAWN BY:

DATE: 2014

DRAWING:

N/A

SKETCH:

1 OF 1

Rain Garden Native Planting List

Perennials and Ferns

Blue false indigo (*Baptista Australis*)
Blue flag iris (*Iris Versicolor*)
Blue star (*Amsonia tabernaemontana*)
Blue vervain (*Verbena hastata*)
Boltonia (*Boltonia asteroides*)
Boneset (*Eupatorium perfoliatum*)
Bottlebrush grass (*Hystrix patula*)
Broomsedge (*Andropogon virginicus*)
Cardinal flower (*Lobelia cardinalis*)
Cinnamon fern (*Osmunda cinnamomea*)
Culvers root (*Veronicastrum virginicum*)
Golden ragwort (*Senecio aureus*)
Goldenrod (*Solidago patula*, *S. rugosa*)
Great blue lobelia (*Lobelia siphilitica*)
Green bullrush (*Scirpus atrovirens*)
Horsetail (*Equisetum* species)
Marsh marigold (*Caltha palustris*)
Mistflower (*Eupatorium coelestinum*)
Monkey flower (*Mimulus ringens*)
New England aster (*Aster novae-angliae*)
New York aster (*aster novi-belgii*)
Obedient plant (*Physotegia virginiana*)
Royal fern (*Osmunda regalis*)
Seedbox (*Ludwigia alternifolia*)
Sensitive fern (*Onoclea sensibilis*)
Sneezeweed (*Helenium autumnale*)
Soft rush (*Juncus effusus*)
Swamp milkweed (*Asclepias incarnata*)
Swamp rose mallow (*Hibiscus moscheutos*)
Swamp sunflower (*Helianthus angustifolius*)
Switchgrass (*Panicum virgatum*)
Threadleaf coreopsis (*Coreopsis Verticillata*)
Tussock sedge (*Carex stricta*)
White turtlehead (*Chelone glabra*)
Woolgrass (*Scirpus cyperinus*)

Shrubs

American beautyberry (*Callicarpa americana*)
Arrowwood (*Viburnum dentatum*)
Black chokeberry (*Aronia melanocarpa*)
Broad-leaved meadowsweet (*Spirea latifolia*)
Buttonbush (*Cephalanthus occidentalis*)
Elderberry (*Sambucus canadensis*)
Inkberry (*Ilex glabra*)
Narrow-leaved meadowsweet (*Spirea alba*)
Ninebark (*Physocarpus opulifolius*)
Possumhaw (*Viburnum nudum*)
Red-osier dogwood (*Cornus sericea*)
St. Johnswort (*Hypericum densiflorum*)
Silky dogwood (*Cornus amomum*)
Smooth alder (*Alnus serrulata*)
Spicebush (*Lindera benzoin*)
Swamp azalea (*Rhododendron viscosum*)
Swamp rose (*Rosa palustris*)
Sweet pepperbush (*Clethra alnifolia*)
Wild raisin (*Viburnum cassinoides*)
Winterberry (*Ilex verticillata*)
Virginia sweetspire (*Itea virginica*)

Small Projects Guide-Sample Operation & Maintenance Plan

Construction:

1. Install erosion and sedimentation control facilities
2. Stormwater Management Facility (ies) shall be installed before impervious areas are completed. If earthwork is involved during the construction of the impervious area, then extreme caution shall be taken so that sediment does not wash into the SWM Facility (ies).
3. Mark the locations of the SWM facility (ies).
4. Excavate the SWM Facility to the required depth. Contact municipality for inspection prior to filling. If standing water is encountered, a SWM Site Plan may need to be submitted; contact Municipal Engineer. All excavated materials shall be removed from the site or stabilized.

For stone Infiltration Structures

5. Line excavation with Geotextile.
6. Backfill SWM facility with required stone. If required: Install piping, cleanouts and associated facilities as detailed.
7. If required: Close geotextile material over stone bedding.
8. If required: Place topsoil over trench.
9. Stabilize and seed all disturbed areas.

For Rain Gardens

10. Place topsoil over excavated area.
11. Install plantings as shown on the plan.
12. Stabilize and seed all disturbed areas.

Maintenance:

1. The SWM facility shall be checked regularly to ensure that no standing water exists in the facility 3 days after a rain event. If water is encountered, the facility may need to be modified. Notification of the municipality is required if facility is not functioning before any modifications are made.
2. Monitor the SWM facility to ensure that no sediment, grass clippings, leaves, and other similar accumulations occur on top of, and/or within, the SWM Facility.
3. Homeowner to submit an inspection report to the Township one year after construction and every 3rd year thereafter.

I have read and agree to the above Operation and Maintenance Plan. I, as the property owner, am responsible for the proper construction and operation and maintenance for the SWM Facilities. If I fail to adhere to any of these tasks, the Township may perform the services required and charge the appropriate fees. Nonpayment of the fees may result in a lien against my property.

Applicant Name (Printed)

Signature

Date

Prepared By: _____

Return To: Same
Parcel ID # _____

STORM WATER MANAGEMENT AGREEMENT AND DECLARATION OF EASEMENT

THIS AGREEMENT AND DECLARATION OF EASEMENT made this _____ day of _____, 20_____, by and between _____ with a mailing address at _____ (hereinafter, whether singular or plural, referred to as the "Grantor"), and **WARWICK TOWNSHIP**, Lancaster County, Pennsylvania, a municipal corporation duly organized under the laws of the Commonwealth of Pennsylvania, with its municipal office located at 315 Clay Road, P. O. Box 308, Lititz, Pennsylvania (hereinafter referred to as the "Township").

BACKGROUND

Grantor is the owner of premises located at _____, in the Township of Warwick, Lancaster County, Pennsylvania, as more specifically described in a deed recorded in Deed or Record Book _____, Volume _____, Page _____, or at Document No. _____ in the Office of the Recorder of Deeds in and for Lancaster County, Pennsylvania (hereinafter referred to as the "Premises"). Grantor is proceeding to build on and develop the Premises in such manner as requires the submission of a Small Project Stormwater Site Plan pursuant to the Warwick Township Stormwater Management Ordinance (hereinafter "SWM Ordinance").

Grantor's Small Project Stormwater Site Plan, which is expressly made a part hereof, as approved or to be approved by the Township, provides for detention of stormwater within the confines of the Premises through the use of Stormwater Best Management Practices (Stormwater BMPs).

In the interest of protecting the health, safety, and welfare of the residents of the Township, the Township requires that on-site Stormwater BMPs as shown on the Small

Project Stormwater Site Plan be constructed and adequately maintained by Grantor, his heirs, personal representatives, successors and assigns. Any additional requirements imposed by the Township are considered part of the Small Project Stormwater Site Plan.

The purpose of this Agreement and Declaration of Easement is to describe the ownership and maintenance responsibilities for the on-site Stormwater BMPs, which will be located on the Premises and to impose the ownership and maintenance responsibilities upon Grantor, his heirs, personal representatives and assigns and upon successor owners of the Premises, and set forth the rights of the Township.

NOW, THEREFORE, intending to be legally bound hereby and in consideration of receiving approval of its Small Project Stormwater Site Plan from the Board of Supervisors, and in consideration of receiving permits from the Township to develop the Premises, Grantor, for Grantor and the heirs, personal representatives, successors and assigns of Grantor, covenant and declare as follows:

1. In accordance with the specifications identified within the Small Project Stormwater Site Plan, Grantor shall construct the on-site Stormwater BMPs, which will be owned by Grantor, his heirs, personal representatives, successors and assigns.

2. Grantor, his heirs, personal representatives, successors and assigns, shall adequately maintain the Stormwater BMPs, including all pipes and channels built to convey stormwater, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions.

3. Grantor, his heirs, personal representatives, successors and assigns, shall inspect the Stormwater BMPs after all rainfall events exceeding one inch of precipitation in a 24-hour period.

4. Grantor agrees that this Agreement creates upon the Premises, for the benefit of all present and future owners of the Premises or part of the Premises, the Township, and all other property owners affected by the storm water facilities, the perpetual right, privilege and easement for the draining of storm water in and through the Stormwater BMPs, and other stormwater facilities depicted on the Small Project Stormwater Site Plan submitted to the Township by Grantor.

5. Grantor, his heirs, personal representatives, successors and assigns, hereby grant permission to the Township, by its authorized agents and employees, to enter upon the Premises without prior notification at reasonable times and upon presentation of proper identification to inspect the Stormwater BMPs whenever the Township deems necessary.

6. In the event the Grantor, or his heirs, personal representatives, successors and assigns, fails to maintain the Stormwater BMPs as shown on the Small Project

Stormwater Site Plan and in good working condition, the Township may enter upon the Premises and take whatever action it deems necessary to maintain said Stormwater BMPs and to charge the costs of such repairs to the Grantor, his heirs, personal representatives, successors and assigns. This provision shall not be construed to allow the Township to erect any structure of permanent nature on the Premises unless such structure(s) were part of the approved Small Project Stormwater Site Plan. It is expressly understood and agreed that the Township is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Township.

7. In the event that the Township, 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 Grantor shall reimburse the Township within thirty (30) days of receipt of invoice for all expenses incurred. The Township has the right to file a municipal lien for unpaid costs and expenses that have not been reimbursed thirty (30) days after receipt of invoice. Any municipal lien filed pursuant to this Agreement shall be in the amount of all costs incurred by the Township, plus a penalty of ten percent (10%) of such costs, plus the Township's reasonable attorneys' fees.

8. The intent and purpose of this Agreement is to ensure the proper maintenance of the Stormwater BMPs by the Grantor. This Agreement shall not be deemed to create any additional liability upon any party for damage(s) alleged to result from or be caused by nonpoint source pollution runoff. Furthermore, this Agreement imposes no liability of any kind whatsoever on the Township, or its elected and appointed officials, agents and employees.

9. Grantor agrees to indemnify the Township and all of its elected and appointed officials, agents and employees (hereafter collectively referred to as the "Indemnitees") against and hold Indemnitees harmless from any and all liability, loss or damage, including attorneys' fees and costs of investigation and defense, as a result of claims, demands, costs or judgments against Indemnitees which arise as a result of the design, installation, construction or maintenance of the Stormwater BMPs or any omissions relating thereto. In the event that a claim arising from Grantor's actions or omissions relating to the installation, construction or maintenance of Stormwater BMPs on the Premises is asserted against Indemnitees, the Township shall promptly notify Grantor, and Grantor shall defend, at his own expense, any suit based on the claim. If any judgment against Indemnitees shall be entered as a result of such claim, the Grantor agrees to indemnify Indemnitees and pay all costs and expenses stemming from said judgment.

10. This Agreement is not intended to, nor shall operate to limit the Township's rights and remedies under the SWM Ordinance. The Township may, in addition to the remedies prescribed herein, proceed with any action at law or in equity to bring about compliance with the Township SWM Ordinance and this Agreement.

11. This Agreement shall be binding on Grantor, his heirs, personal representatives, administrators, executors, assigns, and any other successors in interests, in perpetuity.

[SIGNATURES APPEAR ON FOLLOWING PAGE]

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

WARWICK TOWNSHIP
Lancaster County, Pennsylvania

Attest: _____
(Assistant) Secretary

By: _____
(Vice) Chairman
Board of Supervisors

[TOWNSHIP SEAL]

Witness:

GRANTOR:

_____ (SEAL)

Print Name: _____

_____ (SEAL)

Print Name: _____

All property owners must sign the Storm Water Management Agreement in the presence of a notary public who must complete the acknowledgment on the following page. If the property is jointly owned by husband and wife, both must sign.

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF LANCASTER)

On this _____ day of _____, 20____, before me, the undersigned officer, a notary public in and for the aforesaid Commonwealth and County, personally appeared

_____, who acknowledged himself/herself to be (Vice) Chairman of the Board of Supervisors of Warwick Township, Lancaster County, Pennsylvania, and that he/she, as such officer, being authorized to do so, executed the foregoing Storm Water Management Agreement and Declaration of Easement for the purposes therein contained by signing the name of such Township by himself/herself as such officer.

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

Notary Public

My commission expires:

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF LANCASTER)

On this _____ day of _____, 20____, before me, the subscriber, a notary public, in and for the aforesaid Commonwealth and County, came the above-named

_____, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed on the within instrument, and acknowledged the foregoing Storm Water Management Agreement and Declaration of Easement to be his/her/their act and deed and desired the same to be recorded as such.

Witness my hand and notarial seal.

Notary Public

My commission expires: