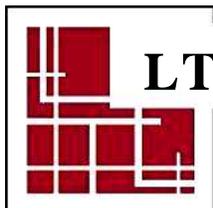


SIMPLIFIED APPROACH **for Stormwater Management**

HANDOUT FOR APPLICANTS
August 2014

FRANKLIN TOWNSHIP
CHESTER COUNTY

Prepared by:



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Attachment C: Form of Operation, Maintenance and Inspection Plan and Agreement for Simplified Approach	(7 page document)

I. GENERAL OVERVIEW

The Pennsylvania Stormwater Management Planning Act (Act 167) of 1978 mandates that counties prepare stormwater management plans and minimum stormwater standards in order to reduce flooding and stormwater impacts of future development and redevelopment. Franklin Township (recently adopted Ordinance 2013-04 that governs all aspects related to stormwater management within the Township and was codified under Chapter 19 of the Franklin Township Code of Ordinances (Stormwater Ordinance).

The Chester County County-wide Act 167 Plan represents the collective outcome of five years of collaborative work involving Chester County Water Resources Authority, the Pennsylvania Department of Environmental Protection (PADEP) and many Chester County municipalities and their managers, staff and engineers, as well as individuals and stakeholder organizations who have provided numerous comments and input through five review cycles. All inputs, comments and concerns were closely evaluated and incorporated as appropriate to reflect the broad range of community and individual interests, circumstances, values, and priorities that exist within the municipalities across Chester County.

Inadequate management of stormwater runoff resulting from land disturbance and development throughout a watershed can create the following:

- increased flooding
- increased flows and velocities in streams that contribute to erosion and sedimentation
- overtaxed capacity of streams and storm sewers
- increased cost of public facilities to convey and manage stormwater
- reduced infiltration and groundwater recharge
- increased pollution to waterways
- destroyed aquatic habitat
- increased pollutant concentrations such as sediment, nutrients, heavy metals and pathogens

A Simplified Approach has been prepared to aid homeowners with the design and construction of the required stormwater management improvements associated with the proposed improvement to the property.

The Simplified Approach discussed in this Handout applies to activities between 1,000 and 2,000 square feet of impervious surface or between 5,000 and 10,000 square feet earth disturbance. Agricultural structures up to 10,000 square feet plus another 5,000 square feet of adjoining parking/movement area may use the Simplified Approach. These limits are as specified in the Stormwater Ordinance to which you should refer if you are interested in more detail.

A stormwater Best Management Practice (BMP) is a facility constructed to manage stormwater impacts by providing water quality treatment, groundwater recharge through infiltration, volume reduction and peak rate control. BMPs include but are not limited to those listed and shown in the Simplified Approach, BMP Size Determination Worksheets (Worksheets) provided in Section V of this Handout. See the Stormwater Ordinance definition of BMP included below for more detail.

There are various methods that can be employed to address the increase in stormwater runoff created by an increase in impervious area. While not considered as formal elements, rain barrels can be provided for educational and small re-use applications. Porous paving on driveways and special precast pavers can also be utilized in certain applications, such as a patio, as an alternative to concrete, to reduce the amount of impervious cover being created.

The goal of the Simplified Approach is to allow the applicant to complete the Worksheets showing compliance with the infiltration goals of the Stormwater Ordinance. As needed or if desired by you, your contractor may complete the Worksheets for you. While the Simplified Approach is offered to applicants with projects that qualify for it, it is not required to be used, so you can always voluntarily elect to hire a design professional that can prepare a detailed design that meets the Township Ordinance requirements for your specific application if you so choose.

Additional information related to stormwater and BMPs can be found online at:

PA DEP's website: www.depweb.state.pa.us

[Home](#) > [Water](#) > [Bureau of Point and Non-Point Source Management](#) > Stormwater Management

Chester County's website www.chesco.org

[Home](#) > [Departments](#) > [Departments R - Z](#) > [Water Resources Authority](#) > Stormwater Management

Pennsylvania's e-library: <http://www.elibrary.dep.state.pa.us>

search 363-0300-002 for the Pennsylvania Stormwater Best Management Practices Manual

II. DEFINITIONS

Following is a list of frequently used definitions related to stormwater management. Additional definitions can be found in the Stormwater Ordinance.

Agricultural Activity – Activities associated with agriculture such as agricultural cultivation, agricultural operation, and animal heavy use areas. This includes the work of producing crops including tillage, plowing, disking, harrowing, planting or 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 to the Municipality for approval to engage in any Regulated Activity as defined in the Stormwater Ordinance.

BMP (Best Management Practice) – 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 the Stormwater Ordinance. Stormwater BMPs are commonly grouped into one (1) of two (2) broad categories or measures: “structural” or “nonstructural.” In the Stormwater Ordinance, nonstructural BMPs or measures refer to operational and/or 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. Non-structural BMPs include items such as protection of sensitive and special value features, minimize disturbance, reduce impervious coverage, disconnect/distribute/decentralize storm sewers, etc.

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

Erosion – The process by which the surface of the land, including water/stream channels, is worn away by water, wind, or chemical action.

Erosion and Sediment Control Plan – A plan which shows structures to minimize accelerated erosion and sedimentation, required by the Conservation District or the Municipality, and that must be prepared and approved per the applicable requirements.

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

Grade/Grading – 1. (Noun) A slope, usually of a road, channel, or natural ground, specified in percent and shown on plans as specified herein. 2. (Verb) To finish the surface of a roadbed, the top of an embankment, or the bottom of an excavation.

Groundwater – Water that occurs in the subsurface and fills or saturates the porous openings, fractures and fissures of under-ground soils and rock units.

Groundwater Recharge – The replenishment of existing natural groundwater supplies from infiltration of rain or overland flow.

Impervious Surface - A surface that has been compacted or covered with a layer of material so that it prevents or is resistant to infiltration of water, including but not limited to: structures such as roofs, buildings, storage sheds; other solid, paved or concrete areas such as streets, driveways, sidewalks, parking lots, patios, tennis or other paved courts; or athletic playfields comprised of synthetic turf materials. For the purposes of determining compliance with the Stormwater Ordinance, compacted soils or stone surfaces used for vehicle parking and movement shall be considered impervious. Surfaces that were designed to allow infiltration (i.e. areas of porous pavement) will be considered on a case-by-case basis by the Township Engineer, based on appropriate documentation and condition of the material, etc.

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

Infiltration Facility – A stormwater BMP designed to collect and discharge runoff in a manner that allows infiltration into underlying soils and groundwater (e.g., French drains, seepage pits, or seepage trenches, etc.).

Municipality – the Township.

PADEP – Pennsylvania Department of Environmental Protection.

Predevelopment – Land cover conditions assumed to exist within the proposed disturbed area prior to commencement of the Regulated Activity for the purpose of calculating the Predevelopment water quality, volume, infiltration volume, and peak flow rates as required in the Stormwater Ordinance.

Proposed Impervious Surface - All new, additional and replacement Impervious Surfaces.

Regulated Activity - Any Earth Disturbance Activity(ies) or any activity that involves the alteration or development of land in a manner that may affect stormwater runoff.

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

Sediment – Soil or other materials transported by, suspended in or deposited by surface water as a product of erosion.

Site – Total area of land in the Municipality where any proposed Regulated Activity is planned, conducted, or maintained or that is otherwise impacted by the Regulated Activity.

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

Stormwater Ordinance – Franklin Township Ordinance 2013-04 codified under Chapter 19 of the Franklin Township Code of Ordinances.

Swale – An artificial or natural waterway or low-lying stretch of land that gathers and conveys stormwater or runoff, and is generally vegetated for soil stabilization, stormwater pollutant removal, and infiltration.

Township – Franklin Township, Chester County, Pennsylvania.

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 groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, fens, and similar areas.

III. BMP INFORMATION

Stormwater management for small projects must consist of infiltration or on-site reuse of the first (1) inch of rainfall from proposed impervious surfaces. Infiltration can be provided by various types of facilities. While not considered as part of the design, certain features can be added 'in line' to the system, for re-use applications. These would include features such as a cistern, rain pillow, and rain barrels. The following are the options that can be selected when utilizing the Simplified Approach:

A. BMP TYPES

Underground Options:

- Infiltration Bed
- Infiltration Trench
- Infiltration Trench with Pipe
- Tank with Holes

Aboveground Options:

- Infiltration Basin
- Rain Garden

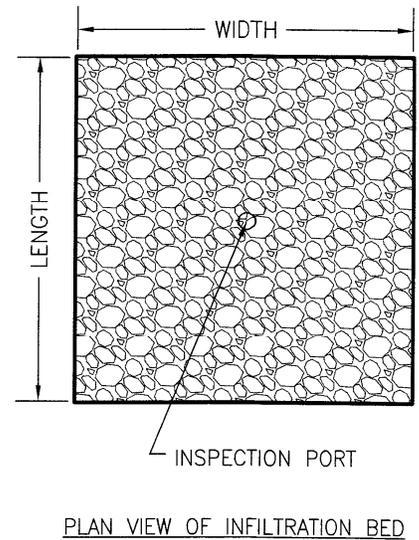
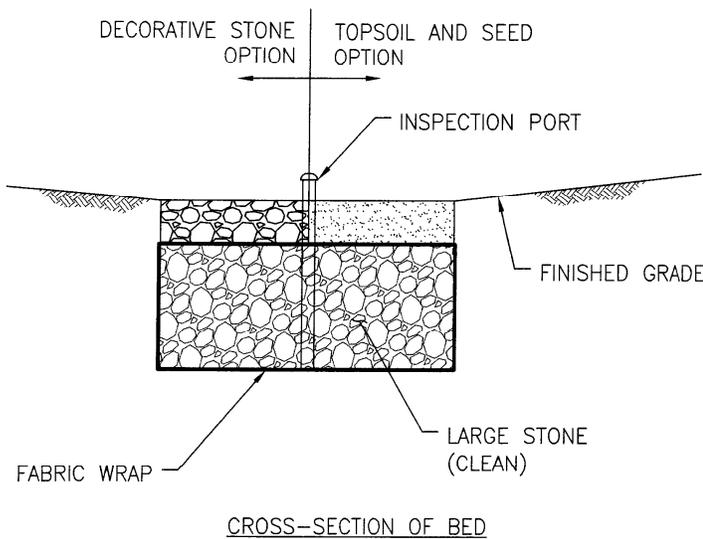
The following pages provide a description of each of the above facilities along with an illustration of each.

For Construction Details for each BMP see Attachment A to this Handout.

B. BMP DESCRIPTIONS AND ILLUSTRATIONS

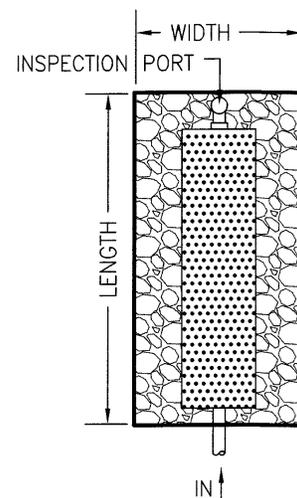
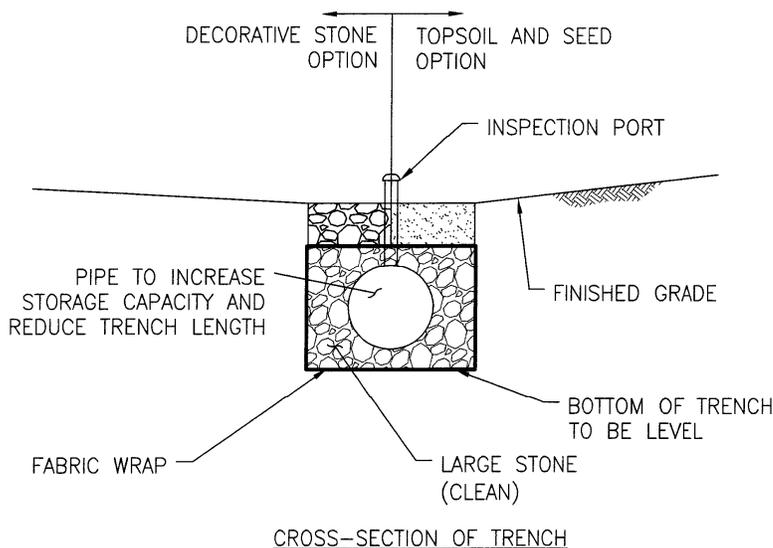
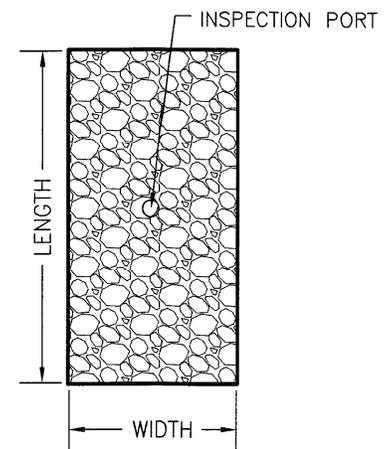
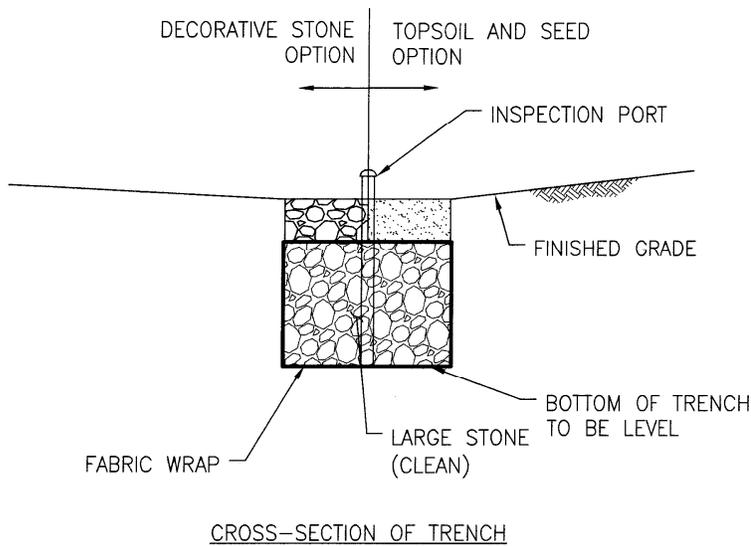
Infiltration Bed

An infiltration bed is typically used to capture surface and/or roof water.. Roof drains from the proposed structure are piped into an underground bed of gravel to allow the stormwater to infiltrate into the ground. An overflow pipe is provided to release excess storm volumes. A cleanout is provided to facilitate maintenance and to facilitate inspection.. The soil over the bed should be planted with vegetation that will not interfere with the operation of the bed. In some cases, decorative stone can cover the infiltration bed.



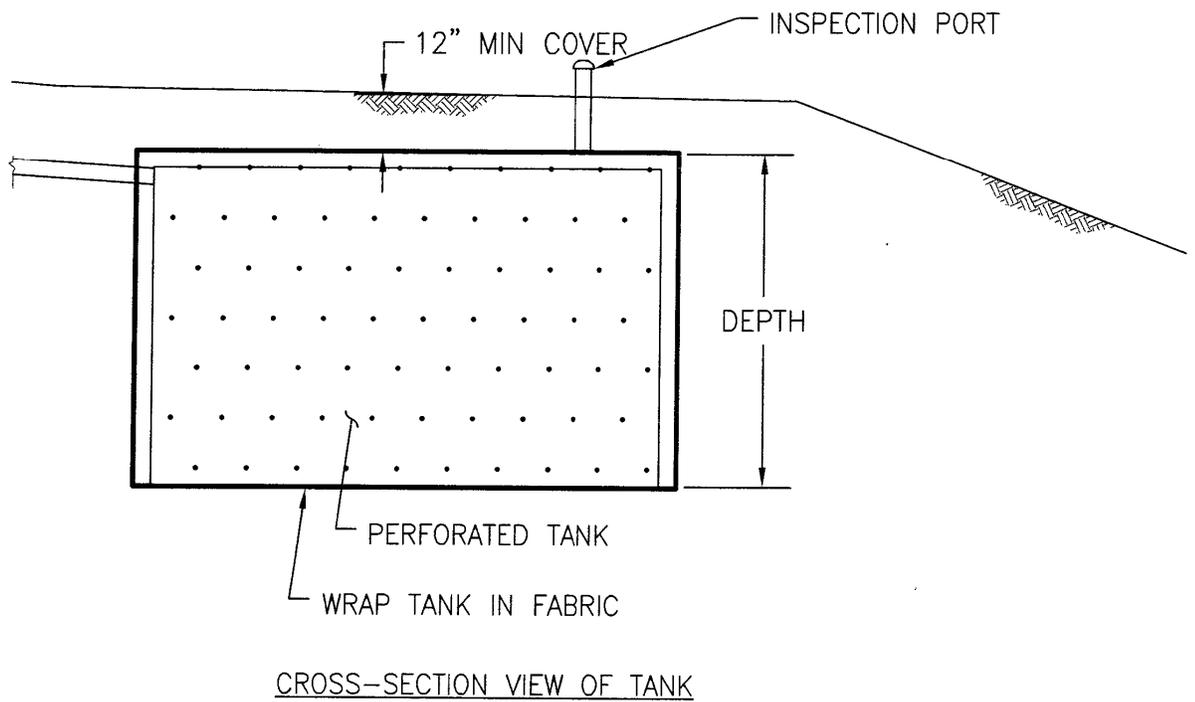
Infiltration Trench [with or without a pipe]

Infiltration trenches are utilized along the perimeter of impervious surfaces to collect, store and infiltrate stormwater runoff from a dwelling, driveway, or other improvement. River rock or equivalent may be placed on the bed to allow the stormwater runoff to enter the trench. Alternatively the bed may utilize a perforated pipe with inlets to facilitate the stormwater entering the trench. When on a slope, the trench is constructed as a terraced system. Pipe can be utilized within the trench to increase the available storage volume. In areas where infiltration is intended, it is important to avoid compaction of the trench and surrounding area (e.g., avoid use of heavy equipment) in order to allow the water to permeate better. To promote infiltration, once the trench has been excavated, the entire bottom area should be scarified to loosen the soils at the bottom of the trench.



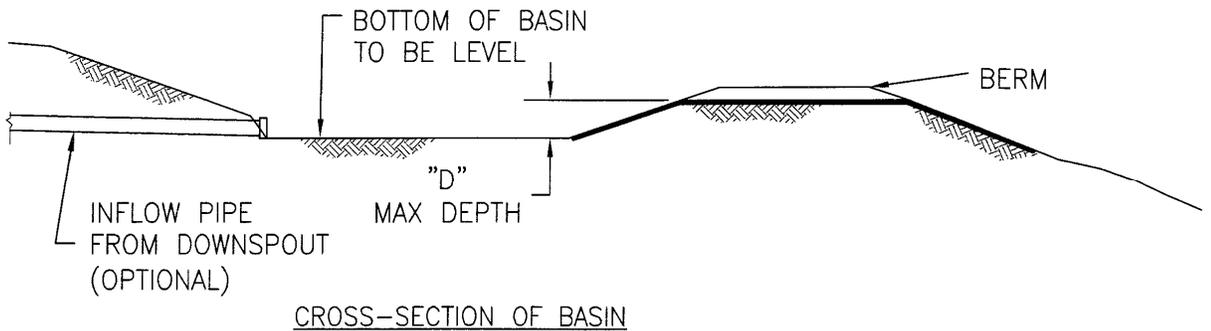
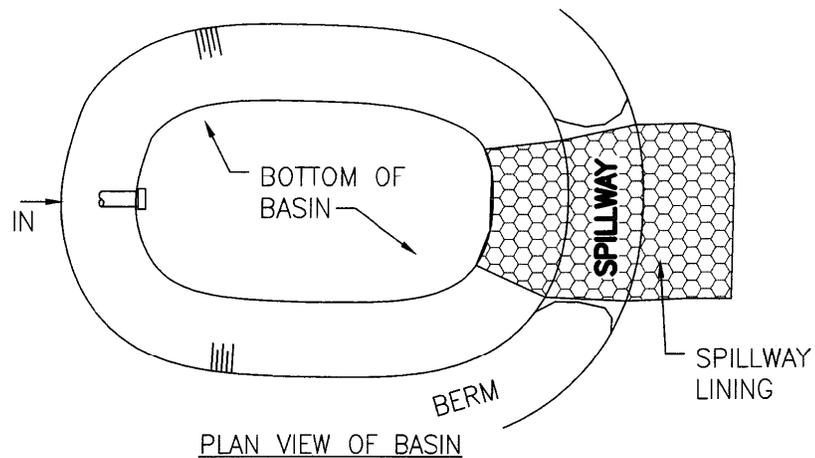
Tank [with holes]

Tanks can be made from a variety of materials, such as steel, concrete, HPDE, etc. Holes are provided in the tank to allow the stored water to slowly drain into the surrounding ground area. Most tanks are pre-manufactured for this type of application, though use of existing materials can be approved on a case-by-case basis.



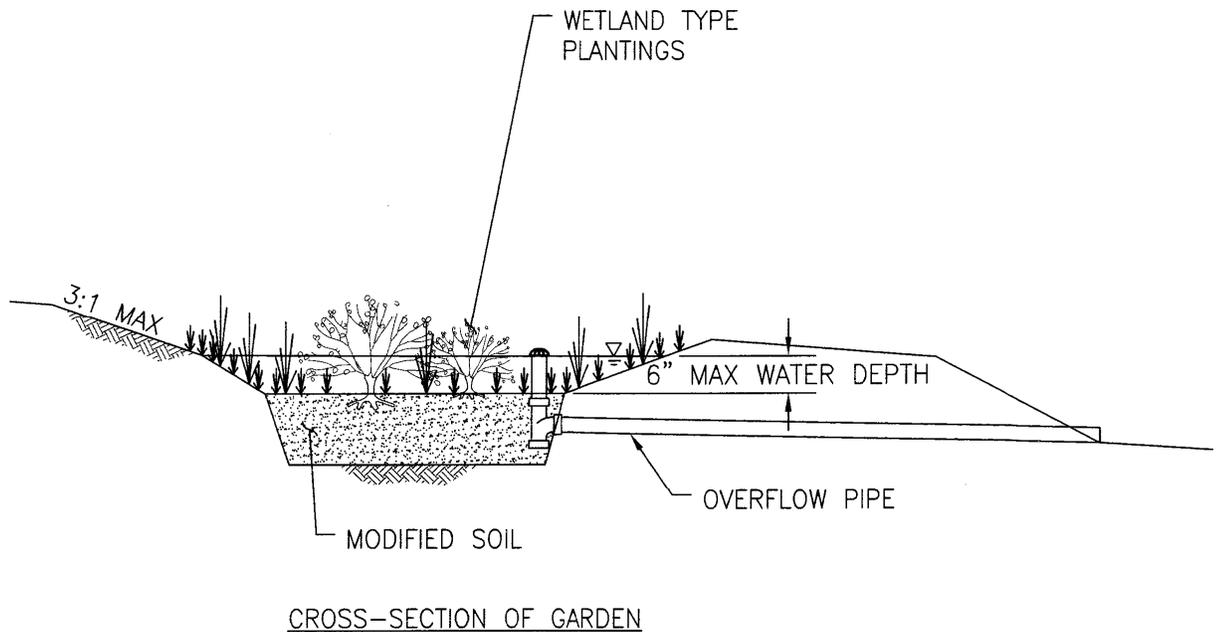
Infiltration Basin

An infiltration basin provides an aboveground area for water to be stored and infiltrate into the ground. Roof drains and overland stormwater runoff are directed into the aboveground basin area. A spillway is provided to release the larger storm volumes. The spillway should be located such that any down slope problems are avoided when water is flowing over it. The basin needs to be planted with vegetation that is tolerant of the wet conditions that will occur.



Rain Garden

Rain gardens are similar to the infiltration basin, but provide less storage volume and rely more on the plantings to provide water quality and to remove the water through evapotranspiration. Plant material utilized in the rain garden should be selected by a landscaping professional and be suitable for the proposed conditions. The bottom of the garden is a modified soil intended to hold water and allow it to infiltrate. An overflow pipe is provided to take larger volumes of stormwater runoff away. At least twice a year the Landowner is to inspect the rain garden for sediment buildup, ground cover and vegetative conditions and make any repairs as needed. Pruning and weeding may be required especially while vegetation is being established. Plant residue/debris, if any, needs to be removed every year. Perennial plantings may be cut down and removed at the end of the growing season. The mulch needs to be re-spread should erosion be evident and replenished as needed. Once every 2 to 3 years the entire area may require mulch replacement. During extended drought, watering may be necessary. The owner of the facility should be aware of the long-term maintenance needs of the plant materials utilized.



C. SELECTION CONSIDERATIONS

Underground Options:

	<u>Pros:</u>	<u>Cons:</u>
<u>Infiltration Bed:</u>	No Visual Impact Direct Connection of Roof Drains Larger Volumes Possible	Requires Roof Gutter Screens Repairs Difficult Area Above Restricted
<u>Infiltration Trench:</u>	No Visual Impact Flexible Location Can Collect Sheet Flow	Requires Roof Gutter Screens Repairs Difficult Area Above Restricted
<u>Infiltration Trench, with Pipe:</u>	No Visual Impact Flexible Location Can Collect Sheet Flow Smaller Footprint-Larger Volume	Requires Roof Gutter Screens Repairs Difficult Area Above Restricted More Expensive
<u>Tank with Holes:</u>	No Visual Impact Direct Connection of Roof Drains Large Volumes Possible Smaller Footprint Easy Access for Inspection	Requires Roof Gutter Screens More Expensive

Aboveground Options:

	<u>Pros:</u>	<u>Cons:</u>
<u>Infiltration Basin:</u>	Easy Maintenance Large Volumes Easily Possible	Standing Water Visually Unattractive
<u>Rain Garden:</u>	Visually Part of Landscape	Some Standing Water More Intense Maintenance

D. LOCATION CONSIDERATIONS

BMP's should be located:

- over the most suitable soil on the site
- avoiding areas of wet or poorly drained soils (high water table)
- avoiding areas underlain by shallow bedrock
- outside wetlands, floodplains and environmentally sensitive areas (requires other permits)

BMP's should be located with the following minimum setbacks:

- ten (10) feet down gradient from a building basement
- one hundred (100) feet up gradient from a building basement
- ten (10) feet from property lines
- one hundred (100) feet from wells
- ten (10) feet from septic system drain fields (or per PADEP)

E. INSTALLATION GUIDELINES

1. BMPs shall be protected during construction to prevent sediment-laden (muddy) water from entering the facility.
2. Excavation for the BMP's shall be conducted in a manner that will not compact the bottom of the facility.
3. For subsurface facilities, the bottom of the facility shall be scarified immediately prior to the placement of geotextile.
4. Geotextile shall be placed in accordance with the manufacturer's specifications. Seams shall be overlapped a minimum of 16 inches.
5. The area of the BMP shall be fenced off during site construction. Construction equipment shall be prohibited from entering the area to avoid soil compaction.

IV. INSTRUCTIONS FOR COMPLETING BMP SIZE DETERMINATION WORKSHEETS

Step One

The first step in sizing any BMP is to determine the total amount of impervious surface added by your project. Impervious surface includes all proposed areas of buildings, paving, concrete and compacted gravel. See the definition of impervious surface in Section II above for more information. This value should be filled in the space provided in the table under Section V. SIZE DETERMINATION WORKSHEETS, STEP ONE.

Step Two

The second step in sizing is to choose a BMP to install. Using the information provided for each BMP in Section III and based on the amount of space available and its configuration, choose amongst the BMPs presented. Multiple BMPs may be chosen, and are encouraged, depending on the types of impervious surface proposed and how the surfaces will drain. Alternative BMPs will be considered for approval by the Township Engineer on a case-by-case basis. Indicate your choice(s) in the table provided under Section V. SIZE DETERMINATION WORKSHEETS, STEP TWO.

Step Three

The third step in sizing your chosen BMP is to read the table provided under Section V. SIZE DETERMINATION WORKSHEETS, STEP THREE. Enter the first column and find the amount of impervious that you determined under Step One, or if multiple BMPs are proposed the amount of impervious surface draining to that BMP. Move to the right until you are under the column containing the BMP that you have chosen. For most of the BMPs, the values in this space will be the length and width of your BMP. The depth and other design criteria is indicated at the top of the column. If you have chosen a “Tank with holes”, the number in the space will be the amount of tanks required. The size of the tank is indicated at the top of the column.

Step Four

The fourth step in completing the worksheets is to prepare a site sketch plan of the existing and proposed features in the project area. The blank graph paper provided under Section V. SIZE DETERMINATION WORKSHEETS, STEP FOUR may be used. A smaller size sheet should not be used, larger is allowed.

V. SIZE DETERMINATION WORKSHEETS

STEP ONE: DETERMINE PROPOSED IMPERVIOUS SURFACE	
<u>PROPOSED TOTAL AREA OF IMPERVIOUS SURFACE</u> Includes all proposed areas of buildings, paving, concrete and compacted gravel that are part of the proposed work. See definition of "Impervious Surface".	sq. ft.

STEP TWO: SELECT BMP(s) TO BE UTILIZED	
BMP TYPE*	(How Many)
1. Infiltration Bed	
2. Infiltration Trench	
3. Infiltration Trench with Pipe	
4. Tank with Holes	
5. Infiltration Basin	
6. Rain Garden	
TOTAL	

* You are not limited to one BMP. Use of multiple BMPs is encouraged and in some cases will be needed to accommodate site topography. Multiple BMPs are also beneficial in the event one would fail or require maintenance, that the secondary BMP is in place and functional.

STEP THREE: SIZE BMP(s)

STORMWATER BMP CALCULATION FOR SIMPLIFIED APPROACH IN FRANKLIN TOWNSHIP, CHESTER COUNTY

	Underground Options				Aboveground Options	
	Infiltration Bed	Infiltration Trench	Infiltration Trench w/ Pipe	Tank with Holes	Infiltration Basin	Rain Garden
	<i>for 2 feet deep**</i>	<i>for 2 feet deep**</i>	<i>for 2 feet deep**</i>	<i>manufacturer</i>	<i>for 5:1 side slope</i>	<i>max 0.5 feet deep**</i>
	<i>square</i>	<i>2 feet wide</i>	<i>and 12 inch pipe</i>	<i>dependent</i>	<i>rectangular</i>	<i>square</i>
					<i>max 0.5 feet deep**</i>	
amount of impervious*	length x width	length x width	length x width	required min.	length x width	length x width
(sq. ft.)	(ft) x (ft)	(ft) x (ft)	(ft) x (ft)	(gallons)	(ft) x (ft)	(ft) x (ft)
500	8 x 8	26 x 2	20 x 2	311	11 x 5	7 x 7 (49 sf ⁺)
600	8 x 8	32 x 2	24 x 2	373	12 x 5	7 x 7 (49 sf)
700	9 x 9	37 x 2	28 x 2	435	12 x 6	8 x 8 (64 sf)
800	10 x 10	42 x 2	32 x 2	497	14 x 6	8 x 8 (64 sf)
900	10 x 10	47 x 2	36 x 2	559	14 x 7	9 x 9 (81 sf)
1000	11 x 11	52 x 2	40 x 2	621	16 x 7	9 x 9 (81 sf)
1100	11 x 11	57 x 2	44 x 2	683	16 x 8	10 x 10 (100 sf)
1200	12 x 12	63 x 2	48 x 2	745	18 x 8	10 x 10 (100 sf)
1300	12 x 12	68 x 2	53 x 2	808	19 x 8	10 x 10 (100 sf)
1400	13 x 13	73 x 2	57 x 2	870	19 x 9	11 x 11 (121 sf)
1500	13 x 13	78 x 2	61 x 2	932	20 x 9	11 x 11 (121 sf)
1600	13 x 13	83 x 2	65 x 2	994	20 x 10	11 x 11 (121 sf)
1700	14 x 14	89 x 2	69 x 2	1056	21 x 10	12 x 12 (144 sf)
1800	14 x 14	94 x 2	73 x 2	1118	22 x 10	12 x 12 (144 sf)
1900	15 x 15	99 x 2	77 x 2	1180	22 x 11	12 x 12 (144 sf)
2000	15 x 15	104 x 2	80 x 2	1242	23 x 11	13 x 13 (169 sf)

* For proposed impervious area between the amounts shown, interpolation is allowed.

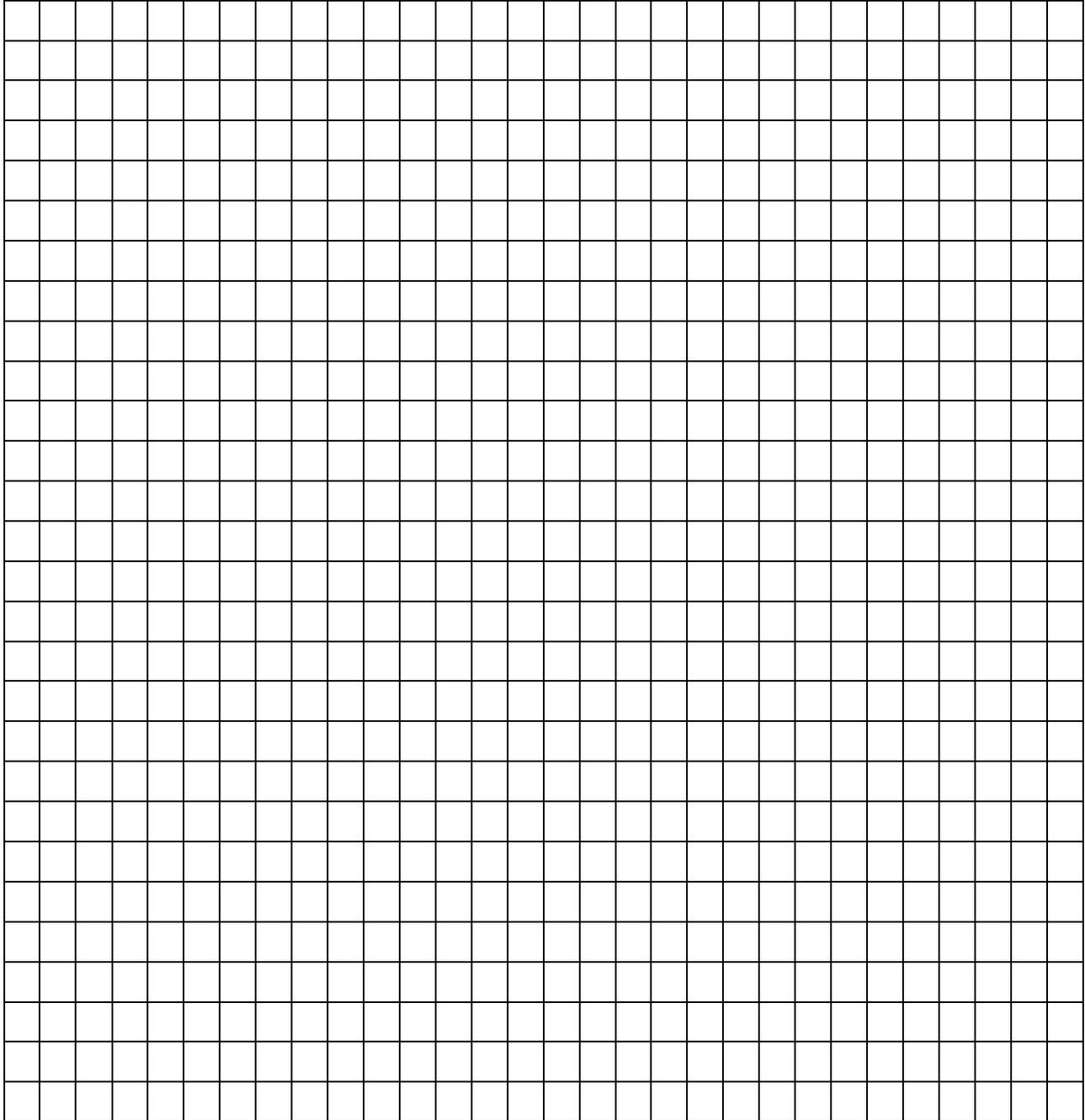
** Alternative BMP dimensions/configurations may be approved on a case by case basis.

⁺ sf = square feet

STEP FOUR: PREPARE A SITE SKETCH PLAN

NAME: _____

LOCATION: _____



Is your drawing to scale Y / N? If yes, what is the scale? _____

**Any questions please contact:
LTL Consultants, Ltd. at 610-987-9290 or 1-888-987-8886**

VI. SUBMISSION/APPLICATION REQUIREMENTS

The items to be submitted to the Township are:

- Stormwater Permit Application (See Attachment B to this Handout)
- Fee
- Worksheets (all pages from Section V above)
- Site Sketch Plan
- Operation, Maintenance and Inspection Plan and Agreement for Simplified Approach (See Attachment C to this Handout)

Basic information is needed regarding the proposed activity and the BMP(s) chosen to manage the stormwater runoff, including but not limited to the types of materials used, total impervious areas and size chosen. Completion of the Worksheets will provide the needed information. In addition, a simple Site Sketch Plan (see example) showing the location of the following features (existing and proposed) shall be submitted:

- structures, driveways and other paved surfaces (all impervious areas) with approximate dimensions in feet,
- BMPs,
- erosion control measures, and
- on-site septic system and wells (potable) showing rough proximity to infiltration facilities.

Completing the Worksheets and submitting them with the Stormwater Permit Application should provide sufficient information for review for compliance with the requirements.

VII. EXAMPLE

STEP ONE: DETERMINE PROPOSED IMPERVIOUS SURFACE	
<u>PROPOSED TOTAL AREA of IMPERVIOUS SURFACE</u> Includes all proposed areas of buildings, paving, concrete and compacted gravel that are part of the proposed work. See definition of impervious surface.	new gravel 30 x 30 = 900 new pole barn 24 x 36 =864 TOTAL 1764 sq. ft.*

STEP TWO: SELECT BMP(s) TO BE UTILIZED	
BMP NAME	(How Many)
1. Infiltration Bed	1
2. Infiltration Trench	1
3. Infiltration Trench with Pipe	
4. Tank with Holes	
5. Infiltration Basin	
6. Rain Garden	
TOTAL	2

In the above case, two separate BMP features are being utilized.

STEP THREE: SIZE BMP(s)

STORMWATER BMP CALCULATION FOR SIMPLIFIED APPROACH IN FRANKLIN TOWNSHIP, CHESTER COUNTY

	Underground Options				Aboveground Options	
	Infiltration Bed	Infiltration Trench	Infiltration Trench w/ Pipe	Tank with Holes	Infiltration Basin	Rain Garden
	<i>for 2 feet deep**</i>	<i>for 2 feet deep**</i>	<i>for 2 feet deep**</i>	<i>manufacturer</i>	<i>for 5:1 side slope</i>	<i>max 0.5 feet deep**</i>
	<i>square</i>	<i>2 feet wide</i>	<i>and 12 inch pipe</i>	<i>dependent</i>	<i>rectangular</i>	<i>square</i>
					<i>max 0.5 feet deep**</i>	
amount of impervious*	length x width	length x width	length x width	required min.	length x width	length x width
(sq. ft.)	(ft) x (ft)	(ft) x (ft)	(ft) x (ft)	(gallons)	(ft) x (ft)	(ft) x (ft)
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1800	14 x 14	94 x 2	73 x 2	1118	22 x 10	12 x 12 (144 sf)
1900	15 x 15	99 x 2	77 x 2	1180	22 x 11	12 x 12 (144 sf)
2000	15 x 15	104 x 2	80 x 2	1242	23 x 11	13 x 13 (169 sf)

* For proposed impervious area between the amounts shown, interpolation is allowed.

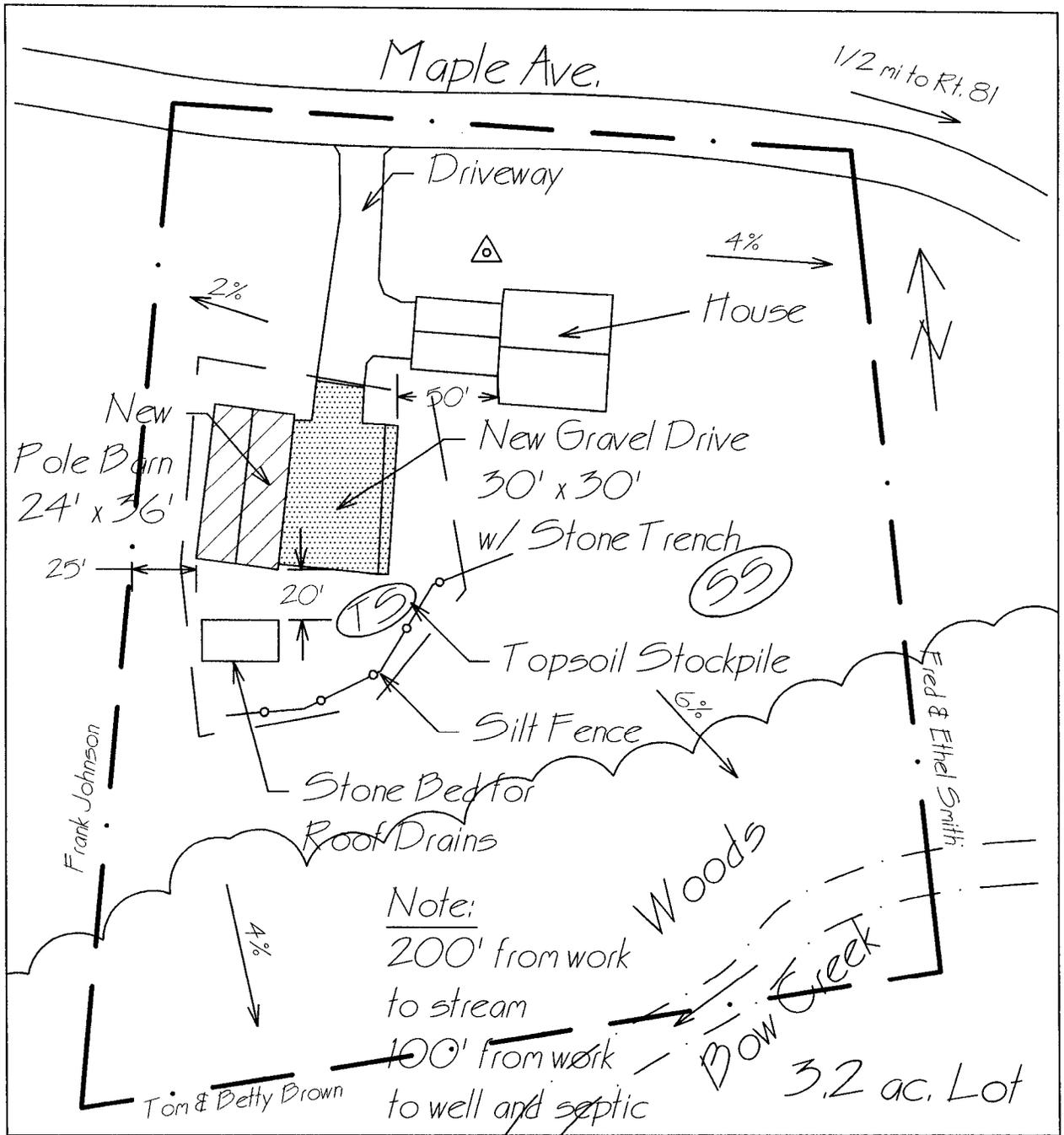
⁺ sf = square feet

** Alternative BMP dimensions/configurations may be approved on a case by case basis.

STEP FOUR: SITE SKETCH PLAN

Plan shall contain the following items:

- Lot configuration and total acreage.
- Existing features: buildings, driveways, parking areas, woodland, streams, etc.
- Proposed impervious surfaces: driveways, parking areas including dimensions.
- Names of owners immediately adjacent to the project site location.
- Locations of existing streets or easements, railroads, drainage facilities.
- Proposed erosion and sedimentation control facilities.
- Location of watercourses, wetlands, and riparian stream buffer located within the property or one hundred (100) feet from the project site location.
- Distances between the proposed activity and existing features, property lines, on-lot sewage facilities, wells and watercourses.

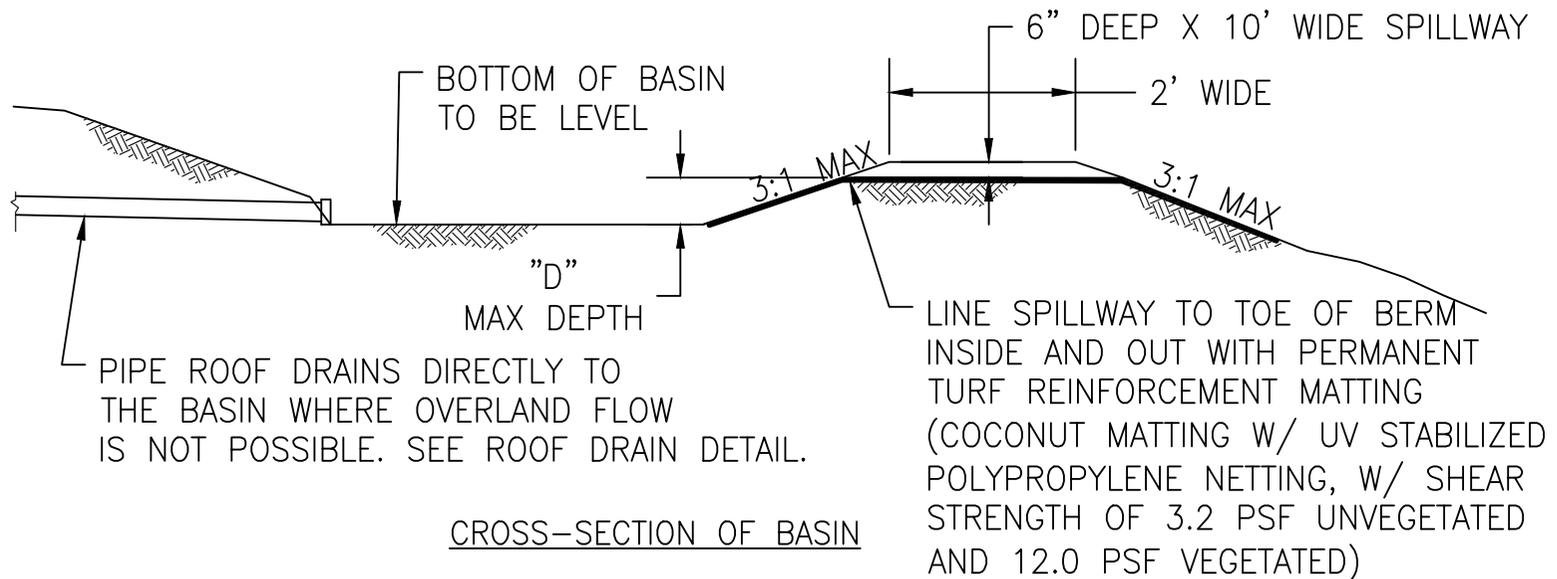
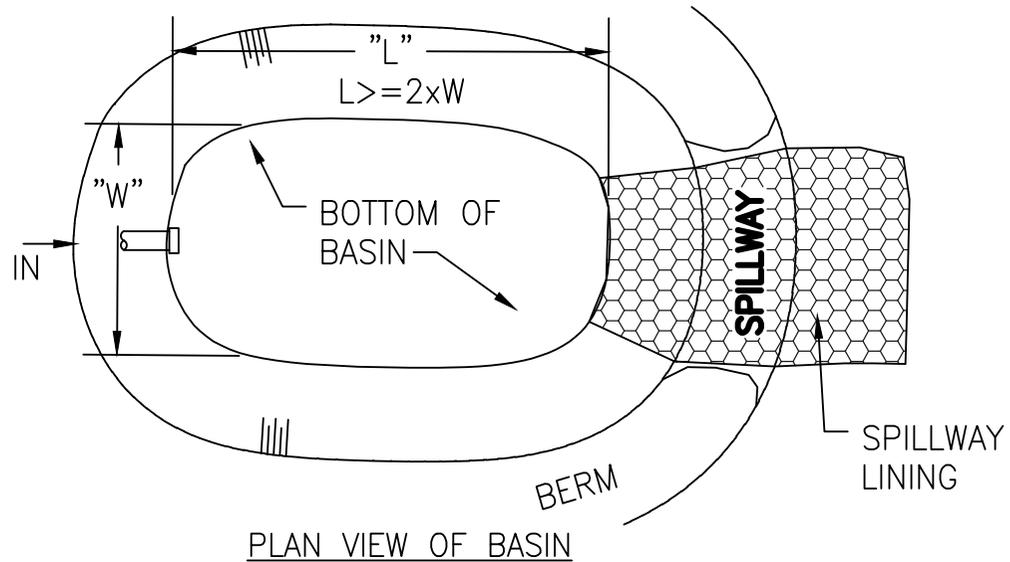


- Landscape Features
- North Arrow
 - Stream
 - Direction and Slope of Flow
 - Limit of Disturbance
 - Septic System
 - Well

Plan prepared by Joe Homeowner
 Date Month XX, 20XX

Attachment A

Construction Details for BMPs



PIPE ROOF DRAINS DIRECTLY TO THE BASIN WHERE OVERLAND FLOW IS NOT POSSIBLE. SEE ROOF DRAIN DETAIL.

LINE SPILLWAY TO TOE OF BERM INSIDE AND OUT WITH PERMANENT TURF REINFORCEMENT MATTING (COCONUT MATTING W/ UV STABILIZED POLYPROPYLENE NETTING, W/ SHEAR STRENGTH OF 3.2 PSF UNVEGETATED AND 12.0 PSF VEGETATED)



SHEET TITLE: INFILTRATION BASIN

DATE: 06/25/14

PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY

SHEET NO.:

PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS

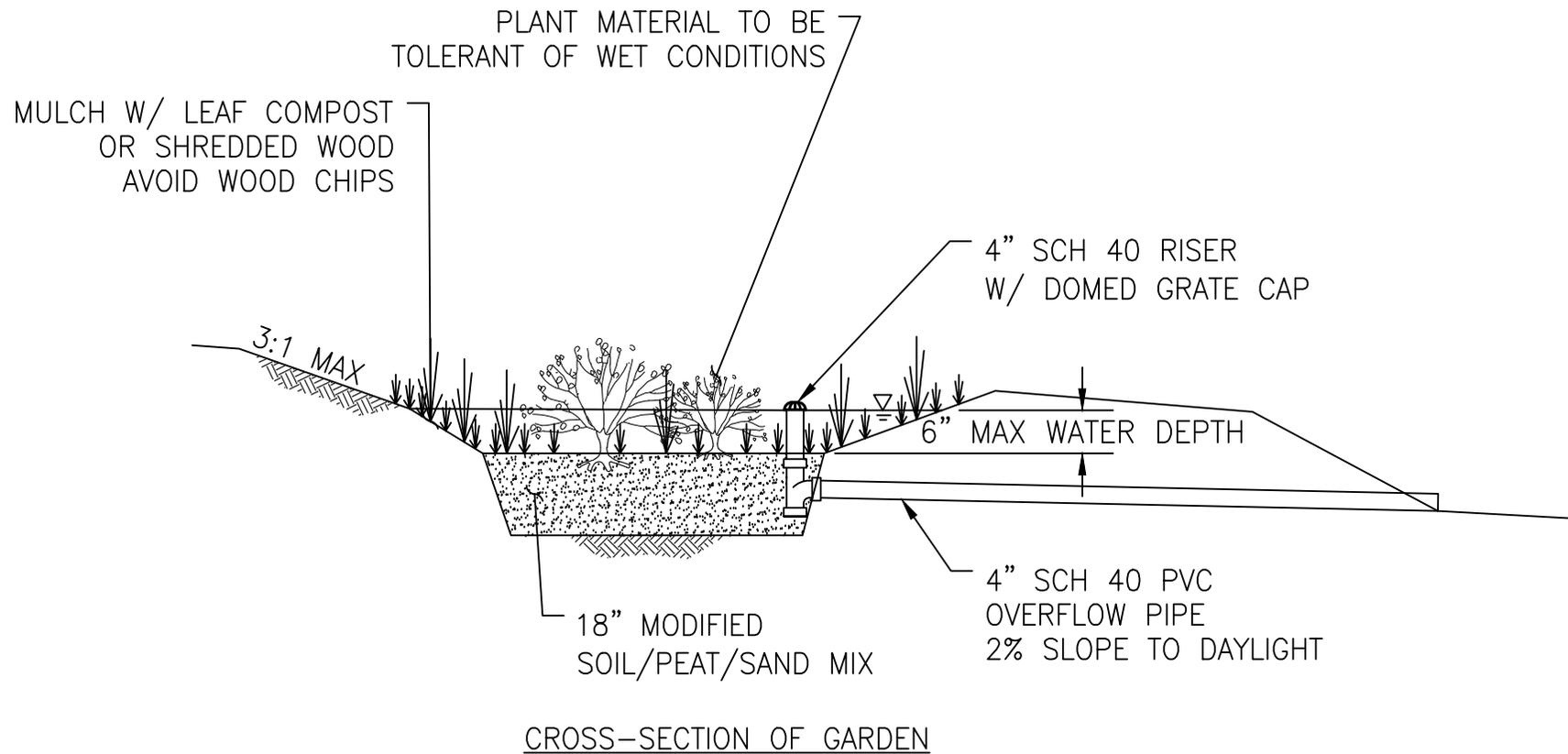
PROJECT NO.: 0205-0147

DRAWN BY: JKW

APPROVED BY: PCE

SCALE: NOT TO SCALE

A1



SHEET TITLE: **RAIN GARDEN**

DATE: 06/25/14

PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY

SHEET NO.: **A2**

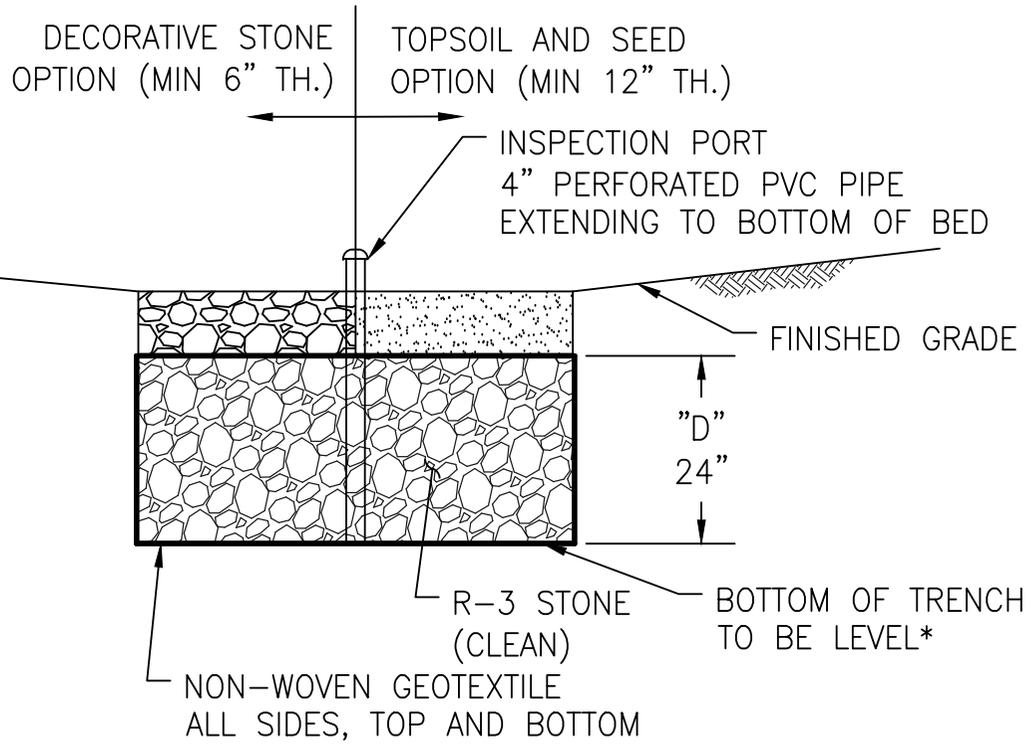
PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS

PROJECT NO.: 0205-0147

DRAWN BY: JKW

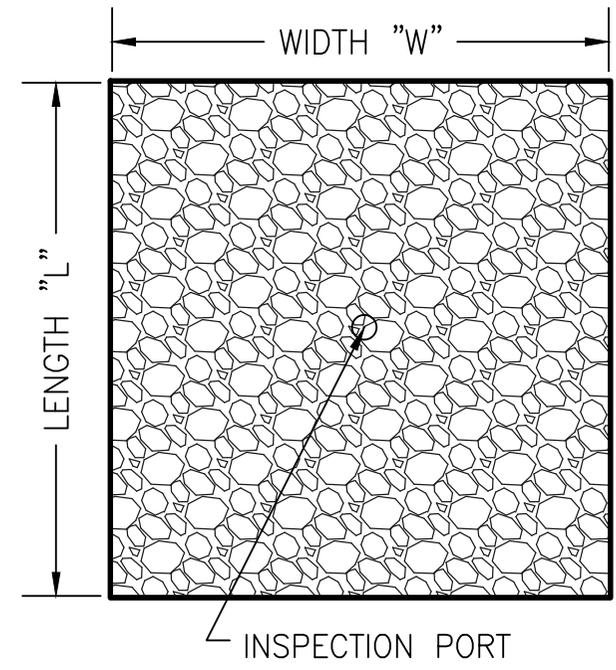
APPROVED BY: PCE

SCALE: NOT TO SCALE



CROSS-SECTION OF BED

* SEE STEPPED TRENCH DETAIL FOR TRENCHES ON SLOPED GROUND



PLAN VIEW OF INFILTRATION BED

NOTE: FOR INFILTRATION BED LENGTH = WIDTH

SEE PIPE CONNECTION DETAIL FOR BEDS FED BY ROOF DRAINS OR OTHER PIPING



SHEET TITLE: INFILTRATION BED	DATE: 06/25/14	PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY		SHEET NO.: U1
	PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS	PROJECT NO.: 0205-0147	DRAWN BY: JKW APPROVED BY: PCE	

DECORATIVE STONE
OPTION (MIN 6" TH.)

TOPSOIL AND SEED
OPTION (MIN 12" TH.)

INSPECTION PORT
4" PERFORATED PVC PIPE
EXTENDING TO BOTTOM OF BED

FINISHED GRADE

"D"
24"

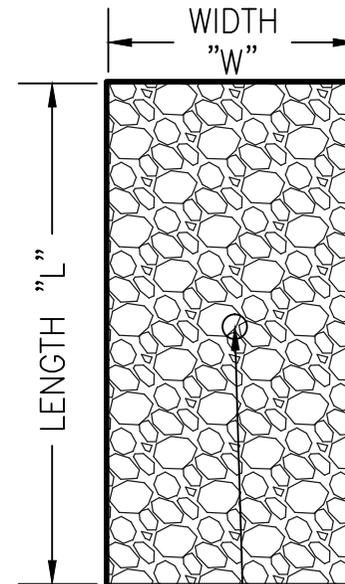
NON-WOVEN GEOTEXTILE
ALL SIDES,
TOP AND BOTTOM

R-3 STONE
(CLEAN)

BOTTOM OF TRENCH
TO BE LEVEL*

CROSS-SECTION OF TRENCH

* SEE STEPPED TRENCH DETAIL
FOR TRENCHES ON SLOPED GROUND



INSPECTION PORT

PLAN VIEW OF INFILTRATION TRENCH

SEE PIPE CONNECTION DETAIL
FOR TRENCHES FED BY ROOF
DRAINS OR OTHER PIPING



SHEET TITLE:
INFILTRATION TRENCH

DATE:
06/25/14

PROJECT LOCATION:
FRANKLIN TOWNSHIP, CHESTER COUNTY

SHEET NO.:

PROJECT: BMP INFILTRATION TYPES
CONSTRUCTION DETAILS

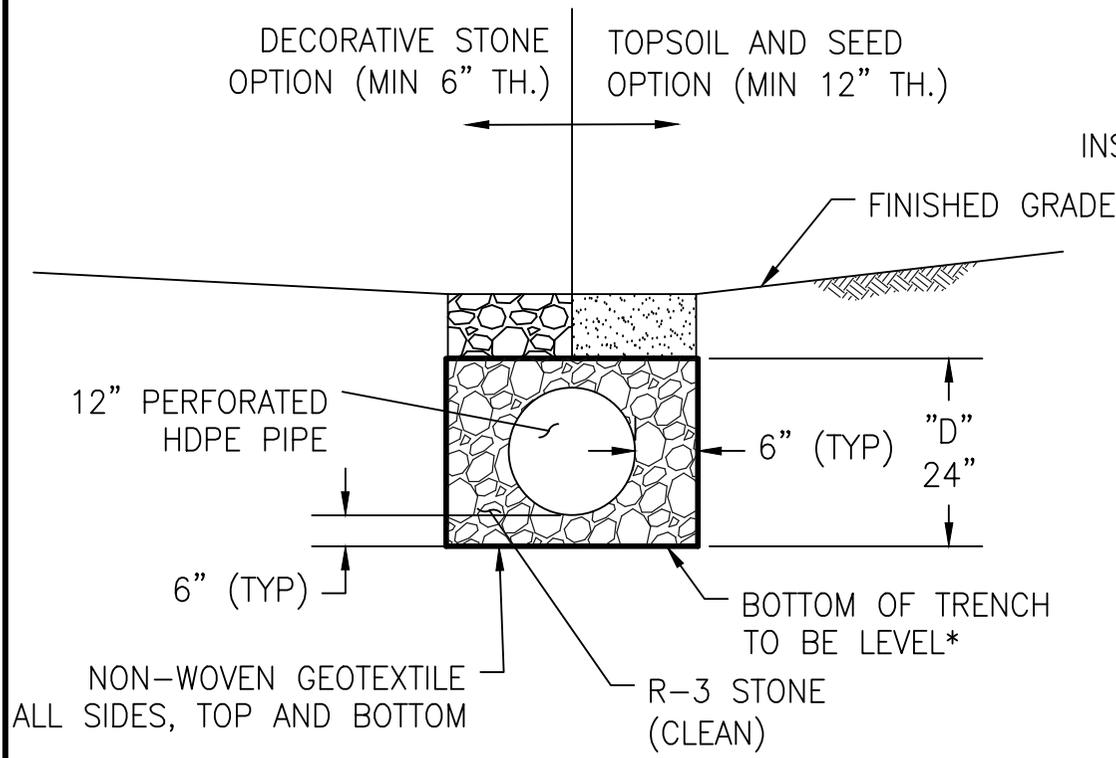
PROJECT NO.:
0205-0147

DRAWN BY:
JKW

APPROVED BY:
PCE

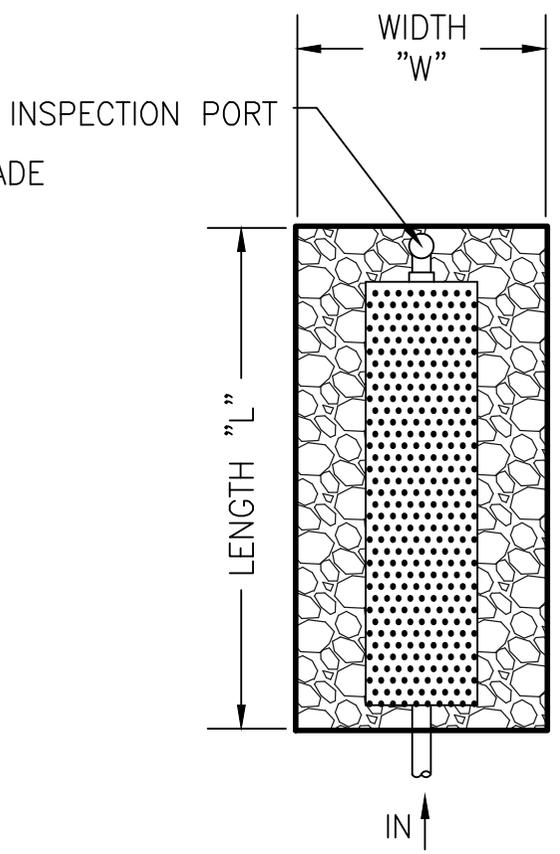
SCALE:
NOT TO SCALE

U2



CROSS-SECTION OF TRENCH

* SEE STEPPED TRENCH DETAIL FOR TRENCHES ON SLOPED GROUND



PLAN OF INFILTRATION TRENCH WITH PIPE

SEE PIPE CONNECTION DETAIL FOR TRENCHES FED BY ROOF DRAINS OR OTHER PIPING



SHEET TITLE: INFILTRATION TRENCH W/ PIPE

PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS

DATE: 06/25/14

PROJECT NO.: 0205-0147

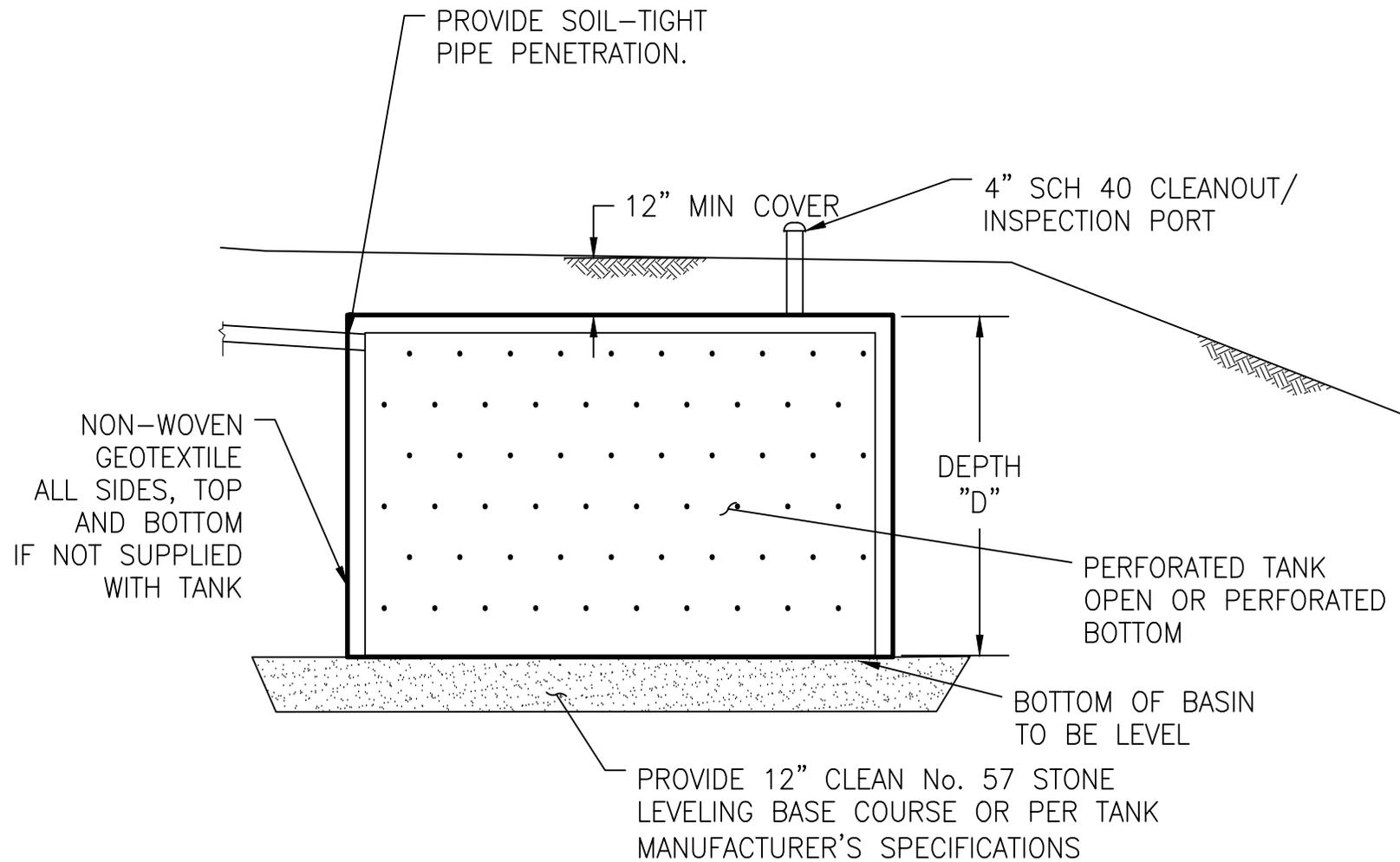
PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY

DRAWN BY: JKW

APPROVED BY: PCE

SCALE: NOT TO SCALE

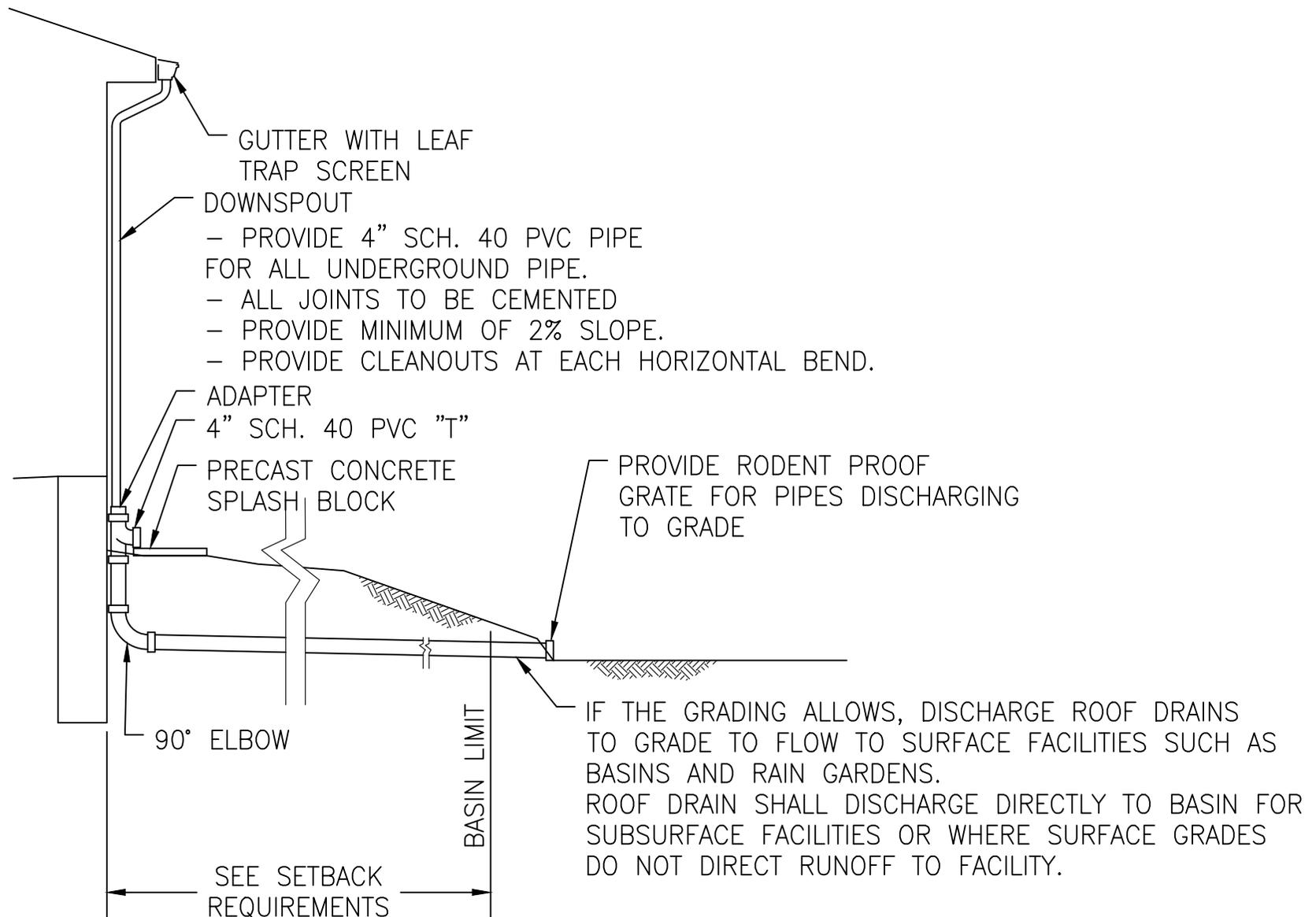
SHEET NO.: U3



CROSS-SECTION VIEW OF TANK



SHEET TITLE: STORAGE TANK	DATE: 06/25/14	PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY		SHEET NO.: U4
	PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS	PROJECT NO.: 0205-0147	DRAWN BY: JKW	



SHEET TITLE: **ROOF DRAIN DETAIL**

PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS

DATE: 06/25/14

PROJECT NO.: 0205-0147

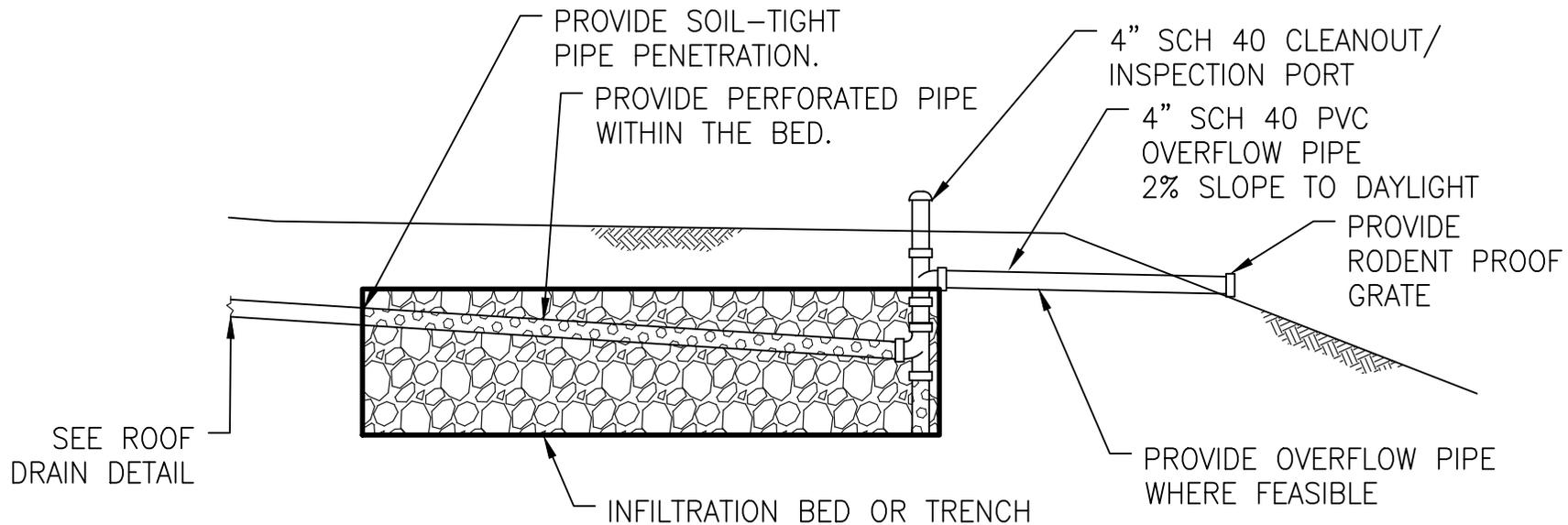
PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY

DRAWN BY: JKW

APPROVED BY: PCE

SCALE: NOT TO SCALE

SHEET NO.: **D1**



CROSS-SECTION OF BED/TRENCH



SHEET TITLE:
PIPE CONNECTION DETAIL

DATE:
06/25/14

PROJECT LOCATION:
FRANKLIN TOWNSHIP, CHESTER COUNTY

SHEET NO.:

PROJECT: BMP INFILTRATION TYPES
CONSTRUCTION DETAILS

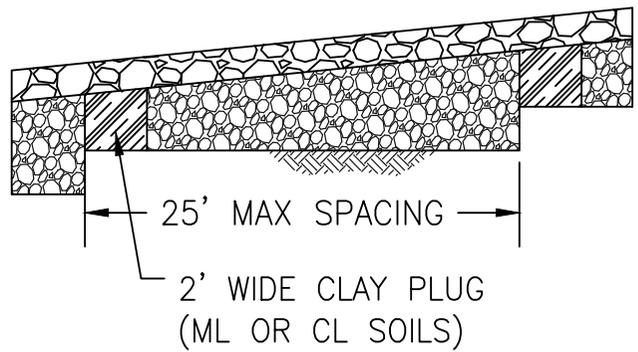
PROJECT NO.:
0205-0147

DRAWN BY:
JKW

APPROVED BY:
PCE

SCALE:
NOT TO SCALE

D2



LONGITUDINAL SECTION OF TRENCH

TO BE USED FOR TRENCHES WHERE THE FINISHED
LONGITUDINAL GRADE OVER THE TRENCH IS GREATER THAN 4%



SHEET TITLE: STEPPED TRENCH DETAIL	DATE: 06/25/14	PROJECT LOCATION: FRANKLIN TOWNSHIP, CHESTER COUNTY		SHEET NO.: D3
	PROJECT: BMP INFILTRATION TYPES CONSTRUCTION DETAILS	PROJECT NO.: 0205-0147	DRAWN BY: JKW	

Attachment B

Franklin Township Stormwater Permit Application

STORMWATER PERMIT APPLICATION

FRANKLIN TOWNSHIP, Chester County, Pennsylvania

	For Township Use:
	Date of Receipt:
	Fee Received:
Name of Property Owner(s) :	
Street Address:	
City:	Zip: Phone:
E-mail address (optional):	
Name of Contractor :	
Street Address:	
City:	Zip: Phone:
E-mail address (optional):	
Name of Architect/Engineer/Surveyor :	
Company:	
Street Address:	
City:	Zip: Phone:
E-mail address (optional):	
Project Location and Address (may state same as owner):	
Proposed Earth Disturbance (in acres or square feet):	
Proposed Impervious Surface (in acres or square feet): impervious includes paving, buildings, compacted gravel areas etc.	
Subdivision or land development plan if applicable: plan name: _____ plan date (last revised): _____	
Brief Description of Proposed Work:	
The undersigned hereby represents that, to the best of their knowledge and belief, all information listed above and contained within the submittal provided is true, correct and complete. I hereby agree to accept and abide by the Stormwater Permit provisions, the conditions of approval pertaining to this permit (if any) and Franklin Township Ordinances.	
Signature of Applicant:	Date:
REQUIRED SUBMITTAL INFORMATION:	
<ol style="list-style-type: none"> 1. this completed application, signed by the applicant 2. fees shall be paid, per Updated Fee Resolution – Stormwater Management Submissions 3. three (3) copies, Simplified Approach Worksheets & Site Sketch Plan OR Stormwater Mgmt. Plan 4. two (2) signed, notarized copies of the Operation, Maintenance and Inspection Plan & Agreement 	

Attachment C

Form of

Operation, Maintenance and Inspection Plan and Agreement

for Simplified Approach

FRANKLIN TOWNSHIP
SIMPLIFIED APPROACH
STORMWATER BEST MANAGEMENT PRACTICES
OPERATION, MAINTENANCE, AND INSPECTION
PLAN AND AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between _____, (hereinafter the “Landowner”), and Franklin Township, 20 Municipal Lane, PO Box 118, Kemblesville, PA 19347, Chester County, Pennsylvania, (hereinafter “Municipality”).

WITNESSETH

WHEREAS, the Landowner is the owner of certain real property by virtue of a deed of conveyance recorded in the land records of Chester County, Pennsylvania, at Deed Book _____ and Page _____, (hereinafter “Property”); and

WHEREAS, the Landowner recognizes that the stormwater management best management practices or BMPs (hereinafter referred to as “BMP” or “BMP(s)”) located on the Property at

_____ (address of Property where BMP is located) must be inspected and maintained; and

WHEREAS, the Municipality and the Landowner, for itself and for its administrators, executors, successors, heirs, 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 BMP(s) be constructed and maintained on the Property; and

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

BMP – “Best Management Practice;” activities, facilities, designs, measures or procedures used to manage stormwater impacts from land development, to protect and maintain water quality and ground water recharge and to otherwise meet the purposes of the Municipality’s Stormwater Management Ordinance, including, but not limited to infiltration trenches, dry wells, bioretention, rain gardens, permeable paving, rain barrels and cisterns, etc. The BMP(s) are permanent appurtenances to the Property; and

Conveyance – As specifically identified in the Simplified Approach Site Sketch Plan (herein after “Plan”), a man-made, existing or proposed facility, structure or channel used for the transportation or transmission of stormwater from one place to another, including pipes, drainage ditches, channels and swales (vegetated and other), gutters, and like facilities or features. The conveyances identified in the Plan are permanent appurtenances to the Property; and

WHEREAS, the Municipality requires that the BMP(s) and conveyances as shown on a Plan and in accordance with the sizing calculations found on the Simplified Approach Worksheets (herein after “Worksheets”) be constructed by the Landowner; the BMP(s) shall further be maintained by the Landowner, its administrators, executors, successors, heirs, and assigns in accordance with the associated operation and maintenance requirements included herein. The Plan and Worksheets are attached hereto and incorporated herein together as Exhibit “A” hereto; and

WHEREAS, the Municipality requires that stormwater management BMP(s) be constructed and adequately inspected, operated and maintained by the Landowner, its administrators, executors, successors, heirs, and assigns, in accordance with the following maintenance requirements:

1. Infiltration Trenches

- a. At least twice a year and after significant rainfall events the Landowner is to inspect the infiltration trench and remove any accumulated debris, sediment and invasive vegetation.
- b. Vegetation along the surface of an infiltration trench is to be maintained in good condition, and any bare spots are to be revegetated as soon as possible.
- c. Vehicles are not to be parked or driven on an infiltration trench, and care is to be taken to avoid excessive compaction by mowers.
- d. Any debris, such as leaves blocking flow from reaching an infiltration trench, is to be routinely removed.

2. Rain Garden

- a. Any debris, such as leaves blocking flow from reaching or infiltrating through a rain garden, is to be routinely removed.
- b. Pruning and weeding are required as needed including removal of invasive species, especially while vegetation is being established for a rain garden.
- c. Mulch cover is to be maintained in a rain garden, re-spread and replaced as needed to prevent erosion, reduce weed growth and assist with plant survival, without restricting the infiltration of stormwater. Once every 2 to 3 years the entire area may require mulch replacement.

- d. At least twice a year the Landowner is to inspect the rain garden for sediment buildup, ground cover and vegetative conditions and make any repairs as needed.
- e. Watering of the rain garden is required as needed, including during periods of extended dry weather and drought.
- f. Trees and shrubs in a rain garden are to be inspected at least twice per year by the Landowner to evaluate their health.
- g. Any deficiency in the features of the rain garden shall be restored to the original design specifications.

3. Dry Wells

- a. Dry wells are to be inspected by the landowner at least four (4) times a year and after significant rainfalls, and debris, trash, sediment, and any other waste material need to be removed and disposed of at suitable disposal or recycling sites and in compliance with local, state, and federal waste regulations.
- b. For dry wells, gutters are to be regularly cleaned out and ensure that proper connections are maintained to facilitate the effectiveness of the dry well.
- c. The filter screen for downspouts or roof gutters which intercepts roof runoff and conveys it to the dry well must be cleaned and replaced as necessary.
- d. Dry wells that are damaged are to be fixed or replaced within two (2) weeks of being damaged.
- e. If an intermediate sump box exists in conjunction with a dry well, it must be cleaned out at least once per year.

4. Rain Barrels and Cisterns

- a. Rain Barrels and Cisterns are to be cleared of debris routinely at least every three (3) months and after significant storms to allow stormwater from gutters to enter them.
- b. Gutters that directly convey rain water to dry wells, rain barrels, and cisterns are to be routinely cleared of trash and debris at least every three (3) months and after significant rainfall events.
- c. Rain Barrels and cisterns should be routinely emptied to allow for storage of additional rain water.
- d. Overflow outlets from rain barrels and cisterns must be kept free and clear of debris.
- e. Rain Barrels and cisterns that are damaged are to be fixed or replaced within two (2) weeks of being damaged.

NOW, THEREFORE, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto, intending to be legally bound hereby, agree as follows:

1. The foregoing recitals to this Agreement are incorporated as terms of this Agreement and obligations of the Landowner as if fully set forth in the body of this Agreement.
2. The Landowner shall construct the BMP(s) in accordance with the specifications identified in the Plan and Worksheets.
3. The Landowner shall inspect, operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality and in accordance with the specific inspection and maintenance requirements outlined in this Agreement.
4. The Landowner hereby grants permission to the Municipality, its authorized agents and employees, to enter upon the Property from the public right-of-way or roadway, at reasonable times and upon presentation of proper identification, to inspect the BMP(s) whenever it deems necessary for compliance with this Agreement and the Municipality's Stormwater Ordinance. Whenever possible, the Municipality shall notify the Landowner prior to entering the Property.
5. The Landowner acknowledges that, per the Municipality's Stormwater Ordinance, it is unlawful, without written approval of the Municipality, to:
 - a. Modify, remove, fill, landscape, alter or impair the effectiveness of any BMP or conveyance that is constructed as part of the Plan;
 - b. Place any structure, fill, landscaping, additional vegetation, yard waste, brush cuttings, or other waste or debris into a BMP or conveyance that would limit or alter the functioning of the BMP or conveyance;
 - c. Allow the BMP or conveyance to exist in a condition which does not conform to the Plan or this Agreement; and
 - d. Dispose of, discharge, place or otherwise allow pollutants including, but not limited to, deicers, pool additives, household chemicals and automotive fluids to directly or indirectly enter any BMP or conveyance.
6. In the event the Landowner fails to operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality the Landowner shall be in violation of this Agreement and the Landowner agrees that the Municipality or its representatives may, in addition to and not in derogation or diminution of any remedies available to it under the Stormwater Ordinance or other statutes, codes, rules or regulations, or this Agreement, enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). 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.

7. 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 15 days of delivery of an invoice from the Municipality. Failure of the Landowner to make prompt payment to the Municipality may result in enforcement proceedings, which may include the filing of a lien against the Property, which filing is expressly authorized by the Landowner.

8. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMP(s) 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.

9. The Landowner, its executors, administrators, assigns, heirs, and other successors in interests, hereby release and shall release the Municipality, its employees, agents and designated representatives from all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the Municipality and/or its said employees, agents or representatives, arising out of the construction, presence, existence, or maintenance of the BMP(s) either by the Landowner or Municipality. In the event that a claim is asserted or threatened against the Municipality, its employees, agents or designated representatives, the Municipality shall notify the Landowner and the Landowner shall defend, at his own expense, any claim, suit, action or proceeding, or threatened claim, suit, action or proceeding against the Municipality or, at the request of the Municipality, pay the cost, including attorneys' fees, of defense of the same undertaken on behalf of the Municipality. If any judgment or claims against the Municipality, its employees, agents or designated representatives shall be allowed, the Landowner shall pay all damages, judgments or claims and any costs and expenses incurred by the Municipality, including attorneys fees, regarding said damages, judgment or claims.

10. The Municipality may enforce this Agreement in accordance with its Stormwater Ordinance, at law or in equity, against the Landowner for breach of this Agreement. Remedies may include fines, penalties, damages or such equitable relief as the parties may agree upon or as may be determined by a Court of competent jurisdiction. Recovery by the Municipality shall include its reasonable attorneys fees and costs incurred in seeking relief under this Agreement.

11. Failure or delay in enforcing any provision of this Agreement shall not constitute a waiver by the Municipality of its rights of enforcement hereunder.

12. The Landowner shall inform future buyers of the Property about the function of, operation, inspection and maintenance requirements of the BMP(s) prior to the purchase of the Property by said future buyer, and upon purchase of the Property the future buyer assumes all responsibilities as Landowner and must comply with all components of this Agreement.

13. This Agreement shall inure to the benefit of and be binding upon, the Municipality and the Landowner, as well as their heirs, administrators, executors, assigns and successors in interest.

This Agreement shall be recorded at the Office of the Recorder of Deeds of the County of Chester, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, in perpetuity.

ATTEST:

For the Municipality:

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

GIVEN UNDER MY HAND THIS _____ day of _____, 20____.

NOTARY PUBLIC

(SEAL)

ATTEST:

For the Landowner:

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

GIVEN UNDER MY HAND THIS _____ day of _____, 20____.

NOTARY PUBLIC

(SEAL)

EXHIBIT “A”

(approved Plan and Worksheets)