

STORMWATER MANAGEMENT

23 Attachment 6

Borough of Honey Brook

Appendix F
Stormwater Management Application and Simplified Approach

Exemption Worksheet for Stormwater Management

Application is hereby made for review of the Stormwater Management Plan and related data as submitted herewith in accordance with the Honey Brook Borough Stormwater Management Ordinance. Please submit 3 copies of all documents. All plans must be folded.

_____ Final Plan _____ Preliminary Plan _____ Sketch Plan

Date of Submission _____ Submission No. _____

1. Name of subdivision or development _____

2. Name of Applicant _____ Telephone No. _____

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

_____ Officer 1
_____ Officer 2

Address _____

Zip _____

Applicants interest in subdivision or development
(if other than property owner, give owners name and address)

3. Name of property owner _____ Telephone No. _____

Address _____

Zip _____

4. Name of engineer or surveyor _____ Telephone No. _____

Address _____

Zip _____

5. Type of subdivision or development proposed:

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

6. Lineal feet of new road proposed _____ L.F.

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7. Area of proposed and existing impervious area on entire tract.
- a. Existing _____ S.F. _____ % of Property
 - b. Proposed (new) _____ S.F. _____ % of Property
 - c. Proposed (new net) _____
if <250 S.F. , no Stormwater Control Required, Continue to Step 11
If >250 S.F. and <500 S.F. see Exemption Worksheet and Continue to Step 9
If >500 S.F. Continue to Step 8 below
8. Stormwater
- a. Does the submission meet the release rate criteria? _____
 - b. Type of proposed runoff control _____
 - c. Does the proposed stormwater control criteria meet the requirements/guidelines of the Stormwater Ordinance? _____
If not, what variances/waivers are requested? _____
Reasons _____
 - d. Does the plan meet the requirements of Article IV of the Stormwater Ordinances? _____
If not, what waivers are requested? _____
Reasons Why _____
 - e. Is a construction schedule or staging attached? _____
 - f. Is a recommended maintenance program attached? _____
9. Erosion and Sediment Pollution Control (E&S):
- a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the Chester County Conservation District? _____
 - b. Total area of earth disturbance _____ S.F.
10. Wetlands
- a. Have the wetlands been delineated by someone trained in wetland delineation? _____
 - b. Have the wetland lines been surveyed? _____
 - d. Total acreage of wetland within the property _____
 - e. Total acreage of wetland disturbed _____
11. Filing
- a. Has the required fee been submitted? _____
Amount _____

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CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF CHESTER

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

_____ Property Owner

My Commission Expires _____ 20 _____

Notary Public _____

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

SIGNATURE OF APPLICANT _____

////////////////////////////////////
///

(Information Below This Line To Be Completed By Honey Brook Borough)

_____ Honey Brook Borough official submission receipt:

Date complete application received _____ Plan number _____

Fees _____ Date fees paid _____ Received by _____

Official submission receipt date _____

Received by _____

Honey Brook Borough

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Exemption Worksheet Simplified
Approach

Project: _____
Municipality: _____
Engineer: _____
Submittal No: _____
Date: _____
Project ID: _____ (for Municipal use ONLY)

SECTION I: REGULATED ACTIVITIES

Reference: Section 23-105

1. Does the Proposed Project meet the definition of a "Regulated Activity"?
- Yes No

STOP - If you have checked NO for the above question, you are not required to submit a Storm Water Management Plan under the Honey Brook Borough Storm Water management Ordinance.

- If you have checked YES for the above question, continue to Section II to determine if you are required to submit a Storm Water Management Plan under the Honey Brook Borough Storm Water management Ordinance.

SECTION II: EXEMPTION

Reference: Section 23-106

Note: Parent Tract refers to the total parcel configuration on February 2, 2009 and includes any subdivision of lands which may have occurred after than date.

- 1) Entire Parent Tract Property Area (in square feet) _____
- 2) Is this property subject to an existing exemption from the 2009 Stormwater Ordinance?
- Yes No
- 3) If No
Allowable Impervious Area per the Ordinance 500 sf
Proceed to Step 4.
- 3) If Yes
- a. Maximum Allowable Impervious Area 500 sf
b. minus previously Approved Impervious Area (sq. ft.) - _____
c. Remaining (Net) Allowable Impervious Area (sq. ft.) _____
- 4) Proposed Impervious Area this application (sq. ft.) _____
- 4.1) If line 4 above is greater than line 3 or 3c above STOP. Exemption criteria is no longer available. Provide Stormwater Calculations per the Ordinance.
- 4.2) If line 4 above is less than line 3c above, continue to step 5 Simplified Approach.

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- 5) SIMPLIFIED APPROACH - ALL RUNOFF FROM IMPERVIOUS AREAS MUST BE DIRECTED TO THE WATER QUALITY FACILITY

Step 1: Provide a Site Plan Sketch

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Step 2: Determine Total Impervious Surfaces

| Impervious Type | Size | = | Area (sq. ft.) |
|-----------------|------------------|---|----------------|
| | | | |
| | | | |
| | | | |
| | New Impervious | = | |
| | | | |
| | | | |
| | | | |
| | Total Impervious | | |

Step 3: Determine Required Volume Control (cubic feet) using the following equation:

Volume (cu. ft.) = (Total impervious area in square feet x 1 inches of rainfall) ÷ (12 inches/foot)

Volume (cu. ft.) = (_____) ÷ (12 inches/foot) = _____ cu. ft.

Stormwater Volume Control

Sizing an Infiltration Trench / Bed Facility

Step 1. Required Infiltration Volume (Determined from Step # 2 above) = _____ cubic feet

Step 2. Stone Depth = 1 feet

(Maximum allowable infiltration trench depth is 1.5-feet)

Step 3. Trench Width = (Must be equal or greater than Stone Depth) = _____ Feet

Step 4. Trench Length = Required Infiltration Volume from Step 1 ÷ (Stone Depth from Step 2 x Trench Width from Step #3 x 0.4) = _____ Feet.

Final infiltration trench dimensions: 1 ft. (D) x _____ ft. (W) x _____ ft. (L)

Sizing a Rain Garden

Maximum allowable depth water depth in a rain garden is 6-inches.

Step 1. Impervious Area = _____ square feet (Determined from Worksheet #1)

Step 2. Depth of water in rain garden = _____ inches.

Step 3. Required Rain Garden Area = (Impervious Area from Step 1) ÷ Rain Garden depth in inches (From Step #2) = _____ square feet

The rain garden should be a minimum _____ sq. ft. in size and _____" deep.

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Borough of Honey Brook

**Appendix G
Small Project Stormwater Design Guidance**

This Small Project Design has been developed to assist those proposing residential projects to comply with requirements of the Honey Brook Borough Stormwater Management Ordinance, Chapter 23 without having to hire professional services to draft a formal stormwater management plan. This Small Project Design is only permitted for projects with proposed impervious areas greater than 250 square feet and less than 500 square feet.

Regulated activities that result in an impervious area greater than 250 square feet and less than 500 square feet can comply with Chapter 23, "Stormwater Management" using the "Small Project Stormwater Design". Projects less than 250 square feet of impervious area are already exempt from drainage plan submission and peak rate control requirements, however, once the 250 square feet is cumulatively exceeded but still less than 500 square feet, this Small Project Design criteria can be used, in lieu of formal stormwater design calculations.

Listed below are circumstances where this ordinance is not applicable:

- Proposed impervious area greater than 500 square feet **must** comply with requirements of the Chapter 23, "Stormwater Management".
- Projects requiring subdivision or land development approval **must** comply with requirements of Chapter 23, "Stormwater Management".
- Properties (parcels) with a cumulative impervious area greater than 500 square feet built after the date of adoption of the 2009 ordinance must comply with Chapter 23, Stormwater Management.

A. What is an applicant required to submit?

Stormwater drainage plan requirements shall include a brief description of the proposed stormwater facilities, including types of materials, total square footage of proposed impervious areas, volume calculations, and a simple sketch plan showing the following information:

- Location of existing lot lines and proposed structures, driveways, or other paved areas with approximate surface area in square feet.
- Location of any existing or proposed onsite septic system and/or potable water wells showing proximity to infiltration facilities.
- Location of existing or proposed utilities including water, sewer, electric, gas, and other utilities that might exist on the property.
- Erosion and sediment control plan.

B. Determination of Required Volume Control and Sizing Stormwater Facilities

By following the simple steps outlined below in the provided example, an applicant can determine the runoff volume that is necessary to control stormwater runoff and how to choose the appropriate stormwater facility to permanently remove the runoff volume from the site. Impervious area calculations must include all areas on the lot proposed to be covered by roof area or pavement which would prevent rain from naturally percolating into the ground, including impervious surfaces such as sidewalks, driveways, parking areas, decks, sheds, pavers, patios, or swimming pools. Sidewalks, driveways, or patios that have been designed and constructed to allow for infiltration are not included in this calculation.

Site Plan Example: Controlling runoff volume from a proposed home site

Step 1: Determine Total Impervious Surfaces

| Impervious Surface | | | Area (sq. ft.) |
|--------------------|------------------|---|----------------|
| New Parking Lot | 10 ft. x 20 ft. | = | 200 sq. ft. |
| New Deck | 10 ft. x 10 ft. | = | 100 sq. ft. |
| | | | ----- |
| | New Impervious | = | 300 sq. ft. |
| Existing Shed | 10 ft. x 12 ft. | = | 120 sq. ft. |
| Existing Walkway | 4 ft. x 10 ft. | = | 40 sq. ft. |
| | | | ----- |
| | Total Impervious | | 460 sq. ft. |

Step 2: Determine Required Volume Control (cubic feet) using the following equation:

$$\text{Volume (cu. ft.)} = (\text{Total impervious area in square feet} \times 1 \text{ inches of rainfall}) / (12 \text{ inches/foot})$$

$$\text{Volume (cu. ft.)} = (460 \text{ sq. ft.} \times 1 \text{ inches of rainfall}) / (12 \text{ inches/foot}) = 38 \text{ cu. ft.}$$

Step 3: Sizing the Selected Volume Control BMP

Several Best Management Practices (BMPs), as described below, are suitable for small stormwater management projects. However, their application depends on the volume required to control, how much land is available, and the site constraints. Proposed development activities can apply various structural BMPs to control the volume of runoff from the site. A number of different volume control BMPs are described below. Note that Figure 2, 3 and 4 are an example of how these BMPs can be utilized in conjunction to control the total required volume on one site.

Structural BMPs

1. Infiltration Trench

An Infiltration Trench is a linear stormwater BMP consisting of a continuously perforated pipe at a minimum slope in a stone-filled trench. During small storm events, infiltration trenches can significantly reduce volume and serve in the removal of fine sediments and pollutants. Runoff is stored between the stones and infiltrates through the bottom of the facility and into the soil matrix. Runoff should be pretreated using vegetative buffer strips or swales to limit the amount of coarse sediment entering the trench which can clog and render the trench ineffective. In all cases, an infiltration trench MUST collect the Total Impervious Surface and should be designed with a positive overflow.

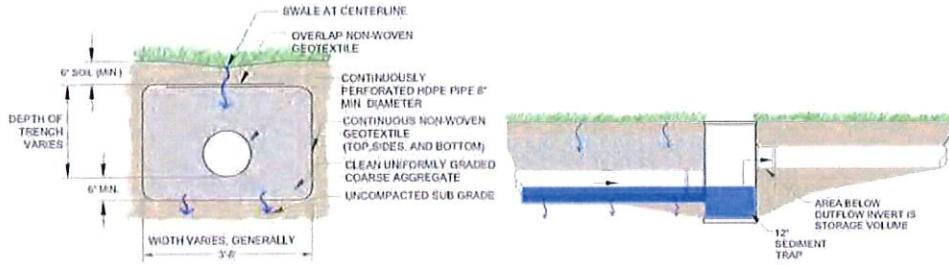
Design Considerations:

- Although the width and depth can vary, it is recommended that Infiltration Trenches shall not exceed a depth of one (1) feet of stone.
- A maximum of 6" of topsoil is placed over trench and vegetated (But not required).
- Trench is wrapped in nonwoven geotextile (top*, sides, and bottom).
* only if topsoil above
- Trench needs to be placed on scarified uncompacted soils.
- Slope of the Trench bottom should be level or with a slope no greater than 1%.
- The discharge or overflow from the Infiltration Trench should be properly designed to drain away from buildings and other impervious structures.
- Cleanouts or inlets should be installed at both ends of the Infiltration Trench and at appropriate intervals to allow access to the perforated pipe.
- Volume of facility = Depth x Width x Length x Void Space of the gravel bed (assume a void space of 0.40)

Maintenance:

- Catch basins and inlets should be inspected and cleaned at least two times a year.
- The vegetation along the surface of the infiltration trench should be maintained in good condition and any bare spots should be re-vegetated as soon as possible.
- Vehicles should not be parked or driven on the trench and care should be taken to avoid soil compaction by lawn mowers.

Figure 2: Infiltration Trench Diagram



Source: PA BMP Guidance Manual, Chapter 6, page 42.

Figure 3: Example of Infiltration Trench Installation



Source: PA BMP Guidance Manual, Chapter 6, Page 46.

Sizing Example for Infiltration Trench

1. Determine Total Impervious Surface to drain to Infiltration Trench:

| | | | |
|-------------|-----------------|---|-------------|
| Deck | 10 ft. x 10 ft. | = | 100 sq. ft. |
| Parking | 10 ft. x 20 ft. | = | 200 sq. ft. |
| Ex. Walkway | 4 ft. x 10 ft. | = | 40 sq. ft. |
| Ex. Shed | 10 ft. x 12 ft. | = | 120 sq. ft. |
| | | | 460 sq. ft. |

2. Determine the required infiltration volume:
 $\text{Volume} = (\text{Impervious area sq. ft.} \times 1 \text{ inches of runoff}) / (12 \text{ inches/ft} \times 0.40 \text{ voids})$
 $(460 \text{ sq. ft.} \times 1 \text{ inches of runoff}) / (12 \text{ inches/ft} \times 0.40 \text{ voids})$
 $(460 \text{ sq. ft.} \times 1 \text{ inches of runoff}) / (4.8) = 96 \text{ cu. ft.}$

3. Sizing the infiltration trench facility:
 $\text{Volume of Facility} = \text{Depth} \times \text{Width} \times \text{Length}$

Set Depth to 1 foot (Max) and determine required surface area of trench.

$$96 \text{ cu. ft.} / 1 \text{ ft.} = 96 \text{ sq. ft.}$$

The width of the trench should be greater than 1 times its depth (1 x D), therefore in this example use a trench width of 2 feet selected.

Determine trench length: $L = 96 \text{ sq. ft.} / 2 \text{ ft.} = 48 \text{ ft.}$, make trench 48-feet in length.

Final infiltration trench dimensions: 1 ft. (D) x 2 ft. (W) x 48 ft. (L)

STORMWATER MANAGEMENT

2. Rain Garden

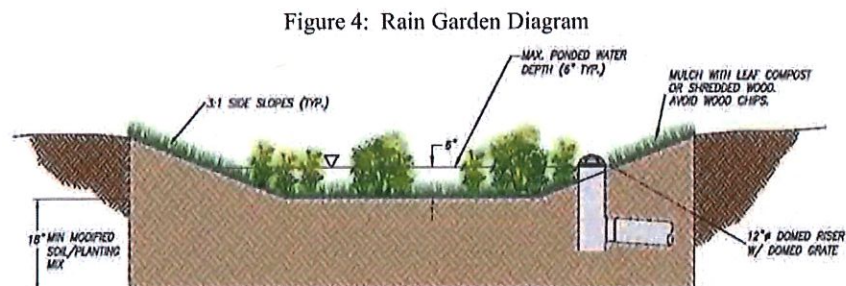
A Rain Garden is a planted shallow depression designed to catch and filter rainfall runoff. The garden captures rain from the Total Impervious Surface. The water sinks into the ground, aided by deep rooted plants that like both wet and dry conditions. The ideal location for a rain garden is between the source of runoff (roofs and driveways) and the runoff destination (drains, stream, low spots, etc.).

Design Considerations:

- A maximum of 3:1 side slope is recommended.
- The depth of a rain garden can range from 6-8 inches. Ponded water should not exceed 8-inches.
- The rain garden should drain within 72 hours.
- The garden should be at least 10-20 feet from a building's foundation and 25 feet from septic system drainfields and wellheads.
- If the site has clay soils, soil should be scarified amended (mixed) with compost or organic material to a depth of 1 foot.
- Choose native plants.
To find native plant sources go to <https://uswildflowers.com/wfquery.php>.
- At the rain garden location, the water table should be at least 2' below the soil level. If water stands in an area for more than one day after a heavy rain you can assume it has a higher water table and is not a good choice for a rain garden.

Maintenance:

- Water plants regularly until they become established.
- Inspect twice a year for sediment buildup, erosion and vegetative conditions.
- Mulch with hardwood when erosion is evident and replenish annually.
- Prune and remove dead vegetation in the spring season.
- Weed as you would any garden.
- Move plants around if some plants would grow better in the drier or wetter parts of the garden.



Sizing Example for Rain Garden

1. Pick a site for the rain garden between the source of runoff and a low-lying area, a.k.a., a drainage area.

2. Determine Total Impervious Surface to drain to the Rain Garden:

| | | | |
|-------------|-----------------|---|-------------|
| Deck | 10 ft. x 10 ft. | = | 100 sq. ft. |
| Parking | 10 ft. x 20 ft. | = | 200 sq. ft. |
| Ex. Walkway | 4 ft. x 10 ft. | = | 40 sq. ft. |
| Ex. Shed | 10 ft. x 12 ft. | = | 120 sq. ft. |

460 sq. ft.

3. Sizing the rain garden:

The depth of the rain garden should be set to 6" in depth of the rain garden. Under no circumstances, should the rain garden depth be greater than 8-inches. The sizing calculation below is based on controlling 1" of runoff. First divide the impervious surface by the depth of the rain garden.

$$460 \text{ sq. ft.} / 6 \text{ (depth of rain garden in inches)} = 77 \text{ sq. ft.}$$

The rain garden should be a minimum 77 sq. ft. in size and 6" deep.