

STORMWATER MANAGEMENT APPLICABILITY

In accordance with the Rockland Township Zoning Ordinance Section 8.04.7, all accessory buildings, regardless of size, are subject to stormwater management controls as deemed necessary by the Township Engineer.

In accordance with the Rockland Township Subdivision and Land Development Ordinance Section 5:801, all subdivision and land development plans proposing new impervious surfaces and/or land disturbances shall provide stormwater management control measures in accordance with the Rockland Township Stormwater Management Ordinance.

When creating **IMPERVIOUS SURFACE** in Rockland Township such as a pole building, home addition, shed, concrete patio, paving a driveway (asphalt, gravel or crushed stone) etc. and/or proposing a **REGULATED ACTIVITY** involving the alteration or development of land in a manner that may affect stormwater runoff such as clearing and grubbing, grading, excavations, embankments, land development, agricultural plowing or tilling, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth materials, the requirements of the Stormwater Management Ordinance (SWMO) apply. **Issuance of any building permit or occupancy permit, or commencement of any earth disturbance activity may not proceed until the Applicant or his/her agent has received any of the following:**

- Determination that the project meets one of the **exemption criteria** listed below while meeting the requirements of Section 402.B.
- Written approval of a **Minor Drainage Plan**; can be prepared by the Applicant or choose to hire a professional to prepare
- Written approval of a **Drainage Plan**; need to hire a professional to prepare a Drainage Plan

Persuant to the above, and upon submittal of a building and/or zoning permit application to the Township, the Township Engineer will review the application and make a determination of applicable stormwater management requirements. The determination will be conveyed to the Applicant, Township Secretary, Zoning Officer and Building Code enforcement.

A. EXEMPTIONS

The following uses and other activities are exempt from the requirements of the SWMO:

1. on lots of 2 acres or less (gross), creation of impervious surface less than or equal to 800 square feet in area (cumulative from March 11, 2008)*
2. on lots larger than 2 acres (gross), creation of impervious surface less than or equal to 1200 square feet in area (cumulative from March 11, 2008)*
3. residential swimming pools (surrounding impervious surface must be less than 800 square feet)*
4. for property where the principal use is agricultural, creation of impervious surface less than or equal to 4000 square feet in area when such surface is located more than 150 feet from a downgradient property line*

regardless of area/size:

5. gardening for home consumption

6. agricultural activities - no new buildings or impervious areas
7. forest management and timber operations

*All projects shall submit a site sketch/grading plan for review. Exemption shall not relieve the Applicant from implementing such measures as are necessary to protect the public health, safety, and property. An exemption shall not relieve the Applicant from providing adequate stormwater management for Regulated Activities to meet the purpose of the SWMO; however, drainage plans will not have to be submitted to Rockland Township. (Section 402.B.3)

Exempt projects must still:

1. provide erosion control
2. not cause physical degradation (scour & stream bank destabilization) to stream
3. not change volume, rate, velocity, course, current, cross section, or temperature of stream

B. MINOR DRAINAGE PLAN

Impervious Surface Amounts & Setbacks Qualifying for Minor Drainage Plan

Lot Area (gross in acres)	Impervious Area (between) (sq. ft.)	Minimum Distance* (feet)
0 to < 0.125 ac	800 - 1,000 sq ft	10 ft
0.125 to < 0.5 ac	800 - 2,500 sq ft	15 ft
0.5 to < 1 ac	800 - 5,000 sq ft	20 ft
1 to < 2 ac	800 - 7,500 sq ft	25 ft
2 to < 3 ac	1200 - 10,000 sq ft	50 ft
3 to < 4 ac	1200 - 12,500 sq ft	100 ft
≥ 4 ac	1200 - 15,000 sq ft	150 ft

* Note: The minimum distance between the proposed impervious area and/or stormwater controls/structures discharge point to the downstream property line.

See Section 310.C of the Rockland Township Stormwater Ordinance for infiltration testing requirements/applicability.

If your project qualifies for a Minor Drainage Plan, a submittal will consist of:

1. Fee
2. Best Management Practices Worksheets (per Ordinance Appendix I)
3. Infiltration testing results (if applicable)
4. Site Sketch Plan with Erosion Control (per Ordinance Appendix I)
5. Erosion Control Plan approval from Berks County Conservation District (for disturbance >5,000 s.f.)
6. Operation & Maintenance Agreement (per Ordinance Appendix A)

Once the Worksheets and Site Sketch Plan are approved by the Township Engineer, the applicant must enter into an Operations and Maintenance Agreement (O&M Agreement) with the Township for any proposed stormwater management facilities or modification of existing facilities. The O&M Agreement must be properly endorsed and

then recorded by the applicant with a copy provided to the Township Secretary prior to issuance of the use and occupancy permit for the project (at the latest).

All facilities must be installed and inspected to the satisfaction of the Township Engineer or their representative prior to issuance of the use and occupancy permit for the project.

C. **DRAINAGE PLAN**

Impervious Surface Amounts & Setbacks that do not Qualifying for Minor Drainage Plan must prepare full Drainage Plan in accordance with the Stormwater Management Ordinance. If your project requires a Drainage Plan, the first step is to call the Township Engineer to discuss what will be required.

Note: total disturbed area over 1 acre requires a NPDES permit and Erosion Control approval from the Berks County Conservation District and PA Department of Environmental Protection

STORMWATER MANAGEMENT FEES

A. **EXEMPTIONS** none

B. **MINOR DRAINAGE PLAN** \$500 when *impervious area is less than 2500 sf AND total disturbed area is less than 5000 sq ft*
\$750 when *impervious area is between 2500 & 5000 sf AND/OR total disturbed area is between 5000 sq ft & 0.99 ac*
\$1500 when *impervious area is greater than 5000 sf AND/OR total disturbed area is between 5000 sq ft & 0.99 ac*

C. **DRAINAGE PLAN** \$750 when *impervious area is less than 2500 sf AND total disturbed area is less than 5000 sq ft**
(*this could only occur on lots less than 0.5 ac)
\$1000 when *impervious area is between 2500 & 5000 sf AND/OR total disturbed area is between 5000 sq ft & 0.99 ac*
\$1750 when *impervious area is greater than 5000 sf AND/OR total disturbed area is between 5000 sq ft & 0.99 ac*

ROCKLAND TOWNSHIP
Stormwater Management (SWM)
Best Management Practices (BMP) Worksheets

Stormwater management design for land disturbance activities qualifying under Section 403 as Minor Drainage Plans must address the intent of the SWM Ordinance by managing the increase in runoff through infiltration facilities. To determine the size of infiltration facilities, utilize a factor of 0.23 times the impervious area. This reflects the infiltration requirement (in feet) contained in Sections 305, 306 and 307 of the SWM Ordinance.

STEP ONE: DETERMINE REQUIRED VOLUME	
PROPOSED TOTAL AREA of IMPERVIOUS COVER Includes all areas of buildings, paving, concrete and compacted gravel that are part of the proposed work.	Sq. ft.
Multiply by 0.23	x 0.23
Infiltration VOLUME REQUIRED – Total	Cu. ft.

Details of the BMP's listed below are provided as guidelines. For additional information on how these BMP's function and ideas of other BMP's refer to the "Pennsylvania Stormwater Best Management Practices Manual" latest edition prepared by the DEP.

STEP TWO: SELECT BMP(s) TO BE UTILIZED	
BMP NAME	(How Many)
1. Infiltration Basin	
2. Infiltration Bed	
3. Infiltration Trench	
4. Rain Garden	
5. Vegetated Swale w/ Check Dam	
6. Cistern/Rain Barrel	
7. Pervious Paver Blocks	
8. Other*	
TOTAL (use of 2 encouraged)	

* As approved by the Township Engineer. Provide additional information as needed.

The first six BMP's listed are Infiltration BMP's and as such should be located on the site in areas with the most suitable soil. Areas of wet or poorly drained soils should be avoided.

Infiltration BMP's should also 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 Pa DEP)

BMP Installation Guidelines:

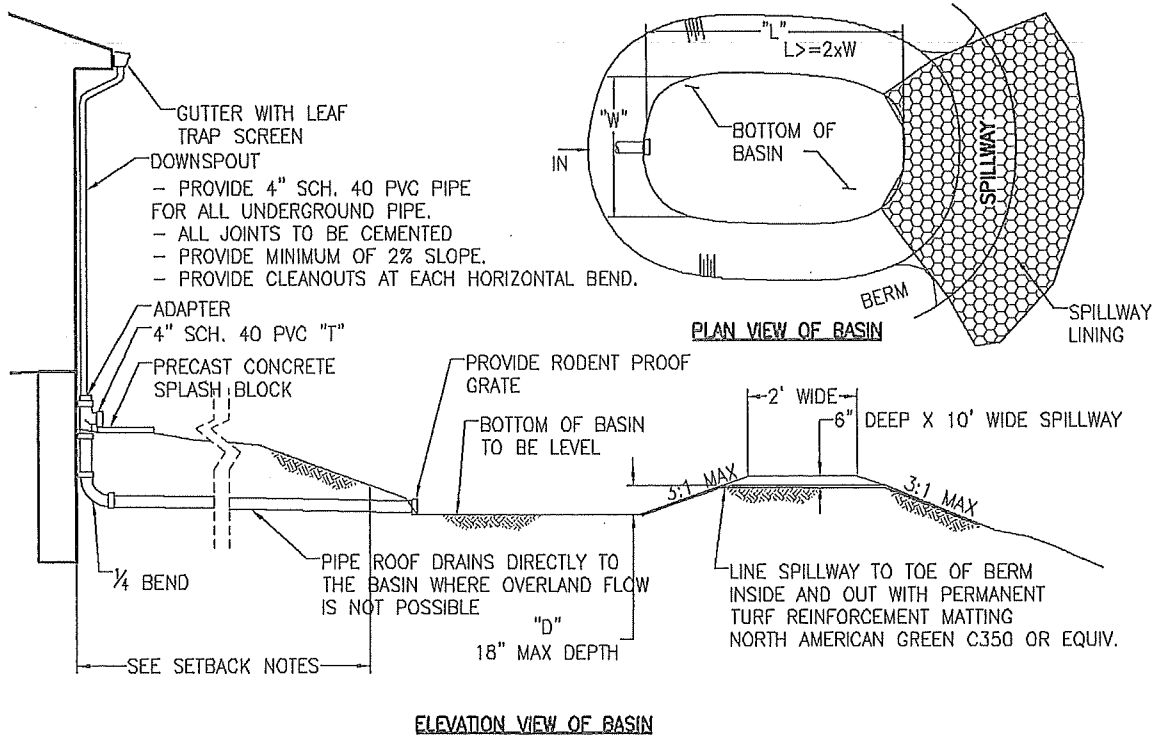
1. BMPs shall be protected during construction to prevent sediment-laden (muddy) water from entering the facility.
2. Excavation for the BMP's shall be conducted in a manner that will not compact the bottom of the facility.
3. For subsurface facilities, the bottom of the facility shall be scarified immediately 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.

STEP THREE: DETERMINE VOLUME PROVIDED	
BMP (see specific detail drawings for volume calculations)	Volume (cu. ft.)
1. Infiltration Basin	
2. Infiltration Bed	
3. Infiltration Trench	
4. Rain Garden	
5. Vegetated Swale w/ Check Dam	
6. Cisterns	
7. Pervious Paver Blocks (show square feet of area to be covered)	N/A
8. Other	
Infiltration VOLUME PROVIDED - TOTAL*	

*must be greater than the Infiltration VOLUME REQUIRED calculated in Step One

SWM BMP #1 –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 spillway should be lined with a permanent erosion mat to prevent deterioration. The spillway should be located as far away as possible from any inflow pipes to promote infiltration and settling of stormwater runoff contaminants. The basin needs to be planted with vegetation that is tolerant of the wet conditions that will occur. The depth of the basin may be increased with the approval of the Township Engineer.

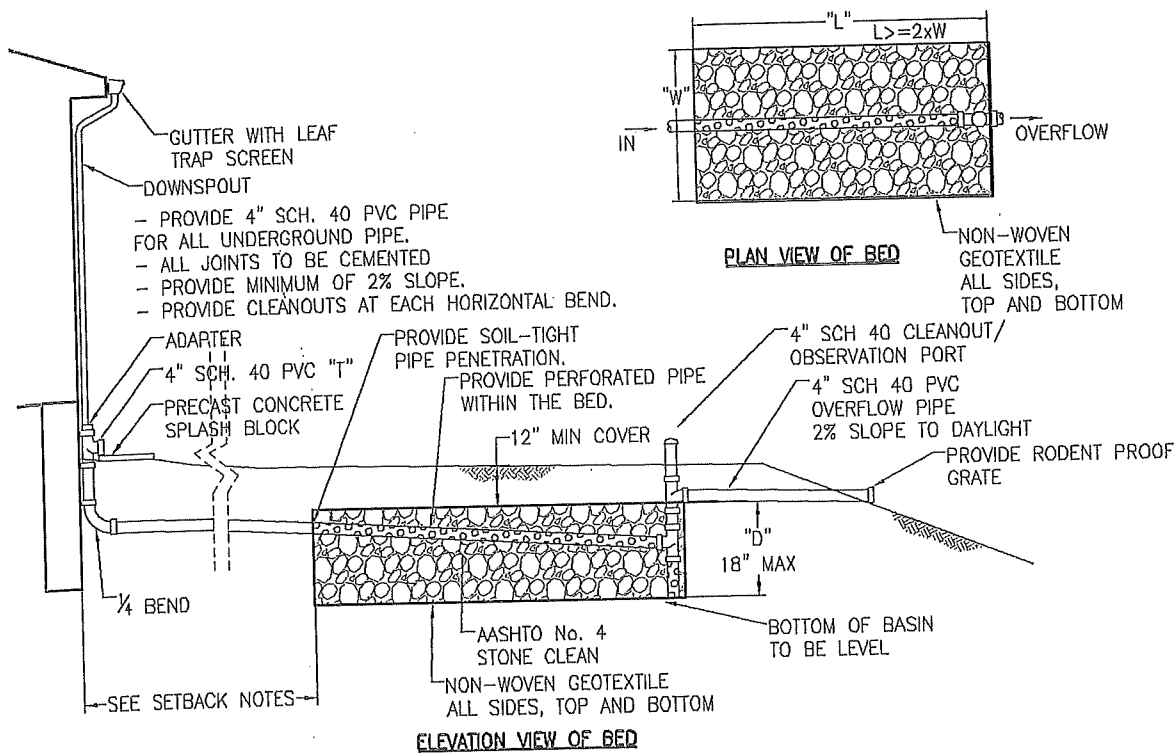


Determination of Water Quality Volume provided:

1	Area – L (length) x W (width) for rectangular basins estimate for irregular shapes	Sq.ft.
2	Depth of Basin = D	Ft.
3	Volume = Area x D (Line 1 x Line 2) (assuming straight sides)	Cu.Ft.
4	Side Slope Factor "Z" – Use 3 for 3:1 slope, 4 for 4:1 slope, etc	
5	Approx. Additional Volume = (L+W) x Z x D x D	Cu.Ft.
6	TOTAL VOLUME PROVIDED (Line 3 + Line 5) (Use this number in Step Three)	Cu. Ft.

SWM BMP #2 –INFILTRATION BED

An infiltration bed can be used where surface stormwater runoff does not need to be captured. Roof drains from the proposed structure are piped into an underground area to infiltrate into the ground. An overflow pipe is provided to release the larger storm volumes. A cleanout is provided to facilitate maintenance and provide an inspection port. The pipe within the bed is perforated and should be run through the basin to the fullest extent to promote infiltration and distribution of the stormwater. Additional pipe can be utilized within the bed to increase the available storage volume. The soil over the bed shall be planted with vegetation that will not interfere with the operation of the bed. The depth of the bed may be increased with the approval of the Township Engineer.



Note: AASHTO No. 4 is approximately 1-2 inch stone

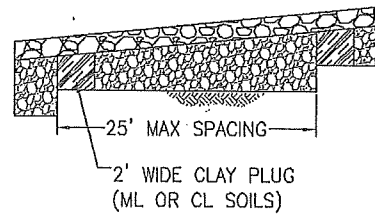
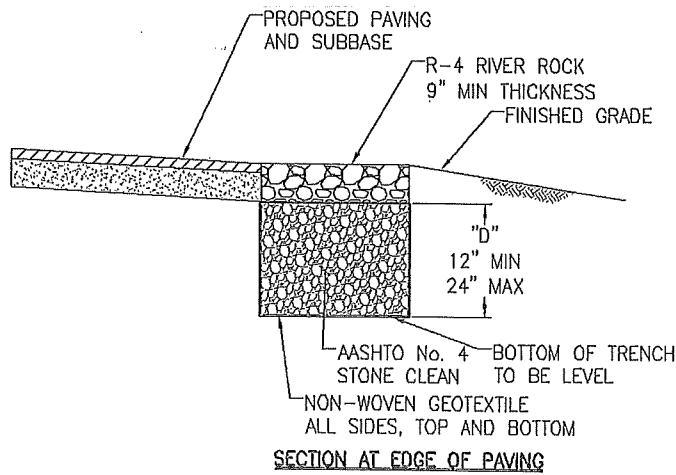
Determination of Water Quality Volume provided:

1	Area – L (length) x W (width)	Sq.ft.
2	Depth of Bed = D	Ft.
3	Volume = Area x D (Line 1 x Line 2) (stone not considered)	Cu.Ft.
4	factor to determine void volume due to stone = 0.4 x Line 3 = TOTAL VOLUME PROVIDED (Use this number in Step Three)	Cu.Ft.

If additional perforated pipe is used in the bed, adjust volume accordingly.

SWM BMP #3 – INFILTRATION TRENCH

Infiltration trenches are utilized along the perimeter of impervious surfaces to collect, store and infiltrate stormwater runoff. River rock or equivalent will be placed on the bed to allow the stormwater runoff to enter the trench; alternately the bed may utilize a perforated pipe with inlets to get the stormwater into the trench. When on a slope, the trench is constructed as a terraced system with clay dikes to promote infiltration. The depth of the trench may be increased with the approval of the Township Engineer. Pipe can be utilized within the trench to increase the available storage volume. When the trench is installed along a paved area that will need to be compacted during construction, extra attention needs to be paid to avoid compaction in the area of the trench and to loosen the material under the trench prior to installation.



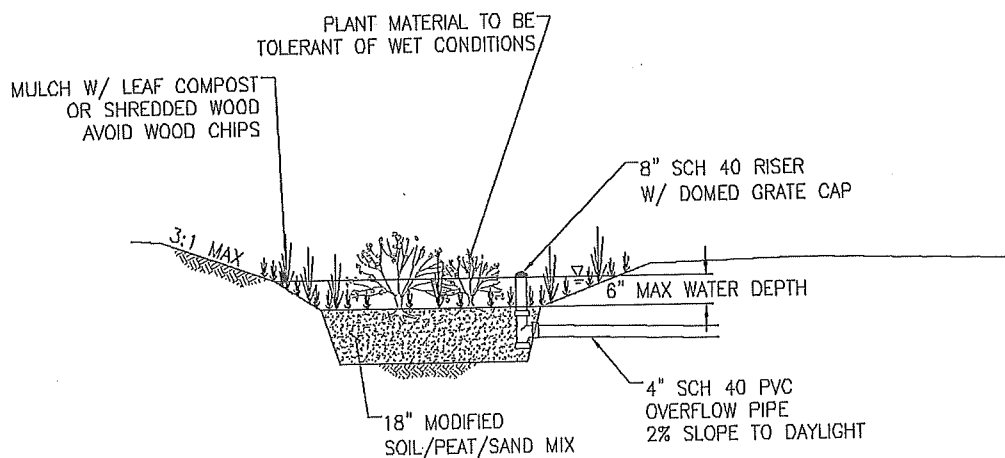
Determination of Water Quality Volume provided:

1	Area = L (length) x W (width)	Sq.ft.
2	Depth of Trench = D	Ft.
3	Volume = Area x D (Line 1 x Line 2) (stone not considered)	Cu.Ft.
4	factor to determine void volume due to stone = 0.4 x Line 3 = TOTAL VOLUME PROVIDED (Use this number in Step Three)	Cu.Ft.

If perforated pipe is used in the bed, adjust volume accordingly.

SWM BMP #4 –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 evapo-transpiration. 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 stormwater runoff away. The planted bed needs regular maintenance and should be mulched on an annual basis. The entire bed should be dug up and rejuvenated every three years or as necessary to maintain function. The owner of the facility should be aware of the long term maintenance needs of the plant materials utilized.

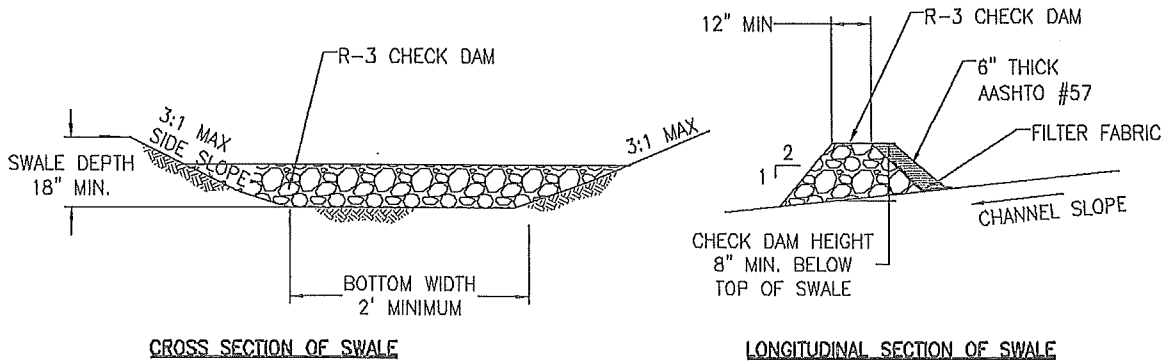


Determination of Water Quality Volume provided:

1	Area – L (length) x W (width) for rectangular areas estimate for irregular shapes	Sq.ft.
2	Depth of Water on Surface = 6" = 0.5'	0.5 Ft.
3	Approx. Above Ground Volume = Area x D (Line 1 x Line 2)	Cu.Ft.
4	Depth of Modified Soil Mix = 18" = 1.5'	1.5 Ft.
5	factor to determine void volume due to modified soil mix = Approx Volume in Soil = Area x D x 0.4 (Line 1 x Line 4 x 0.4)	Cu.Ft.
6	TOTAL VOLUME PROVIDED (Line 3 + Line 5) (Use this number in Step Three)	Cu.Ft.

SWM BMP #5 –VEGETATED SWALE WITH CHECK DAM

A vegetated swale with a check dam provides both a way to convey water around the site and provide an infiltration component. Swales should be installed with longitudinal slopes of 1-6%. Check dams are provided for swales over 3% in slope. The swales should be planted with grasses that are sod forming and can withstand frequent inundation or may be planted with other dense vegetation. For maximum benefit the grasses in the swale should be mowed infrequently. The swale and check dams should be inspected after every storm event to repair any erosion areas that may form. The dimensions shown for the channel and check dam will satisfy most applications. Larger swales may be required depending on actual site conditions.



Note: R-3 is approximately 3 inch stone & AASHTO No. 57 is approximately 1/2 inch stone

Determination of Water Quality Volume provided:

1	Check Dam Height	Ft.
2	Channel Slope = Vertical Rise / 100 ft length x 100%	%
3	Impoundment Length = (Line 1 / Line 2) x 100	Ft.
4	Side Slope (Horizontal Length in Ft./ 1 ft Vertical Rise)	
5	Bottom Width of Channel	Ft.
6	Top Width of Check Dam = Line 5 + 2 x Line 4 x Line 1	Ft.
7	TOTAL VOLUME PROVIDED = 0.5 x Line 3 x Line 1 x (Line 5 + Line 6) / 2 (Use this number in Step Three)	Cu.Ft.

SWM BMP #6 –CISTERN/RAIN BARREL

A cistern provides an artificial reservoir, such as a tank, for storing water. Cisterns date back to early civilizations as a way to collect and manage stormwater. Historically the water was collected to serve as a source of drinking water, but for these purposes that is, as a SWM BMP, the cistern is not intended as a source of drinking water but for utilization for watering plants/irrigation systems. The sizing of the facility is primarily based on the intended use of the water. In order for the facility to be effective during storm events it must be emptied on a regular basis between storms. No details are provided here since each use would be unique. The following design criteria should be considered:

- A. Determine the amount needed. Consider the area to be irrigated and the amount to be applied and the frequency. This is the minimum volume to be stored. Consider a factor of safety to allow for drought conditions.
- B. Conversely, methods should be provided to draw down the cistern from time to time especially during non-growing seasons to insure that there is adequate volume in the cistern for storm events.
- C. Stormwater from roofs is preferred due to their low amounts of pollutants and sediments.
- D. Pumps and piping utilized in the system should be clearly labeled that this is not potable water and cross-contamination of drinking water supplies must be avoided. All systems should be watertight.
- E. An overflow system should be provided.
- F. Facilities need to be kept from freezing.

SWM BMP #7 –PERVIOUS PAVER BLOCK

Pervious paver blocks consist of interlocking units (often concrete) that provide some portion of the surface that may be filled with a pervious material such as gravel or topsoil. These are often used in patio area or small parking areas. Pervious paver blocks can be utilized as part of site landscaping plan to minimize the impervious coverage. Brand names of such products include, but are not limited to: Turfstone, UNI Eco-stone, Checkerblock, EcoPaver, Turf Pavers, or Monoslab. If the products are installed per manufacturer's specification as part of a permeable paving system with minimal compaction, the area can be considered as a non-impervious area in calculating the Water Quality Volume requirements as part of Step One of the BMP Worksheets. The Township Engineer shall review all materials proposed to determine if they are suitable for this application.

RESOLUTION 2011-07

PROCEDURE UNDER ROCKLAND TOWNSHIP STORMWATER MANAGEMENT ORDINANCE

BE IT RESOLVED by the Rockland Township Board of Supervisors, that the policy for Stormwater Ordinance requirements, exemptions, Minor Drainage Plans and Drainage Plans within Rockland Township that are not reviewed as part of a subdivision or land development submittal shall be as follows:

1. The Township Code Enforcement Officer (CEO) forwards a copy of pertinent building permit application information to the Township Engineer.
2. The Township Engineer conducts a review of the application information to determine the applicability of Ordinance requirements versus proposal. The Township Engineer drafts a letter to the applicant copying the Township and the CEO regarding the decision and course of action for the applicant. One of the following decisions can be rendered:
 - a. A full Drainage Plan is required to be submitted for review and approval. Applicant may comply or appeal the determination to the Board of Supervisors. The applicant, or their consultant, must prepare a Drainage Plan in accordance with Section 403 of the Ordinance, acceptable in design to the Township Engineer to address the intent of the requirements. Upon review of acceptable design alternative and the applicant providing all necessary fees to the Township, applicant is issued compliance letter and may be issued a permit for construction by the CEO if all applicable regulations are satisfied.
 - b. The application qualifies for a Minor Drainage Plan as listed under Section 403. Applicant may comply or appeal the determination to the Board of Supervisors. The applicant, or their consultant, must prepare a Minor Drainage Plan in accordance with Appendix I of the Ordinance, acceptable in design to the Township Engineer to address the intent of the requirements. Upon review of acceptable design alternative and the applicant providing all necessary fees to the Township, applicant is issued compliance letter and may be issued a permit for construction by the CEO if all applicable regulations are satisfied.
 - c. The application qualifies for an exemption if the project meets the criteria listed in Section 402; no further action required by the applicant. All new impervious surfaces will be tracked for future construction on the same property.

Said determination can be made prior to application for a building permit if the applicant provides sufficient information to the CEO. Such determination is subject to change based on the actual information that is eventually submitted.

3. Upon addressing the requirements of the Ordinance to the satisfaction of the Township Engineer, the applicant shall post all necessary filing fees, and enter into a Stormwater Controls and Best Management Practices Operations and Maintenance Agreement (O&M Agreement) with the Township for any proposed stormwater management facilities or modification of existing facilities. The O&M Agreement must be properly endorsed and recorded by the applicant with a copy provided to the Township Secretary prior to issuance of the use and occupancy permit for the project.

4. The Applicant is required to install all proposed facilities, and all facilities must be inspected to the satisfaction of the Township Engineer prior to issuance of the use and occupancy permit for the project.