

THE FOLLOWING AGENDA IS PRELIMINARY AND SUBJECT TO CHANGE

AGENDA

**PUBLIC MEETING
ENVIRONMENTAL ADVISORY COUNCIL
RADNOR TOWNSHIP**

**May 26, 2016
THURSDAY
6:00 P.M.**

- 1) Call to Order/Pledge of Allegiance
- 2) Review/Approval of Minutes
- 3) Announcements
- 4) Workgroup Reports and Discussion
 - a) Radnor Green Team
 - b) Sustainable Parks
- 5) Community Environmental Education/Awareness
- 6) Liaison Reports
- 7) Old Business
- 8) New Business
- 9) Public Comment



Gannett Fleming

*Excellence Delivered **As Promised***

Stormwater Ordinance Revision Radnor Township

Presentation
May 26, 2016



Presentation Agenda

- **Stormwater Ordinance Revision**
 - Cumulative Development Stormwater Requirement Revision
 - Non-Structural Project Design Revision
 - Groundwater Recharge Title Revision
 - Water Quality Infiltration Volume Revision
 - Peak Rate Control Exemption Revision
 - Existing Impervious Cover Calculation Revision
- **Additional Stormwater Calculation Topics**
 - Stone Voids as Storage
 - Impervious/Pervious Cover Credit
- **Questions**



Stormwater Ordinance Revision

Cumulative Development Stormwater Requirement Revision

Current 245-6 Exemptions:

245-6.B.(2) - *These criteria shall apply to the total development even if the development is to take place in phases. The date of the municipal ordinance adoption shall be the starting point from which to consider tracts as "parent tracts" upon which future subdivisions and respective earth disturbance computations shall be cumulatively considered.*

Proposed Addition as an Example after the above statement:

If a property owner proposes a **150 square foot shed** after adoption of the municipal stormwater management Ordinance, that property owner would be **exempted from water quality and quantity requirements of the Ordinance as noted in Table 105.1 of the Ordinance**. If, at a later date, the property owner proposes to construct a 499 square foot room addition, the applicant would be required to comply with the requirements for the **Simplified Method for the full 649 square feet of impervious cover created since adoption of the municipal Ordinance**. If an additional 700 square foot patio is proposed later, the property owner would be required to implement the full stormwater quantity and quality control submission requirements of this Ordinance for the **total 1,349 square feet of additional impervious surface added to the original property since adoption of the municipal Ordinance**.



Stormwater Ordinance Revision

Non-Structural Project Design Revision

Current 245-21 Non-structural project design (sequencing to minimize stormwater impacts):

245-21.A – *The design of all regulated activities shall include the following to minimize stormwater impacts.*

Proposed Change to Section 245-21:

The design of all regulated activities shall include the following to minimize stormwater impacts to reduce the surface discharge of stormwater, reduce the creation of unnecessary impervious surfaces, prevent the degradation of water of the Commonwealth, and maintain as much as possible the natural hydrologic regime of the site.

Groundwater Recharge Title Revision

Current 245-22 Title: Groundwater Recharge

Proposed 245-22 Title: Infiltration volume requirements

Within Section 245-22 the term “groundwater recharge volume” is to be replaced with “infiltration volume”



Stormwater Ordinance Revision

Water Quality Infiltration Volume Revision

Current 245-23 Water Quality Requirements Calculation Methodology:

$$245-23-D.(1) - WQv = [(P) \times (Rv) \times (A)] / 12$$

Where:

WQv = Water Quality Volume (Acre-feet)

P = 1.0 inches

A = Area of the project contributing to the water quality BMP (acres)

Rv = 0.05 + 0.009(I) where I is the percent of the area that is impervious surface [(impervious area/A) x 100]

Proposed Change to Section 245-23-D.(1):

P = 1.50 inches

(Effectively increasing the amount required to be infiltrated in water quality required projects by 50%)



Stormwater Ordinance Revision

Peak Rate Control Exemption Revision

Current 245-25 Peak Rate Control and Management Districts Alternate Criteria for redevelopment sites:

245-25-B.(5).(b) & 245-25-A.(7).(b) – Reduce the total impervious surface on the site by at least 20%, based upon a comparison of existing impervious surface to proposed impervious surface.

Proposed Change to Section 245-25-B.(5).(b) & 245-25-A.(7).(b):

Reduce the total impervious surface on the site by at least **25%**, based upon a comparison of existing impervious surface to proposed impervious surface. **Calculations must be provided to show that the peak rate has not increased.**

Note: This portion of the ordinance is used in lieu of performing rate reduction per Table 408.2 and 245-25.B.(1), the revisions would make this exemption more stringent to achieve, and would require proof that the flow is not being concentrated or increased.

Stormwater Ordinance Revision

Existing Impervious Cover Calculation Revision

Current 245-26 Calculation Methodology:

245-26-C.(2) – For development and redevelopment sites, the ground cover used in determining the existing conditions' flow rates for the developed portion of the site shall be based upon actual land cover conditions.

Proposed Change to Section 245-26-C.(2):

For development and redevelopment sites, the ground cover used in determining the existing conditions' flow rates for the developed portion of the site shall be based upon actual land cover conditions, **and twenty five (25) percent of existing impervious area, when present, shall be considered “meadow in good condition”**

Note: This text is in addition of the current ordinance section. It shall make the redevelopment of an existing site more stringent. Currently redevelopment of existing sites with a large amount of impervious surfaces results in minimal stormwater infiltration volumes based on Water Quality or Net Two Year calculations under the current ordinance.

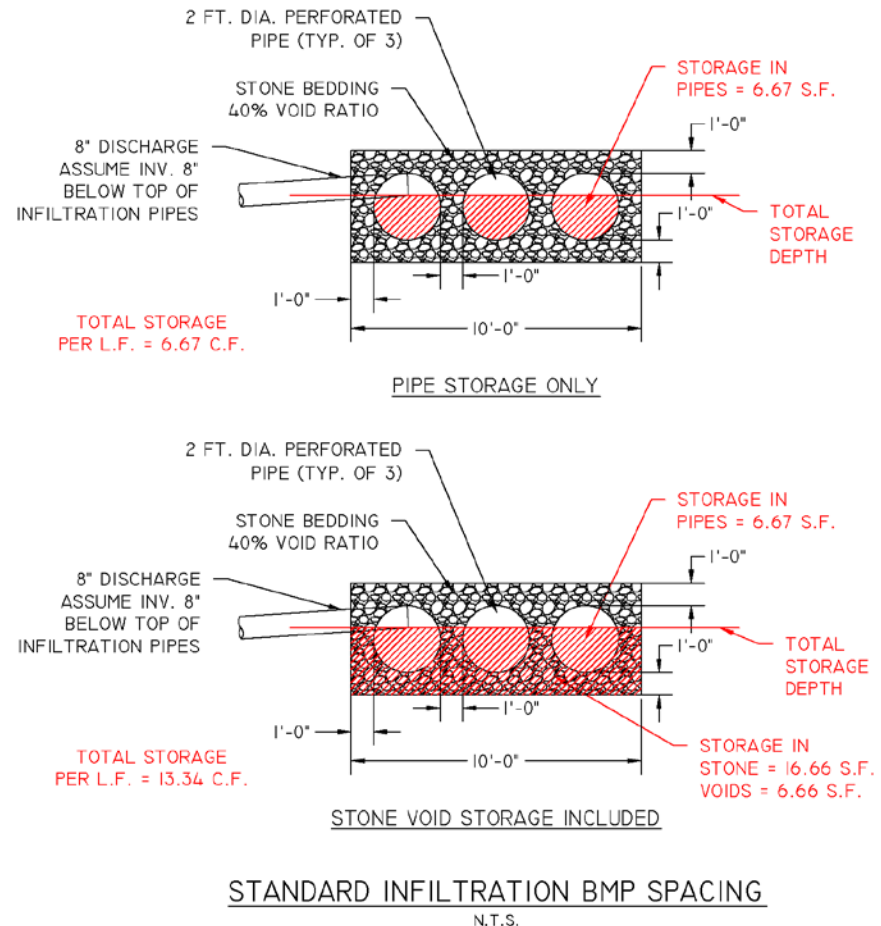


Additional Stormwater Calculation Topics

Stone Voids Used as Storage

Current 245-27 Other Requirements:

245-27-J – *Underground stormwater management systems must be designed to store the two- through one-hundred-year storms within a pipe or other open system that will permit the inspection and maintenance of the system. The entire storm must be placed in the pipe (i.e., the stone bedding around the pipe is not to be included in the volume calculations).*



Additional Stormwater Calculation Topics

Stone Voids Used as Storage – Example Grading Permit Application

RADNOR TOWNSHIP
 STORMWATER ORDINANCE REVISION
 May-15

Example Home Construction

Grading Permit Table

GENERAL SITE INFORMATION

Permit Number:	15 - 999	
Address:	123 STORMWATER AVENUE	
Zoning District:	R-1	(MENU)
Stormwater District:	C-Other	(MENU)
Gross Lot Area:	43560	s.f.

PROPOSED CONSTRUCTION

<u>Description</u>	<u>Existing</u>	<u>Removed</u>	<u>Addition</u>	<u>Proposed</u>
Building Area:	0.00	0.00	3,000.00	3,000.00 s.f.
Walk Area:	0.00	0.00	100.00	100.00 s.f.
Patio Area:	0.00	0.00	200.00	200.00 s.f.
Drive Area:	0.00	0.00	1,000.00	1,000.00 s.f.
Deck Area:	0.00	0.00	200.00	200.00 s.f.
Other Area:	0.00	0.00		0.00 s.f.
Impervious %:	0.00%			10.33% %
Total Impervious Area:	0.00	0.00	4,500.00	4,500.00 s.f.

*The Applicant is responsible for the requirements of the Groundwater Recharge, Water Quality and Peak Rate Control portions of the Stormwater Ordinance



Additional Stormwater Calculation Topics

Stone Voids Used as Storage – Infiltration Volume Calculations

RADNOR TOWNSHIP
STORMWATER ORDINANCE REVISION
May-15

Example Home Construction

Recharge Requirements for 123 STORMWATER AVENUE

Groundwater Recharge

Requirement 1: 1-Inch over all new or replacement impervious

4,500.00 *s.f. of new or replacement impervious surfaces*
375 c.f. of storage is required

Requirement 2: Net Two-Year Volume Pre vs. Post Conditions

Based on TR-55 SCS Runoff Method

P (rainfall) = 3.2 *inches (2 Year Storm)*

Net Two Year Volume 540.84 c.f. of storage is required

Water Quality Volume

Requirement 1: Infiltrate the Water Quality Volume

WQv (P = 1 inch) = 519 c.f. *(Water Quality Volume per Existing Ordinance)*
WQv (P = 1.5 inch) = 778.5 c.f. *(Water Quality Volume per Proposed Revision)*

Additional Stormwater Calculation Topics

Stone Voids Used as Storage – Infiltration BMP Sizing

RADNOR TOWNSHIP
 STORMWATER ORDINANCE REVISION
 May-15

Voids in Stone Bedding of Infiltration BMP Installations

Typical Infiltration BMP Design
 ASSUMED VOLUME INFILTRATION

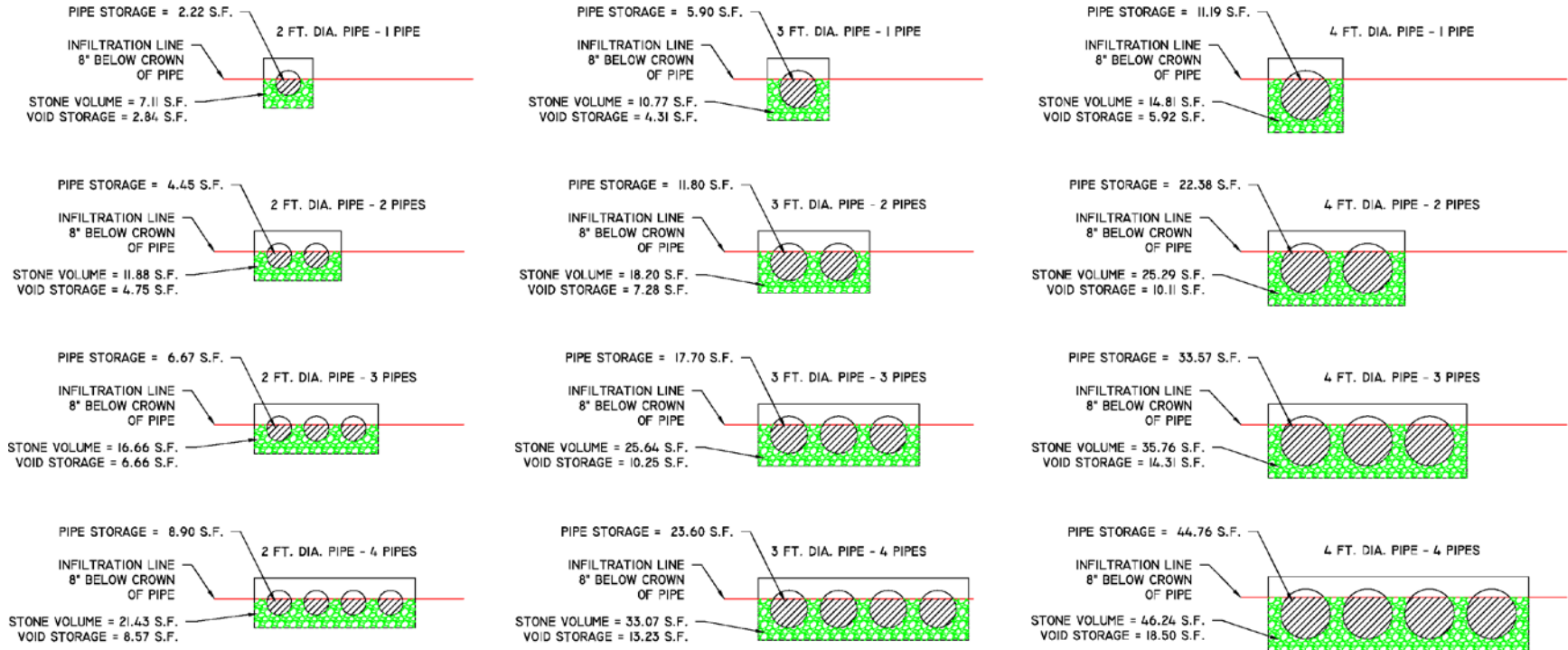
778.5 C.F.

{123 STORMWATER AVENUE EXAMPLE = 375-778.5 C.F. REQUIRED}

PIPE DIA. (FT.)	NO. OF PIPES	PIPE STORAGE ONLY		PIPE + STONE VOIDS STORAGE			PRICE REDUCTION BY INCLUDING STONE
		PIPE STORAGE (S.F.)	LENGTH (L.F.)	STONE VOID STORAGE (S.F.)	TOTAL STORAGE (S.F.)	LENGTH (L.F.)	
2	1	2.22	349.90	2.84	5.07	153.60	56.10%
2	2	4.45	174.95	4.75	9.20	84.59	51.65%
2	3	6.67	116.63	6.66	13.34	58.37	49.96%
2	4	8.90	87.48	8.57	17.47	44.55	49.07%
3	1	5.90	131.97	4.31	10.21	76.28	42.20%
3	2	11.80	65.99	7.28	19.08	40.80	38.16%
3	3	17.70	43.99	10.25	27.95	27.85	36.69%
3	4	23.60	32.99	13.23	36.82	21.14	35.92%
4	1	11.19	69.57	5.92	17.11	45.49	34.62%
4	2	22.38	34.79	10.11	32.49	23.96	31.13%
4	3	33.57	23.19	14.31	47.87	16.26	29.88%
4	4	44.76	17.39	18.50	63.26	12.31	29.24%

Additional Stormwater Calculation Topics

Stone Voids Used as Storage – Stone Storage Area



Additional Stormwater Calculation Topics

Impervious/Pervious Cover Credit

Current 245-11 Definition (Stormwater Ordinance):

Impervious Surface – A surface that prevents the infiltration of water into the ground. Impervious surfaces include, but are not limited to, streets, sidewalks, pavements, driveway areas, or roofs. Any surface areas designed to be gravel or crushed stone shall be regarded as impervious surfaces.

Current 255-6 Definitions and word usage (Sub-Division of Land Ordinance):

Impervious Surface – That portion of a tract where, due to surface coverage, the water runoff coefficient is 0.85 or more, as determined by the Township Engineer.

Current 280-4 Definitions and word usage (Zoning Ordinance):

Impervious Surface – Surfaces that do not absorb rainwater. All buildings, parking areas, driveways, interior roads, sidewalks and areas of concrete and nonporous asphalt or other areas of a lot as determined by the Township Engineer. This definition shall not include any portion of a lot located within the street.

Additional Stormwater Calculation Topics

Township Interpretations/Practices

Decks are considered 100% impervious, regardless of gaps in decking boards.

Pools are not considered impervious within the bounds of the water level. Coping and any concrete patio surrounds are considered impervious.

Infiltration testing is required to be standard percolation tests for projects requiring only Groundwater Recharge, however Double Ring Infiltrometer testing is required for projects requiring Water Quality.

APPLICATION FOR GRADING PERMIT

RADNOR TOWNSHIP ENGINEERING DEPARTMENT

The undersigned hereby makes application for Grading Permit under Chapter 175 and any amendments thereof.

LOCATION: _____

WHAT ARE YOU BUILDING:: _____

OWNER OF PROPERTY: _____

OWNER ADDRESS: _____

Zoning Officer Approval: _____

TOWNSHIP USE ONLY

PERMIT No. _____

SUBMISSION DATE _____

SHADE TREE DATE _____

REVISION DATES _____

FINAL APPROVAL DATE: _____

APPROVED BY: _____

Permit Void: If work not started in six (6) months.

Five (5) copies of site plan to be submitted with application.

* Plans must be folded and no larger than 24" x 34" *

TWELVE (12) COPIES IF PLAN NEEDS TO BE REVIEWED BY SHADE TREE

PREPARED BY: _____ DATE: _____ REGISTERED SURVEYOR: _____ REGISTERED ENGINEER _____

DO PLANS SHOW ALL ITEMS LISTED ON PAGE 2? _____ GROSS LOT AREA: _____ SQ. FT.

COVER TYPE	EXISTING SQUARE FEET		REMOVED SQUARE FEET	ADDED SQUARE FEET	TOTAL SQUARE FEET	
BUILDINGS			-	+	=	
WALKS			-	+	=	
PATIOS			-	+	=	
DRIVES			-	+	=	
DECKS		EXISTING %	-	+	=	TOTAL NEW %
OTHER		OF LOT	-	+	=	OF LOT
TOTAL		%	-	+	=	%

Ground Water Recharge and Storm Water Calculations

- No credit for removal of impervious.
- Calculations are based on the total added impervious not the net.

↑ 500 to 1499 sq. ft. Ground Water Recharge Required
1500 sq. ft. and over Storm Water Management Required
(For additional information see Ordinance 05-11)

Contacts

QUESTIONS??

Roger A. Phillips, P.E.

rphillips@gfnet.com

610-650-8101