TYSONS CORNER, VIRGINIA COMPREHENSIVE PLAN STORMWATER COMPLIANCE



COUNTY OF FAIRFAX, VIRGINIA DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL SERVICES APRIL 2012



Tysons Corner Comprehensive Plan **Stormwater Goals**:

- ✓ "At a minimum, the first inch of rainfall should be retained on-site through infiltration, evapotranspiration and/or reuse …"
- "Reduction of runoff volume is the single most important stormwater design objective for Tysons"
- "… all available measures should be implemented to the extent possible."
- ✓ "... attain **LEED credit** for stormwater quality / quantity"
- ✓ "… return water into the ground where soils are suitable or reuse it, where allowed"
- ✓ "... incorporate Low Impact Development into streets"

✓ must also meet PFM requirements for quality, quantity, flooding, stream protection, etc.

3 Tools to help measure a plan's conformance with the Comprehensive Plan Stormwater Goals











Tysons Corner Comparent pliance **Tysons Corner Stormwater**

Check List

- Step-by-step implementation of flow chart
- Should be completed by designer and submitted with plans



moliance **Tysons Corner Stormwater** s Tor the proposed stormwater management stategy will co Public Facilities Manual (PFM)? This should include, as a I the story water cuanties requirements of FLN 6.0300 I The story water detention requirements of PLN 6.0300 xopo sed stormwater management stategy will comply lities Manual (PPMO? This should include as a The water quality requirements of PPM 6.0400

Check List cont'd

- Recommended at **CDP/FDP/Site Plan**
- Can include sheet number reference to plan, if applicable
- Place for explanatory at end of check list
- f Storamater Coabrance opresourer in ease Reviewers want to see that designer has gone through the process

Sheet No. if applica

I The overland relief requirements of series of of pEM 6.1500

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REMARKS:





Runoff Reduction Practices	Virginia Stormwater Regulation ¹	West Virginia MS4 ^{2, 3}	District of Columbia MS4 ^{2, 3}
Green Roof	45%-60%	Up to 100%	Up to 100%
Rain Harvesting ⁴	Up to 90%	Up to 100%	Up to 100%
Permeable Pavement	45%-75%	Up to 100%	Up to 100%
Infiltration	50%-90%	Up to 100%	Up to 100%
Bioretention	40%-80%	Up to 100%	60%-100%
Dry Swale	40%-60%	Up to 100%	Up to 100%
Roof Disconnection	25%-90%	Up to 100%	

FOOTNOTES:

1. Runoff Reduction used as a means to reduce phosphorus load so percentages are lower

2. Both West Virginia and the District of Columbia compliance is determined by capturing all of the target rainfall volume.

3. Depending on the actual storage volume of the BMP practice.

4. Depending on amount of captured rainfall reused.

Runoff reduction is defined as the total post-development runoff volume that is reduced through canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, evapo-transpiration, or *extended filtration*.*

> * 'The acceptance of 'extended filtration' in meeting the "100% managed on-site" performance goal is based on the extended nature of the discharge. Even though the underdrain becomes active and allows a portion of the first one inch volume to discharge, it typically occurs over a period of days such that the hydrograph to the receiving stream mimics pre development hydrology, and the stream is not inundated with large unnatural flows.'

> > Source: MEMORANDUM OF UNDERSTANDING REGARDING EXTENDED FILTRATION LANGUAGE IN THE WV MS4 GENERAL PERMIT West Virginia Department of Environmental Protection

Spreadsheet Purpose:

"At a minimum, the first inch of rainfall should be relained on site through infiltration, At a minimum, me it's inch of ramfall should be realised on site incogn inflitation, evaporanspiration and/or reuse. If, on a given site, the retention on-site of the first inch of ramfall is demonstrated on the forth-order of the activity of the matching of the state of the st

(e.g., green roofs, pervious parking).

evapouranspiration and or reuse. If, on a given site, the retention on-site of the first time or ramifall is demonstrated not to be fully achievable, all available measures should be implemented to the extent provides in order to support the sould achieve control established of the first include of the first include of the second achieve control established of the first include of the second achieve control established of the first include of the second achieve control established of the first include of the second achieve control established of the first include of the second achieve control established of the

"Stormwater management and water quality controls for redevelopment should be designed to return

"Stormwater management and water quarty controls for receivelopment should be designed to return valer into the ground where soils are suitable or reuse it, where allowed, to the estent practicable. water mio me grouno wnere sous are sunaute or reuse 11, vuere autoreo, 10 me exteni pacacaute. Reduction of stormwater runoff volume is the single most important stormwater design objective for

oemonsusse not to be rully active all available measures should be implemented to the e possible in order to support this goal and achieve partial retention of the first inch of rainfall."

Spreadsheet includes detailed instructions the Tysons Corner Stormwater Conformance Spreadsheet rausneer rurpose: This spreadsheet was developed to evaluate a site's stormwater management design for conformance with the former Commentant and the Amountant Amountant and the storm and the storm and the storm and the storm and the i nis spreaosneet was oevelopeo 10 evanare a site 5 stormwater management oesign for conformance with the Tysons Corner Comprehensive Plan Amendment stormwater management goals that include as follows:

Definitions

- Reduction of stormwater runous seems Typons."
 Reduction of stormwater runous seems "Reduction Ints spreagneet is solely for the purpose of evaluating a stormwater management strategy's performations of the transformer comprehensive Plan low and relating the first inch of rainfall on sites subject to the Typons Corner Comprehensive Plan does not make the provide the storm of the transformer provide the provided the provide the provided the pro toward retaining the list mch of raniali on sites subject to the Tysons Corner Comprehensive Plan Amendment stormwater goals. The land cover types, Rv values, BMP gradices and assigned runoff reduction conditions are stormated to enclose or conditioned the matrix functions and environment, etc. Amenoment stormwater goals. The land cover 05P5, KV values, BAR Practices and assigned runoff feducion credits are not intended to replace or supplement the specifications and requirements of the PFM and should only he work for our other encodes then an encode required rememory creates are not attenues to repare or suppressing it and should not be used for any other purpose than as noted.
- Step by step instruction in the site of row for form and summary Tab: . Laput the site of row for locations and a description (i.e. phase, section, etc.) . Laput the site of row for formation and impervious cover for each drainage area. The following land cover . Laput the site of row for formation and impervious cover for each drainage area. The following land cover . Laput the site of row for formation and impervious cover for each drainage area. The following land cover . Laput the site of row for formation and impervious cover for each drainage area. The following land cover . Laput the site of row formation and the site of row for each drainage area. The following land cover . Laput the site of row formation and the site of the site of row for each drainage area. The following land cover . Laput the site of row formation and the site of the site of row for each drainage area. The following land cover . Laput the site of row for formation and the site of the site of row for each drainage area. The following land cover . Laput the site of row for formation and the site of the site of row for each drainage area. The following land cover . Laput the site of row for formation and the site of the si Koadways, driveways, roomops, parking lots, sudewalks, and other areas of impervious cover.
 This category also includes the surface area of sormwater BMPs that (1) are wet ponds, OR (2) replace 1 ms caregory also metuoes me surface area of stormwater BAR's uat. (1) are wet ponds, VK (4) ref, an otherwise impervious surface (e.g., green roof, pervious parking). Certain stormwater BAR's are considered immersions with research to the land enture concentrations. These DADs are series and music an omerwise impervious surface (e.g., green root, pervious parsing). Uertain stormwater BMP's are onsidered impervious with regard to the land cover computations. These BMP's are assigned runoff CONSIGERES IMPERVIOUS WITH REGARD TO USE LAND COVER COMPUTATIONS. THESE BOARS are assigned HUBOIT follocition rates within the spreadsheet, so their "values" for stormwater management are still accounted for The casene they are considered incorring in that they aither do not reduce man of valuance (are used follocition fales writing the spreadsheet, so their "Values" for stormwater management are shill accounted for. The reason they are considered impervious is that they either do not reduce runoff volumes (e.g., we model or their same fire during on the are bread on converting to a more converting that have true

Ior. The reason they are considered impervious is that they either do not reduce runoit volumes (*. F., w ponds) or their runoff reduction rates are based on comparison to a more conventional land cover type

ive Plan Amendment is to retain piration. The spreadsheet will off volume using the calculated

ormance Spread sheet

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drainage area, the Runoff and calculate the effective The spreadsheet applies credit the selected stormwater

> e areas for purposes of D. and E should be left er as D.A. A.

Drainage Area based on

runoff reduction goal. used on the Fairfax ecifications should Clearinghouse design

& Open Space Category: as that will be considered as ded for designers to ans AND demarcated in the field new practice not

all data

re assumed to be disturbed a specifications for soil ecifications if the area will be 1 roof) can be stem, in Col C. ction practices a must have documentation tiate documentation includes: In no case ements and plans, parcel of or purposes thin public right-of-way or program authority. vities may be prescribed row. If a in Col H rest management, control imited bush hogging to e the RR Co1F/G ıme in

rmwater Conformance Spread sheet aged turf wheed, including yard areas, septic fields,

ained as turf

arf within residential, commercial, industrial, and

ead sheet

d to a hydrologically functional state: etion, will be used as filter strips, grass

I restoration or placement of engineered soil ely, but left in a natural vegetated state (can ate (can include areas that will be bush

e some type of vegetative cover, and that sory include bioretention, dry swale,

stormwater wetland, soil amended cted during construction and that will

13

Spreadsheet also includes pop-up instructions when y hover over cells with red flag in the upper right-hand corner

Rv (turf) ervious)	0.00 0.95			data input cells	6			
ıfall (cf)	0		Estimate DW/		I			
% Credit	Volume Received from Upstream Practices (cf)	Total Volume Received by Practice (cf)	Avg Daily Drawdown (gallons)	Available Cistern Volume (gallons)	Runoff Reduction Vøl (cf)	Re is a Vol wil	ite: timate available Il only b at is av	the portion of cistern storage volume that e for reuse. The runoff reduction volume be applied to the useful storage volume ailable to receive stormwater inflow and
	0	0			0	do cut air	es not toff ele gap al	count "dead" storage below the pump evation, storage above the overflow, or an pove the maximum storage level. For final
	Received from Upstream Practices (ft ³)	Total Volume Received by Practice (ft ³)	Surface Area of Practice (ft ²)	Storag Provided Practice (ft ³)	Runoff fuction Vol (ft ³)	Re DC Vol sho	sign a R Rain ould be	continuous simulation model (e.g. Virginia water Harvesting Spreadsheet or equal) a used.
100%	0	0	N/A		0	_ _		ſ
100%	N/A	0	N/A		0	0)	
100%	N/A	0	N/A		0	0)	
45%	N/A	0	N/A		0	0)	
100%	0	0	N/A		0	0)	
60%	0	0	N/A		0	0		
N/A	0	0		N/A	0	0)	
N/A	0	0		N/A	0	0)	
N/A	0	0		N/A	0	0		
100%	0	0	N/A		0	0		
100%	0	0	N/A		0	0		
50%	0	0	N/A		0	0		
100%	0	0	N/A		0	0		
100%	0	0	N/A		0	0)	

Spreadsheet function

- Calculates the site's Volumetric Runoff Coefficient, Rv
- Calculates total rainfall volume from 1 inch of rainfall for entire site
- Determines total runoff volume from first 1 inch of rainfall
- Applies credit for rainfall that is never converted to runoff (accounts for some interception, infiltration, depression storage, and evaporation represented by Total Site Area x Rv)
- 1 inch runoff = Target Runoff Reduction Volume

Land Cover Summary		
Forest/Preserved Open 3 Weighted Rv (forest)	Space (ac)	0.12 0.05
% Forest		3%
Managed Turf (acres)		0.75
Weighted Rv (turf)		0.24
% Managed Turf		19%
Impervious Cover (acres Rv (impervious)	;)	3.00 0.95
% Impervious		78%
	Total Site Area (acres)	3.87
	Site	0.78
Rainfall / Runoff Summa	агу	
Target Rainfall to Retain	Onsite (inches)	1.0
1-inch Rainfall Volume for	or entire site (cf)	14,048
Volume Not Converted to	Runoff (cf)	3,027
1-inch Runoff Volume fo	or entire site (cf)	11,021

	Tysons Corner Comprehensive Pla	n Stormwater Conformance Spreadsheet - Beta Version 4-4-2012						
Site Name:								
Description:								
Post-Development Land Cover	data input cells highlighted in yellow							
Drainage Area A		Spreadsheet an put fore to Site						
Land Cover Type Forest / Open Space - Undisturbed,	HSG A soils HSG B Soils HSG C Soils HSG D Soils	s Totals open space or reforested i						
protected forest / open space or Managed Turf (acres)	Data and Summary Tab							
Impervious Cover (acres)		0.00 Project name and description						
	Total							
Drainage Area B Land Cover Type	HSG A soils HSG B Soils HSG C Soils HSG D Soils	Forest/Preserved Open Space (ac) Statistics Weighted Rv (forest)						
Forest / Open Space - Undisturbed, protected forest / open space or		• Use vellow cells to input acres by land						
Managed Turf (acres)								
Impervious Cover (acres)		dover and hydrologic soil group for						
	Total	0.00 % Managed Turf						
Drainage Area C								
Land Cover Type	HSG A soils HSG B Soils HSG C Soils HSG D Soils	s Totals Rv (impervious)						
Forest / Open Space - Undisturbed, protected forest / open space or		0.00 % Impervious						
Managed Turf (acres)		0.00 Total Site Area (ad						
Impervious Cover (acres)		0.00 Si						
	Total	0.00 Rainfall / Runoff Summary						
Drainage Area D		Target Rainfall to Retain Onsite (inches)						
Land Cover Type	HSG A soils HSG B Soils HSG C Soils HSG D Soils	s Totals Volume Not Converted to Runoff (cf)						

Apply Runoff Reduction Practices	Description of Area	Impervious Cover in Contributing D.A. (ac)	Managed Turf in Contributin	Max Volume Received by Practice (ft ³)	e Descrip)
Infiltration Practice		2.11. (30)	g 0.11. (00)	0	Subtract 100% of
Vegetated Roof		0.50	N/A	1,724	Subtract 100% of
Permeable Pavement - DCR Level 2 Design Spec		1.00	N/A	3,449	Subtract 100% of
Permeable Pavement - DCR Level 1 Design Spec			N/A	0	Snreadsheet Innut - Site
Bioretention - DCR Level 2 Design Spec (enhanced)			0.40	0	
Bioretention - DCR Level 1Design Spec (standard)		0.15	0.10	517	Subtract 60% of p
Disconnection to A/B Soils or Compost-Amended Filter Path			N/A	0	Data and Summary Tab
Simple Disconnection to C/D Soils			N/A	0	0.02 cu. ft per sq.
Simple Disconnection to Conservation Area			N/A	0	0.06 cu. treesq.
Disconnection to Rain Garden (Micro-bioretention)				0	
Disconnection to Dry Well/French Drain-DCR Level 2			N/A	0	Subtract 100% of p
Design Disconnection to Dry Well/French Drain-DCR Level 1			N/A	0	subtrac draining to individual
Design Disconnection to Stormwater Planter, Extended Tree					
Pit, or Curb Extension (Urban Bioretention)			N/A	0	
Dry Swale - DCR Level 2 Design Spec				0	Subtrac 100% or
Dry Swale - DCR Level 1 Design Spec				0	Subtract 40% of p
Grass Channel A/B Soils				0	Reduce volume of grass changel by:
Grass Channel C/D Soils				0	
Grass Channel with Compost Amended Soils				0	grass of the provided of the contributing drainage to
Extended Detention Pond				o	Reduce volume di detention pond by
Sheetflow to Conservation Area with A/B Soils				0	
Sheetflow to Conservation Area with C/D Soils				0	Reduce volume by of conservation ar
Sheetflow to Vegetated Filter Strip in A/B Soils or Amended C/D Soils				0	Reduce volume by of conservation ar
Proprietary / Other practice not listed above				0	
	Totals:	2.65	0.50	•	
Total Dra	ainage Area Treate	ed (acres):	3.15]	

	% Credit	Received from Upstream	Totul Volume Received by Practice (ft ³)	Surface Area of Practice (ft ²)	Storage Vol Provided by Practice (ft ³)	Runoff Reduction Vol (ft ³)	Re	emaining /olume (ft ³)	Dowr
e vol.	100%	0	0	N/A		0		0	
e vol. 🔪	100%	N/A	1,724	N/A	2,500	1,724		0	
e vol. 🔪	100%	N/A	3,4 3	N/A	5,000	3,449		0	
vol.	45%	N/A	د ا	N/A		0		0	
e vol.	100%	0	0	N/A	1,000	0		0	
vol.	60%	0	517	N/A	1,000	517		0	
on	N/A	0	0		N/A	0		0	
nea by on	N/A	0	0		N/A	0		0	
nearby On	N/A	0	0		N/A	0		0	
g vol.	100%	172	172	N/A	180	172		0	
e vol.	100%	0	0	N/A		0		þ	
vol.	50%	0	0	N/A		0		þ	
e vol.	100%	0	0	N/A		0		þ	
e vol.	100%	0	0	N/A		0		þ	
vol.	40%	0	0	N/A		0		D	
h	20%	0	0	N/A	N/A	0		0	
h	10%	0	0	N/A	N/A	0		0	
h	30%	0	0	N/A	N/A	0		0	
ded	10%	0	0	N/A	N/A	0		0	
sq. ft.	N/A	0	0		N/A	D		0	
sq. ft.	N/A	0	0		N/A	0		0	
sq. ft.	N/A	0	4		N/A	0		0	
aye		0	0	N/A		0		0	
educt	ion Vol	ume Achieve	d for Draina	ige Arc. A //	whic feet):	9,139	Se	e Site D	ata and Summ

Spreadsheet Input – Drainage Area Tabs

For each BMP selected, as applicable:

- Storage volume provided by practice, OR
- Surface area of practice

I 0							1	
Volume		Estimate RWI	HRR % Credit				H	
Received	Total Volume	Avg Daily	Available	Runoff	Remaining			
from	Received by	Drawdown (gelleng)	Volume	Reduction	Volume	Downstream Practice		Curree debe et lunut
Practices (cf)	Practice (cf)	(galions)	(gallons)	Vor(cr)	(CI)			Spreadsneet input –
0	3,449	2,500	25,000	3,276	172	Disconnection to Rain Garden	1.00	opi saasiissi inpat
Received	Total	Surface Area	Storage Vol	Runoff	Reg aining			Drainage Area Taba
from	Volume Beceived hu	of Practice	Provided by	Reduction	l yolume	Downstream Practice		Drainade Area Tabs
Upstream	Practice (ft ³)	(ft²)	Practice (ft ³)	Vol (ft ³)	(ft ³)			Pranage / nea raise
0	0	N/A		0	0		_	
N/A	1,724	N/A	2,500	1,724	0	Select Downstr	eam BMP	Salaat dawnatraam
N/A N/A	3,449	N/A N/A	5,000	3,449		If remaining vol	ume	
0	0	N/A	1,000	0	0	continues to a d	lownstream	
0	517	N/A	1,000	517	0	practice in series	s, select the	nractica if annlicable
0	0		N/A	0	0	menu.	e arop-aown	practice, il applicable
0	0		N/A	0	0			
0	0		N/A	0	0			
172	172	N/A	180	172	0			
0	0	N/A		0	-		hair	r ng
-							dur	e Downstream Practice
0	0	N/A		0	0		- 'ft	
0	0	N/A		0	0		-	·
0	0	N/A		0	0			v
0	0	N/A		0	0		0	Rooftop Rainwater Harvesting
0	0	N/A	N/A	0	0			Infiltration Practice
0	0	N/A	N/A	0	0			Bioretention - DCR Level 2 Design Spec
0	0	N/A	N/A	0	0			Disconnection to A/B or Amended soils hstream
0	0	N/A	N/A	0	0		0	Simple Disconnection to Conservation Area lect the
0	0		N/A	0	0	N/A	0	Disconnection to Hain Garden
0	0		N/A	0	0	N/A	1 📕	inenu.
0	0		N/A	0	0	N/A	0	
0	0	N/A		0	0			
							0	

	Drainage Area B Post-Development Land	Cover (acres)		D.A.	Total (acres)	3.87 Site Runoff from	m 1" Rai	nfall (cf)
Spreadsh	eet function Apply Runoff Reduction Practices	Description of Area	Roof Area Contributing to RWH (ac)	Design Rainfall for RWH (in)	Max Volume Captured by Practice (cf)	RWHS Credit	Input % RR from Model	% Credit
	Rooftop Rainwater Harvesting		1.00	1.00	3,449	Estimate Runoff Reduction % Using Spreadsheet		95%
 Can mod areas (p 	del 5 main drainag Apply Runoff Reduction Practices lus sub-areas to	Description of Area	Impervious Cover in Contributing D.A. (ac)	Managed Turf in Contributing D.A. (ac)	Max Volume Received by Practice (ft ³)	Description of Credit		% Credit
	Infiltration Practice				0	Subtract 100% of provided storage	e vol.	100%
individu	at practices)		0.50	N/A	1,724	Subtract 100% of provided storage	e vol.	100%
	Permeable Pavement - DCR Level 2 Design Spec		1.00	N/A	3,449	Subtract 100% of provided storage	e vol.	100%
	Permeable Pavement - DCR Level 1 Design Spec			N/A	0	Subtract 45% of provided storage	vol.	45%
	Bioretention - DCR Level 2 Design Spec (enhanced)		0.15	0.40	348 604	Subtract 100% of provided storage	e vol.	100%
 Can link 	Disconnection to AB Soils or Compost-Amended Filter	s	0.15	N/A	0	Reduce volume to conservation ar 0.04 cu. ft per sq. ft. of conservati	rea by on area.	N/A
	Simple Disconnection to C/D Soils			N/A	0	Reduce volume to conservation ar 0.02 cu. ft per sq. ft. of conservati	rea by on area.	N/A
	Simple Disconnection to Conservation Area			N/A	0	Reduce volume to conservation ar 0.06 cu. ft per sq. ft. of conservati	rea by on area.	N/A
I ists RM	D pnection to Rain Garden (Micro-bit-retention)	0/			0	Subtract 100% of surface ponding	j vol.	100%
		/0		N/A	0	Subtract 100% of provided storage	e vol.	100%
RR cred	Besign Of to Carch Drain-DCR Level 1			N/A	0	Subtract 50% of provided storage	vol.	50%
	Disconnection to Stormwater Planter, Extended Tree Pit, or Curb Extension (Urban Bioretention)			N/A	0	Subtract 100% of provided storage	e vol.	100%
	Dry Swale - DCR Level 2 Design Spec				0	Subtract 100% of provided storage	e vol.	100%
	Dry Swale - DCR Level 1 Design Spec				0	Subtract 40% of provided storage	vol.	40%
 Has line 	tor BMP other that	an			0	Reduce volume conveyed through channel by 20%.	grass	20%
those lis	temannel C/D Soils				0	Reduce volume conveyed through channel by 10%.	grass	10%
	Grass Channel with Compost Amended Soils				0	Reduce volume conveyed through channel by 30%.	grass	30%
						Reduce volume directed to extend	led	

VA DCR STORMWATER DESKY CCF Cor No. s TRGINIA DCR STOI **Tysons Corner Stormwater Compli** TRGINA DCR STORIWATER DESIGN SPECIFICATION No. 9 RAINWATER

VEGETATED ROOF

Spreadsheet the function control of the stormwater of the stormwater of the stormwater of the storm of the stormwater of the storm of the store storm of the store of the storm of the storm of the stor VA DCR STORMWATER DESIGN SPECIFICATION NO. 5 RAINWATER HARVESTING VA DCR STORMWATER DESIGN SPECIFICATION NO. 8

March 1, 2011

- VA DCR STORMWATER DESIGN SPECIFICATION NO. 7 Use Virginia DCR Stormwater Design VIRGINIA DCR STORMWATER DESIGN SPECIFICATION No. 7 Specifications for sizing and design of Runoff Ensurement March 1, 2011 **Reduction practices**
- Sin' Design standards and specifications are available online from the BMP Clearinghouse http://wwrrc.vt.edu/swc/NonProprietaryBMPs.html



BIORETENTION

PERMEABLE PAVEMENT

VERSION 1.9 March 1, 2011

BIORETENTION







Rainwater Harvesting

- 'Shortcut tool' does not account for seasonal or other variations in reuse demand (uses same daily demand over full 30-yr. period)
- Does not "optimize" the cistern size – simply trial and error process
- Estimates RR % credit by taking 30 years of daily rainfall data and calculating daily cistern levels accounting for when it's empty or overflowing
- RR% is sum of all stored water used over 30 yrs. divided by all the stormwater generated for 30 yrs. for all events of 1 inch or less

Tysons Corner Stormwater Compliance VA POR O LONINGI LA PLOION OF LONINATIO

DESIGN SPECIFICATION No. 6 RAINWATER HARVESTING VERSION 1.9.5 March 1, 2011 •

VIRGINIA DCR STORMWATER

rainwater harvesting is used in this specification, but it is also known as a cistern or rainwater harvesting system. Rainwater that falls on a rooftop is collected and conveyed into an above- or below-ground storage tank where it can be used for non-potable water uses and on-site stormwater disposal/infiltration. Non-potable uses may include flushing of toilets and urnals inside buildings, landscape irrigation, exterior washing (e.g. car washes, building facades sidewalks, street sweepers, fire trucks, etc.), fire suppression (sprinkler) systems, supply fe chilled water cooling towers, replenishing and operation of water features and water fountair and laundry, if approved by the local authority. Replenishing of pools may be acceptable

special measures are taken, as approved by the appropriate regulatory authority.

In many instances, rainwater harvesting can be combined with a secondary (down-grad runoff reduction practice to enhance runoff volume reduction rates and/or provide treatm overflow from the rainwater harvesting system. Some candidate secondary practices includ

Rainwater Harvesting, cont'd

- 'Shortcut tool' assumes Rv roof is 0.95
- Assumes 0.05 inch 'first flush' is diverted from the cistern.
- Maximum inflow to Cistern is Roof Area x 0.90 inches

Rainwater harvesting systems intercept, divert, store and release rainfall for future use. The term Rainwater harvesting is used in this specification, but it is also known as a cistem or rainwater hormsting is used in this specification, but it is also known as a cistem or an above-or Can send first flush diversion to another BMP

Hose bibb drip lean-out plug Figure 6.8. First Flush Diverter

Pade 1 of 4D

Version 1.9.5. March 1. 2011

Outlet

Figure 6.9. Roof Washer

Rainwater Harvesting

- Spreadsheet allows designer to 'over design' the cistern by using up to 1.4 inches (approximate 95th percentile) as the "design rainfall" for the roof capture.
- Although this is not the preferred approach, it could be an option if other practices are unable to achieve the 1 inch retention goal and a larger rainwater harvesting system can help reach the goal.



Spreadsheet summary results

- Compares RR volume achieved to target 1-inch volume
- Calculates total % of site area captured by a BMP
- Equates total RR volume achieved to total volume generated by 1 inch rainfall and provides result in fraction of 1 inch

Rainfall / Runoff Summary	
Target Rainfall to Retain Onsite (inches)	1.0
1-inch Rainfall Volume for entire site (cf)	14,048
Volume Not Converted to Runoff (cf)	3,027
1-inch Runoff Volume for entire site (cf)	11,021
Runoff Reduction Summary	
Target Runoff Reduction Volume (cf)	11,021
Runoff Reduction Volume Achieved (cf)	9,570
Total Runoff Volume Retained (cf)	12,597
Total Area of Site Cantured in a BMP (acres)	3.15
Conformance with Comprehensive Plan Goal	
Total Site Area Captured by a BMP (%)	81%
Rainfall Depth Retained Onsite (inch)	0.90

Apr 2012

Tysons Corner Stormwater Compliance

Spreadsheet summary results cont'd

- The spreadsheet is set up to print on legal size paper (except the instructions, which is letter size)
- You may make electronic submissions using the spreadsheet (County staff may prefer electronic copy)

Spreadsheet can be downloaded from the county website at the Transforming Tysons web page http://www.fairfaxcounty.gov/tysons/

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Address questions or comments to:

Site Code Research and Development Branch

Code Development and Compliance Division Land Development Services Department of Public Works and Environmental Services 12055 Government Center Parkway Fairfax, Virginia 22035-5503 http://www.fairfaxcounty.gov/dpwes/

703-324-1780, TTY 711



COUNTY OF FAIRFAX, VIRGINIA DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL SERVICES

