Project Name:	4219 Lorcom Lane
Date:	2/19/2019
Linear Development Project?	No

CLEAR ALL

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.5683

Maximum reduction required:	*10%*
The site's net increase in impervious cover (acres) is:	*0.0522*
Post-Development TP Load Reduction for Site (lb/yr):	*0.1333*

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project? No
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.0000
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed		0.4627			0.4627
Impervious Cover (acres)		0.1056			0.1056
					0.5683

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land					0.0000
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed		0.4105			0.4105
Impervious Cover (acres)		0.1578			0.1578
Area Check	OK.	OK.	OK.	OK.	0.5683

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre

Pre-ReDevelopment	Listed	Adjusted[1]
Forest/Open Space Cover (acres)	0.0000	0.0000
Weighted Rv(forest)	0.0000	0.0000
% Forest	0%	0%
Managed Turf Cover (acres)	0.4627	0.4105
Weighted Rv(turf)	0.2000	0.2000
% Managed Turf	81%	80%
Impervious Cover (acres)	0.1056	0.1056
Rv(impervious)	0.9500	0.9500
% Impervious	19%	20%
Total Site Area (acres)	**0.5683**	**0.5161**
Site Rv	**0.3394**	**0.3535**

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0161	0.0152
Pre-ReDevelopment Treatment Volume (cubic feet)	700.1792	662.2792
Pre-ReDevelopment TP Load (lb/yr)	**0.4399**	**0.4161**
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	0.7700	0.8100
Baseline TP Load (lb/yr) (**0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*0.2116*

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)

Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.0000
Weighted Rv(forest)	0.0000
% Forest	0%
Managed Turf Cover (acres)	0.4105
Weighted Rv (turf)	0.2000
% Managed Turf	72%
Impervious Cover (acres)	0.1578
Rv(impervious)	0.9500
% Impervious	28%
Final Site Area (acres)	**0.5683**
Final Post Dev Site Rv	**0.4083**

Land Cover Summary-Post

Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.0000
Weighted Rv(forest)	0.0000
% Forest	0%
Managed Turf Cover (acres)	0.4105
Weighted Rv (turf)	0.2000
% Managed Turf	80%
ReDev. Impervious Cover (acres)	0.1056
Rv(impervious)	0.9500
% Impervious	20%
Total ReDev. Site Area (acres)	**0.5161**
ReDev Site Rv	**0.3535**

Land Cover Summary-Post

Post-Development New Impervious	
New Impervious Cover (acres)	0.0522
Rv(impervious)	0.9500

Treatment Volume and Nutrient Load

Final Post-Development Treatment Volume (acre-ft)	0.0193
Final Post-Development Treatment Volume (cubic feet)	842.3042
Final Post-Development TP Load (lb/yr)	**0.5292**
Final Post-Development TP Load per acre (lb/acre/yr)	0.9300

Post-ReDevelopment Treatment Volume (acre-ft)	0.0152
Post-ReDevelopment Treatment Volume (cubic feet)	662.2792
Post-ReDevelopment Load (TP) (lb/yr)*	**0.4161**
Post-ReDevelopment TP Load per acre (lb/acre/yr)	0.8100
Max. Reduction Required (Below Pre-ReDevelopment Load)	10%
TP Load Reduction Required for Redeveloped Area (lb/yr)	**0.0416**

Post-Development Treatment Volume (acre-ft)	0.0041
Post-Development Treatment Volume (cubic feet)	180.0250
Post-Development TP Load (lb/yr)	**0.1131**
TP Load Reduction Required for New Impervious Area (lb/yr)	**0.0917**

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	0.1333

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	3.1471
Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	3.7859

Drainage Area A

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.0000	0.0000
Managed Turf (acres)		0.4105			0.4105	0.2000
Impervious Cover (acres)		0.1578			0.1578	0.9500
				Total	0.5683	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	0.5292
Post Development Treatment Volume in D.A. A (ft^3)	842.3042

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft^3)	Runoff Reduction (ft^3)	Remaining Runoff Volume (ft^3)	Total BMP Treatment Volume (ft^3)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
3. Permeable Pavement (RR)													
3.a. Permeable Pavement #1 (Spec #7)	45		0.0337	0.0000	52.3688	64.0063	116.3750	25	0.0000	0.0730	0.0429	0.0301	
6. Bioretention (RR)													
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40		0.0837	0.0000	115.3933	173.0900	288.4833	25	0.0000	0.1810	0.0996	0.0815	

Practice	Nitrogen Removal Efficiency (%)	Nitrogen Load from Upstream Practices (lbs)	Untreated Nitrogen Load to Practice (lbs)	Nitrogen Removed By Practice (lbs)	Remaining Nitrogen Load (lbs)
3. Permeable Pavement (RR)					
3.a. Permeable Pavement #1 (Spec #7)	25	0.0000	0.5225	0.3070	0.2155
6. Bioretention (RR)					
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40	0.0000	1.2952	0.8289	0.4663

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.0000	0.0000	0.0000	0.0000	0.0000	OK.
IMPERVIOUS COVER (ac)	0.1578	0.0000	0.0000	0.0000	0.0000	OK.
IMPERVIOUS COVER TREATED (ac)	0.1174	0.0000	0.0000	0.0000	0.0000	OK.
MANAGED TURF AREA (ac)	0.4105	0.0000	0.0000	0.0000	0.0000	OK.
MANAGED TURF AREA TREATED (ac)	0.0000	0.0000	0.0000	0.0000	0.0000	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

Site Treatment Volume (ft^3) 842.3042

Runoff Reduction Volume and TP By Drainage Area

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft^3)	167.7621	0.0000	0.0000	0.0000	0.0000	167.7621
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	0.5292	0.0000	0.0000	0.0000	0.0000	0.5292
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.1425	0.0000	0.0000	0.0000	0.0000	0.1425
TP LOAD REMAINING (lb/yr)	0.3867	0.0000	0.0000	0.0000	0.0000	0.3867
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	1.1359	0.0000	0.0000	0.0000	0.0000	1.1359

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	0.5292
TP LOAD REDUCTION REQUIRED (lb/yr)	0.1333
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.1425
TP LOAD REMAINING (lb/yr):	0.3867
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	0.0000 **

** TARGET TP REDUCTION EXCEEDED BY 0.0092 LB/YEAR **

Total Nitrogen (For Information Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	3.7859
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	1.1359
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	2.6501

Site Information - Revised 9/19/2017

Project SWM #	LDA Permit #	Disturbed Area (acres)	% Pre-Impervious	% Post-Impervious	Pre-Development TP load (lb/yr)	Post-Development TP load (lb/yr)	TP load reduction achieved (lb/yr)	Pre-Development TN load (lb/yr)	Post-Development TN load (lb/yr)	TN load reduction achieved (lb/yr)	Total Site Area (acres)
19-0040		0.5683	18.6	27.8	0.44	0.53	0.14	3.15	3.79	1.14	0.5683

Project SWM #	Pre-Forest Area (acres)	Pre-Turf Area (acres)	Pre-Impervious Area (acres)	Post-Forest Area (acres)	Post-Turf Area (acres)	Post-Impervious Area (acres)	Pre-Runoff Volume	Post-Runoff Volume	Runoff Volume Reducation Achieved	Site Latitude (Decimal Degrees)	Site Longitude (Decimal Degrees)	Anticipated Start Date
19-0040	0.0000	0.4627	0.1056	0.0000	0.4105	0.1578	700.1792	842.3042	167.7621	38.901520	77.113813	5/1/2019

Stormwater Management Facility Information- Revised 5/31/2018

Facility Type**	Description	Location	LDA Permit #	Project SWM #	Building Permit #	Facility ID	BMP downstream of another BMP (in Series)?	Upstream (Primary) BMP	Chesapeake Bay Segment	Watershed	HUC6	Soils
BIORETENTION #1	PLANTER #1A	LOT A1	0	19-0040		19-0040A	No		POTTF_DC	Donaldson Run	PL24	A/B
BIORETENTION #1	PLANTER #2A	LOT A1	0	19-0040	0	19-0040B	No		POTTF_DC	Donaldson Run	PL24	A/B
BIORETENTION #1	PLANTER #1B	LOT B1	0	19-0040	0	19-0040C	No		POTTF_DC	Donaldson Run	PL24	A/B
BIORETENTION #1	PLANTER #2B	LOT B1	0	19-0040	0	19-0040D	No		POTTF_DC	Donaldson Run	PL24	A/B
PERMEABLE PAVEMENT #1	LOT A1 WALK	LOT B1	0	19-0040	0	19-0040E	No		POTTF_DC	Donaldson Run	PL24	A/B
PERMEABLE PAVEMENT #1	LOT A1 DRIVE	LOT A1	0	19-0040	0	19-0040F	No		POTTF_DC	Donaldson Run	PL24	A/B
PERMEABLE PAVEMENT #1	LOT A1 PATIO	LOT A1	0	19-0040	0	19-0040G	No		POTTF_DC	Donaldson Run	PL24	A/B
PERMEABLE PAVEMENT #1	LOT B1 WALK	LOT B1	0	19-0040	0	19-0040H	No		POTTF_DC	Donaldson Run	PL24	A/B
PERMEABLE PAVEMENT #1	LOT B1 DRIVE	LOT B1	0	19-0040	0	19-0040I	No		POTTF_DC	Donaldson Run	PL24	A/B
PERMEABLE PAVEMENT #1	LOT B1 PATIO	LOT B1	0	19-0040	0	19-0040J	No		POTTF_DC	Donaldson Run	PL24	A/B
DRY WELL	LOT A1	#1A	0	19-0040	0	19-0040K			POTTF_DC	Donaldson Run	PL24	A/B
DRY WELL	LOT A1	#1B	0	19-0040	0	19-0040L			POTTF_DC	Donaldson Run	PL24	A/B
DRY WELL	LOT B1	#2	0	19-0040	0	19-0040M			POTTF_DC	Donaldson Run	PL24	A/B

Facility ID	Runoff Treated (in)	Volume Treated (ft^3)	Treated Area (acres)	Forest Area (acres)	Turf Area (acres)	Impervious Area (acres)	RPC	Phosphorus Efficiency (%)	Nitrogen Efficiency (%)	Sediment Efficiency (%)	TP load removed (lbs)	TN load removed (lbs)
19-0040A	1.00	62.5	0.0181	0.0000	0.0000	0.0181	05026028	55.00	64.00	75.00	0.0216	0.1797
19-0040B	1.00	81.7	0.0237	0.0000	0.0000	0.0237	05026028	55.00	64.00	75.00	0.0282	0.2348
19-0040C	1.00	62.5	0.0181	0.0000	0.0000	0.0181	05026028	55.00	64.00	75.00	0.0216	0.1797
19-0040D	1.00	81.7	0.0237	0.0000	0.0000	0.0237	05026028	55.00	64.00	75.00	0.0282	0.2348
19-0040E	1.00	24.5	0.0029	0.0000	0.0000	0.0029	05026028	59.00	59.00	75.00	0.0036	0.0261
19-0040F	1.00	93.2	0.0109	0.0000	0.0000	0.0109	05026028	59.00	59.00	75.00	0.0139	0.0992
19-0040G	1.00	26.5	0.0031	0.0000	0.0000	0.0031	05026028	59.00	59.00	75.00	0.0039	0.0282
19-0040H	1.00	24.5	0.0029	0.0000	0.0000	0.0029	05026028	59.00	59.00	75.00	0.0036	0.0261
19-0040I	1.00	93.2	0.0109	0.0000	0.0000	0.0109	05026028	59.00	59.00	75.00	0.0139	0.0992
19-0040J	1.00	26.5	0.0032	0.0000	0.0000	0.0032	05026028	59.00	59.00	75.00	0.0039	0.0282
19-0040K	#N/A							#N/A	#N/A	#N/A		
19-0040L	#N/A							#N/A	#N/A	#N/A		
19-0040M	#N/A							#N/A	#N/A	#N/A		

SWM FACILITIES PRIVATE MAINTENANCE NOTES

THE STORMWATER MANAGEMENT FACILITIES SHALL BE PRIVATELY INSPECTED AND MAINTAINED ACCORDING TO COUNTY REQUIREMENTS.

BMP NARRATIVE

THE SITE WILL COMPLY WITH ARLINGTON COUNTY WATER QUALITY REQUIREMENTS THROUGH THE INSTALLATION OF FOUR (4) URBAN BIO-RETENTION PLANTERS WHICH DISCHARGE INTO TWO (2) DRY WELLS AND LEVEL 1 PERMEABLE PAVER DRIVEWAYS, LEAD WALKS, AND PATIOS.

THE FOUR (4) URBAN BIO-RETENTION PLANTERS WILL TREAT RUNOFF FROM 3,644 SF OF ROOF AREA PRIOR TO DISCHARGING INTO THE DRY WELLS LOCATED IN THE REAR OF THE PROPOSED HOUSES. THE PERMEABLE PAVER DRIVEWAYS, LEADWALKS, AND PATIOS WILL TREAT 1,420 SF OF AREA (THE PAVER SURFACE AREA). WITH THE URBAN BIORETENTION PLANTERS AND PERMEABLE PAVERS THE SITE MEETS THE BMP REQUIREMENTS PER ARLINGTON COUNTY STORMWATER CODE AS SHOWN ON THIS SHEET (VRRM).

WATER PROOFING NOTES

NOTE: WALTER L. PHILLIPS, INC. IS NOT RESPONSIBLE FOR WATER PROOFING DESIGN REQUIRED AT BUILDING FOUNDATION. CONTRACTOR AND OWNER TO PROVIDE PROPER WATERPROOFING ESPECIALLY NEAR PROPOSED BMP FACILITIES.

NOTE:
ARLINGTON COUNTY DOES NOT REVIEW THE WATERPROOFING DESIGN AND THE OWNER/DEVELOPER AGREES TO HOLD ARLINGTON COUNTY HARMLESS IN THE EVENT OF FAILURE.

COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
07/17/19
PROFESSIONAL ENGINEER

SWM NARRATIVE AND VRRM SPREADSHEET

WALTER L. PHILLIPS INCORPORATED ESTABLISHED 1945
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

4219/4221 LORCOM LANE
THE PROPERTY OF R.A. PHILLIPS
GRADING PLAN
4219/4221 LORCOM LANE, ARLINGTON, VIRGINIA 22207

SCALE: NONE	DRAWN CR	CHECKED TPB/KW
SUBMITTED DATE 03/05/2019, 05/07/2019, 06/24/2019, 07/17/2019		APPROVED DATE
		DIRECTOR OF ENVIRONMENTAL SERVICES
	SHEET: C-0702	