Z-0006 - 2014



PLANNING DIVISION

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Project Description

The Peninsula Pentecostals Rezoning of the 40.3± acre Greenmount Kirby Tract (Lots P-1, P-2 & P-3) contemplates development of a House of Worship, Day Care, Administration Offices, Ministry Support Apartment, Family Life Center, Accessory/Utility Structure, multi-purpose recreational fields, 480 car parking lot and associated drive aisles and sidewalks on the 24.8± acre Lot P-1. The Peninsula Pentecostals Rezoning of the 40.3± acre Greenmount Kirby Tract also contemplates a Commercial Mixed Use development on the 10.8± acre Lot P-2 and 4.7± acre Lot P-3. The 40.3± acre Greenmount Kirby Tract (Lots P-1, P-2 & P-3) is located on the northerly side of US Route 60 (Pocahontas Trail) near the corporate boundary between James City County and Newport News.

Existing Site Conditions

Lot P-1 is 24.8± acres in size, half of which is wooded. The other half is in cropland. Lot P-1 is also encumbered by a high voltage electricity transmission line and appurtenant easement. The easement is maintained in a cleared condition. 15± acres of the Lot P-1 is anticipated to be disturbed as a part of this project. The western boundaries of Lot P-1 is the centerline of a tributary stream to Skiffes Creek. The northern boundary is the centerline of Skiffes Creek. There are wetlands and buffers upland and along the northern and western boundaries. The southern boundary is US Route 60 (Pocahontas Trail) a Community Character Corridor and the eastern boundary is the centerline of the 120' wide easement for the existing high voltage electricity transmission line.

Lot P-2 is 10.8 acres in size, 4.5± acres are wooded and 6.3± acres are open, in cropland. Lot P-2 is also encumbered by an high voltage electricity transmission line and appurtenant easement. The easement is maintained in a cleared condition.

Lot P-3 is 4.7± acres in size, 3.5± acres are wooded and 1.2± acres are open, in cropland. Part of Lot P-3 has been identified as corridor for the preferred alternative for the Skiffes Creek Connector (US Route 60 Realignment) project.

Lots P-2 and P-3 are bound on the west by Lot P-1, the north and erast by Skiffes Creek and south by US Route 60 (Pocahontas Trail) a Community Character Corridor.

Slopes vary from less than 2% across the cropland areas to 3:1 or steeper along embankments leading down to the streams. Elevations range from 16 to 60 feet above sea level.



Adjacent Area

Adjacent property to the west, north and east of Lots P-1, P-2 and P-3 is part of Skiffes Creek and Skiffes Creek Reservoir. Erosion and sediment control measures will need to be designed to protect these sensitive lands from construction activities on Lots P-1, P-2 and P-3. Stormwater runoff from Lots P-1, P-2 and P-3 during and after construction will need to conform to water quality and water quantity design criteria defined by Code.

Offsite Disturbed Area

No off-site disturbance is anticipated with this project.

Critical Erosion Areas

Disturbance of steep slopes will be avoided to the extent practicable, other than the work necessary for stormwater BMPs discharge and sanitary sewer connection. Such disturbances will have protective covering applied immediately in order to accelerate stabilization as will constructed slopes 3:1 and steeper.

Demolition

Demolition will involve clearing and grubbing the portion of Lots P-1, P-2 and P-3 as needed for construction.

Utilities

The proposed buildings will be served by underground electric, telephone, sanitary, and gas utilities. The existing overhead utilities along U.S. Route 60 (Pocahontas Trail) will remain as will the existing overhead high voltage electricity transmission line.

Proposed Grading and Paving

Lots P-1, P-2 and P-3 will be graded to direct stormwater runoff away from the proposed buildings to perimeter grass lined swales and BMPs.

Stormwater Management Considerations

The site naturally drains south to north from US Route 60 to Skiffes Creek. This drainage pattern will be maintained to the extent practicable.



The buildings, parking areas, drive aisles and sidewalks will create 8.7± acres of impervious surfaces on Lot P-1. Additionally, 6± acres of woods and cropland will be converted into managed turf and landscaped areas. The stormwater runoff from these areas will need to conform to water quality and water quantity design criteria defined by Code. Multiple areas will be available to accommodate stormwater BMPs. Stormwater runoff from the constructed improvements will be conveyed via grass lined swales to the BMPs for quality improvement and quantity control prior to discharge to a stilling basin upstream of wetlands, thus dissipating the energy from the concentrated flow before discharging to the receiving channel, Skiffes Creek. The point of discharge to Skiffes Creek is located approximately 1,000 feet upstream of Skiffes Creek Reservior. At the point of discharge, the receiving channel is a mild gradient meandering channel, several feet wide, stable condition and within a broad, moderately wooded floodplain. Channel protection criteria will be as required by the minimum stadards published in section 9CAC25-870-66 Water Quantity of the Virginia Stormwater Management Regulations.

Two options are proposed to provide compliance with Code required water quality and water quantity discharge criteria. Exhibit A provides an option using several bioretention basins and an extended detention pond. The bioretention basins are proposed to be located in areas of the site suitable to treat most of the parking area and the building roof. Bioretention basins A, B, and C are located in drainage area #1 which covers most of the front half of the site. Drainage area #1 is 6.3± acres and will require all three basins because of the Code requirement limiting each bioretention cell to 2.5 acres of drainage area. Drainage area #2 is 4.0± acres and receives runoff from the middle of the parking lot and the building roof. Basin D is shown as a single bioretention basin and will need to be designed as two separate cells since the drainage area is larger than 2.5 acres. Drainage area #3 is 2.0 acres and covers the rear of the proposed building and part of the roof. Bioretention basins E and F are sized much larger than required since the contributing drainage area may change depending on roof drainage design. Overflow from all of the bioretention basins will be conveyed to the extended detention basin in the rear of the site via open channels or underground conduits. Exhibit B provides an option using wet ponds. Grass lined channels will convey the runoff from the improved areas wet ponds. A single wet pond near the rear of Lot P-1 is preferable, however, it may necessary to construct supplemental wet ponds around the front parking area in order to achieve the treatment shown in the VRRM Worksheet.

In both of these scenarios, a storm sewer system will convey discharge from the ponds' outlet control structures to a stilling basin located upland of the wetlands, requiring encroachment into the RPA buffer. Encroachment into the RPA buffer will be limited to construction of the BMP discharge structure and stilling basin.

Virginia Runoff Reduction Metho	od New Devel	opment Works	heet - v2.8 - June	2014	
To be used w/ 2011 BMP Standa				_	
Site Data	lao ana opoo				
Project Name: Peninsula Pentecosta	Lat D 1 Evhib	it A Diaretentian			
Date: 1/2015	LOUP-1 - EXIIID	IL A DIOTELETILIOTI			
Date: 1/2015					
	data input cells				
	calculation cells				
	constant values				
1. Post-Development Project & L	and Cover In	formation			
Constants					
Annual Rainfall (inches)	43				
Target Rainfall Event (inches)	1.00				
Phosphorus EMC (mg/L)	0.26		Nitrogen EMC (mg/L)	1.86	
Target Phosphorus Target Load (lb/acre/yr)	0.41		gg (g/L)		
Pj	0.90				
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	0.0000	5.2700	0.0000	5.2700
Managed Turf (acres) disturbed, graded for					
yards or other turf to be mowed/managed	0.0000	0.0000	10.8600	0.0000	10.8600
Impervious Cover (acres)	0.0000	0.0000	8.6700	0.0000	8.6700
				Total	24.8000
Rv Coefficients					
RV Coefficients	A soils	B Soils	C Soils	D Soils	
Forest/Open Space	0.02	0.03	0.04	0.05	
Managed Turf	0.02	0.20	0.22	0.25	
Impervious Cover	0.15	0.20	0.95	0.95	
Impervious cover	0.95	0.90	0.90	0.95	
Land Cover Summary					
Forest/Open Space Cover (acres)	5.2700	1			
Weighted Rv(forest)	0.0400				
% Forest	21%				
Managed Turf Cover (acres)	10.8600				
Weighted Rv(turf)	0.2200				
% Managed Turf	44%				
Impervious Cover (acres)	8.6700				
Rv(impervious)	0.95				
% Impervious	35%				
Total Site Area (acres)	24.8000				
Site Rv	0.44				
	0.00				
Post-Development Treatment Volume (acre-ft) Post-Development Treatment Volume (cubic	0.90				
feet)	39,336				
Post Development Load (TP) (lb/yr)	24.72		Innment Load (TN) (lb/sm)	176.81	
Total Load (TP) Reduction Required (lb/yr)	14.55	Post_Deve	lopment Load (TN) (lb/yr)	170.01	

Column																			
Selection of the select	inage Area A Land Cover (acres) est/Open Space (acres)	A soils B Soils 0.0000 0.0000	C Soils D Soils 0.0000 0.0000	Totals 0.0000	Land Cover Rv 0.00	i													
Part	aged Turf (acres) ervious Cover (acres)	0.0000 0.0000	8.6700 0.0000 Total	8.6700 16.6700	0.22		Post Devel	opment Treatm	ent Volume (c	36287	1								
The column	ply Runoff Reduction Pract	ices to Reduce Treatn	ent Volume & Post-l	Developmen	nt Load in Dra				I	Phosphorus	Untreated					Nitrogen Load			
Column		11-74	December of Occasion		Credit Area	Volume from Upstream RR	Runoff	Remaining Runoff	Phosphorus	Load from Upstream RR	Phosphorus	Phosphorus Removed By	Remaining Phosphorus	B	Nitrogen Efficiency	from Upstream RR Practices	Nitrogen Load	Nitrogen Removed By	Remaining Nitrogen Load
Mary Column	egetated Roof	OHE	Description of Credit	Credit	(acres)	Practice (ci)	resouction (cr)	Volume (cr)	Emiciency (%	(Practices (IDS)	(109.)	Practice (los.)	Load (los.)	Downstream Freatment to be Employed	1. Green	Roof	to Practice (lbs.	Practice (lbs.)	(109.)
Mathematical part	Vegetated Roof#1 (Spec #5)	acres of green roof	45% runoff volume reduction		0.0000	0	0		0						0				
Series of the se	Vegetated Roof #2 (Spec #5)	acres of green roof	60% runoff volume reduction	0.60	0.0000	0	0	0	0	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00
March Marc	Rooftop Disconnection		50% out off volume and volume												2. Imper	vious Surface D	isconnection		
March Marc			d for treated area 25% runoff volume reduction			0	0	0	0						0				
Series of the se	To Soil Amended Filter Path as ner	impervious acres disconnecte	d for treated area	0.25	0.0000	0	0	0	0	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00
Mathematical Math	cifications (existing C/D soils) (Spec #4) To Dry Well or French Drain #1	impervious acres disconnecte	d for treated area 50% runoff volume reduction			0	0	0	0						0				
Mathematical			d for treated area 90% runoff volume reduction	1		0	0												
Marchane	To Rain Garden #1 (Micro Bioretention	impervous acres disconnecte				0	0												
Martine Mart	To Rain Garden #2 (Micro-Bioretention (Spec #9)	impervious acres disconnects	80% runoff volume reduction d for treated area	1		0	0	0											
Martin	To Rainwater Harvesting (Spec #6)	impervious acres captured	based on tank size and design spreadsheet (See Spec #6)	0.00	0.0000	0	0	0	0	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00
Selection of the property of t			40% runoff volume reduction																
Marchand and Color	etention) (Spec #9, Appendix A)	impervious acres disconnecte	d for treated area	0.40	0.0000	0	0	0	25	0.00	0.00	0.00	0.00				0.00	0.00	0.00
Martine Mart	Permeable Pavement	acres of permeable pavement													3. Perm	sable Pavement			
The content of the		acres of "external" (upgradient impervious pavement	45% runoff volume reduction			0	0	0	25						25				
Martin M		acres of permeable pavemen	75% runoff volume reduction	0.75	0.0000	0	0	0	25	0.00	0.00	0.00	0.00		25	0.00	0.00	0.00	0.00
March Marc	Grass Channel	imponious area desiri													4. Grass	Channel			
March Marc	4.a. Grass Channel A/B Soils (Spec #3)	grass channers turf acres draining to grass	20% runoff volume reduction			0	0	0											
March Marc		channels impervious acres draining to				0	0												
March 1985 Mar	4.b. Grass Channel C/D Soils (Spec #3)	grass channels turf acres draining to grass				0	0												
Mathematical Math	c. Grass Channel with Compost Amended	impervious acres draining to				0													
The state of the s	Soils as per specs (see Spec #4)	turf acres draining to grass																	
Column C	Ory Swale																		
Control 1985 Cont		impervious acres draining to di swale	y 40% runoff volume reduction	0.40	0.0000	0	0	0	20	0.00	0.00	0.00	0.00				0.00	0.00	0.00
Column C	J.a. Liry Omans #1 (Spec #10)	turf acres draining to dry swaf	40% runoff volume reduction			0	0	0	20										
The state of the s	5.b. Dry Swale #2 (Spec #10)	impervious acres draining to di swale	60% runoff volume reduction			0	0	0							35				
March Marc		turf acres draining to dry swal	60% runoff volume reduction	0.60	0.0000	0	0	0	40	0.00	0.00	0.00	0.00		35	0.00	0.00	0.00	0.00
March Marc	Bioretention														6. Biore	ention			
14 Part 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	a. Bioretention #1 or Urban Bioretention (Spec #9)	Dioresention	40% runoff volume reduction	0.40	0.0000	0	0	0	25	0.00	0.00	0.00	0.00		40	0.00	0.00	0.00	0.00
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The state The	6.b. Bioretention #2 (Spec #9)	bioretention				0			50					8 a. ED #1					
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Property of the property of	7.a. Infiltration #1 (Spec #8)	infiltration	50% runoff volume reduction			0	0	0	25										
Control Cont		impervious acres draining to	50% runoff volume reduction			0	0												
March Columnic No. Columnic No	7.b. Infiltration #2 (Spec #8)					0	0	0											
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Accordange of the property o	8.a. ED #1 (Spec #15)						0												
Marie	8b. ED #2 (Rose #15)						0												
Profession for Company for C				0.15	0.0000	0	0	0	15	0.00					10		0.00		
Part Comment	Sheetflow to Filter/Open Space													÷	9. Sheet	flow to Conserv	ation Area or Fi	Iter Strip	
Section Company Comp	Characteristic C	conserved open space	for treated area	0.75	0.0000	0	0	0	0	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00
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Column C	c. Sheetflow to Vegetated Filter Strip in A is or Compost Amended B/C/D Soils (Spe #2 8 ma)	filter strip							0										
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10.4 Mil feels #1 (Sign #11)	ctice	Unit	Description of Credit	Credit		Upstream RR Practice (cf)	rtunoff Reduction (cf)	Nunoff Volume (cf)	rnosphorus Efficiency (%		Load to Practic (lbs.)	Practice (lbs.)	Phosphorus Load (lbs.)	Downstream Treatment to be Employed	Efficiency (%)	(lbs)	to Practice (lbs.	rtemoved By Practice (lbs.)	nitrogen Load (lbs.)
Second Control of Note 10	Wet Swale (Coastal Plain)																		
Processing Control (1) Processing Control	40 - 100	swale	0% runoff volume reduction			0	0	0											
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The Finding Particle #1 (Spec #12)		turf acres draining to wet swal				0	0	0	60	0.00	0.00	0.00	0.00			Ĭ	0.00	0.00	0.00
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Point of the Control Plan Spec File International Plan Spe	Filtering Practices 11.s Filtering Practice #1 (Spec #12) 11.s Filtering Practice #2 (Spec #12) 11.s Filtering Practice #2 (Spec #12) Constructed Welfand 2.s Constructed Welfand #1 (Spec #13) 2.s Constructed Welfand #2 (Spec #13)	Impanvious acres draining to filer faces draining to filer furnishes acres draining to filer furnishes acres draining to filer furnishes acres draining to filer to faces draining to filer walkfall furnishes acres draining to walkfall	O'ls runoff volume reduction O'ls runoff volume reduction O'ls runoff volume reduction O'ls runoff volume reduction O'ls runoff volume reduction O'ls runoff volume reduction O'ls runoff volume reduction O'ls runoff volume reduction	0.00	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0 0		0	65 50 50 75 75	0.00	0.00 0.00 0.00 0.00	0.00	0.00		45 45 12. Con 25 25 55 55 13. Wet	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00
inventors destricts to use	Filtering Practices 11.8 Filtering Practice #1 (Spec #12) 11.8 Filtering Practice #2 (Spec #12) Constructed Wetland 2.4 Constructed Wetland #1 (Spec #13) 2.5 Constructed Wetland #1 (Spec #13) 2.5 Constructed Wetland #2 (Spec #13) Wet Ponds	Impervious desemple to the filter that does extend to the filter that does extend to their impervious accordance to their impervious accordance to the filter that does desiring to their impervious accordance to their	O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction O's sunoff volume seduction	0.00 0.00 0.00 0.00 0.00 0.00	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0 0	0	0	65 50 50 75 75 75	0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00		45 45 12. Con 25 25 55 55 13. Wet	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.00 0.00 0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.00 0.00 0.00 0.00
poor de contraction d	Filtering Practices 11.a Filtering Practice #1 (Spec #12) 11.b Filtering Practice #2 (Spec #12) 11.b Filtering Practice #2 (Spec #12) Constructed Westand #2 (Spec #13) 2.a Constructed Westand #2 (Spec #13) West Ponds 13.a West Pond #1 (Spec #14)	Importations and distinting to the filter of	O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction O's sured volume reduction	0.00 0.00 0.00 0.00 0.00 0.00	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0 0 0 0	0 0	0 0 0	65 50 50 75 75 75 50 50	0.00	0.00 0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.00 0.00 0.00		45 45 12 Con 25 25 55 55 13 Wet 30 30 20	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.00 0.00 0.00 0.00

13.c. Wet Pond #2 (Spec #14)	turf acres draining to wet pond	0% runoff volume reduction	0.00	0.0000	0	0	0	75	0.00	0.00	0.00	0.00		40	0.00	0.00	0.00	0.00	
	impervious acres draining to we pond	0% runoff volume reduction	0.00	0.0000	0	0	0	65	0.00	0.00	0.00	0.00		30	0.00	0.00	0.00	0.00	ĺ
13.d. Wet Pond #2 (Coastal Plain) (Spec #14)	turf acres draining to wet pond	0% runoff volume reduction	0.00	0.0000	0	0	0	65	0.00	0.00	0.00	0.00		30	0.00	0.00	0.00	0.00	ĺ
14. Manufactured BMP														14. Manufa	ctured BMP				
	impervious acres draining to device	0% runoff volume reduction	0.00	0.0000	0	0	0	0	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00	
14. Insert Name of Device	turf acres draining to device	0% runoff volume reduction	0.00	0.0000	0	0	0	0	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00	ĺ
		TOTAL IMPERVIOUS COVE TOTAL TURF ARE	AREA CHECK	8.0000															
		REMOVAL BY PRACTICES	THAT DO NOT R	EDUCE RUNOFF			ĺ												
	SEE WATER QUA	LITY COMPLIANCE TAB	FOR SITE C	OMPLIANCE CA	ALCULATIONS														
	NITROGEN	REMOVAL BY PRACTICES	HAT DO NOT R	EDUCE RUNOFF	VOLUME IN D.A.	0.00	İ												

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
IMPERVIOUS COVER	8.6700	0.0000	0.0000	0.0000	0.0000	OK.
IMPERVIOUS COVER TREATED	8.6700	0.0000	0.0000	0.0000	0.0000	OK.
TURF AREA	8.0000	0.0000	0.0000	0.0000	0.0000	OK.
TURF AREA TREATED	8.0000	0.0000	0.0000	0.0000	0.0000	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	
Phosphorus						
TOTAL TREATMENT VOLUME (cf)	39,336					
TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED (LB/YEAR)	14.55					
RUNOFF REDUCTION (cf)	21723					
PHOSPHORUS LOAD REDUCTION ACHIEVED (LB/YR)	16.45					
ADJUSTED POST-DEVELOPMENT PHOSPHORUS LOAD (TP) (lb/yr)	8.26					
		YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
ADJUSTED POST-DEVELOPMENT PHOSPHORUS LOAD (TP) (Iblyr) REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO		YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO		I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO	ONGRATULATIONS!!	I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO		I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO	ONGRATULATIONS!!	I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf)	ONGRATULATIONS!!	I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEARI		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf) RUNOFF REDUCTION (cf)	39,336 21723	I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf)	ONGRATULATIONS!!	I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf) RUNOFF REDUCTION (cf)	39,336 21723	I YOU EXCEEDED THE	E TARGET REDUCTIO	N BY 1.9 LB/YEAR!		

		T	4	2	10	Г	
Target Rainfall Event (in)			1-year storm 0.00	2-year storm 0.00	10-year storm 0.00		-
raiget Kaiman Event (iii)			0.00	0.00	0.00		
Drainage Area A							
Drainage Area (acres)		16.6700					
Runoff Reduction Volume (cf)		21,723					
Drainage Area B							
Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0					
Drainage Area C Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0.0000					
ranon reduction volume (or)							
Drainage Area D							
Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0					
Drainage Area E							
Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0					
Based on the use of Runoff Reduction	practices in the sele	cted drainage areas	the spreadsheet calc	ulates an adjusted P	Voand adjusted	1 Curve Number	
	p. actions in the sele	cica aramage areas,	oprodusileet calc	un aujusteu K	-Developed with adjusted	z zarvo maniber.	
Drainage Area A			A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, pro		Area (acres)	0.0000	0.0000	0.0000	0.0000	
space or reforested la		CN	30	55	70	77	
Managed Turf disturbed, graded for ya	rds or other turf to be	Area (acres) CN	0.0000 39	0.0000 61	8.0000 74	0.0000 80	
mowed/managed		Area (acres)	0.0000	0.0000	8.6700	0.0000	
Impervious Cover		ĊN	98	98	98	98	
						Weighted CN	S
			4	0	40	86	1.63
	DV (in) with	no Runoff Reduction	1-year storm 0.00	2-year storm 0.00	10-year storm 0.00		
		ith Runoff Reduction		-0.36	-0.36		
	Developed (III) W	Adjusted CN	#N/A	#N/A	#N/A		
		rajuotou ott	21021	#1071	,,,,,,,		
Drainage Area B			A soils	B Soils		D Soils	
Forest/Open Space undisturbed, pro		Area (acres) CN	0.0000	0.0000	0.0000	0.0000	
space or reforested la Managed Turf disturbed, graded for ya		Area (acres)	30 0.0000	55 0.0000	70 0.0000	77 0.0000	
mowed/managed	ids of other turn to be	CN	39	61	74	80	
		Area (acres)	0.0000	0.0000	0.0000	0.0000	
Impervious Cover		CN	98	98	98	98	
						Weighted CN 0	S 1000.00
			1-year storm	2-year storm	10-year storm	0	1000.00
	RV _{Developed} (in) with	no Runoff Reduction	0.00	0.00	0.00		
	RV _{Developed} (in) w	ith Runoff Reduction		0.00	0.00		
		Adjusted CN	100	100	100		
Drainage Area C			A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, pro		Area (acres)	0.0000	0.0000	0.0000	0.0000	
space or reforested la		CN	30	55	70	77	
Managed Turf disturbed, graded for ya mowed/managed	ras or other turn to be	Area (acres) CN	0.0000	0.0000 61	0.0000 74	0.0000	
moweu/manageu		Area (acres)	0.0000	0.0000	0.0000	0.0000	
Impervious Cover		CN	98	98	98	98	
						Weighted CN	S 4000.00
			1-year storm	2-year storm	10-year storm	0	1000.00
	RV _{Developed} (in) with	no Runoff Reduction		0.00	0.00		
		ith Runoff Reduction		0.00	0.00		
	Developed (/	Adjusted CN	100	100	100		
		-					
Drainage Area D	to stand from 17	Anna ()	A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, pro space or reforested lar		Area (acres) CN	0.0000 30	0.0000 55	0.0000 70	0.0000 77	
Managed Turf disturbed, graded for ya		Area (acres)	0.0000	0.0000	0.0000	0.0000	
mowed/managed		CN	39	61	74	80	
		Area (acres)	0.0000	0.0000	0.0000	0.0000	
Impervious Cover		CN	98	98	98	98 Weighted CN	c
						Weighted CN 0	S 1000.00
			1-year storm	2-year storm	10-year storm		1000.00
	RV _{Developed} (in) with	no Runoff Reduction	0.00	0.00	0.00		
	RV _{Developed} (in) wi	ith Runoff Reduction		0.00	0.00		
		Adjusted CN	100	100	100		
Drainage Area E			A soils	B Soils	C Soils	D Soils	1
. Diamage Afea E		<u> </u>					-
	tected forest/onen	Area (acres)	0.0000	().()()()	0.0000	0.0000	
Forest/Open Space undisturbed, pro space or reforested lar		Area (acres) CN	0.0000 30	0.0000 55	0.0000 70	0.0000 77	

CN Area (acres) CN	39 0.0000	61 0,0000	74	80	
		0.000	0.0000		
CN			0.0000	0.0000	
	98	98	98	98	
				Weighted CN	S
				0	1000.00
	1-year storm	2-year storm	10-year storm		
noff Reduction	0.00	0.00	0.00		
noff Reduction	0.00	0.00	0.00		
sted CN	100	100	100		
		noff Reduction 0.00 noff Reduction 0.00	noff Reduction 0.00 0.00 noff Reduction 0.00 0.00	noff Reduction 0.00 0.00 0.00 noff Reduction 0.00 0.00 0.00	1-year storm 2-year storm 10-year storm 0

ı Runoff Reduction Method New Development Worksheet - v2.8 - June 2014

Site Data Summary

Total Rainfall = 43 inches

Site Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.0000	0.0000	5.2700	0.0000	5.2700	21.25
Turf (acres)	0.0000	0.0000	10.8600	0.0000	10.8600	43.79
Impervious (acres)	0.0000	0.0000	8.6700	0.0000	8.6700	34.96
					24.8000	100.00

Site Rv	0.44
Post Development Treatment Volume (ft3)	39336
Post Development TP Load (lb/yr)	24.72
Post Development TN Load (lb/yr)	176.81
Total TP Load Reduction Required (lb/yr)	14.55

Total Runoff Volume Reduction (ft ³)	21723
Total TP Load Reduction Achieved (lb/yr)	16.45
Total TN Load Reduction Achieved (lb/yr)	162.92
Adjusted Post Development TP Load (lb/yr)	8.26
Remaining Phosphorous Load Reduction (Lb/yr) Required	0.00

Drainage Area Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
Forest (acres)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Turf (acres)	8.0000	0.0000	0.0000	0.0000	0.0000	8.0000
Impervious (acres)	8.6700	0.0000	0.0000	0.0000	0.0000	8.6700
						16.6700

Drainage Area Compliance Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
TP Load Red. (lb/yr)	16.45	0.00	0.00	0.00	0.00	16.45
TN Load Red. (lb/yr)	162.92	0.00	0.00	0.00	0.00	162.92

Drainage Area A Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Turf (acres)	0.00	0.00	8.00	0.00	8.00	47.99
Impervious (acres)	0.00	0.00	8.67	0.00	8.67	52.01
					16.67	

BMP Selections

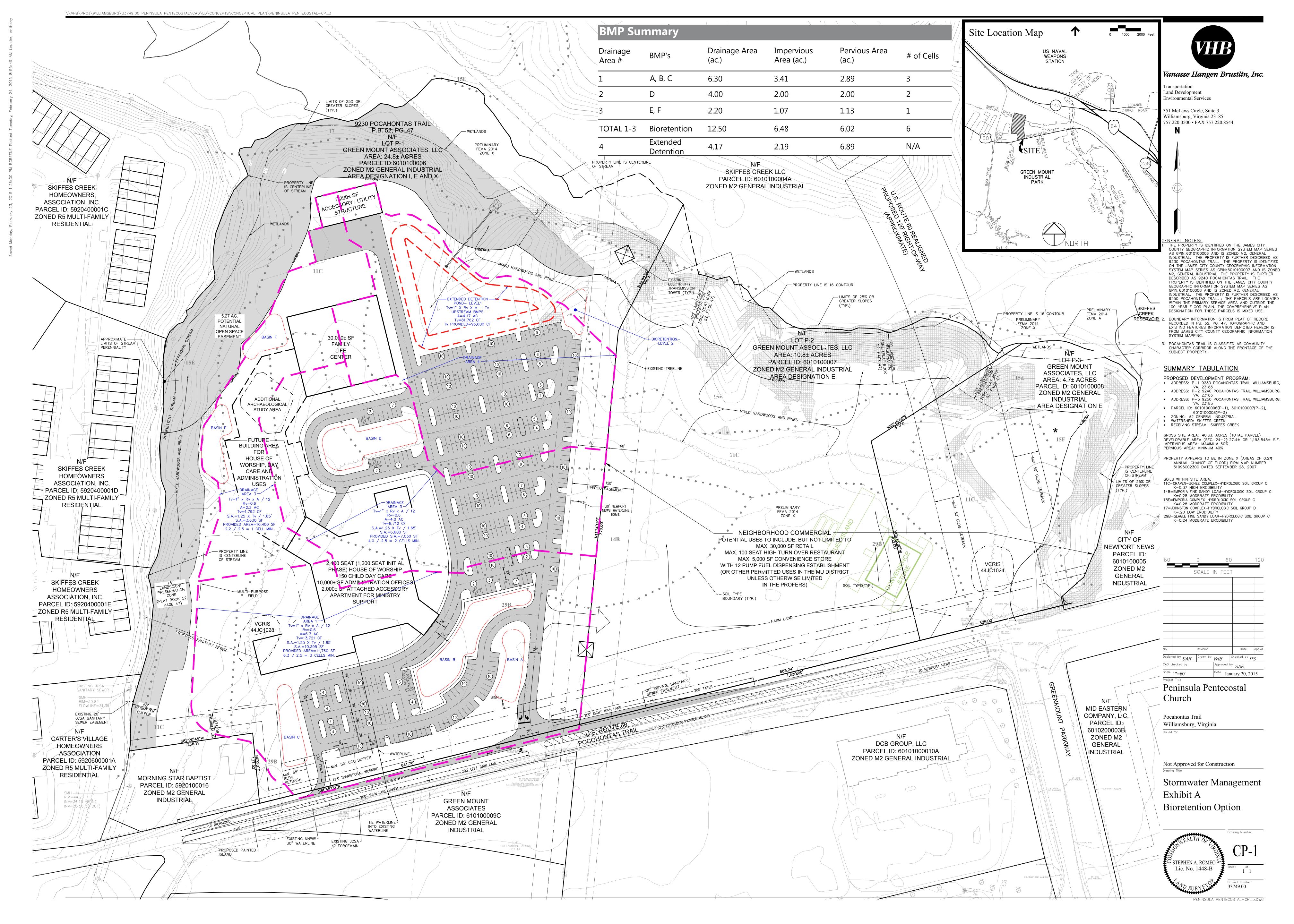
Practice	Credit Area (acres)	Downstream Practice			
Total Impervious Cover Treated (acres)	8.67				
Total Turf Area Treated (acres)	8.00				
Total TP Load Reduction Achieved in D.A. A (lb/yr)	16.45				
Total TN Load Reduction Achieved in D.A. A (lb/yr)	162.92				

Channel and Flood Protection

		1-year storm Adjusted CN	Adjusted CN	10-year storm Adjusted CN
Target Rainfall Event (in)		0.00	0.00	0.00
D.A. A CN	86	#N/A	#N/A	#N/A
D.A. B CN	0	100	100	100
D.A. C CN	0	100	100	100
D.A. D CN	0	100	100	100
D.A. E CN	0	100	100	100

Version 2.8 - June 2014 - 2011 BMP Stnds & Specs

- 1 Fixed summary sheet totals /percentage column fixed
- 2 Corrected nitrogen efficiency percentages
- 3 Corrected the Rv value in column J for managed turf
- 4 Checked and revised runoff reduction credit values assigned



Virginia Runoff Reduction Metho	od New Devel	opment Works	heet - v2.8 - June	2014	
To be used w/ 2011 BMP Standa				_	
Site Data	lao ana opoo				
Project Name: Peninsula Pentecosta	LLot D.4 Evhib	it P Wat Dand			
Date: 1/2015	LOT P-1 - EXHID	it b wet Pond			
Date: 1/2015					
	data input cells				
	calculation cells				
	constant values				
1. Post-Development Project & L	and Cover In	formation			
Constants					
Annual Rainfall (inches)	43				
Target Rainfall Event (inches)	1.00				
Phosphorus EMC (mg/L)	0.26		Nitrogen EMC (mg/L)	1.86	
Target Phosphorus Target Load (lb/acre/yr)	0.41		(g (g/L)		
Pj	0.90				
Land Cover (acres)	A coile	P Caile	C Saila	D Coile	Totals
Forest/Open Space (acres) undisturbed,	A soils	B Soils	C Soils	D Soils	lotais
protected forest/open space or reforested land	0.0000	0.0000	5.2700	0.0000	5.2700
Managed Turf (acres) disturbed, graded for	0.0000	0.0000	0.2100	0.0000	0.2700
yards or other turf to be mowed/managed	0.0000	0.0000	10.8600	0.0000	10.8600
Impervious Cover (acres)	0.0000	0.0000	8.6700	0.0000	8.6700
,				Total	24.8000
Rv Coefficients				20.11	
	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					
Forest/Open Space Cover (acres)	5.2700				
Weighted Rv(forest)	0.0400		<u> </u>		
% Forest	21%		<u> </u>		
Managed Turf Cover (acres)	10.8600		<u> </u>		
Weighted Rv(turf)	0.2200				
% Managed Turf	44%				
Impervious Cover (acres)	8.6700				
	0.95				
Rv(impervious) % Impervious	35%	1			
Total Site Area (acres)	24.8000				
Site Rv	0.44				
	0.11				
Post-Development Treatment Volume (acre-ft)	0.90				
Post-Development Treatment Volume (cubic					
feet)	39,336				
Post_Development Load (TP) (lb/yr)	24.72	Post_Deve	lopment Load (TN) (lb/yr)	176.81	
Total Load (TP) Reduction Required (lb/yr)	14.55				

1. Vegetated Roof #1 (Spec #5) acres of green roof 40% nurell volume reduction 0.45 0.0000 0.	((bs) en Roof 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	Untreated Nitrogen Load to Practice (lbs.) (lbs.) 0.00 0.00 isconnection 0.00	rogen moved by Remaining cticle Nitrogen Load (lbs.) 0.00 0.00 0.00
Practice (but to Description of Credit Area Values From Practice (cf) (but to Description of Credit Area Values From Practice (cf) (but to Description of Credit Area Values From Practice (cf) (but to Description of Credit Area Values From Practice (cf) (but to Description of Credit Area Values From Practice (m (m) Upstream RR Practices (100 Upstream RR Practices (100 Upstream RR Practices (100 Upstream RR Practices (100 Upstream RR Practices (100 Upstream	Untreated Nitrogen Load to Practice (lbs.) (lbs.) 0.00 0.00 isconnection 0.00	moved By Remaining Nitrogen Load (lbs.)
1. Vegetated Roof #1 (Spec #5) acres of green roof 45% nonft volume reduction 0.60 0.0000 0 0 0 0 0.0	0.00 0.00 ervious Surface Di 0.00 0.00 0.00	0.00 isconnection 0.00	
2. Roottop Disconnection 2.a. Simple Disconnection by AB Solis (Spec 2.b. Simple Disconnection to CIO Solis (Spec 2.b. Simple Disconnection to CIO Solis (Spec 2.b. Simple Disconnection to CIO Solis (Spec 2.b. Simple Disconnection to CIO Solis (Spec 2.b. Simple Disconnection to CIO Solis (Spec 2.b. Simple Disconnection to CIO Solis (Spec 2.b. To Solid Amended Filter Path as per passolisations (seeding CIO Solis) (Spec 2.b. To Not Amended Filter Path as per passolisations (seeding CIO Solis) (Spec 2.b. To Not West or Firench Danie 2 (Marco Microsoffistation #1) (Spec #8) 2.b. To Not West or Firench Danie 2 (Marco Microsoffistation #1) (Spec #8) 2.b. To Not West or Firench Danie 2 (Marco Microsoffistation #1) (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. To Rainwaster Harvesting (Spec #8) 2.b. Permeable Pavement #1 (Spec #7) 2.b. Permeable Pavement #1 (Spec #7) 2.b. Permeable Pavement #1 (Spec #7) 2.b. Permeable Pavement #1 (Spec #7) 2.b. Permeable Pavement #1 (Spec #7) 2.c. Permeable Pavement #1 (Spec #7) 2.c. To Parameter Parker (LiAn) 2.c. To Parameter Parker (LiAn) 2.c. To Parameter Parker (LiAn) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.c. To Parameter Pavement #1 (Spec #7) 2.	0.00 0.00 0.00	isconnection 0.00	0.00 0.00
2a. Simple Disconnection to AB Solis (Spec Bit 1)	0.00	0.00	
2. To Soil Amended Filter Path as per specifications (cristing CD soils) (Spec 84) majorivous scress disconnected specifications (cristing CD soils) (Spec 84) majorivous scress disconnected specifications (existing CD soils) (Spec 84) majorivous scress disconnected specifications (existing CD soils) (Spec 84) majorivous scress disconnected specifications (existing CD soils) (Spec 84) majorivous scress disconnected specifications (existing CD soils) (Spec 84) majorivous scress disconnected specifications (existing CD soils) (Spec 84) (Micro-Brouthers (existing CD soils) (Spec 84) (Mi	0.00	0.00	0.00 0.00
Observation Observation		0.00	0.00 0.00
21. To Rain Garden #1 (Micro-Biordention #1) (Spec #8) Spec *8)		0.00 0.00	
2.h. To Rainwater Harvesting (Spec #8) impervious acres captured seems of permeable pavement # acres of permeable pavement # acres of permeable pavement # acres of permeable pavement # 45% runoff volume reduction 0.45 0.0000 0 0 0 0 25 0.00 0.00 0.00 0.00	0.00	0.00	0.00 0.00
Bioretention Spec #9, Appendix A Impervious acres disconnected for treated area 0.40 0.0000 0 0 0 25 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00		0.00 0.00
3.a. Permeable Pavement #1 (Spcc #7) acres of permeable pavement + acres of Technical (Logistical Control Cont	0.00	0.00	0.00 0.00
3.b. Permeable Pavement #2 (Spec #7) acres of permeable pavement 75% runoff volume reduction 0.75 0.0000 0 0 0 25 0.00 0.00 0.00 0.00 0.00 25 0.00	meable Pavement	0.00	0.00
to the control of the	5 0.00		0.00 0.00
Impervious acres draining to 10% appell solutions reducting 0.20 0,000 0 0 0 0 15 0.00 0.00 0.00 0.00 0.00	ss Channel	0.00	0.00 0.00
4.8. Grass Chainnel Als Solis (Spec R) buf acres distining to grass chainnels buf acres distining to grass 20% runoff volume reduction 0.20 0.0000 0 0 0 15 0.00 0.00 0.00 0.00 0.	0.00	0.00	0.00 0.00
4.D. Class Cliarmes UI 50sis (oper #) turf acres draining to grass charmes 10% runoff volume reduction 0.10 5.7899 0 462 4161 15 0.00 2.90 0.68 2.22 13.d. Wet Pond #2 (Coastal Plain) 20 (Coastal Plain)	0.00	20.76	5.81 14.95
A.c. Grass Channel with Compost Amended Solls as per specs (see Spec #4) Solls as per specs (see Spec #4) Solls as per specs (see Spec #4) 100 0000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0.00 0.00
S. Dry Swale Impervious acres draining to dry S. Dry Swale Impervious acres draining to dry S. Dry Swale Structure		0.00	0.00 0.00
5.8. Lry Swale #1 (Spec #1U) Surf acres draining to dry swale #0% runoff volume reduction Impervious acres draining to dry swale #0% runoff volume reduction O.40 0.0000 0 0 0 20 0.00 0.00 0.00 0.00	5 0.00	0.00	0.00 0.00
S.b. Dry Swale #2 (Spec #10)	5 0.00		0.00 0.00
S. Bioretention S. Bioretention imperiorus acres d'aining to boretention of the control of the	retention 0.00	0.00	0.00 0.00
(Spec #9)	0.00	0.00	0.00 0.00
6.b. Bioreferition #2 (Spec #8) boreferition 80% runoff volume reduction 0.80 0.0000 0 0 0 50 0.00 0.00 0.00 0.0			0.00 0.00
7. Infiltration Impervious acres d'aining to Impervious acres d'aining to Infiltration Impervious acres d'aining to Impervious acres d'a	tration 0.00	0.00	0.00 0.00
(a. interretion #1 (spec #8) turf acres draining to infiltration 50% runoff volume reduction 0.50 0.0000 0 0 0 25 0.00 0.00 0.00 0.0	5 0.00	0.00	0.00 0.00
7.b. Infiltration #2 (Spec #8) infiltration 90% runoff volume reduction 0.99 0.0000 0 0 0 25 0.00 0.00 0.00 0.00 15 15 15 15 15 15 15 15 15 15 15 15 15			0.00 0.00 0.00 0.00
	ended Detention Po		0.00 0.00
a.a. ELD# ((Spec #15) Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 15 0.00 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 15 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 15 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 15 0.00 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 15 0.00 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 15 0.00 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 15 0.00 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 0 15 0.00 0.00 0.00 0.00 Luf acres draining to ED 0% runoff volume reduction 0.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00	0.00	0.00 0.00
8.b. ED #2 (Spec #15) Impervious acres draining to ED 15% runoff volume reduction buf acres draining to ED 15% runoff volume reduction 0.15 0.0000 0 0 0 15 0.00 0.00 0.00 0.0			0.00 0.00 0.00 0.00
9. Sheetflow to Filter/Open Space Impervious acres draining to conserved open space 75% runoff volume reduction conserved open space 0.75% unoff volume reduction 0.75% unoff vol	etflow to Conserva	ation Area or Filter St	0.00 0.00
9.a. Sheedlow to Conservation Area with AB but area draining to conserved 75% runoff volume reduction for open space. For irrested area	0.00		0.00 0.00
9.b. Sheeflow to Conservation Area with CID furfacres draining to conservation Area with CID furfacres draining to conservation Area with CID furfacres draining to conservation Area with CID furfacres draining to conserve described area of the furfacres draining to conserve drainin	0.00	0.00	0.00 0.00
Sols or Compost Amended BICD Soils (Spec #2 8.#4) 50% runoff reduction volume for treated area 0.50 0.000 0 0 0 0 0.00 0.00 0.00 0.00	0.00		0.00 0.00
TOTAL IMPERIOUS COVER TREATED (ac) 7.5222 TOTAL TURF AREA TREATED (ac) 5.7899 AREA CHECK COK.			
TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (IB/V) 14.55 TOTAL RUNGER REQUIRED ON A Job 1.055 BHOSPHORUS REMOVAL EQUIRED REACTION IN DA. A. Job 1.055 TOTAL RUNGER REQUIRED IN THE REACTION IN DA. A. Job 1.055 TOTAL RUNGER REGUIRED IN THE REACTION IN DA. A. Job 1.055 TOTAL RUNGER REGUIRED IN THE REACTION IN DA. A. Job 1.055 TOTAL RUNGER REGUIRED IN THE REACTION IN DA. A. Job 1.055 TOTAL RUNGER REGUIRED IN THE REACTION IN DA. A. JOB 1.055 TOTAL RUNGER REGUIRED IN THE REACTION IN DA. A. JOB 1.055 TOTAL RUNGER REGUIRED IN THE RUN	TAL RUNOFF REDUC	CTION IN D.A. A (cf)	3,056
SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS NITROGEN REMOVAL FROM RUNOFF RI	EDUCTION PRACTICE	ES IN D.A. A (lb/yr)	3,056 137.22
Apply Practices that Remove Pollutants but Do Not Reduce Runoff Volume Volume from Remaining Phosphorus University University Phosphorus Phosphoru	Nitrogen Load n from Upstream		rogen moved By Remaining
Practice Unit Description of Credit Credit (acres) Practice (cf) Reduction (cf) Volume (cf) Efficiency (%) Practices (lbs) Practices (lbs) Practice (lbs.) Practice (lbs.) Downstream Treatment to be Employed (%)		Nitrogen Load Practice (lbs.) (lbs.	ctice Nitrogen Load
Impervious acres draining to wet swale 0% runoff volume reduction 0.00 0.0000 0 0 0 20 0.00 0.00 0.00 0.	5 0.00	0.00	0.00 0.00
10.a. Wet Swate #1 (Spec #11) but a crea draining to wet swate. Of surrolf volume reduction on 0.00 0.0000 0 0 0 20 0.00 0.00 0.00 0.		0.00	0.00 0.00
10.b. Wet Swale #2 (Spec #11) turf acres draining to wet swale 0% runoff volume reduction 0.00 0.0000 0 0 0 40 0.00 0.00 0.00 0.	0.00 Itering Practices	0.00	0.00 0.00
Impervious acres draining to Officer O			0.00 0.00
Impervious acres draining to 0% nuroff volume reduction 0.00 0.0000 0 0 0 65 0.00 0.00 0.00 0.0	5 0.00	0.00	0.00 0.00
	onstructed Wetland		0.00 0.00
Impervious acres draining to wetfand 0	5 0.00		0.00 0.00
Impervious acres draining to wetland 0% nunoff volume reduction 0.00 0.0000 0 0 0 75 0.00 0.00 0.00 0.0	0.00	0.00	0.00 0.00
13. Wet Ponds	et Ponds	0.00	0.00 0.00
Imperious acres draining to wet pond 9 in rundir volume reduction 0.00 0.0000 0 0 0 50 0.00 0.00 0.00 0.			0.00 0.00 0.00 0.00
Impervious acress draining to well	0.00	0.00	0.00 0.00
	0.00	0.00	0.00 0.00
Impervious acres draining to wet			0.00 0.00 30.49 71.14
Impervious acres drawing to well you acres d	14.95	7.92	6.86 16.01
pond 0% jumpit volume reduction 0.00 0.0000 0 0 0 75 0.00 0.00 0.00 0.0	nufactured PMP		0.00
20 20 20 20 20 20 20 20	nufactured BMP		0.00 0.00
20 20 20 20 20 20 20 20			0.00 0.00
200 200	0.00		
200 200	0.00		

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
IMPERVIOUS COVER	8.6700	0.0000	0.0000	0.0000	0.0000	OK.
IMPERVIOUS COVER TREATED	8.6700	0.0000	0.0000	0.0000	0.0000	OK.
TURF AREA	8.0000	0.0000	0.0000	0.0000	0.0000	OK.
TURF AREA TREATED	8.0000	0.0000	0.0000	0.0000	0.0000	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	
Phosphorus						
TOTAL TREATMENT VOLUME (cf)	39,336					
TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED (LB/YEAR)	14.55					
RUNOFF REDUCTION (cf)	3056					
PHOSPHORUS LOAD REDUCTION ACHIEVED (LB/YR)	16.38					
ADJUSTED POST-DEVELOPMENT PHOSPHORUS LOAD (TP) (lb/yr)	8.33					
. , , , , ,		YOU EXCEEDED TH	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
ADJUSTED POST-DEVELOPMENT PHOSPHORUS LOAD (TP) (Ib/yr) REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO		YOU EXCEEDED THI	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO		YOU EXCEEDED TH	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO	ONGRATULATIONS!!	YOU EXCEEDED THI	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO		I YOU EXCEEDED THI	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO	ONGRATULATIONS!!	I YOU EXCEEDED THI	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf)	ONGRATULATIONS!!	I YOU EXCEEDED THI	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf) RUNOFF REDUCTION (cf)	39,336 3056	I YOU EXCEEDED THI	E TARGET REDUCTIO	ON BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf)	ONGRATULATIONS!!	YOU EXCEEDED THI	E TARGET REDUCTIO	IN BY 1.8 LB/YEAR!		
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED CO Nitrogen (for information purposes) TOTAL TREATMENT VOLUME (cf) RUNOFF REDUCTION (cf)	39,336 3056	I YOU EXCEEDED THI	E TARGET REDUCTIO	N BY 1.8 LB/YEAR!		

		T	14	0	140	I	
Target Rainfall Event (in)			1-year storm 0.00	2-year storm 0.00	10-year storm 0.00		
. a. get Namian Event (iii)			0.00	0.00	0.00		+
Drainage Area A							
Drainage Area (acres)		16.6700					
Runoff Reduction Volume (cf)		3,056					
Drainage Area B							
Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0					
Drainage Area C Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0.0000					
(,		-					
Drainage Area D							
Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0					
Drainage Area E							
Drainage Area (acres)		0.0000					
Runoff Reduction Volume (cf)		0					
Based on the use of Runoff Reduction pra	actices in the sele	cted drainage areas.	the spreadsheet calc	ulates an adjusted R	Vocational and adjusted	d Curve Number.	
			,	and any action in	Saveraped wajastot		
Drainage Area A			A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, protect	cted forest/open	Area (acres)	0.0000	0.0000	0.0000	0.0000	
space or reforested land	as ather to the	CN Area (aerea)	0.0000	55 0.0000	70 8.0000	77 0.0000	
Managed Turf disturbed, graded for yards mowed/managed	s or other turf to be	Area (acres) CN	0.0000 39	0.0000	8.0000 74	0.0000	
moweu/manageu		Area (acres)	0.0000	0.0000	8.6700	0.0000	
Impervious Cover		CN	98	98	98	98	
						Weighted CN	S
			4	2	10-year storm	86	1.63
R)	V ₋ (in) with i	no Runoff Reduction	1-year storm 0.00	2-year storm 0.00	0.00		
· · ·		th Runoff Reduction		-0.05	-0.05		
	TV Developed (III) WI	Adjusted CN	#N/A	#N/A	#N/A		
Drainage Area B			A soils	B Soils		D Soils	
Forest/Open Space undisturbed, protect	cted forest/open	Area (acres) CN	0.0000 30	0.0000 55	0.0000 70	0.0000	
space or reforested land Managed Turf disturbed, graded for yards	or other turf to be	Area (acres)	0.0000	0.0000	0.0000	77 0.0000	
mowed/managed	or other turn to be	CN	39	61	74	80	
Impervious Cover		Area (acres)	0.0000	0.0000	0.0000	0.0000	
Impervious cover		CN	98	98	98	98	
						Weighted CN 0	S 1000.00
			1-year storm	2-year storm	10-year storm	0	1000.00
R	V _{Developed} (in) with I	no Runoff Reduction	0.00	0.00	0.00		
	RV _{Developed} (in) wi	ith Runoff Reduction Adjusted CN	0.00 100	0.00 100	0.00 100		
		Aujusteu CN	100	100	100		
Drainage Area C			A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, protect	cted forest/open	Area (acres)	0.0000	0.0000	0.0000	0.0000	
space or reforested land Managed Turf disturbed, graded for yards	or other turf to he	CN Area (acres)	30 0.0000	55 0.0000	70 0.0000	77 0.0000	-
managed Turr disturbed, graded for yards mowed/managed	o or ourer turl to be	Area (acres) CN	0.0000	0.0000	0.0000 74	0.0000	
exedimanaged		Area (acres)	0.0000	0.0000	0.0000	0.0000	
Impervious Cover		ĊN	98	98	98	98	
						Weighted CN	\$ 1000.00
			1-year storm	2-year storm	10-year storm	U	1000.00
R	V _{Developed} (in) with I	no Runoff Reduction		0.00	0.00		
		ith Runoff Reduction		0.00	0.00		
	Боголореи ()	Adjusted CN	100	100	100		
Drainage Area D	atod forest/s	Area (acres)	A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, protect space or reforested land	cied forest/open	Area (acres) CN	0.0000 30	0.0000 55	0.0000 70	0.0000 77	
Managed Turf disturbed, graded for yards	or other turf to be	Area (acres)	0.0000	0.0000	0.0000	0.0000	
mowed/managed		CN	39	61	74	80	
		Area (acres)	0.0000	0.0000	0.0000	0.0000	
Impervious Cover		CN	98	98	98	98 Weighted CN	S
						0	1000.00
			1-year storm	2-year storm	10-year storm		. 500.00
R	V _{Developed} (in) with I	no Runoff Reduction	0.00	0.00	0.00		
	RV _{Developed} (in) wi	ith Runoff Reduction		0.00	0.00		
		Adjusted CN	100	100	100		
Drainage Area E			A soils	B Soils	C Soils	D Soils	
Forest/Open Space undisturbed, protect	cted forest/onen	Area (acres)	0.0000	0.0000	0.0000	0.0000	
space or reforested land		CN	30	55	70	77	

CN Area (acres) CN	39 0.0000	61 0,0000	74	80	
		0.000	0.0000		
CN			0.0000	0.0000	
	98	98	98	98	
				Weighted CN	S
				0	1000.00
	1-year storm	2-year storm	10-year storm		
noff Reduction	0.00	0.00	0.00		
noff Reduction	0.00	0.00	0.00		
sted CN	100	100	100		
		noff Reduction 0.00 noff Reduction 0.00	noff Reduction 0.00 0.00 noff Reduction 0.00 0.00	noff Reduction 0.00 0.00 0.00 noff Reduction 0.00 0.00 0.00	1-year storm 2-year storm 10-year storm 0

ı Runoff Reduction Method New Development Worksheet - v2.8 - June 2014

Site Data Summary

Total Rainfall = 43 inches

Site Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.0000	0.0000	5.2700	0.0000	5.2700	21.25
Turf (acres)	0.0000	0.0000	10.8600	0.0000	10.8600	43.79
Impervious (acres)	0.0000	0.0000	8.6700	0.0000	8.6700	34.96
	•	·			24.8000	100.00

Site Rv	0.44
Post Development Treatment Volume (ft3)	39336
Post Development TP Load (lb/yr)	24.72
Post Development TN Load (lb/yr)	176.81
Total TP Load Reduction Required (lb/yr)	14.55

Total Runoff Volume Reduction (ft ³)	3056
Total TP Load Reduction Achieved (lb/yr)	16.38
Total TN Load Reduction Achieved (lb/yr)	174.57
Adjusted Post Development TP Load (lb/yr)	8.33
Remaining Phosphorous Load Reduction (Lb/yr) Required	0.00

Drainage Area Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
Forest (acres)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Turf (acres)	8.0000	0.0000	0.0000	0.0000	0.0000	8.0000
Impervious (acres)	8.6700	0.0000	0.0000	0.0000	0.0000	8.6700
						16.6700

Drainage Area Compliance Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
TP Load Red. (lb/yr)	16.38	0.00	0.00	0.00	0.00	16.38
TN Load Red. (lb/yr)	174.57	0.00	0.00	0.00	0.00	174.57

Drainage Area A Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Turf (acres)	0.00	0.00	8.00	0.00	8.00	47.99
Impervious (acres)	0.00	0.00	8.67	0.00	8.67	52.01
					16.67	

BMP Selections

Practice	Credit Area (acres)	Downstream Practice
Total Impervious Cover Treated (acres)	8.67	

Channel and Flood Protection

	Weighted CN	1-year storm Adjusted CN	Adjusted CN	10-year storm Adjusted CN
Target Rainfall Event (in)		0.00	0.00	0.00
D.A. A CN	86	#N/A	#N/A	#N/A
D.A. B CN	0	100	100	100
D.A. C CN	0	100	100	100
D.A. D CN	0	100	100	100
D.A. F CN	0	100	100	100

Version 2.8 - June 2014 - 2011 BMP Stnds & Specs

- 1 Fixed summary sheet totals /percentage column fixed
- 2 Corrected nitrogen efficiency percentages
- 3 Corrected the Rv value in column J for managed turf
- 4 Checked and revised runoff reduction credit values assigned

