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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.

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**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 east 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.



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### **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.

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### **Offsite Disturbed Area**

No off-site disturbance is anticipated with this project.

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### **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.

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### **Demolition**

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

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### **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.

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### **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.

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### **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 Reservoir. 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 standards 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 Method New Development Worksheet - v2.8 - June 2014**
**To be used w/ 2011 BMP Standards and Specifications**
**Site Data**
**Project Name: Peninsula Pentecostal Lot P-1 - Exhibit A Bioretention**
**Date: 1/2015**

|  |                   |  |  |  |  |
|--|-------------------|--|--|--|--|
|  | data input cells  |  |  |  |  |
|  | calculation cells |  |  |  |  |
|  | constant values   |  |  |  |  |

**1. Post-Development Project & Land Cover Information**

|  |                |                                    |                     |                |                |
|--|----------------|------------------------------------|---------------------|----------------|----------------|
| <b>Constants</b>   |                |                                    |                     |                |                |
| 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           |                                    |                     |                |                |
| Pj   | 0.90           |                                    |                     |                |                |
| <b>Land Cover (acres)</b>  |                |                                    |                     |                |                |
|  | <b>A soils</b> | <b>B Soils</b>                     | <b>C Soils</b>      | <b>D Soils</b> | <b>Totals</b>  |
| 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         |
|  |                |                                    |                     | <b>Total</b>   | <b>24.8000</b> |
| <b>Rv Coefficients</b>   |                |                                    |                     |                |                |
|  | <b>A soils</b> | <b>B Soils</b>                     | <b>C Soils</b>      | <b>D Soils</b> |                |
| 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           |                |
| <b>Land Cover Summary</b>  |                |                                    |                     |                |                |
| Forest/Open Space Cover (acres)  | 5.2700         |                                    |                     |                |                |
| 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%            |                                    |                     |                |                |
| <b>Total Site Area (acres)</b>   | <b>24.8000</b> |                                    |                     |                |                |
| <b>Site Rv</b>   | <b>0.44</b>    |                                    |                     |                |                |
| 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_Development Load (TN) (lb/yr) |                     | 176.81         |                |
| Total Load (TP) Reduction Required (lb/yr)   | 14.55          |                                    |                     |                |                |

# Drainage Area A

| Drainage Area A Land Cover (acres) | A Soils | B Soils | C Soils | D Soils | Total  | Land Cover Pct |
|------------------------------------|---------|---------|---------|---------|--------|----------------|
| Forest/Open Space (acres)          | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 | 0.00           |
| Managed Turf (acres)               | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 | 0.22           |
| Impervious Cover (acres)           | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 | 0.95           |
| Total                              | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 | 100.00         |

Post Development Treatment Volume (cfs)

362.97

## Apply Runoff Reduction Practices to Reduce Treatment Volume & Post-Development Load in Drainage Area A

| Practice  | Unit  | Description of Credit                                   | Credit | Credit Area (acres) | Volume from Upstream RR Practice (cfs) | Runoff Reduction (cfs) | Remaining Runoff Volume (cfs) | Phosphorus Efficiency (%) | Phosphorus Load from Upstream RR Practices (lbs) | Estimated Phosphorus Load to Practice (lbs) | Phosphorus Removed By Practice (lbs) | Remaining Phosphorus Load (lbs) | Downstream Treatment to be Employed |
|---|---|---|--------|---------------------|--|------------------------|-------------------------------|---------------------------|--|---|--------------------------------------|---------------------------------|-------------------------------------|
| <b>1. Vegetated Roof</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 1.a. Vegetated Roof #1 (Spec #5)  | acres of grass roof                               | 45% runoff volume reduction                             | 0.45   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 1.b. Vegetated Roof #2 (Spec #5)  | acres of grass roof                               | 45% runoff volume reduction                             | 0.45   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>2. Rooftop Disconnection</b>   |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 2.a. Simple Disconnection to A/B Soils (Spec #1)  | impervious acres disconnected                     | 50% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.b. Simple Disconnection to C/D Soils (Spec #1)  | impervious acres disconnected                     | 25% runoff volume reduction for treated area            | 0.25   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.c. To Soil Amended Filter Path as per specifications outlined in CD policy (Spec #4)      | impervious acres disconnected                     | 60% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.d. To Dry Well or French Drain #1 (Micro-Infiltration #1) (Spec #6)                       | impervious acres disconnected                     | 50% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.e. To Dry Well or French Drain #2 (Micro-Infiltration #2) (Spec #6)                       | impervious acres disconnected                     | 50% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.f. To Rain Garden #1 (Micro-Bioretenion #1) (Spec #8)                                     | impervious acres disconnected                     | 40% of volume captured                                  | 0.40   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.g. To Rain Garden #2 (Micro-Bioretenion #2) (Spec #8)                                     | impervious acres disconnected                     | 40% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 50                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.h. To Rainwater Harvesting (Spec #9)  | impervious acres captured                         | Based on tank size and design spreadsheet (See Spec #9) | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 2.i. To Stormwater Planter (Urban Bio-retention) (Spec #9, Appendix A)                      | impervious acres disconnected                     | 40% runoff volume reduction for treated area            | 0.40   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>3. Permeable Pavement</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 3.a. Permeable Pavement #1 (Spec #7)  | acres of permeable pavement                       | 45% runoff volume reduction                             | 0.45   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 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                            |                                     |
| <b>4. Grass Channel</b>   |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 4.a. Grass Channel A/B Soils (Spec #3)  | impervious acres draining to grass channels       | 20% runoff volume reduction                             | 0.20   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to grass channels             | 20% runoff volume reduction                             | 0.20   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 4.b. Grass Channel C/D Soils (Spec #3)  | impervious acres draining to grass channels       | 10% runoff volume reduction                             | 0.10   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to grass channels             | 10% runoff volume reduction                             | 0.10   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 4.c. Grass Channel with Compost Amended Soils as per spec area (Spec #4)                    | impervious acres draining to grass channels       | 30% runoff volume reduction                             | 0.30   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to grass channels             | 30% runoff volume reduction                             | 0.30   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>5. Dry Swale</b>   |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 5.a. Dry Swale #1 (Spec #10)  | impervious acres draining to dry swale            | 40% runoff volume reduction                             | 0.40   | 0.0000              | 0                                      | 0                      | 0                             | 20                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to dry swale                  | 40% runoff volume reduction                             | 0.40   | 0.0000              | 0                                      | 0                      | 0                             | 20                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 5.b. Dry Swale #2 (Spec #10)  | impervious acres draining to dry swale            | 60% runoff volume reduction                             | 0.60   | 0.0000              | 0                                      | 0                      | 0                             | 40                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to dry swale                  | 60% runoff volume reduction                             | 0.60   | 0.0000              | 0                                      | 0                      | 0                             | 40                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>6. Bioretention</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 6.a. Bioretention #1 or Urban Bioretention (Spec #9)  | impervious acres draining to bioretention         | 40% runoff volume reduction                             | 0.40   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to bioretention               | 40% runoff volume reduction                             | 0.40   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 6.b. Bioretention #2 (Spec #9)  | impervious acres draining to bioretention         | 40% runoff volume reduction                             | 0.40   | 0.4800              | 0                                      | 17877                  | 4469                          | 50                        | 0.00   | 14.02                                       | 12.62                                | 1.40                            | PA, ED #1                           |
|   | turf acres draining to bioretention               | 60% runoff volume reduction                             | 0.60   | 0.4800              | 0                                      | 3846                   | 962                           | 50                        | 0.00   | 3.02  | 2.72                                 | 0.30                            | PA, ED #1                           |
| <b>7. Infiltration</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 7.a. Infiltration #1 (Spec #8)  | impervious acres draining to infiltration         | 50% runoff volume reduction                             | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to infiltration               | 50% runoff volume reduction                             | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 7.b. Infiltration #2 (Spec #8)  | impervious acres draining to infiltration         | 50% runoff volume reduction                             | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to infiltration               | 50% runoff volume reduction                             | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 25                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>8. Extended Detention Pond</b>   |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 8.a. ED #1 (Spec #15)   | impervious acres draining to ED                   | 0% runoff volume reduction                              | 0.00   | 2.1900              | 4469                                   | 0                      | 12021                         | 15                        | 1.40   | 4.74  | 0.92                                 | 5.22                            |                                     |
|   | turf acres draining to ED                         | 0% runoff volume reduction                              | 0.00   | 1.9800              | 962                                    | 0                      | 2543                          | 15                        | 0.30   | 0.99  | 0.19                                 | 1.10                            |                                     |
| 8.b. ED #2 (Spec #15)   | impervious acres draining to ED                   | 10% runoff volume reduction                             | 0.15   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to ED                         | 10% runoff volume reduction                             | 0.15   | 0.0000              | 0                                      | 0                      | 0                             | 15                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>9. Sheetflow to Filter/Open Space</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 9.a. Sheetflow to Conservation Area with A/B Soils (Spec #2)                                | impervious acres draining to conserved open space | 75% runoff volume reduction for treated area            | 0.75   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to conserved open space       | 75% runoff volume reduction for treated area            | 0.75   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 9.b. Sheetflow to Conservation Area with C/D Soils (Spec #2)                                | impervious acres draining to conserved open space | 50% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to conserved open space       | 50% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 9.c. Sheetflow to Filter Strip (in A/B Soils or Compost Amended B/C/D Soils) (Spec #2 & #4) | impervious acres draining to filter strip         | 60% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to filter strip               | 60% runoff volume reduction for treated area            | 0.50   | 0.0000              | 0                                      | 0                      | 0                             | 0                         | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>TOTAL IMPERVIOUS COVER TREATED AND TOTAL TURF AREA TREATED</b>                           |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| AREA CREDIT   |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lbs)   |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| TOTAL RUNOFF REDUCTION IN D.A. A (cfs)  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| PHOSPHORUS REMOVAL FROM RUNOFF REDUCTION PRACTICES IN D.A. A (lbs)                          |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS.                          |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| <b>Apply Practices that Remove Pollutants but Do Not Reduce Runoff Volume</b>               |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| Practice  | Unit  | Description of Credit                                   | Credit | Credit Area (acres) | Volume from Upstream RR Practice (cfs) | Runoff Reduction (cfs) | Remaining Runoff Volume (cfs) | Phosphorus Efficiency (%) | Phosphorus Load from Upstream RR Practices (lbs) | UPSTREAM Phosphorus Load to Practice (lbs)  | Phosphorus Removed By Practice (lbs) | Remaining Phosphorus Load (lbs) | Downstream Treatment to be Employed |
| <b>10. Wet Swale (Coastal Plain)</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 10.a. Wet Swale #1 (Spec #11)   | impervious acres draining to wet swale            | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 20                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to wet swale                  | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 20                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 10.b. Wet Swale #2 (Spec #11)   | impervious acres draining to wet swale            | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 40                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to wet swale                  | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 40                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>11. Filtering Practices</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 11.a. Filtering Practice #1 (Spec #12)  | impervious acres draining to filter               | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 60                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to filter                     | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 60                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 11.b. Filtering Practice #2 (Spec #12)  | impervious acres draining to filter               | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 65                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to filter                     | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 65                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>12. Constructed Wetland</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 12.a. Constructed Wetland #1 (Spec #13)   | impervious acres draining to wetland              | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 50                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to wetland                    | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 50                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 12.b. Constructed Wetland #2 (Spec #13)   | impervious acres draining to wetland              | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 75                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to wetland                    | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 75                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| <b>13. Wet Ponds</b>  |   |   |        |                     |  |                        |                               |                           |  |   |                                      |                                 |                                     |
| 13.a. Wet Pond #1 (Spec #14)  | impervious acres draining to wet pond             | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 50                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to wet pond                   | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 50                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
| 13.b. Wet Pond #2 (Spec #14)  | impervious acres draining to wet pond             | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 45                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |
|   | turf acres draining to wet pond                   | 0% runoff volume reduction                              | 0.00   | 0.0000              | 0                                      | 0                      | 0                             | 45                        | 0.00   | 0.00  | 0.00                                 | 0.00                            |                                     |

|  | Nitrogen Efficiency (%) | Nitrogen Load from Upstream RR Practices (lbs) | Untreated Nitrogen Load to Practice (lbs) | Nitrogen Removed By Practice (lbs) | Remaining Nitrogen Load (lbs) |
|--|-------------------------|--|---|------------------------------------|-------------------------------|
| 1. Green Roof  |                         |  |   |                                    |                               |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 15   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 15   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 40   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 60   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 40   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 3. Permeable Pavement                                  |                         |  |   |                                    |                               |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 4. Grass Channel                                       |                         |  |   |                                    |                               |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 5. Dry Swale   |                         |  |   |                                    |                               |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 35   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 35   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 6. Bioretention  |                         |  |   |                                    |                               |
| 40   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 40   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 60   | 0.00                    | 100.33   | 92.30                                     | 8.03                               | 8.03                          |
| 60   | 0.00                    | 21.58  | 19.86                                     | 1.73                               | 1.73                          |
| 7. Infiltration  |                         |  |   |                                    |                               |
| 15   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 15   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 15   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 15   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 8. Extended Detention Pond                             |                         |  |   |                                    |                               |
| 10   | 8.03                    | 33.91  | 4.19                                      | 37.74                              | 37.74                         |
| 10   | 1.73                    | 7.10   | 0.88                                      | 7.94                               | 7.94                          |
| 10   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 10   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 9. Shallowflow to Conservation Area or Filter Strip    |                         |  |   |                                    |                               |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 0  | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| TOTAL RUNOFF REDUCTION IN D.A. A (Hydrology)           |                         |  |   |                                    |                               |
|  |                         |  |   |                                    | 212.23                        |
| TOTAL RUNOFF REDUCTION PRACTICES IN D.A. A (Hydrology) |                         |  |   |                                    | 162.59                        |
|  | Nitrogen Efficiency (%) | Nitrogen Load from Upstream RR Practices (lbs) | Untreated Nitrogen Load to Practice (lbs) | Nitrogen Removed By Practice (lbs) | Remaining Nitrogen Load (lbs) |
| 10. Wet Swale (Coastal Plain)                          |                         |  |   |                                    |                               |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 35   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 35   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 11. Filtering Practices                                |                         |  |   |                                    |                               |
| 30   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 30   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 45   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 45   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 12. Constructed Wetland                                |                         |  |   |                                    |                               |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 25   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 55   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 55   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 13. Wet Ponds  |                         |  |   |                                    |                               |
| 30   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 30   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 20   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |
| 40   | 0.00                    | 0.00   | 0.00                                      | 0.00                               | 0.00                          |

|  |  |                                      |  |                            |        |      |        |   |    |      |      |      |        |      |      |  |  |
|--|--|--------------------------------------|--|----------------------------|--------|------|--------|---|----|------|------|------|--------|------|------|--|--|
| 13.c. Wet Pond #2 (Spec #14)   |  |                                      |  |                            |        |      |        |   |    |      |      |      | 40     |      |      |  |  |
| soil/rock access draining to wet pond                                    |  | 3% runoff volume reduction           |  | 0.00                       | 0.0000 | 0    | 0      | 0 | 75 | 0.00 | 0.00 | 0.00 | 0.00   | 0.00 | 0.00 |  |  |
| impervious access draining to wet pond                                   |  | 2% runoff volume reduction           |  | 0.00                       | 0.0000 | 0    | 0      | 0 | 65 | 0.00 | 0.00 | 0.00 | 0.00   | 0.00 | 0.00 |  |  |
| soil/rock access draining to wet pond                                    |  | 2% runoff volume reduction           |  | 0.00                       | 0.0000 | 0    | 0      | 0 | 65 | 0.00 | 0.00 | 0.00 | 0.00   | 0.00 | 0.00 |  |  |
| 13.d. Wet Pond #2 (Coastal Plain) (Spec #14)                             |  |                                      |  |                            |        |      |        |   |    |      |      |      | 30     |      |      |  |  |
| soil/rock access draining to wet pond                                    |  | 2% runoff volume reduction           |  | 0.00                       | 0.0000 | 0    | 0      | 0 | 65 | 0.00 | 0.00 | 0.00 | 0.00   | 0.00 | 0.00 |  |  |
| 14. Manufactured BMP   |  |                                      |  |                            |        |      |        |   |    |      |      |      |        |      |      |  |  |
| 14. Insert Name of Device  |  | impervious access draining to device |  | 2% runoff volume reduction |        | 0.00 | 0.0000 | 0 | 0  | 0    | 9    | 0.00 | 0.00   | 0.00 | 0.00 |  |  |
|  |  | soil access draining to device       |  | 2% runoff volume reduction |        | 0.00 | 0.0000 | 0 | 0  | 0    | 9    | 0.00 | 0.00   | 0.00 | 0.00 |  |  |
| TOTAL IMPERVIOUS COVER TREATED (ac)                                      |  |                                      |  |                            |        |      |        |   |    |      |      |      | 0.0000 |      |      |  |  |
| TOTAL TURF AREA TREATED (ac)   |  |                                      |  |                            |        |      |        |   |    |      |      |      | 0.0000 |      |      |  |  |
| AREA CHECK OK  |  |                                      |  |                            |        |      |        |   |    |      |      |      |        |      |      |  |  |
| PHOSPHORUS REMOVAL BY PRACTICES THAT DO NOT REDUCE RUNOFF VOLUME IN D.A. |  |                                      |  |                            |        |      |        |   |    |      |      |      | 0.00   |      |      |  |  |
| TOTAL PHOSPHORUS REMOVAL IN D.A. A (lbs/yr)                              |  |                                      |  |                            |        |      |        |   |    |      |      |      | 16.45  |      |      |  |  |
| SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS        |  |                                      |  |                            |        |      |        |   |    |      |      |      |        |      |      |  |  |
| NITROGEN REMOVAL BY PRACTICES THAT DO NOT REDUCE RUNOFF VOLUME IN D.A.   |  |                                      |  |                            |        |      |        |   |    |      |      |      | 0.00   |      |      |  |  |
| TOTAL NITROGEN REMOVAL IN D.A. A (lbs/yr)                                |  |                                      |  |                            |        |      |        |   |    |      |      |      | 162.52 |      |      |  |  |

| Site Results   |   |        |        |        |        |            |
|--|---|--------|--------|--------|--------|------------|
|  | 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  |        |        |        |        |            |
| REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED     | CONGRATULATIONS!! YOU EXCEEDED THE TARGET REDUCTION BY 1.9 LB/YEAR! |        |        |        |        |            |
| Nitrogen (for information purposes)                    |   |        |        |        |        |            |
| TOTAL TREATMENT VOLUME (cf)                            | 39,336  |        |        |        |        |            |
| RUNOFF REDUCTION (cf)                                  | 21723   |        |        |        |        |            |
| NITROGEN LOAD REDUCTION ACHIEVED (LB/YR)               | 162.92  |        |        |        |        |            |
| ADJUSTED POST-DEVELOPMENT NITROGEN LOAD (TN) (lb/yr)   | 13.89   |        |        |        |        |            |

|  |   |        |              |              |               |             |         |
|--|---|--------|--------------|--------------|---------------|-------------|---------|
|  |   |        | 1-year storm | 2-year storm | 10-year storm |             |         |
| Target Rainfall Event (in)   |   |        | 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   |        |              |              |               |             |         |
| 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 selected drainage areas, the spreadsheet calculates an adjusted RV <sub>Developed</sub> and adjusted Curve Number. |   |        |              |              |               |             |         |
| Drainage Area A  |   |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN  | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres)  | 0.0000 | 0.0000       | 8.0000       | 0.0000        |             |         |
|  | CN  | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres)  | 0.0000 | 0.0000       | 8.6700       | 0.0000        |             |         |
|  | CN  | 98     | 98           | 98           | 98            |             |         |
|  |   |        |              |              |               | Weighted CN | S       |
|  |   |        |              |              |               | 86          | 1.63    |
|  |   |        | 1-year storm | 2-year storm | 10-year storm |             |         |
|  | RV <sub>Developed</sub> (in) with no Runoff Reduction | 0.00   | 0.00         | 0.00         |               |             |         |
|  | RV <sub>Developed</sub> (in) with Runoff Reduction    | -0.36  | -0.36        | -0.36        |               |             |         |
|  | Adjusted CN   | #N/A   | #N/A         | #N/A         |               |             |         |
| Drainage Area B  |   |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 98     | 98           | 98           | 98            |             |         |
|  |   |        |              |              |               | Weighted CN | S       |
|  |   |        |              |              |               | 0           | 1000.00 |
|  |   |        | 1-year storm | 2-year storm | 10-year storm |             |         |
|  | RV <sub>Developed</sub> (in) with no Runoff Reduction | 0.00   | 0.00         | 0.00         |               |             |         |
|  | RV <sub>Developed</sub> (in) with Runoff Reduction    | 0.00   | 0.00         | 0.00         |               |             |         |
|  | Adjusted CN   | 100    | 100          | 100          |               |             |         |
| Drainage Area C  |   |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 98     | 98           | 98           | 98            |             |         |
|  |   |        |              |              |               | Weighted CN | S       |
|  |   |        |              |              |               | 0           | 1000.00 |
|  |   |        | 1-year storm | 2-year storm | 10-year storm |             |         |
|  | RV <sub>Developed</sub> (in) with no Runoff Reduction | 0.00   | 0.00         | 0.00         |               |             |         |
|  | RV <sub>Developed</sub> (in) with Runoff Reduction    | 0.00   | 0.00         | 0.00         |               |             |         |
|  | Adjusted CN   | 100    | 100          | 100          |               |             |         |
| Drainage Area D  |   |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 98     | 98           | 98           | 98            |             |         |
|  |   |        |              |              |               | Weighted CN | S       |
|  |   |        |              |              |               | 0           | 1000.00 |
|  |   |        | 1-year storm | 2-year storm | 10-year storm |             |         |
|  | RV <sub>Developed</sub> (in) with no Runoff Reduction | 0.00   | 0.00         | 0.00         |               |             |         |
|  | RV <sub>Developed</sub> (in) with Runoff Reduction    | 0.00   | 0.00         | 0.00         |               |             |         |
|  | Adjusted CN   | 100    | 100          | 100          |               |             |         |
| Drainage Area E  |   |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres)  | 0.0000 | 0.0000       | 0.0000       | 0.0000        |             |         |
|  | CN  | 30     | 55           | 70           | 77            |             |         |



|   |   |              |              |               |             |         |
|---|---|--------------|--------------|---------------|-------------|---------|
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed | Area (acres)  | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|   | CN  | 39           | 61           | 74            | 80          |         |
| Impervious Cover  | Area (acres)  | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|   | CN  | 98           | 98           | 98            | 98          |         |
|   |   |              |              |               | Weighted CN | S       |
|   |   |              |              |               | 0           | 1000.00 |
|   |   | 1-year storm | 2-year storm | 10-year storm |             |         |
|   | <b>RV<sub>Developed</sub> (in) with no Runoff Reduction</b> | 0.00         | 0.00         | 0.00          |             |         |
|   | <b>RV<sub>Developed</sub> (in) with Runoff Reduction</b>    | 0.00         | 0.00         | 0.00          |             |         |
|   | <b>Adjusted CN</b>  | <b>100</b>   | <b>100</b>   | <b>100</b>    |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |

## 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 (ft <sup>3</sup> ) | 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 <sup>3</sup> )      | 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<br>(acres) | Downstream<br>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**

|                            | Weighted CN | 1-year storm<br>Adjusted<br>CN | 2-year storm<br>Adjusted CN | 10-year<br>storm<br>Adjusted<br>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



- PENINSULA PENTECOSTAL-CP 3.DWG



**Virginia Runoff Reduction Method New Development Worksheet - v2.8 - June 2014**
**To be used w/ 2011 BMP Standards and Specifications**
**Site Data**
**Project Name: Peninsula Pentecostal Lot P-1 - Exhibit B Wet Pond**
**Date: 1/2015**

|  |                   |  |  |  |  |
|--|-------------------|--|--|--|--|
|  | data input cells  |  |  |  |  |
|  | calculation cells |  |  |  |  |
|  | constant values   |  |  |  |  |

**1. Post-Development Project & Land Cover Information**

|  |                |                                    |                     |                |                |
|--|----------------|------------------------------------|---------------------|----------------|----------------|
| <b>Constants</b>   |                |                                    |                     |                |                |
| 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           |                                    |                     |                |                |
| Pj   | 0.90           |                                    |                     |                |                |
| <b>Land Cover (acres)</b>  |                |                                    |                     |                |                |
|  | <b>A soils</b> | <b>B Soils</b>                     | <b>C Soils</b>      | <b>D Soils</b> | <b>Totals</b>  |
| 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         |
|  |                |                                    |                     | <b>Total</b>   | <b>24.8000</b> |
| <b>Rv Coefficients</b>   |                |                                    |                     |                |                |
|  | <b>A soils</b> | <b>B Soils</b>                     | <b>C Soils</b>      | <b>D Soils</b> |                |
| 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           |                |
| <b>Land Cover Summary</b>  |                |                                    |                     |                |                |
| Forest/Open Space Cover (acres)  | 5.2700         |                                    |                     |                |                |
| 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%            |                                    |                     |                |                |
| <b>Total Site Area (acres)</b>   | <b>24.8000</b> |                                    |                     |                |                |
| <b>Site Rv</b>   | <b>0.44</b>    |                                    |                     |                |                |
| 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_Development Load (TN) (lb/yr) |                     | 176.81         |                |
| Total Load (TP) Reduction Required (lb/yr)   | 14.55          |                                    |                     |                |                |

| 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  | 0.0000  | 0.0000              | 0.0000                                 | 0.00                                    |                               |                           |  |  |                                       |                                  |                                     |
| Managed Turf (acres)   | 0.0000  | 0.0000  | 8.6700  | 0.0000              | 8.6700                                 | 0.22                                    |                               |                           |  |  |                                       |                                  |                                     |
| Impervious Cover (acres)   | 0.0000  | 0.0000  | 8.6700  | 0.0000              | 8.6700                                 | 0.95                                    |                               |                           |  |  |                                       |                                  |                                     |
| Total  |   |   |         |                     | 16.6700                                | Post Development Treatment Volume (cft) |                               | 36287                     |  |  |                                       |                                  |                                     |
| Apply Runoff Reduction Practices to Reduce Treatment Volume & Post-Development Load in Drainage Area A |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| Practice   | Unit  | Description of Credit                                   | Credit  | Credit Area (acres) | Volume from Upstream RR Practice (cft) | Runoff Reduction (cft)                  | Remaining Runoff Volume (cft) | Phosphorus Efficiency (%) | Phosphorus Load from Upstream RR Practices (lbs) | Untreated Phosphorus Load to Practice (lbs.) | Phosphorus Removed By Practice (lbs.) | Remaining Phosphorus Load (lbs.) | Downstream Treatment to be Employed |
| 1. Vegetated Roof  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 1.a. Vegetated Roof #1 (Spec #5)   | acres of green roof   | 45% runoff volume reduction                             | 0.45    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 1.b. 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                             |                                     |
| 2. Rooftop Disconnection   |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 2.a. Simple Disconnection to A/B Soils (Spec #1)   | impervious acres disconnected   | 50% runoff volume reduction for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.b. Simple Disconnection to C/D Soils (Spec #1)   | impervious acres disconnected   | 25% runoff volume reduction for treated area            | 0.25    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #4)                  | impervious acres disconnected   | 50% runoff volume reduction for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.d. To Dry Well or French Drain #1 (Micro-infiltration #1) (Spec #5)                                  | impervious acres disconnected   | 60% runoff volume reduction for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.e. To Dry Well or French Drain #2 (Micro-infiltration #2) (Spec #5)                                  | impervious acres disconnected   | 90% runoff volume reduction for treated area            | 0.90    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.f. To Rain Garden #1 (Micro-Bioretenion #1) (Spec #5)  | impervious acres disconnected   | 40% of volume captured                                  | 0.40    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.g. To Rain Garden #2 (Micro-Bioretenion #2) (Spec #5)  | impervious acres disconnected   | 80% runoff volume reduction for treated area            | 0.80    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 2.h. 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                             |                                     |
| 2.i. To Stormwater Planter (Urban Bioretention) (Spec #5, Appendix A)                                  | impervious acres disconnected   | 40% runoff volume reduction for treated area            | 0.40    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 3. Permeable Pavement  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 3.a. Permeable Pavement #1 (Spec #7)   | acres of permeable pavement + acres of "testnet" (upgradient) impervious pavement | 45% runoff volume reduction                             | 0.45    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 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                             |                                     |
| 4. Grass Channel   |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 4.a. Grass Channel A/B Soils (Spec #3)   | impervious acres draining to grass channels                                       | 20% runoff volume reduction                             | 0.20    | 0.0000              | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to grass channels   | 20% runoff volume reduction                             | 0.20    | 0.0000              | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 4.b. Grass Channel C/D Soils (Spec #3)   | impervious acres draining to grass channels                                       | 10% runoff volume reduction                             | 0.10    | 7.5222              | 0                                      | 2594                                    | 23346                         | 15                        | 0.00   | 16.28  | 3.83                                  | 12.45                            | 13.d. Wet Pond #2 (Coastal Plain)   |
|  | turf acres draining to grass channels   | 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)   |
| 4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #4)                               | impervious acres draining to grass channels                                       | 30% runoff volume reduction                             | 0.30    | 0.0000              | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to grass channels   | 30% runoff volume reduction                             | 0.30    | 0.0000              | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 5. Dry Swale   |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 5.a. Dry Swale #1 (Spec #10)   | impervious acres draining to dry swale  | 40% runoff volume reduction                             | 0.40    | 0.0000              | 0                                      | 0                                       | 0                             | 20                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to dry swale  | 40% runoff volume reduction                             | 0.40    | 0.0000              | 0                                      | 0                                       | 0                             | 20                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 5.b. Dry Swale #2 (Spec #10)   | impervious acres draining to dry swale  | 60% runoff volume reduction                             | 0.60    | 0.0000              | 0                                      | 0                                       | 0                             | 40                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to dry swale  | 60% runoff volume reduction                             | 0.60    | 0.0000              | 0                                      | 0                                       | 0                             | 40                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 6. Bioretention  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 6.a. Bioretention #1 or Urban Bioretention (Spec #5)   | impervious acres draining to bioretention   | 40% runoff volume reduction                             | 0.40    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to bioretention   | 40% runoff volume reduction                             | 0.40    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 6.b. Bioretention #2 (Spec #5)   | impervious acres draining to bioretention   | 80% runoff volume reduction                             | 0.80    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to bioretention   | 80% runoff volume reduction                             | 0.80    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 7. Infiltration  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 7.a. Infiltration #1 (Spec #8)   | impervious acres draining to infiltration   | 50% runoff volume reduction                             | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to infiltration   | 50% runoff volume reduction                             | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 7.b. Infiltration #2 (Spec #8)   | impervious acres draining to infiltration   | 90% runoff volume reduction                             | 0.90    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to infiltration   | 90% runoff volume reduction                             | 0.90    | 0.0000              | 0                                      | 0                                       | 0                             | 25                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 8. Extended Detention Pond   |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 8.a. ED #1 (Spec #15)  | impervious acres draining to ED   | 0% runoff volume reduction                              | 0.00    |                     | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to ED   | 0% runoff volume reduction                              | 0.00    |                     | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 8.b. ED #2 (Spec #15)  | impervious acres draining to ED   | 15% runoff volume reduction                             | 0.15    | 0.0000              | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to ED   | 15% runoff volume reduction                             | 0.15    | 0.0000              | 0                                      | 0                                       | 0                             | 15                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 9. Sheetflow to Filter/Open Space  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 9.a. Sheetflow to Conservation Area with A/B Soils (Spec #2)   | impervious acres draining to conserved open space                                 | 75% runoff volume reduction for treated area            | 0.75    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to conserved open space                                       | 75% runoff volume reduction for treated area            | 0.75    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 9.b. Sheetflow to Conservation Area with C/D Soils (Spec #2)   | impervious acres draining to conserved open space                                 | 50% runoff volume reduction for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to conserved open space                                       | 50% runoff reduction volume for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 9.c. Sheetflow to Vegetated Filter Strip in A Soils or Compost Amended B/C/D Soils (Spec #2 & #4)      | impervious acres draining to filter strip   | 50% runoff volume reduction for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to filter strip   | 50% runoff reduction volume for treated area            | 0.50    | 0.0000              | 0                                      | 0                                       | 0                             | 0                         | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| TOTAL IMPERVIOUS COVER TREATED (ac)  |   |   |         |                     | 7.5222                                 |   |                               |                           |  |  |                                       |                                  |                                     |
| TOTAL TURF AREA TREATED (ac)   |   |   |         |                     | 5.7899                                 |   |                               |                           |  |  |                                       |                                  |                                     |
| AREA CHECK OK  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)  |   |   |         |                     | 14.55                                  |   |                               |                           |  |  |                                       |                                  |                                     |
| TOTAL RUNOFF REDUCTION IN D.A. A (cft)   |   |   |         |                     | 3,056                                  |   |                               |                           |  |  |                                       |                                  |                                     |
| PHOSPHORUS REMOVAL FROM RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)                                   |   |   |         |                     | 4.51                                   |   |                               |                           |  |  |                                       |                                  |                                     |
| SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS                                      |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| Apply Practices that Remove Pollutants but Do Not Reduce Runoff Volume                                 |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| Practice   | Unit  | Description of Credit                                   | Credit  | Credit Area (acres) | Volume from Upstream RR Practice (cft) | Runoff Reduction (cft)                  | Remaining Runoff Volume (cft) | Phosphorus Efficiency (%) | Phosphorus Load from Upstream RR Practices (lbs) | Untreated Phosphorus Load to Practice (lbs.) | Phosphorus Removed By Practice (lbs.) | Remaining Phosphorus Load (lbs.) | Downstream Treatment to be Employed |
| 10. Wet Swale (Coastal Plain)  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 10.a. Wet Swale #1 (Spec #11)  | impervious acres draining to wet swale  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 20                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to wet swale  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 20                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | impervious acres draining to wet swale  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 40                        | 0.00   | 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                                  | 0.00                             |                                     |
| 11. Filtering Practices  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 11.a. Filtering Practice #1 (Spec #12)   | impervious acres draining to filter   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 60                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to filter   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 60                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | impervious acres draining to filter   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 65                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 11.b. Filtering Practice #2 (Spec #12)   | turf acres draining to filter   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 65                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 12. Constructed Wetland  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 12.a. Constructed Wetland #1 (Spec #13)  | impervious acres draining to wetland  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to wetland  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | impervious acres draining to wetland  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 75                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 12.b. Constructed Wetland #2 (Spec #13)  | turf acres draining to wetland  | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 75                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 13. Wet Ponds  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 13.a. Wet Pond #1 (Spec #14)   | impervious acres draining to wet pond   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | turf acres draining to wet pond   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 50                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
|  | impervious acres draining to wet pond   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 45                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 13.b. Wet Pond #1 (Coastal Plain) (Spec #14)   | turf acres draining to wet pond   | 0% runoff volume reduction                              | 0.00    | 0.0000              | 0                                      | 0                                       | 0                             | 45                        | 0.00   | 0.00   | 0.00                                  | 0.00                             |                                     |
| 13.c. Wet Pond #2 (Spec #14)   | impervious 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                             |                                     |
|  | 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                             |                                     |
|  | impervious acres draining to wet pond   | 0% runoff volume reduction                              | 0.00    | 1.1478              | 23,346                                 | 0                                       | 27304                         | 65                        | 12.45  | 2.48   | 9.71                                  | 5.23                             |                                     |
| 13.d. Wet Pond #2 (Coastal Plain) (Spec #14)   | turf acres draining to wet pond   | 0% runoff volume reduction                              | 0.00    | 2.2101              | 4,161                                  | 0                                       | 5926                          | 65                        | 2.22   | 1.11   | 2.16                                  | 1.16                             |                                     |
| 14. Manufactured BMP   |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| 14. Insert Name of Device  | 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                             |                                     |
|  | 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                             |                                     |
| TOTAL IMPERVIOUS COVER TREATED (ac)  |   |   |         |                     | 8.6700                                 |   |                               |                           |  |  |                                       |                                  |                                     |
| TOTAL TURF AREA TREATED (ac)   |   |   |         |                     | 8.0000                                 |   |                               |                           |  |  |                                       |                                  |                                     |
| AREA CHECK OK  |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| PHOSPHORUS REMOVAL BY PRACTICES THAT DO NOT REDUCE RUNOFF VOLUME IN D.A. A                             |   |   |         |                     | 11.87                                  |   |                               |                           |  |  |                                       |                                  |                                     |
| TOTAL PHOSPHORUS REMOVAL IN D.A. A (lb/yr)   |   |   |         |                     | 16.38                                  |   |                               |                           |  |  |                                       |                                  |                                     |
| SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS                                      |   |   |         |                     |  |   |                               |                           |  |  |                                       |                                  |                                     |
| NITROGEN REMOVAL BY PRACTICES THAT DO NOT REDUCE RUNOFF VOLUME IN D.A. A                               |   |   |         |                     | 37.35                                  |   |                               |                           |  |  |                                       |                                  |                                     |
| TOTAL NITROGEN REMOVAL IN D.A. A (lb/yr)   |   |   |         |                     | 174.57                                 |   |                               |                           |  |  |                                       |                                  |                                     |

| 1. Green Roof                       |      |        |       |       |
|-------------------------------------|------|--------|-------|-------|
| 0                                   | 0.00 | 0.00   | 0.00  | 0.00  |
| 0                                   | 0.00 | 0.00   | 0.00  | 0.00  |
| 2. Impervious Surface Disconnection |      |        |       |       |
| 0                                   | 0.00 | 0.00   | 0.00  | 0.00  |
| 0                                   | 0.00 | 0.00   | 0.00  | 0.00  |
| 0                                   | 0.00 | 0.00   | 0.00  | 0.00  |
| 15                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 15                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 40                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 60                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 0                                   | 0.00 | 0.00   | 0.00  | 0.00  |
| 40                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 3. Permeable Pavement               |      |        |       |       |
| 25                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 25                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 4. Grass Channel                    |      |        |       |       |
| 20                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 20                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 20                                  | 0.00 | 116.46 | 32.61 | 83.85 |
| 20                                  | 0.00 | 20.76  | 5.81  | 14.95 |
| 20                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 20                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 5. Dry Swale                        |      |        |       |       |
| 25                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 25                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 35                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 35                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 6. Bioretention                     |      |        |       |       |
| 40                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 40                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 60                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 60                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 7. Infiltration                     |      |        |       |       |
| 15                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 15                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 15                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 15                                  | 0.00 | 0.00   | 0.00  | 0.00  |
| 8. Extended Detention Pond          |      |        |       |       |
| 10                                  | 0.00 | 0.00   | 0.00  | 0.00  |
|                                     |      |        |       |       |



Site Results

|                          | 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  |
| REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED     | CONGRATULATIONS!! YOU EXCEEDED THE TARGET REDUCTION BY 1.8 LB/YEAR! |

Nitrogen (for information purposes)

|  |        |
|--|--------|
| TOTAL TREATMENT VOLUME (cf)                          | 39,336 |
| RUNOFF REDUCTION (cf)                                | 3056   |
| NITROGEN LOAD REDUCTION ACHIEVED (LB/YR)             | 174.57 |
| ADJUSTED POST-DEVELOPMENT NITROGEN LOAD (TN) (lb/yr) | 2.24   |

|  |              |        |              |              |               |             |         |
|--|--------------|--------|--------------|--------------|---------------|-------------|---------|
|  |              |        | 1-year storm | 2-year storm | 10-year storm |             |         |
| Target Rainfall Event (in)   |              |        | 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            |        |              |              |               |             |         |
| 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 selected drainage areas, the spreadsheet calculates an adjusted RV <sub>Developed</sub> and adjusted Curve Number. |              |        |              |              |               |             |         |
| Drainage Area A  |              |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres) | 0.0000 | 0.0000       | 8.0000       | 0.0000        |             |         |
|  | CN           | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres) | 0.0000 | 0.0000       | 8.6700       | 0.0000        |             |         |
|  | CN           | 98     | 98           | 98           | 98            |             |         |
|  |              |        |              |              |               | Weighted CN | S       |
|  |              |        |              |              |               | 86          | 1.63    |
|  |              |        | 1-year storm | 2-year storm | 10-year storm |             |         |
| RV <sub>Developed</sub> (in) with no Runoff Reduction  |              |        | 0.00         | 0.00         | 0.00          |             |         |
| RV <sub>Developed</sub> (in) with Runoff Reduction   |              |        | -0.05        | -0.05        | -0.05         |             |         |
| Adjusted CN  |              |        | #N/A         | #N/A         | #N/A          |             |         |
| Drainage Area B  |              |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 98     | 98           | 98           | 98            | 98          |         |
|  |              |        |              |              |               | Weighted CN | S       |
|  |              |        |              |              |               | 0           | 1000.00 |
|  |              |        | 1-year storm | 2-year storm | 10-year storm |             |         |
| RV <sub>Developed</sub> (in) with no Runoff Reduction  |              |        | 0.00         | 0.00         | 0.00          |             |         |
| RV <sub>Developed</sub> (in) with Runoff Reduction   |              |        | 0.00         | 0.00         | 0.00          |             |         |
| Adjusted CN  |              |        | 100          | 100          | 100           |             |         |
| Drainage Area C  |              |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 98     | 98           | 98           | 98            | 98          |         |
|  |              |        |              |              |               | Weighted CN | S       |
|  |              |        |              |              |               | 0           | 1000.00 |
|  |              |        | 1-year storm | 2-year storm | 10-year storm |             |         |
| RV <sub>Developed</sub> (in) with no Runoff Reduction  |              |        | 0.00         | 0.00         | 0.00          |             |         |
| RV <sub>Developed</sub> (in) with Runoff Reduction   |              |        | 0.00         | 0.00         | 0.00          |             |         |
| Adjusted CN  |              |        | 100          | 100          | 100           |             |         |
| Drainage Area D  |              |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 30     | 55           | 70           | 77            |             |         |
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed  | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 39     | 61           | 74           | 80            |             |         |
| Impervious Cover   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 98     | 98           | 98           | 98            | 98          |         |
|  |              |        |              |              |               | Weighted CN | S       |
|  |              |        |              |              |               | 0           | 1000.00 |
|  |              |        | 1-year storm | 2-year storm | 10-year storm |             |         |
| RV <sub>Developed</sub> (in) with no Runoff Reduction  |              |        | 0.00         | 0.00         | 0.00          |             |         |
| RV <sub>Developed</sub> (in) with Runoff Reduction   |              |        | 0.00         | 0.00         | 0.00          |             |         |
| Adjusted CN  |              |        | 100          | 100          | 100           |             |         |
| Drainage Area E  |              |        | A soils      | B Soils      | C Soils       | D Soils     |         |
| Forest/Open Space -- undisturbed, protected forest/open space or reforested land   | Area (acres) | 0.0000 | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|  | CN           | 30     | 55           | 70           | 77            |             |         |

|   |   |              |              |               |             |         |
|---|---|--------------|--------------|---------------|-------------|---------|
| Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed | Area (acres)  | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|   | CN  | 39           | 61           | 74            | 80          |         |
| Impervious Cover  | Area (acres)  | 0.0000       | 0.0000       | 0.0000        | 0.0000      |         |
|   | CN  | 98           | 98           | 98            | 98          |         |
|   |   |              |              |               | Weighted CN | S       |
|   |   |              |              |               | 0           | 1000.00 |
|   |   | 1-year storm | 2-year storm | 10-year storm |             |         |
|   | <b>RV<sub>Developed</sub> (in) with no Runoff Reduction</b> | 0.00         | 0.00         | 0.00          |             |         |
|   | <b>RV<sub>Developed</sub> (in) with Runoff Reduction</b>    | 0.00         | 0.00         | 0.00          |             |         |
|   | <b>Adjusted CN</b>  | <b>100</b>   | <b>100</b>   | <b>100</b>    |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |
|   |   |              |              |               |             |         |

## 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 (ft <sup>3</sup> ) | 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 <sup>3</sup> )      | 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<br>(acres) | Downstream<br>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) | 16.38  |
| Total TN Load Reduction Achieved in D.A. A (lb/yr) | 174.57 |

**Channel and Flood Protection**

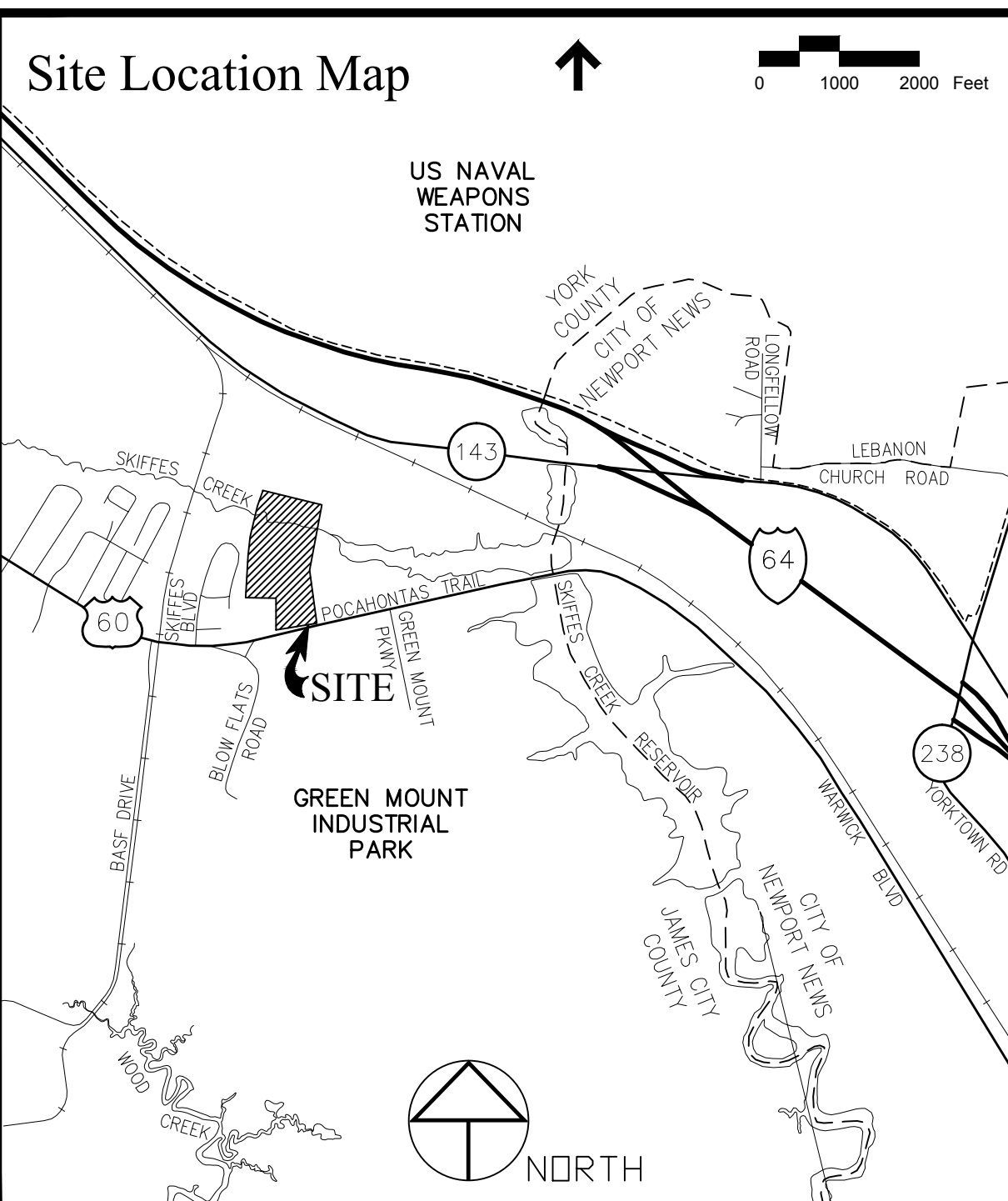
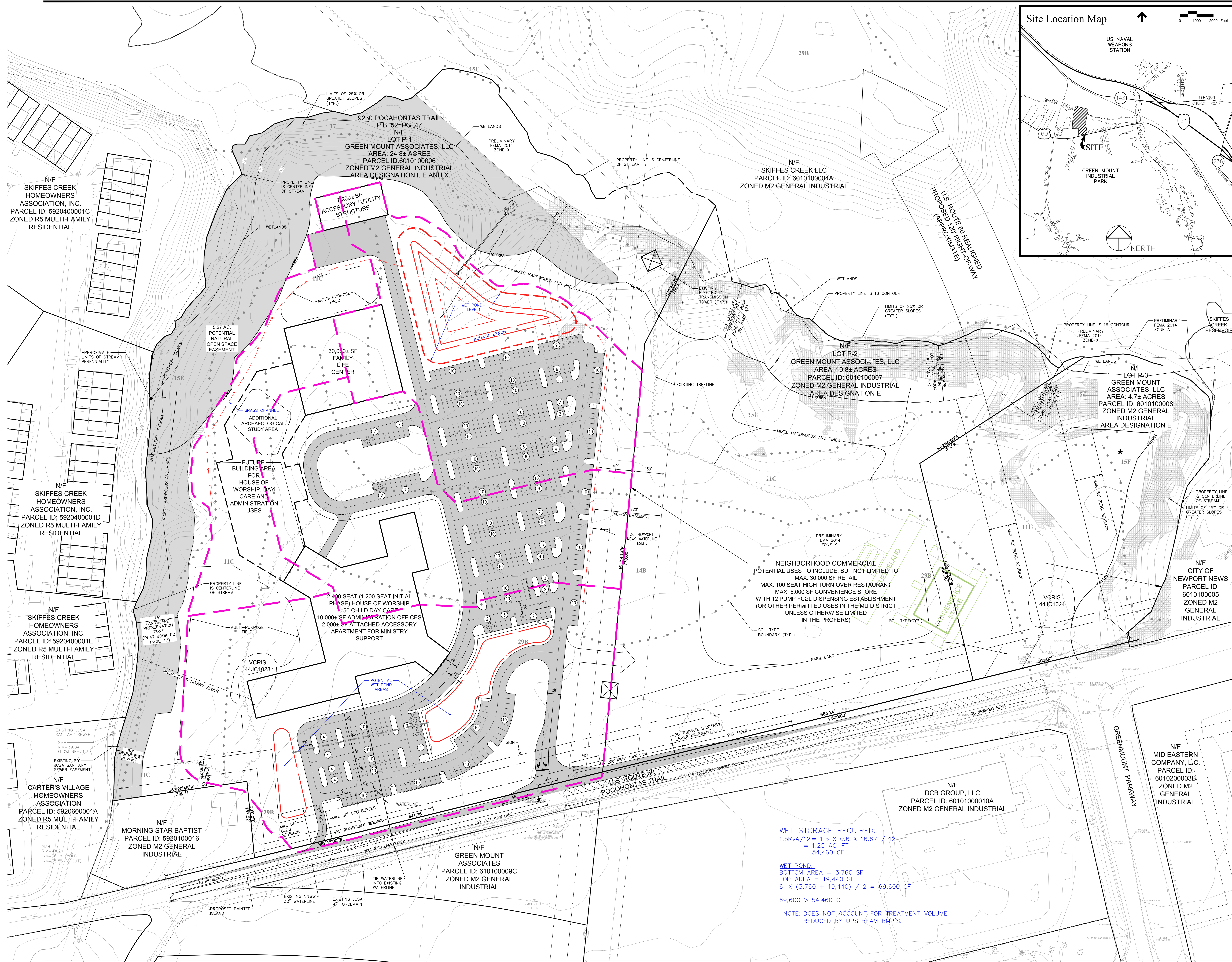
|                            | Weighted CN | 1-year storm<br>Adjusted<br>CN | 2-year storm<br>Adjusted CN | 10-year<br>storm<br>Adjusted<br>CN |
|----------------------------|-------------|--------------------------------|-----------------------------|------------------------------------|
| Target Rainfall 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



\\VHB\PROJ\WILLIAMSBURG\33749.00 PENINSULA PENTECOSTAL\CAD\UD\CONCEPTS\CONCEPTUAL PLAN\PENINSULA PENTECOSTAL-CP-3  
Saved Monday, February 23, 2015 1:26:00 PM BORENE Plotted Tuesday, February 24, 2015 8:56:08 AM Loder, Anthony



**Vanasse Hangen Brustlin, Inc.**  
Transportation  
Land Development  
Environmental Services  
351 McLaws Circle, Suite 3  
Williamsburg, Virginia 23185  
757.220.0500 • FAX 757.220.8544

**GENERAL NOTES:**

- THE PROPERTY IS IDENTIFIED ON THE JAMES CITY COUNTY GEOGRAPHIC INFORMATION SYSTEM MAP SERIES AS GPN:6010100006 AND IS ZONED M2, GENERAL INDUSTRIAL. THE PROPERTY IS FURTHER DESCRIBED AS 9230 POCAHONTAS TRAIL. THE PROPERTY IS IDENTIFIED ON THE JAMES CITY COUNTY GEOGRAPHIC INFORMATION SYSTEM MAP SERIES AS GPN:6010100007 AND IS ZONED M2, GENERAL INDUSTRIAL. THE PROPERTY IS FURTHER DESCRIBED AS 9240 POCAHONTAS TRAIL. THE PROPERTY IS IDENTIFIED ON THE JAMES CITY COUNTY GEOGRAPHIC INFORMATION SYSTEM MAP SERIES AS GPN:6010100008 AND IS ZONED M2, GENERAL INDUSTRIAL. THE PROPERTY IS FURTHER DESCRIBED AS 9250 POCAHONTAS TRAIL. THE PARCELS ARE LOCATED WITHIN THE PRIMARY SERVICE AREA AND OUTSIDE THE 100 YEAR FLOOD PLAN. THE COMPREHENSIVE PLAN DESIGNATION FOR THESE PARCELS IS MIXED USE.
- BOUNDARY INFORMATION IS FROM PLAT OF RECORD RECORDED IN FB: 52, PG. 47, TOPOGRAPHIC AND EXISTING FEATURES INFORMATION DEPICTED HEREON IS FROM JAMES CITY COUNTY GEOGRAPHIC INFORMATION SYSTEM MAPPING.
- POCAHONTAS TRAIL IS CLASSIFIED AS COMMUNITY CHARACTER CORRIDOR ALONG THE FRONTAGE OF THE SUBJECT PROPERTY.

**GENERAL TABULATION**

**PROPOSED DEVELOPMENT PROGRAM:**

- ADDRESS: P-1 9230 POCAHONTAS TRAIL WILLIAMSBURG, VA, 23185
- ADDRESS: P-2 9240 POCAHONTAS TRAIL WILLIAMSBURG, VA, 23185
- ADDRESS: P-3 9250 POCAHONTAS TRAIL WILLIAMSBURG, VA, 23185
- PARCEL ID: 6010100006(P-1), 6010100007(P-2), 6010100008(P-3)
- ZONING: M2 GENERAL INDUSTRIAL
- WATERSHED: SKIFFES CREEK
- RECEIVING STREAM: SKIFFES CREEK

GROSS SITE AREA: 40.3± ACRES (TOTAL PARCEL)  
DEVELOPABLE AREA (SEC. 24-2): 27.4± OR 1,193,545± S.F.  
IMPERVIOUS AREA: MAXIMUM 60%  
PERVIOUS AREA: MINIMUM 40%

PROPERTY APPEARS TO BE IN ZONE X (AREAS OF 0.2% ANNUAL CHANCE OF FLOOD) FROM MAP NUMBER 5109000200 DATED SEPTEMBER 28, 2007

SOILS WITHIN SITE AREA:  
11C=SHAW-WICHE COMPLEX-HYDROLOGIC SOIL GROUP C  
K=0.37 HIGH ERODIBILITY  
14B=EMPIRIA FINE SANDY LOAM-HYDROLOGIC SOIL GROUP C  
K=0.28 MODERATE ERODIBILITY  
15E=EMPIRIA COMPLEX-HYDROLOGIC SOIL GROUP C  
K=0.28 MODERATE ERODIBILITY  
17=JOHNSTON COMPLEX-HYDROLOGIC SOIL GROUP D  
K=20 LOW ERODIBILITY  
29B=SLADE FINE SANDY LOAM-HYDROLOGIC SOIL GROUP C  
K=0.24 MODERATE ERODIBILITY

| No. | Revision           | Date | Appr. |
|-----|--------------------|------|-------|
| 1   | DESIGNED BY SAR    |      | PS    |
| 2   | CAD CHECKED BY SAR |      | SAR   |
| 3   | APPROVED BY SAR    |      | SAR   |

Scale: 1"=60'

Date: January 20, 2015

Project Title: Peninsula Pentecostal Church

Not Approved for Construction

Stormwater Management Exhibit B Wet Pond Option

Peninsula Pentecostal Church  
Pocahontas Trail  
Williamsburg, Virginia  
Issued for: N/F MID EASTERN COMPANY, L.C. PARCEL ID: 6010200003B ZONED M2 GENERAL INDUSTRIAL

STEPHEN A. ROMEO  
Lic. No. 1448-B  
LAND SURVEYOR

Drawing Number: CP-1  
Sheet of 11  
Project Number: 33749.00

**WET STORAGE REQUIRED:**  
 $1.5RvA/12 = 1.5 \times 0.6 \times 16.67 / 12 = 1.25 \text{ AC-FT} = 54,460 \text{ CF}$

**WET POND:**  
BOTTOM AREA = 3,760 SF  
TOP AREA = 19,440 SF  
 $6' \times (3,760 + 19,440) / 2 = 69,600 \text{ CF}$

69,600 > 54,460 CF

NOTE: DOES NOT ACCOUNT FOR TREATMENT VOLUME REDUCED BY UPSTREAM BMP'S.