

090021826

COPY

Return to:  
JCC Attorney's Office  
101-C Mount's Bay Road  
Williamsburg, VA 23185  
(757) 253-6612



COUNTY OF JAMES CITY, VIRGINIA

DECLARATION OF COVENANTS  
INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

Please type or print legibly in black ink. Covenantor(s) should submit this form to the JCC Environmental Division, 101-E Mounts Bay Road, Williamsburg, VA 23185.

THIS DECLARATION OF COVENANTS, made this 27th day of MAY, 2007, between OSCAR HARRELL, and all successors in interest, ("COVENANTOR(S)"), owner(s) of the following property:

Parcel Identification Number: 23202D0001A  
Legal Description: L-1,2,3,4,5,6,7,8,9,10,11,12,13 BLKD Novalia Subdivision  
Project or Subdivision Name: Williamsburg, Wickham Expansion - Phase 2  
Document/Instrument No. 050008314 or Deed Book \_\_\_\_\_, Page No. \_\_\_\_\_, and the County of James City, Virginia ("COUNTY.")

WITNESSETH:

I (We), the COVENANTOR(S), with full authority to execute deeds, mortgages, other covenants, and all rights, titles and interests in the property described above, do hereby covenant with the COUNTY as follows:

1. The COVENANTOR(S) shall provide maintenance for the drainage system including any runoff control facilities, conveyance systems and associated easements, hereinafter referred to as the "SYSTEM," located on and serving the above-described property to ensure that the SYSTEM is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations. The SYSTEM shall not include any elements located within any Virginia Department of Transportation rights-of-way.
2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the SYSTEM to ensure that the SYSTEM is properly maintained.
3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the SYSTEM for the COUNTY, its agent and its contractor.
4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the SYSTEM for the purpose of inspecting, monitoring, operating, installing, constructing, reconstructing, maintaining or repairing the SYSTEM.
5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the SYSTEM in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the SYSTEM for the cost of the work and any applicable penalties.
6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the SYSTEM.

Wmby Wicker Exp.

YC058

**Order of Contents for Stormwater Management Facilities As-built Files**

Each file is to contain:

- ✓1. Maintenance Agreement
- ✓2. Completed construction certification
- ✓3. As-built plan
- ✓4. Watershed Map - in ~~water~~ calculation package
- ✓5. Construction Plan
- ✓6. Design Calculations
- ✓7. Geotechnical Reports
- ✓8. Correspondence with owners
- ✓9. Inspection Records (construction phase)
10. Enforcement Actions (construction phase)
- ✓11. Miscellaneous

7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S) responsibilities for the SYSTEM. The COVENANTOR(S) shall supply the COUNTY with a copy of any document of transfer, executed by both parties.

8. The covenants contained herein shall run with the land and shall bind the COVENANTOR(S) and the COVENANTOR(S)' heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of property served by the SYSTEM.

9. This COVENANT shall be recorded in the County Land Records.

IN WITNESS WHEREOF, the COVENANTOR(S) has executed this DECLARATION OF COVENANTS as of the date first above written.

COVENANTOR(S)

Oscar Harrell  
Signature

Oscar Harrell  
Print Name and Title  
owner

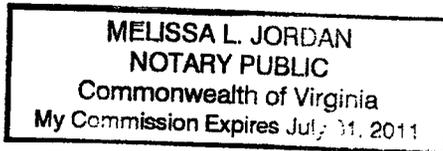
ACKNOWLEDGMENT

COMMONWEALTH OF VIRGINIA  
CITY/COUNTY OF James City County, to wit:

I hereby certify that on this 28th day of may, 2009, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared Oscar Harrell and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 28th day of may, 2009.

[SEAL]



Melissa Jordan  
Notary Public

Notary Registration Number: 7076732  
My Commission expires: July 31, 2011

Approved as to form:

JL M G  
Asst. County Attorney

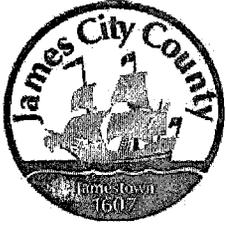
This Declaration of Covenants prepared by:

Signature: Melissa Jordan Print Name and Title: Melissa L. Jordan / Admin.

Address: PO Box 92 Lightfoot VA 23090

Phone Number: 757-565-1725

Drainage1\_pre\_doc  
(Revised 9-5-08)



**James City County Environmental Division  
Stormwater Management/BMP Record Drawing &  
Construction Certification Review  
Tracking Form**

Project Name: Williamsburg Wicker Expansion  
 County Plan No.: SP-074-08  
 Stormwater Management Facility: Bioretention  
 BMP Phase #:  I  II  III  
 Information Package Received. Date/By: 5/6/10  
 Completeness Check:  
 Record Drawing Date/By: 5/6/10 AES  
 Construction Certification Date/By: 5/6/10 AES  
 RD/CC Standard Forms (Required for all BMPs after Feb 1<sup>st</sup> 2001 Only)  
 Insp/Maint Agreement # / Date: 5/27/09 Sheet 5-App Plan SP07408  
 BMP Maintenance Plan Location: \_\_\_\_\_  
 Other: \_\_\_\_\_  
 Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review  
 Yes  No Location: Sheet 4-SP-074-08  
 Assign County BMP ID Code #: Code: YC058  
 Preliminary Input/Log into Division's "As-Built Tracking Log"  
 Add Location to GIS Map. Obtain basic site information (GPIN, Owner, Address, etc.)  
 Preliminary Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)  
 Active Project File Review (correspondence, H&H, design computations, etc.)  
 Initial As-Built File setup (File label, folder, copy plan/details/design information, etc.)  
 Inspector Check of RD/CC (forward to Inspector using transmittal for cursory review).  
 Pre-Inspection Drawing Review of Approved Plan (Quick look prior to Field Inspection).  
 Final Inspection (FI) Performed Date: 5/11/10  
 Record Drawing (RD) Review Date: 5/11/10  
 Construction Certification (CC) Review Date: 5/11/10  
 Actions:  
 No comments.  
 Comments. Letter Forwarded. Date: \_\_\_\_\_  
 Record Drawing (RD)  
 Construction Certification (CC)  
 Construction-Related (CR)  
 Site Issues (SI)  
 Other : \_\_\_\_\_  
 Second Submission: N/A  
 Reinspection (if necessary): N/A  
 Acceptable for SWM Purposes (RD/CC/CR/Other). Ok to proceed with bond release.  
 Complete "Surety Request Form".  
 Check/Clean active file of any remaining material and finish "As-Built" file.  
 Add to County BMP Inventory/Inspection schedule (Phase I, II or III).  
 Copy Final Inspection Report into County BMP Inspection Program file.  
 Obtain Digital Photographs of BMP and save into County BMP Inventory.  
 Request mylar/reproducible from As-Built plan preparer.  
 Complete "As-built Tracking Log".  
 Last check of BMP Access Database (County BMP Inventory).  
 Add BMP to JCC Hydrology & Hydraulic database (optional).  
 Add BMP to Municipal BMP list (if a County-owned facility)  
 Add BMP to PRIDE BMP ratings database.

**Final Sign-Off**

Inspector: Via Creach  
 Chief Engineer: [Signature]

Date: 5/26/10  
 Date: 3/6/12

*Returned to ERP  
2/3/12 FOR sign.  
by chief  
17 aug.*

\*\*\* See separate checklist, if needed.

[Signature] 09/06/12



**James City County, Virginia  
Environmental Division**

**Stormwater Management / BMP Facilities  
Record Drawing and Construction Certification Forms**

*(Note: In accordance with the requirements of the Chesapeake Bay Preservation Ordinance, Chapter 23, Section 23-10(4), BMP's shall be designed and constructed in accordance with the manual entitled James City County Guidelines for Design and Construction of Stormwater Management BMP's. Erosion and sediment control policy and approved plans generally require that at the completion of the project and prior to release of surety, an "as-built" plan prepared by a registered Professional Engineer or Certified Land Surveyor must be provided for the drainage system for the project, including any Best Management Practice (BMP) facilities. In addition, for BMP facilities involving the construction of an impounding structure or dam embankment, certification is required by a Professional Engineer who has inspected the structure during its construction. Currently there are over 20 water quality type BMP's accepted by the County.)*

**Section 1 – Site Information:**

Project Name: Williamsburg Wisker  
 Structure/BMP Name: Bio-Retention  
 Project Location: 7414 Richmond Road  
 BMP Location: Northeast corner of site parallel to Peninsula Street  
 County Plan No.: SP - 0074 - 2008

Project Type:     Residential                       Business                      Tax Map/Parcel No.: (23-2)(2-D-1A)  
                           Commercial                       Office                      BMP ID Code (if known): \_\_\_\_\_  
                           Institutional                       Industrial                      Zoning District: B-1  
                           Public                                       Roadway                      Land Use: Warehouse Building  
                           Other \_\_\_\_\_                      Site Area (sf or acres): 1.127 acres

Brief Description of Stormwater Management/BMP Facility: Bio-Retention Facility

Nearest Visible Landmark to SWM/BMP Facility: Intersection of Peninsula Street and Peach Street

Nearest Vertical Ground Control (if known):  
 JCC Geodetic Ground Control     USGS                       Temporary                       Arbitrary                       Other  
 Station Number or Name: Railroad Spike set in Power Pole  
 Datum or Reference Elevation: NGVD29 Elevation 115.87  
 Control Description: Railroad Spike set in Power Pole  
 Control Location from Subject Facility: Intersection Richmond Road and Peninsula Street

**Section 2 – Stormwater Management / BMP Facility Construction Information:**

PreConstruction Meeting Held for Construction of SWM/BMP Facility:  Yes  No  Unknown  
Approx. Construction Start Date for SWM/BMP Facility: January 2009  
Facility Monitored by County Representative during Construction:  Yes  No  Unknown  
Name of Site Work Contractor Who Constructed Facility: Michael Hipple Builder  
Name of Professional Firm Who Routinely Monitored Construction: AES Consulting Engineers  
Date of Completion for SWM/BMP Facility: 2010  
Date of Record Drawing/Construction Certification Submittal: May 2010

*(Note: Record Drawing and Construction Certifications are required within thirty (30) days of the completion of Stormwater Management and/or BMP facility construction. Record Drawings and Construction Certifications must be reviewed and approved by the James City County Environmental Division prior to final inspection, acceptance and bond or surety release.)*

**Section 3 – Owner / Designer / Contractor Information:**

Owner/Developer: *(Note: Site Owner or Applicant responsible for development of the project.)*

Name: Williamsburg Wicker and Rattan Shoppe  
Mailing Address: 105 John Paine  
Williamsburg, VA 23185  
Business Phone: (757) 220-2683 Fax: (757) 220-8448  
Contact Person: Oscar Harrell Title: Owner

Design Professional: *(Note: Professional Engineer or Certified Land Surveyor responsible for the design and preparation of plans and specifications for the Stormwater Management / BMP facility.)*

Firm Name: AES Consulting Engineers  
Mailing Address: 5248 Olde Towne Road Suite 1  
Williamsburg, Virginia 23188  
Business Phone: 757-253-0040  
Fax: 757-220-8994  
Responsible Plan Preparer: Robert E. Cosby, III, P.E.  
Title: Project Manager  
Plan Name: Williamsburg Wicker Expansion, Phase I  
Firm's Project No. 9556  
Plan Date: June 3, 2008  
Sheet No.'s Applicable to SWM/BMP Facility: 4 / 5 / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

BMP Contractor: *(Note: Site Work Contractor directly responsible for construction of the Stormwater Management / BMP facility.)*

Name: Michael Hipple Builder  
Mailing Address: P.O. Box 43  
Ligtfoot, VA 23090  
Business Phone: (757) 565-1725  
Fax: (757) 565-1210  
Contact Person: Michael Hipple  
Site Foreman/Supervisor: \_\_\_\_\_  
Specialty Subcontractors & Purpose (for BMP Construction Only):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Section 4 – Professional Certifications:**

Certifying Professionals: *(Note: A Registered Professional Engineer of Certified Land Surveyor is responsible for preparation of a Record Drawing, sometimes referred to as an As-Built plan, for the drainage system for the project including any Stormwater Management/BMP Facilities. A Registered Professional Engineer is responsible for the inspection, monitoring and certification of Stormwater Management / BMP facilities during its construction.)*

**Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities**

**Record Drawing Certification**

Firm Name: AES Consulting Engineers  
Mailing Address: 5248 Olde Towne Road Suite 1  
Williamsburg, Virginia 23188  
Business Phone: 757-253-0040  
Fax: 757-220-8994

Name: Robert E. Cosby, III, P.E.  
Title: Project Manager

Signature:   
Date: 5/6/10

I hereby certify to the best of my knowledge and belief that this record drawing represents the actual condition of the Stormwater Management / BMP facility. The facility appears to conform with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.



\_\_\_\_\_  
(Seal)  
Virginia Registered Professional Engineer  
Or Certified Land Surveyor

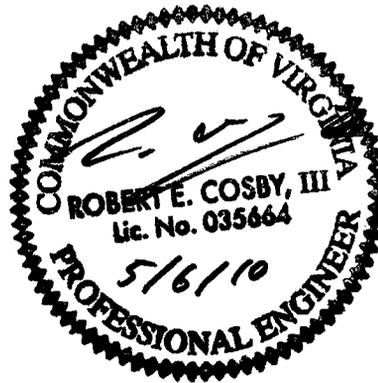
**Construction Certification**

Firm Name: AES Consulting Engineers  
Mailing Address: 5248 Olde Towne Road Suite 1  
Williamsburg, Virginia 23188  
Business Phone: 757-253-0040  
Fax: 757-220-8994

Name: Robert E. Cosby, III, P.E.  
Title: Project Manager

Signature:   
Date: 5/6/10

I hereby certify to the best of my knowledge and belief that this Stormwater Management / BMP facility was monitored and constructed in accordance with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.



\_\_\_\_\_  
(Seal)  
Virginia Registered  
Professional Engineer

## **Section 5 – Record Drawing and Construction Certification Requirements and Instructions:**

- ❑ PreConstruction Meeting – Provides an opportunity to review SWM / BMP facility construction, maintenance and operation plans and address any questions regarding construction and/or monitoring of the structure. The design engineer, certifying professionals (if different), Owner/Applicant, Contractor and County representative(s) are encouraged to attend the preconstruction meeting. Advanced notice to the Environmental Division is requested. Usually, this requirement can be met simultaneously with Erosion and Sediment Control preconstruction meetings held for the project.
- ❑ A fully completed ***STORMWATER MANAGEMENT / BMP FACILITIES, RECORD DRAWING and CONSTRUCTION CERTIFICATION FORM and RECORD DRAWING CHECKLIST***. All applicable sections shall be completed in their entirety and certification statements signed and sealed by the registered professional responsible for individual record drawing and/or construction certification.
- ❑ The Record Drawing shall be prepared by a Registered Professional Engineer or Certified Land Surveyor for the drainage system of the project including any Best Management Practices.
- ❑ Construction Certification. Construction of Stormwater Management / BMP facilities which contain impoundments, embankments and related engineered appurtenances including subgrade preparation, compacted soils, structural fills, liners, geosynthetics, filters, seepage controls, cutoffs, toe drains, hydraulic flow control structures, etc. shall be visually observed and monitored by a Registered Professional Engineer or his/her authorized representative. The Engineer must certify that the structure, embankment and associated appurtenances were built in accordance with the approved design plan, specifications and stormwater management plan and standard accepted construction practice and shall submit a written certification and/or drawings to the Environmental Division as required. Soil and compaction test reports, concrete test reports, inspection reports, logs and other required construction material or installation documentation may be required by the Environmental Division to substantiate the certification, if specifically requested. The Engineer shall have the authority and responsibility to make minor changes to the approved plan, in coordination with the assigned County inspector, in order to compensate for unsafe or unusual conditions encountered during construction such as those related to bedrock, soils, groundwater, topography, etc. as long as changes do not adversely affect the integrity of the structure(s). Major changes to the approved design plan or structure must be reviewed and approved by the original design professional and the James City County Environmental Division.
- ❑ Record Drawing and Construction Certifications are required within **thirty (30) days** of the completion of Stormwater Management / BMP facility construction. Submittals must be reviewed and accepted by James City County Environmental Division prior to final inspection, acceptance and bond/surety release.

**Dual Purpose Facilities** – Completion of construction also includes an interim stage for Stormwater Management / BMP facilities which serve dual purpose as temporary sediment basins during construction and as permanent stormwater management / BMP facilities following construction, once development and stabilization are substantially complete. For these dual purpose facilities, construction certification is required once the temporary sediment basin phase of construction is complete. Final record drawing and construction certification of additional permanent components is required once permanent facility construction is complete.

*Interim Construction Certification* is required for those dual purpose embankment-type facilities that are generally ten (10) feet or greater in dam height (\*) and may not be converted, modified or begin function as a permanent SWM / BMP structure for a period generally ranging from six (6) to eighteen (18) months or more from issuance of a Land Disturbance permit for construction.

Interim or final record drawing and construction certifications are not required for temporary sediment basins which are designed and constructed in accordance with current minimum standards and specifications for temporary sediment basins per the Virginia Erosion and Sediment Control Handbook (VESCH); have a temporary service life of less than eighteen (18) months; and will be removed completely once associated disturbed areas are stabilized, unless a distinct hazard to the public's health, safety and welfare is determined by the Environmental Division due to the size or presence of the structure or due to evidence of improper construction.

(\*Note: Dam Height as referenced above is generally defined as the vertical distance from the natural bed of the stream or waterway at the downstream toe of the embankment to the top of the embankment structure in accordance with 4VAC50-20-30, Virginia Impoundment Structure Regulations and the Virginia Dam Safety Program.)

- ❑ Record Drawings shall provide, at a minimum, all information as shown within these requirements and the attached **RECORD DRAWING CHECKLIST** specific to the type of SWM/BMP facility being constructed. Other additional record data may be formally requested by the James City County Environmental Division. *(Note: Refer to the current edition of the James City County Guidelines for Design and Construction of Stormwater Management BMP's manual for a complete list of acceptable BMP's. Currently there are over 20 acceptable water quality type BMP's accepted by the County.)*
- ❑ Record Drawings shall consist of blue/black line prints and a reproducible (mylar, sepia, diazo, etc.) set of the approved stormwater management plan including applicable plan views, profiles, sections, details, maintenance plans, etc. as related to the subject SWM / BMP facility. The set shall indicate "**RECORD DRAWING**" in large text in the lower right hand corner of each sheet with record elevations, dimensions and data drawn in a clearly annotated format and/or boxed beside design values. Approved design plan values, dimensions and data shall not be removed or erased. Drawing sheet revision blocks shall be modified as required to indicate record drawing status. Elevations to the nearest 0.1' are sufficiently accurate except where higher accuracy is needed to show positive drainage. Certification statements as shown in Section 4 of the Record Drawing and Construction Certification Form, *or similar forms thereof*, and professional signatures and seals, with dates matching that of the record drawing status in the revision or title block, are also required on all associated record drawing plans, prints or reproducible.
- ❑ Submission Requirements. Initial and subsequent submissions for review shall consist of a minimum of one (1) blue/black line set for record drawings and one copy of the construction certification documents with appropriate transmittal. Under certain circumstances, it is understood that the record drawing and construction certification submissions may be performed by different professional firms. Therefore, record drawing submission may be in advance of construction certification or vice versa. Upon approval and prior to release of bond/surety, final submission shall include one (1) reproducible set of the record drawings, one (1) blue/black line set of the record drawings and one (1) copy of the construction certification. Also for current and/or future incorporation into the County BMP database and GIS system, it is requested that the record drawings also be submitted to the Environmental Division on a diskette or CD-ROM in an acceptable electronic file format such as \*.dxf, \*.dwg, etc. or in a standard scanned and readable format. The electronic file requirement can be discussed and coordinated with Environmental Division staff at the time of final submission.

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

(Key for Checklist is as follows: XX Acceptable    N/A Not Applicable    Inc Incomplete)

**I. Methods and Presentation:** (Required for all Stormwater Management / BMP facilities.)

- XX 1. All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.
- XX 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.
- XX 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).
- XX 4. All plans sheet revision blocks modified to indicate date and record drawing status.
- XX 5. All plan sheets have certification statements and certifying professional's signature and seal.

**II. Minimum Standards:** (Required for all Stormwater Management / BMP facilities, as applicable.)

- XX 1. All requirements of Section I (Methods and Presentation) apply to this section.
- XX 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- N/A 3. Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.
- N/A 4. Top widths, berm widths and embankment side slopes.
- XX 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.
- N/A 6. Cross-section of the embankment through the principal spillway or outlet barrel. Must extend at least 100 ft. downstream of the pipe outlet or to recorded site property line, whichever is closer. Proper correlation is required between principal spillway (control structure) crest, emergency spillway crest, orifice and weirs and the top of the dam or facility. All elevations and dimensions must reasonably match the design plan or be sequentially relative to each other and the facility must reflect the required design storage volume(s) and/or design depth.
- N/A 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.
- N/A 8. Elevation of the principal spillway crest or outlet crest of the structure.

- N/A 9. Primary control structure (riser) diameter or dimensions, height, type of material and base size. Indicate provisions for access that are present such as steps, ladders, etc.
- N/A 10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
- N/A 11. Type and size of anti-vortex and trash rack device. Height, diameter, dimensions, bar spacings (if applicable) and elevations relative to the principal spillway crest. Indicate if lockable hatch is present or not.
- N/A 12. Type, location, size and number of anti-seep collars or documentation of other methods utilized for seepage control. **May need to obtain this information during construction.**
- N/A 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
- N/A 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- N/A 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
- N/A 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
- XX 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
- XX 18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- N/A 19. Fencing location and type, if applicable to facility.
- N/A 20. BMP vicinity properly cleaned of stockpiles and construction debris.
- N/A 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- XX 22. Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

( Key for Checklist is as follows: XX Acceptable    N/A Not Applicable    Inc Incomplete)

### III.    **Group A – Wet Ponds** (Includes A-1 Small Wet Ponds; A-2 Wet Ponds; A-3 Wet Ext Det Ponds.)

- \_\_\_\_\_ A1.    All requirements of Section II, Minimum Standards, apply to Group A facilities.
- \_\_\_\_\_ A2.    Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- \_\_\_\_\_ A3.    Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.
- \_\_\_\_\_ A4.    Access for maintenance and equipment is provided to the forebay(s). Access corridors are at least 12 ft. wide, have a maximum slope of 15 percent and are adequately stabilized to withstand heavy equipment or vehicle use.
- \_\_\_\_\_ A5.    Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.
- \_\_\_\_\_ A6.    Pond liner (if required) provided. Either clay liners, polyliners, bentonite liners or use of chemical soil additives based on requirements of the approved plan.
- \_\_\_\_\_ A7.    Minimum 6 percent slope safety bench extending a minimum of 15 feet outward from normal pool edge and/or an aquatic bench extending a minimum of 10 feet inward from the normal shoreline with a maximum depth of 12 inches below the normal pool elevation, if applicable, per the approved design plans. (Note: Safety benches may be waived if pond side slopes are no steeper than 4H:1V).
- \_\_\_\_\_ A8.    No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.
- \_\_\_\_\_ A9.    Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
- \_\_\_\_\_ A10.    Low flow orifice has a non-clogging mechanism.
- \_\_\_\_\_ A11.    A pond drain pipe with valve was provided.
- \_\_\_\_\_ A12.    Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.
- \_\_\_\_\_ A13.    End walls above barrels (outlet pipe) greater than 48 inch in diameter are fenced to prevent a fall hazard.

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

*(Key for Checklist is as follows: **XX** Acceptable    **N/A** Not Applicable    **Inc** Incomplete)*

**IV.    Group B – Wetlands:** *(Includes B-1 Shallow Marsh; B-2 Ext Det Shallow Wetlands; B-3 Pond Wetland System and B-4 Pocket Wetland).*

- B1.    Same requirements as Group A Wet Ponds.
- B2.    Minimum 2:1 length to width flow path provided across the facility.
- B3.    Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
- B4.    Wetland type landscaping provided in accordance with approved plan. Includes correct pondscaping zones, plant species, planting arrangements, wetland beds, etc. Wetland plants include 5 to 7 emergent wetland species. Individual plants at 18 inches on center in clumps.
- B5.    Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
- B6.    No more than one-half (½) of the wetland surface area is planted.
- B7.    Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
- B8.    Planting zones staked or flagged in field and locations subsequently established by appropriate field surveying methods for record drawing presentation.

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

(Key for Checklist is as follows: **XX** Acceptable    **N/A** Not Applicable    **Inc** Incomplete)

- V.    **Group C – Infiltration Practices** (Includes C-1 Infiltration Trench; C-2 Infiltration Trench; C-3 Infiltration Basin; and C-4 Infiltration Basin)
- \_\_\_\_\_ C1.    All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.
- \_\_\_\_\_ C2.    Facility is not located on fill slopes or on natural ground in excess of six (6) percent.
- \_\_\_\_\_ C3.    Pretreatment devices provided prior to entry into the infiltration facility. Acceptable pretreatment devices include sediment forebays, sediment basins, sediment traps, sump pits or inlets, grass channels, plunge pools or other acceptable measures.
- \_\_\_\_\_ C4.    Three (3) or more of the following pretreatment devices provided to protect long term integrity of structure: grass channel; grass filter strip; bottom sand layer; upper filter fabric layer; use of washed bank run gravel aggregate.
- \_\_\_\_\_ C5.    Sides of infiltration practice lined with filter fabric.
- \_\_\_\_\_ C6.    Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- \_\_\_\_\_ C7.    Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- \_\_\_\_\_ C8.    Minimum one hundred (100) foot separation horizontally from any known water supply well and minimum one hundred (100) foot separation upslope from any building.
- \_\_\_\_\_ C9.    Minimum twenty-five (25) foot separation down gradient from any structure.
- \_\_\_\_\_ C10.    Stormwater outfalls provided for overflow associated with larger design storms.
- \_\_\_\_\_ C11.    No visual signs of erosion or channel degradation immediately downstream of facility.
- \_\_\_\_\_ C12.    Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.
- \_\_\_\_\_ C13.    Observation well provided.
- \_\_\_\_\_ C14.    Adequate, direct access provided to the facility for future maintenance, operation and inspection.

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

( Key for Checklist is as follows: **XX** Acceptable    **N/A** Not Applicable    **Inc** Incomplete)

- VI.    Group D – Filtering Systems**    *Includes D-1 Bioretention Cells; D-2 Surface Sand Filters; D-3 Underground Sand Filters; D-4 Perimeter Sand Filters; D-5 Organic Filters; and D-6 Pocket Sand Filters)*
- XX    D1.    All requirements of Section II, Minimum Standards, apply to Group D facilities.
- XX    D2.    Sediment pretreatment devices provided.
- XX    D3.    For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.
- XX    D4.    For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.
- XX    D5.    Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- XX    D6.    No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed.
- N/A    D7.    Filtering system is off-line from storm drainage conveyance system.
- N/A    D8.    Overflow outlet has adequate erosion protection.
- N/A    D9.    Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
- N/A    D10.    Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
- XX    D11.    Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.
- XX    D12.    Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- XX    D13.    No visual signs of erosion or channel degradation immediately downstream of facility.
- XX    D14.    Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

( Key for Checklist is as follows: **XX** Acceptable    **N/A** Not Applicable    **Inc** Incomplete)

**VII.    Group E – Open Channel Systems**    *(Includes E-1 Wet Swales (Check Dams); E-2 Dry Swales; and E-3 Biofilters)*

- \_\_\_\_\_ E1.    All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.
- \_\_\_\_\_ E2.    Open channel system has constructed longitudinal slope of less than four (4) percent.
- \_\_\_\_\_ E3.    No visual signs of erosion in the open channel system's soil and/or vegetative cover.
- \_\_\_\_\_ E4.    Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
- \_\_\_\_\_ E5.    No visual signs of ponding are present at any location in the open channel system, except at rock check dam locations for E-1 systems (Wet Swales).
- \_\_\_\_\_ E6.    For E-2 BMPs (Dry Swales), an underdrain system was provided.
- \_\_\_\_\_ E7.    Treated timber or rock check dams provided as pretreatment devices for the open channel system.
- \_\_\_\_\_ E8.    Gravel diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.
- \_\_\_\_\_ E9.    Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.
- \_\_\_\_\_ E10.    Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
- \_\_\_\_\_ E11.    Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- \_\_\_\_\_ E12.    No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.
- \_\_\_\_\_ E13.    For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
- \_\_\_\_\_ E14.    For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
- \_\_\_\_\_ E15.    For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
- \_\_\_\_\_ E16.    For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

(Key for Checklist is as follows: **XX** Acceptable    **N/A** Not Applicable    **Inc** Incomplete)

**VIII.    Group F – Extended Dry Detention** (Includes F-1 Timber Walls; and F-2 Dry Extended Detention with Forebay)

- \_\_\_\_\_ F1.    All requirements of Section II, Minimum Standards, apply to Group F facilities.
- \_\_\_\_\_ F2.    Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.
- \_\_\_\_\_ F3.    Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)
- \_\_\_\_\_ F4.    Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
- \_\_\_\_\_ F5.    A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging
- \_\_\_\_\_ F6.    Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- \_\_\_\_\_ F7.    Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.
- \_\_\_\_\_ F8.    Low flow orifice, if used, has a minimum diameter of three (3) inches or two (2) inches if internal orifice control was utilized and a small, cage type external trash rack.
- \_\_\_\_\_ F9.    Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.
- \_\_\_\_\_ F10.    Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.
- \_\_\_\_\_ F11.    Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.
- \_\_\_\_\_ F12.    Stilling basin or standard outlet protection provided at principal spillway outlet.
- \_\_\_\_\_ F13.    Adequate, direct access provided to the facility. Access corridor to facility is at least ten (10) feet wide, slope is less than twenty (20) percent and appropriate stabilization provided for equipment and vehicle use. Access extends to forebay, standpipe and timber wall, as applicable.
- \_\_\_\_\_ F14.    No visual signs of undercutting of timber walls or clogging of the low orifice were present.
- \_\_\_\_\_ F15.    No visual signs of erosion or channel degradation immediately downstream of facility.
- \_\_\_\_\_ F16.    No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

*( Key for Checklist is as follows: **XX** Acceptable    **N/A** Not Applicable    **Inc** Incomplete)*

**IX.    Group G – Open Spaces    *(Includes All Open Space Types G-1; G-2; and G-3)***

- G1.    All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.
- G2.    Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance.
- G3.    Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.
- G4.    Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).
- G5.    Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.
- G6.    Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

(Key for Checklist is as follows: XX Acceptable    N/A Not Applicable    Inc Incomplete)

### X. Storm Drainage Systems (Associated with BMP's Only)

*(Includes all incidental stormwater drainage conveyance systems associated with SWM/BMP facilities such as onsite or offsite storm drains, open channels, inlets, manholes, junctions, outlet protections, deflectors, etc. These facilities are external to the treatment function of, but are directly associated with drainage to and/or from a constructed SWM/BMP facility. The intent of this portion of the certification is to accurately identify the type and quantity of inflow or outflow points associated with the facility for future reference. The Professional may use his/her own discretion to determine inclusive facilities to meet the intent of this section. As a general rule, storm drainage systems would include incidental facilities to the nearest access structure upslope or downslope from the normal physical limits of the facility or 800 feet of storm drainage conveyance system length, whichever is less.)*

- N/A SD1. All requirements of Section II, Minimum Standards, apply to Storm Drainage Systems.
- N/A SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.
- N/A SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).
- N/A SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.
- N/A SD5. Class, length, width and depth of riprap and outlet protections or dimensions of special energy dissipation structures.

### XII. Other Systems

*(Includes any non-typical, specialty, manufactured or innovative stormwater management/BMP practices or systems generally accepted for use as or in conjunction with other acceptable stormwater management / BMP practices. Requires evidence of prior satisfactory industry use and prior Environmental Division approval, waiver or exception.)*

- \_\_\_\_\_ O1. All requirements of Section II, Minimum Standards, apply to this section.
- \_\_\_\_\_ O2. Certification criteria to be determined on a case-by-case basis by the Environmental Division specific to the proposed SWM/BMP facility.

## STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

**XIII. References** *(The James City County Record Drawing and Construction Certification Forms and Checklists for Stormwater Management / BMP facilities were developed using the following sources and references.)*

- Baltimore County, Maryland Soil Conservation District, As-Built Stormwater Management Pond Checklist.
- James City County, Virginia, Guidelines for Design and Construction of Stormwater Management BMP's (October 1999.)
- James City County, Virginia, Stormwater Detention/Retention Basin Design Checklist and Erosion and Sediment Control and Stormwater Management Design Plan Checklists.
- James City County Stormwater Policy Framework, Final Report of the James City County BMP Policy Project, October 1998, The Center for Watershed Protection.
- Prince Georges County, Maryland, As-Built Requirements Retention or Detention Pond/Basin.
- Prince William County, Virginia, Stormwater Management Fact Sheet.
- Stafford County, Virginia As-Built Plan Checklist.
- Stormwater Management Design Manual, NRCS Maryland Code No. 378, Pond Standards and Specifications.
- USEPA/Watershed Management Institute, Stormwater Management Inspection Forms.
- Virginia Impounding Structure Regulations (Dam Safety), Department of Conservation & Recreation, 1997.
- Virginia Erosion and Sediment Control Handbook, Third Edition 1992, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.
- Virginia Stormwater Management Handbook, 1999 edition, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.

WRITTEN ENVIRONMENTAL DIVISION APPROVAL IS REQUIRED TO PLANT SUBSTITUTION WITHIN THE BIO-RETENTION AREA AND PERIMETER.

DOWNSPOUTS ARE TO TIE INTO A MINIMUM OF 4-55 GALLON RAIN BARRELS TO BE PROVIDED AT THE CORNERS OF THE BUILDING AS DEPICTED ON THE PLANS.

NOW OR FORMERLY  
NANCY S. BRADSHAW  
101 PENINSULA STREET  
TAX MAP PARCEL # (23-2)(1-20)  
ZONED: A1

"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

Thomas C. Sublett 4/30/10  
THOMAS C. SUBLETT DATE



**EROSION AND SEDIMENTATION CONTROL LEGEND**

SAF	[Symbol]	SAFETY FENCE (SPEC. 3.01)
CE	[Symbol]	CONSTRUCTION ENTRANCE (SPEC. 3.02)
SF	[Symbol]	SILT FENCE (SPEC. 3.05)
CIP	[Symbol]	CULVERT INLET PROTECTION (SPEC. 3.08-1 WITH STONE COMBIN. INSTEAD OF SILT FENCE)
PS	[Symbol]	PERMANENT SEEDING (SPEC. 3.32)
DC	[Symbol]	DUST CONTROL (SPEC. 3.39)

NOTE: SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

**REQUIRED SPECIAL STORMWATER CRITERIA (SSC) FEATURES**  
(TYPE 1 CLASS 2 - REQUIRES 2 UNIT MEASURES 2 UNIT MEASURES PROVIDED)  
A. MAINTAIN SHEET FLOW (SSCP #7) - APPLIED SITE-WIDE, FOR 1 UNIT MEASURE  
B. RAIN BARRELS/CISTERNS (SSCP #29) - APPLIED SITE-WIDE, FOR 1 UNIT MEASURE

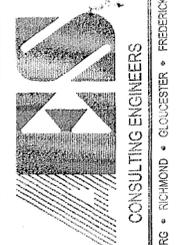
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"INTERNATIONAL ORANGE" SILT FENCE MAY BE USED IN LIEU OF SAFETY FENCE AND SILT FENCE.

NO.	DATE	REVISION / COMMENT / NOTE

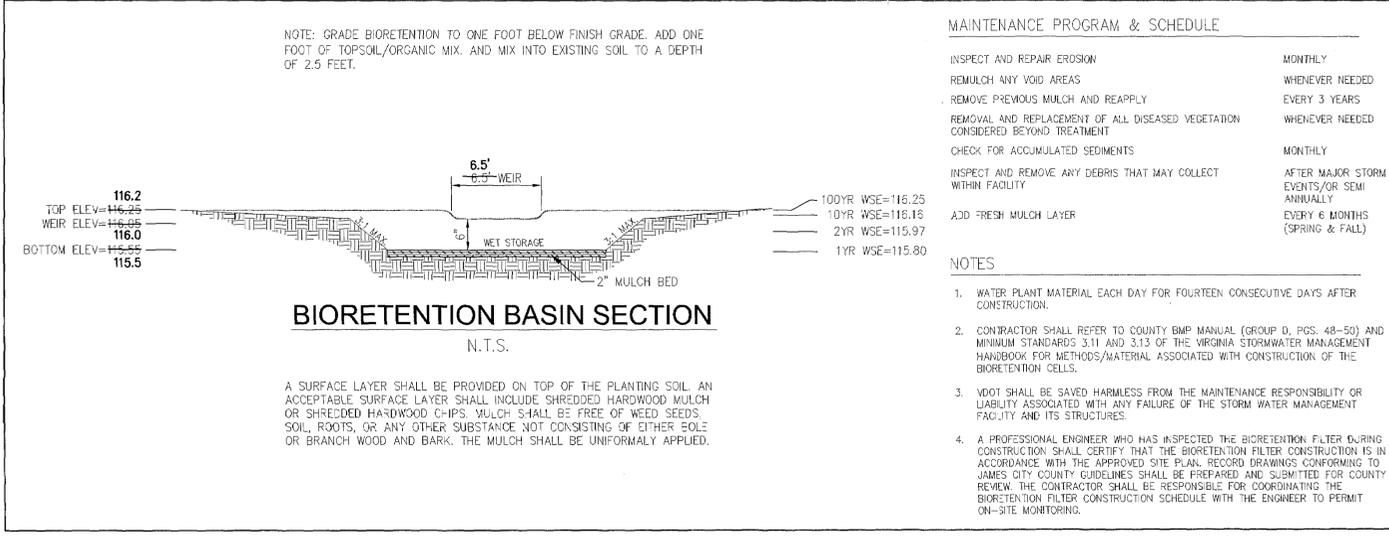
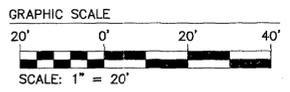
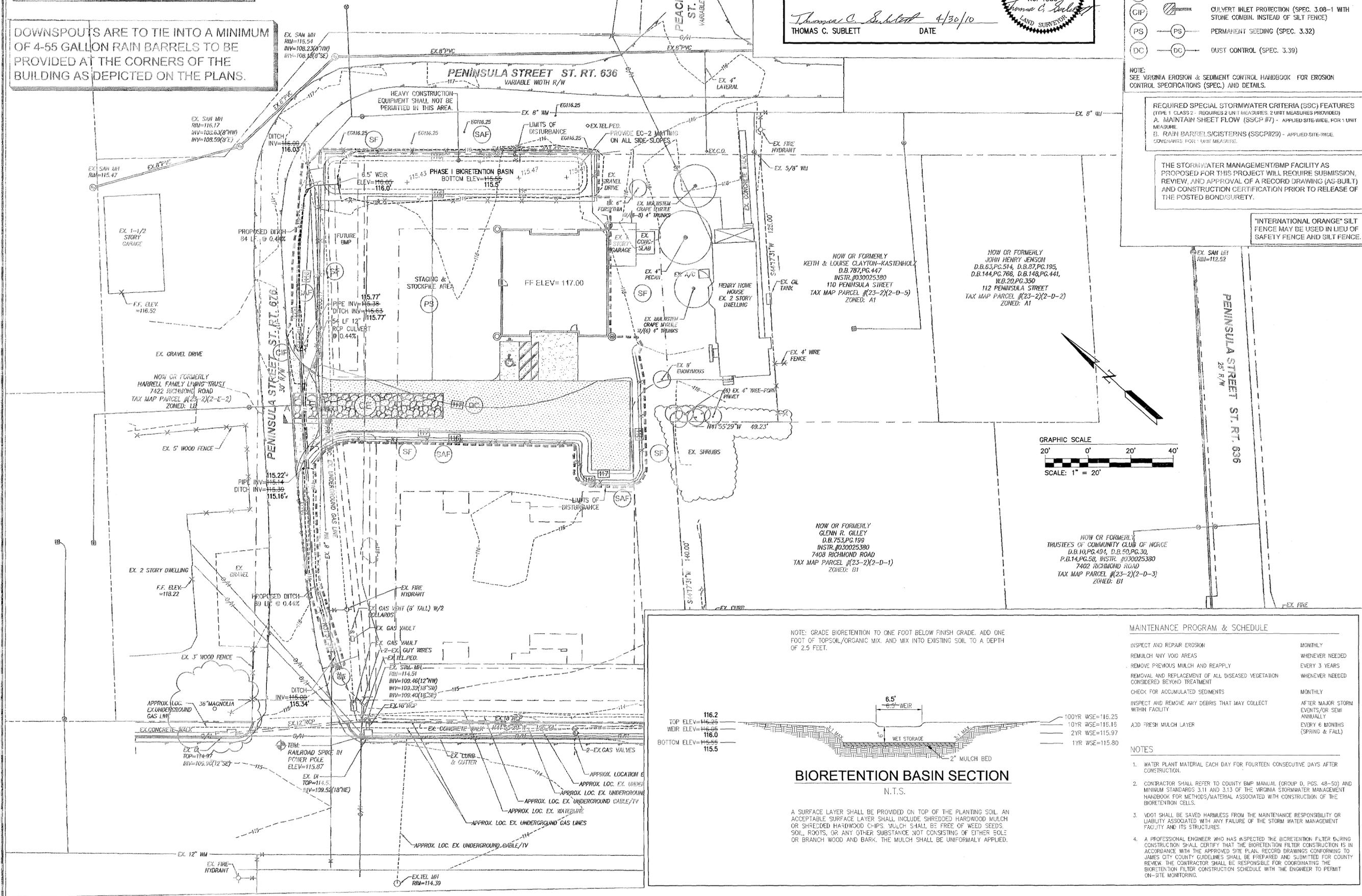
Environmental Division  
MAY 06 2010  
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5248 Old Towne Road, Suite 1  
Williamsburg, Virginia 23188  
(757) 253-0040  
Fax (757) 250-8984



BIORETENTION POND RECORD DRAWING  
WILLIAMSBURG WICKER EXPANSION PHASE I

Assigned VAB Drawn BBS  
Scale 1"=20' Date 4/30/10  
Project No. 9556  
Drawing No. 01



**MAINTENANCE PROGRAM & SCHEDULE**

INSPECT AND REPAIR EROSION	MONTHLY
REMUOV ANY VOID AREAS	WHENEVER NEEDED
REMOVE PREVIOUS MULCH AND REAPPLY	EVERY 3 YEARS
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	WHENEVER NEEDED
CHECK FOR ACCUMULATED SEDIMENTS	MONTHLY
INSPECT AND REMOVE ANY DEBRIS THAT MAY COLLECT WITHIN FACILITY	AFTER MAJOR STORM EVENTS/OR SEMI ANNUALLY
ADD FRESH MULCH LAYER	EVERY 6 MONTHS (SPRING & FALL)

- NOTES**
- WATER PLANT MATERIAL EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER CONSTRUCTION.
  - CONTRACTOR SHALL REFER TO COUNTY BMP MANUAL (GROUP D, PGS. 48-50) AND MINIMUM STANDARDS 3.11 AND 3.13 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK FOR METHODS/MATERIAL ASSOCIATED WITH CONSTRUCTION OF THE BIORETENTION CELLS.
  - VDOT SHALL BE SAVED HARMLESS FROM THE MAINTENANCE RESPONSIBILITY OR LIABILITY ASSOCIATED WITH ANY FAILURE OF THE STORM WATER MANAGEMENT FACILITY AND ITS STRUCTURES.
  - A PROFESSIONAL ENGINEER WHO HAS INSPECTED THE BIORETENTION FILTER DURING CONSTRUCTION SHALL CERTIFY THAT THE BIORETENTION FILTER CONSTRUCTION IS IN ACCORDANCE WITH THE APPROVED SITE PLAN, RECORD DRAWINGS CONFORMING TO JAMES CITY COUNTY GUIDELINES SHALL BE PREPARED AND SUBMITTED FOR COUNTY REVIEW. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE BIORETENTION FILTER CONSTRUCTION SCHEDULE WITH THE ENGINEER TO PERMIT ON-SITE MONITORING.

Use the outer circles for creating the view named "PlotHalf" to be used with the JDL 5000 plotter for Half scale plots. Use the inner circles for creating the view named "PlotHalf" to be used with the JDL 5000 plotter.

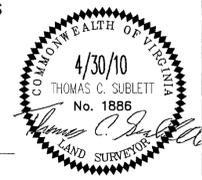
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**EROSION AND SEDIMENTATION CONTROL LEGEND**

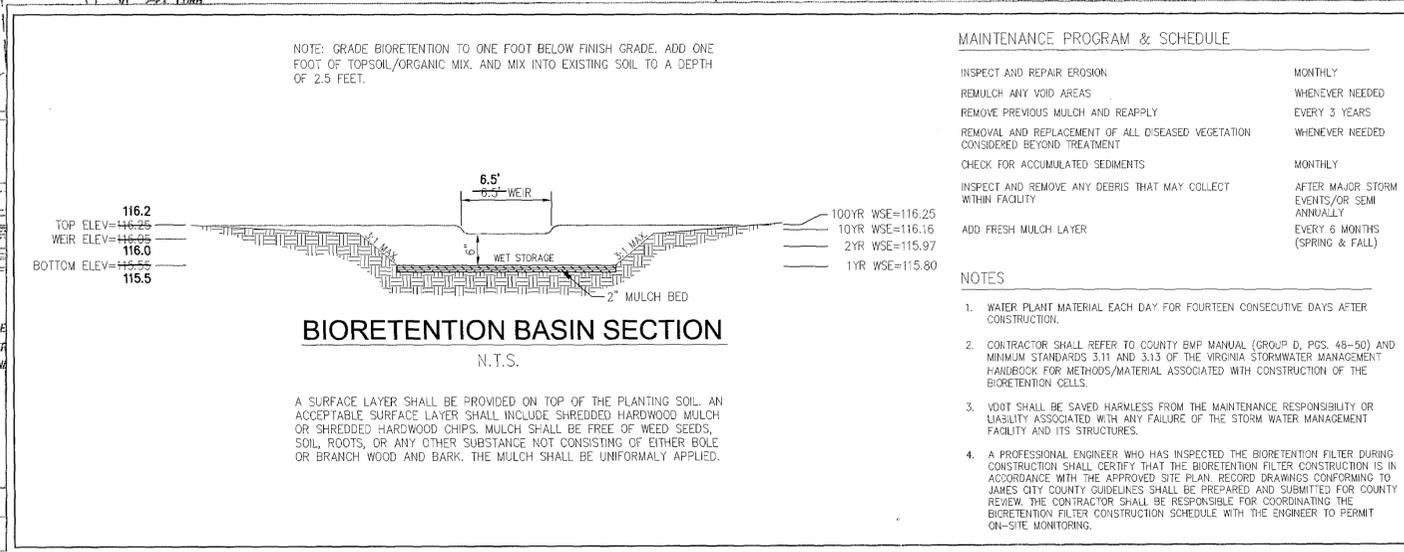
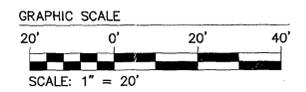
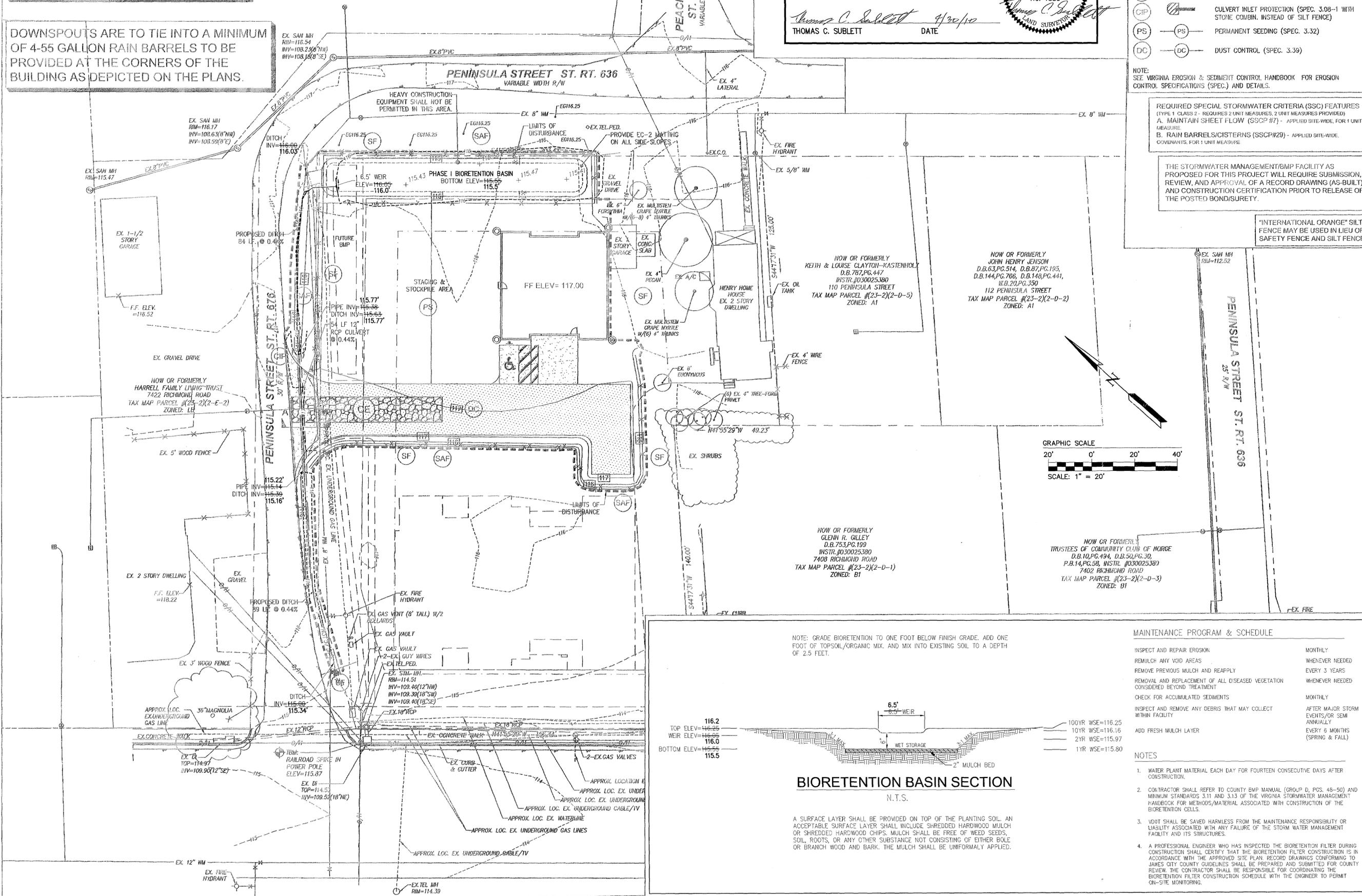
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REMOVE PREVIOUS MULCH AND REAPPLY	EVERY 3 YEARS
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	WHENEVER NEEDED
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NO.	DATE	REVISION / COMMENT / NOTE

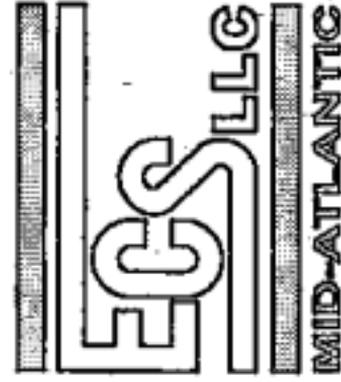
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**BIORETENTION POND RECORD DRAWING**  
**WILLIAMSBURG WICKER EXPANSION PHASE I**

DESIGNED: VAB  
DRAWN: BBS  
SCALE: 1"=20'  
DATE: 4/30/10  
PROJECT NO.: 9556  
DRAWING NO.: 01



**DAVID J. GORDINIER, P.E.**

**Geotechnical Department Manager**

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## **ECS Mid-Atlantic, LLC**

**Geotechnical • Construction Materials • Environmental**

**108 Ingram Road, Suite 1 • Williamsburg, Virginia 23188  
(757) 229-6677 • FAX (757) 229-9978 • CELL (757) 870-2014**

**E-mail: [dgordinier@ecslimited.com](mailto:dgordinier@ecslimited.com)**

See additional office locations on reverse side

SP-0074-2008



COUNTY OF JAMES CITY FINAL SITE PLAN	
APPROVALS	DATE
Fire Dept. <i>[Signature]</i>	08/11/08
Health Dept. <i>[Signature]</i>	11/13/08
VDOT <i>[Signature]</i>	11/17/08
Planning <i>[Signature]</i>	11/24/08
Environ. <i>[Signature]</i>	12/08/08
Zoning Adm. <i>[Signature]</i>	12/08/08
JCSA <i>[Signature]</i>	12/08/08
County Eng. <i>[Signature]</i>	11/12/08
REA <i>[Signature]</i>	11/12/08
Other <i>[Signature]</i>	11/12/08

# SITE PLAN FOR WILLIAMSBURG WICKER EXPANSION PHASE I

STONEHOUSE DISTRICT  
JAMES CITY COUNTY, VIRGINIA

**INDEX OF SHEETS**

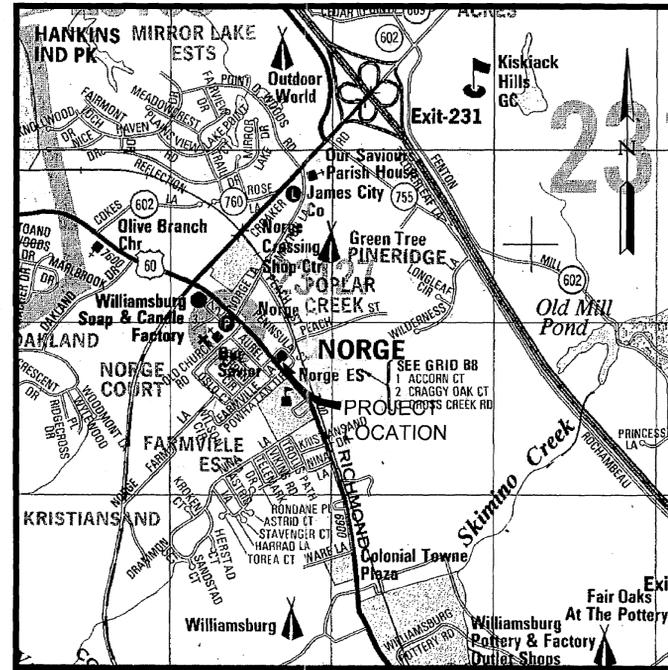
SHEET NUMBER	DESCRIPTION
01	COVER
02	ENVIRONMENTAL INVENTORY PLAN
03	SITE AND UTILITY PLAN
04	GRADING AND DRAINAGE & EROSION CONTROL PLAN
05	NOTES AND DETAILS
06	NOTES AND DETAILS
L-1	LANDSCAPE PLAN
LL-1	LIGHTING PLAN

**LEGEND**

EXISTING	PROPOSED
WATER	WATER
SANITARY SEWER	SANITARY SEWER
STORM SEWER	STORM SEWER
FORCE MAIN	FORCE MAIN
SANITARY MANHOLE	SANITARY MANHOLE
STORM MANHOLE	STORM MANHOLE
CURB DROP INLET	CURB DROP INLET
YARD DROP INLET	YARD DROP INLET
FLARED END SECTION VALVE	FLARED END SECTION VALVE
FIRE HYDRANT ASSEMBLY	FIRE HYDRANT ASSEMBLY
BLOW-OFF VALVE	BLOW-OFF VALVE
AIR RELEASE ASSEMBLY	AIR RELEASE ASSEMBLY
CLEAN OUT	CLEAN OUT
WATER METER	WATER METER
STREETLIGHT	STREETLIGHT
CENTERLINE/BASELINE	CENTERLINE/BASELINE
RIGHT OF WAY	RIGHT OF WAY
PROPERTY LINE	PROPERTY LINE
DITCH/SWALE	DITCH/SWALE
CONCRETE LINED DITCH	CONCRETE LINED DITCH
EXISTING TREELINE	EXISTING TREELINE
LIMITS OF CLEARING	LIMITS OF CLEARING
RIP RAP	RIP RAP
CURB	CURB
CURB AND GUTTER	CURB AND GUTTER
REVERSE GUTTER PAN	REVERSE GUTTER PAN
EDGE OF PAVEMENT	EDGE OF PAVEMENT
EXISTING GROUND ELEVATION	EXISTING GROUND ELEVATION
PROPOSED SPOT GRADE	PROPOSED SPOT GRADE
CONTOUR	CONTOUR

PROHIBITED USES, THE FOLLOWING USES, OTHERWISE PERMITTED BY RIGHT IN THE B-1 DISTRICT, SHALL NOT BE PERMITTED ON THE PROPERTY:

- ADULT DAYCARE CENTERS;
- AUTOMOBILE SERVICE STATIONS;
- FIRE STATIONS;
- HEALTH CLUBS, EXERCISE CLUBS, FITNESS CENTERS;
- HOTELS, MOTELS, TOURIST HOMES AND CONVENTION CENTERS;
- INDOOR SPORTS FACILITIES;
- INDOOR THEATERS;
- MARINAS, DOCKS, PIERS, YACHT CLUBS, BOAT BASINS, AND SERVICING, REPAIR AND SALE FACILITIES FOR THE SAME;
- MARINE OR WATERFRONT BUSINESSES;
- PUBLIC BILLIARD PARLORS, ARCADES, POOL ROOMS, BOWLING ALLEYS, DANCE HALLS, AND OTHER INDOOR CENTERS OF AMUSEMENT;
- RADIO AND TELEVISION STATIONS AND ACCESSORY, ANTENNA OR TOWERS OR TOWER MOUNTED WIRELESS COMMUNICATION FACILITIES, WHICH ARE 60 FEET OR LESS IN HEIGHT; AND
- FAST FOOD RESTAURANTS.



VICINITY MAP (APPROX. SCALE 1"=2000')

ORIGINAL SUBMITTAL DATE: JUNE 3, 2008  
JCC-SP-0074-2008  
AES PROJECT NO.: 9556  
SHEET 1 OF 8  
SP-0074-2008



CONSULTING ENGINEERS

WILLIAMSBURG • RICHMOND • GLOUCESTER • FREDERICKSBURG

5248 Olde Towne Road, Suite 1 • Williamsburg, Virginia 23188  
Phone (757) 253-0040 • Fax (757) 220-8994

**GENERAL NOTES**

- TAX MAP PARCEL NO. (23-2)(2-D-1A)
- SITE ADDRESS: 7414 RICHMOND ROAD, JAMES CITY COUNTY, VIRGINIA 23188
- SITE IS CURRENTLY ZONED B-1, GENERAL BUSINESS DISTRICT WITH PROFFERS REFERENCING JCC CASE Z-0008-2005 AND CONCEPTUAL PLAN C-0018-2008.
- THIS PROPERTY IS IN FLOOD ZONE "X" AS SHOWN ON MAP NUMBER 51095C, PANEL 0110C, FOR COMMUNITY NUMBER 510201, DATED SEPTEMBER 28, 2007 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA.
- ALL PROPOSED UTILITIES ARE TO BE PLACED UNDERGROUND. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS UTILITY (1-800-552-7001) FOR EXISTING UTILITY LOCATIONS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THE PLANS AND SHALL REPAIR AT THE CONTRACTOR'S OWN EXPENSE ALL UTILITIES DAMAGED BY CONSTRUCTION.
- EXISTING UTILITY LOCATIONS INDICATED ARE APPROXIMATE. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION, INCLUDING VERIFYING CLEARANCES BETWEEN EXISTING AND PROPOSED UTILITIES PRIOR TO CONSTRUCTION.
- ANY ERRORS OR DISCREPANCIES WITH THE PLANS OR EXISTING FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER OR SURVEYOR BEFORE PROCEEDING WITH THE WORK.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, DOMINION VIRGINIA POWER, VERIZON TELEPHONE, APPROPRIATE TELEVISION CABLE COMPANY.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK TO INCLUDE, BUT NOT LIMITED TO LAND DISTURBANCE, CERTIFICATE TO CONSTRUCT UTILITIES & VDOT CE-7 PERMIT.
- A VDOT CE-7 PERMIT IS REQUIRED FOR ALL WORK WITHIN THE VDOT RIGHT-OF-WAY. CONTRACTOR SHALL NOTIFY VDOT IN WRITING 48 HOURS PRIOR TO COMMENCEMENT OF ANY WORK WITHIN VDOT RIGHT-OF-WAY.
- ANY UTILITIES TO BE RELOCATED SHALL BE RELOCATED AT THE OWNER/DEVELOPER'S EXPENSE, INCLUDING UTILITIES WITHIN THE RIGHT-OF-WAY OF THE COUNTY.
- A PRE-CONSTRUCTION MEETING IS REQUIRED PRIOR TO THE ISSUANCE OF A LAND DISTURBING ACTIVITY PERMIT (LDA) AND COMMENCING ANY SITE WORK REQUIRED BY THIS PROJECT. THE PROPERTY OWNER/DEVELOPER, OR THEIR REPRESENTATIVE, MUST ATTEND THE SITE WORK CONTRACTOR ARE REQUIRED TO ATTEND. NOTE: THIS PRE-CONSTRUCTION MEETING WILL NOT BE SCHEDULED UNTIL THE LDA APPLICATION HAS BEEN APPROVED.
- VERIFY ALL DIMENSIONS AND NOTIFY JAMES CITY SERVICE AUTHORITY PRIOR TO ANY EXCAVATION OR DEMOLITION WITHIN UTILITY CORRIDORS.
- ANY EXISTING, UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
- ALL NEW SIGNS SHALL BE IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE JAMES CITY COUNTY ZONING ORDINANCE.
- CONTOUR INTERVAL IS 1 FOOT.
- STORM STRUCTURES, SEWER AND BEDDING SHALL CONFORM TO THE VDOT ROAD AND BRIDGE STANDARDS AND VDOT SPECIFICATIONS. ALL PIPE BEDDING SHALL BE IN ACCORDANCE WITH PB-1 AND MANUFACTURER SPECS. AND GUIDELINES, AND MANHOLES DEEPER THAN 4 FEET SHALL HAVE STEPS (S1-1). ALL REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS III UNLESS OTHERWISE NOTED. STORM SEWER OUTSIDE OF VDOT R.O.W. CAN BE HIGH DENSITY POLYETHYLENE (HDPE). ALL STORM SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MANUFACTURER AND VDOT REQUIREMENTS, STANDARDS, AND SPECIFICATIONS. IN ANY INSTANCE WHERE THESE ITEMS CONFLICT, THE MOST STRINGENT SHALL APPLY.
- THE PROFESSIONAL WHOSE SEAL IS AFFIXED HEREON SHALL ACT AS THE "RESPONSIBLE LAND DISTURBER" FOR PURPOSES OF PLAN APPROVAL ONLY. PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT, THE OWNER OR DEVELOPER SHALL PROVIDE THE NAME OF A "RESPONSIBLE LAND DISTURBER" WHO SHALL ASSUME RESPONSIBILITY AS THE "RESPONSIBLE LAND DISTURBER" FOR THE CONSTRUCTION PHASE OF THE PROJECT. THE OWNER OR DEVELOPER SHALL PROVIDE WRITTEN NOTIFICATION SHOULD THE "RESPONSIBLE LAND DISTURBER" CHANGE DURING CONSTRUCTION.
- THIS PROJECT IS LOCATED IN JAMES CITY COUNTY SUB WATERSHED 104 OF THE YARMOUTH CREEK WATERSHED.
- EVERYTHING BEYOND THE RIGHT-OF-WAY LINE WILL BE CONSIDERED PRIVATE AND NOT MAINTAINED BY VDOT.
- ALL ITEMS TO BE DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
- ALL OBJECTIVE MATERIAL SHALL BE REMOVED FROM SITE AND PROPERLY DISPOSED IN A FACILITY MEETING LOCAL, STATE, AND FEDERAL REGULATIONS.
- BENCHMARK: RAILROAD SPIKE SET IN POWER POLE, EASTING(X) 11985475.51, NORTHING(Y) 3662176.20, ELEVATION=115.87  
HORIZONTAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK  
VA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE  
NAD 83 (A94 VA HARN)  
VERTICAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK  
NGVD 29
- OWNER/DEVELOPER: WILLIAMSBURG WICKER AND RATTAN SHOPPE  
105 JOHN PAINE  
WILLIAMSBURG, VA 23185  
CONTACT: OSCAR HARRELL  
PHONE NO.: 757-220-2883  
FAX NO.: 757-220-8448
- A LAND DISTURBING PERMIT AND SILTATION AGREEMENT, WITH SURETY ARE REQUIRED FOR THIS PROJECT.
- A VIRGINIA STORM WATER MANAGEMENT PROGRAM (VSWMP) PERMIT IS REQUIRED PRIOR TO CONSTRUCTION ACTIVITIES.
- PRIVATELY OWNED UTILITIES ARE REGULATED BY THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE AND ENFORCED BY THE CODE COMPLIANCE DIVISION. PRIVATELY OWNED UTILITIES MUST COMPLY FULLY WITH THE INTERNATIONAL PLUMBING CODE, THE NATIONAL FIRE PREVENTION ASSOCIATION STANDARD 24, AND THE INTERNATIONAL FIRE CODE. THE CONTRACTOR IS CAUTIONED NOT TO INSTALL OR CONCEAL PRIVATELY OWNED SITE UTILITIES WITHOUT OBTAINING REQUIRED PERMITS AND INSPECTIONS.
- BUILDING SETBACKS PER THE PLANNING COMMISSION MEETING OCTOBER 3, 2005:  
RICHMOND ROAD: 25' FROM RIGHT-OF-WAY LINE  
PENINSULA STREET (NORTHEAST): 50' AVERAGE FROM CENTER LINE  
PENINSULA STREET (NORTHWEST): 50' AVERAGE FROM CENTER LINE  
ADJACENT TO A-1, 50' FROM PROPERTY LINE  
ADJACENT TO B-1, 20' FROM PROPERTY LINE
- IN ACCORDANCE WITH SECTION 24-398 OF THE ZONING ORDINANCE BUILDING COVERAGE SHALL NOT EXCEED 25 PERCENT OF THE TOTAL AREA AND THE FLOOR AREA RATION SHALL NOT EXCEED 60 PERCENT.
- IN ACCORDANCE WITH SECTION 24-57(C) "ADEQUATE LIGHTING SHALL BE PROVIDED IF THE USES WHICH ARE SERVED BY THE PARKING LOT WILL BE IN OPERATION AT NIGHT."

**PARKING CALCULATIONS**

WAREHOUSE/STORAGE (1/2 EMPLOYEES)	TYPE:	REQUIRED	PROVIDED
	REGULAR	1	1
	HANDICAP SPACE	1	1
	TOTAL SPACES	2	2
	LOADING SPACE	1	1

NO PLUMBING WILL BE DONE IN CONNECTION TO THIS SITE PLAN.

**SITE DATA**

SITE ADDRESS: 7414 RICHMOND ROAD  
TAX MAP PARCEL NO.: (23-2)(2-D-1A)  
LEGAL DESCRIPTION: L-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, BLKD NORVALIA SUBDIVISION  
PROPERTY REF: INSTR.#050008314  
ZONING: B-1 WITH PROFFERS

	PHASE I	PHASE II	TOTAL
TOTAL SITE AREA:	49,088 SF± OR 1.127 AC.		
IMPERVIOUS AREA:	7,397 SF± OR 0.17 AC± 15.0%	17,063 SF± OR 0.39 AC± 35.0%	24,460 SF± OR 0.56 AC± 50%
DISTURBED AREA:	21,573 SF± OR 0.50 AC±		



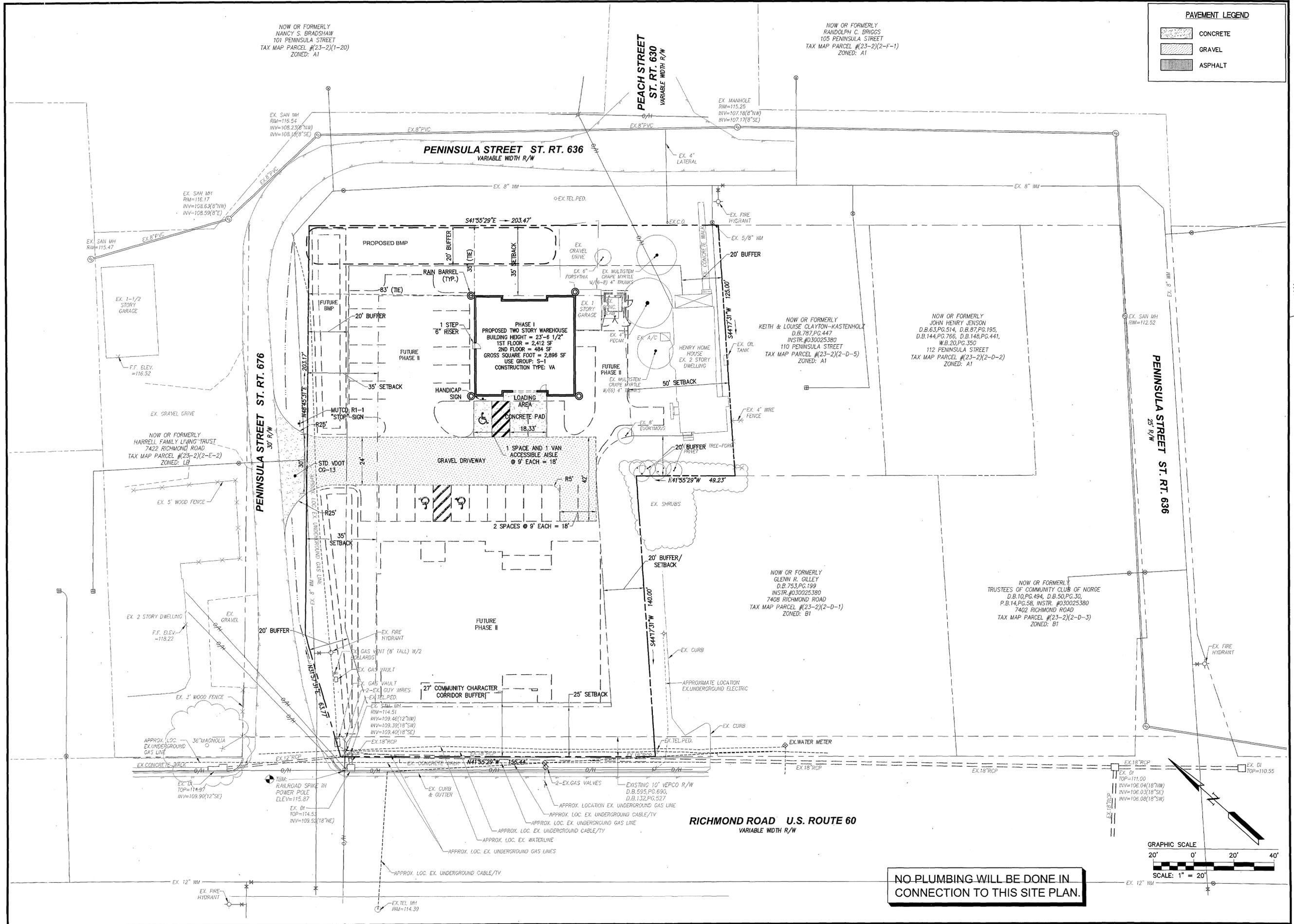
ONLY PHASE I CLEARING, GRADING, BUILDING, PAVEMENT, STORMWATER MANAGEMENT, BMP'S, AND DITCH SHOWN ON SHEET 04 WILL BE APPROVED WITH THIS SITE PLAN.

APPROVAL DATE	NO.	DATE	REVISION / COMMENT / NOTE	REVIEWED BY	REVIEWED BY
	2	10/27/08	REVISED PER COUNTY COMMENTS	BBS	VAB
	1	8/8/08	REVISED PER COUNTY COMMENTS	BBS	VAB

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WILLIAMSBURG WICKER JOB # 9556-00

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**PAVEMENT LEGEND**

	CONCRETE
	GRAVEL
	ASPHALT

NO.	DATE	REVISION / COMMENT / NOTE
1	8/9/08	BBS
2	10/27/08	BBS



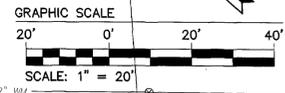
5248 Old Towne Road, Suite 1  
 Williamsburg, Virginia 23188  
 (757) 253-0040  
 Fax (757) 220-8994



CONSULTING ENGINEERS  
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SITE AND UTILITY PLAN	
WILLIAMSBURG WICKER EXPANSION	
PHASE I	
Designed VAB	Drawn BBS
Scale 1"=20'	Date 6/03/08
Project No. 9556	
Drawing No. 03	

**NO PLUMBING WILL BE DONE IN CONNECTION TO THIS SITE PLAN.**



WRITTEN ENVIRONMENTAL DIVISION APPROVAL IS REQUIRED TO PLANT SUBSTITUTION WITHIN THE BIO-RETENTION AREA AND PERIMETER.

DOWNSPOUTS ARE TO TIE INTO A MINIMUM OF 4-55 GALLON RAIN BARRELS TO BE PROVIDED AT THE CORNERS OF THE BUILDING AS DEPICTED ON THE PLANS.

NOW OR FORMERLY  
NANCY S. BRADSHAW  
101 PENINSULA STREET  
TAX MAP PARCEL #23-2(1-20)  
ZONED: A1

NOW OR FORMERLY  
RANDOLPH C. BRIGGS  
105 PENINSULA STREET  
TAX MAP PARCEL #23-2(2-F-1)  
ZONED: A1

EROSION AND SEDIMENTATION CONTROL LEGEND

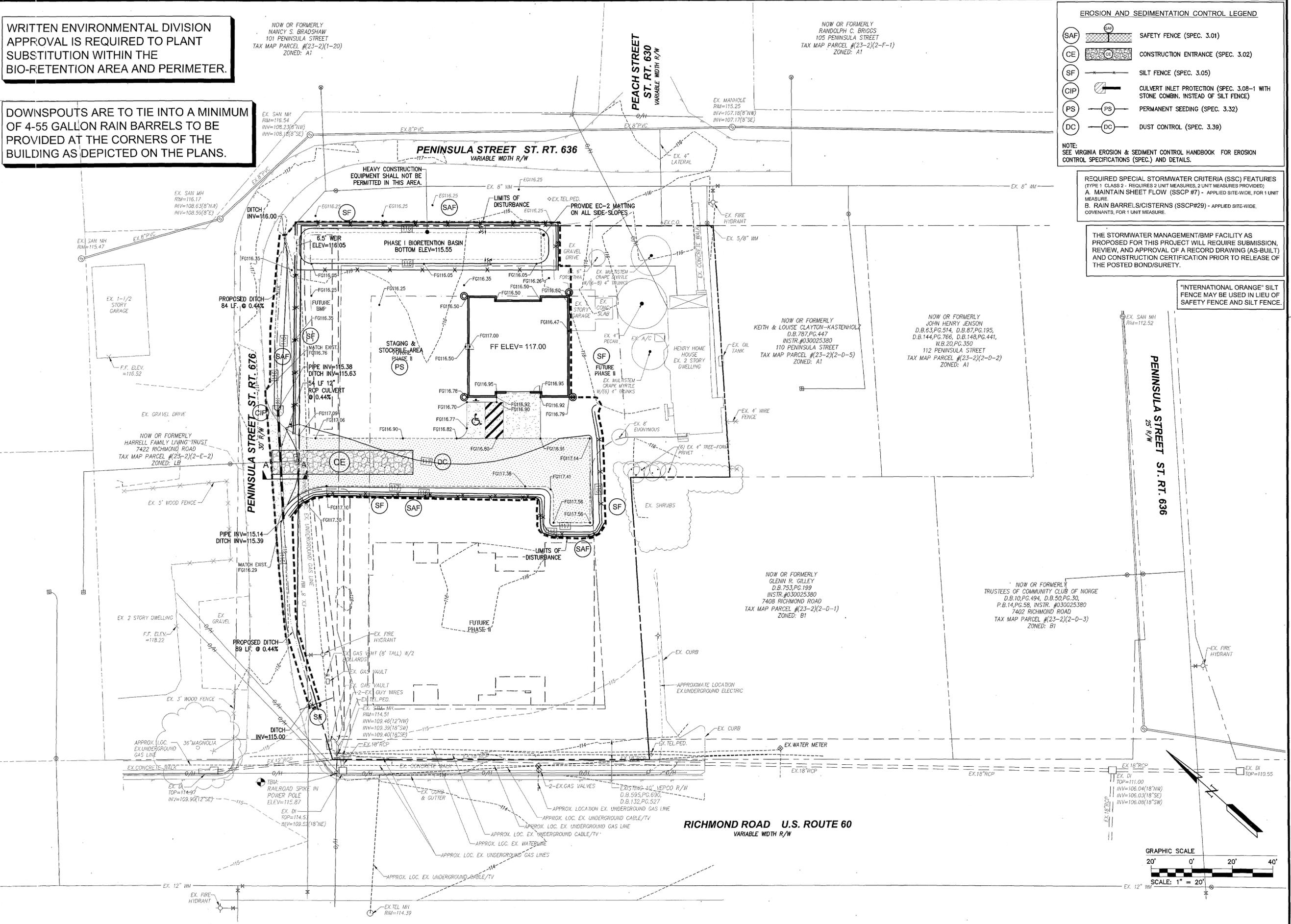
- SAF SAFETY FENCE (SPEC. 3.01)
- CE CONSTRUCTION ENTRANCE (SPEC. 3.02)
- SF SILT FENCE (SPEC. 3.05)
- CIP CULVERT INLET PROTECTION (SPEC. 3.08-1 WITH STONE COMBIN. INSTEAD OF SILT FENCE)
- PS PERMANENT SEEDING (SPEC. 3.32)
- DC DUST CONTROL (SPEC. 3.39)

NOTE: SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

REQUIRED SPECIAL STORMWATER CRITERIA (SSC) FEATURES  
(TYPE 1 CLASS 2 - REQUIRES 2 UNIT MEASURES, 2 UNIT MEASURES PROVIDED)  
A. MAINTAIN SHEET FLOW (SSCP #7) - APPLIED SITE-WIDE, FOR 1 UNIT MEASURE  
B. RAIN BARRELS/CISTERNS (SSCP#29) - APPLIED SITE-WIDE, COVENANTS, FOR 1 UNIT MEASURE.

THE STORMWATER MANAGEMENT/BMP FACILITY AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW, AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.

"INTERNATIONAL ORANGE" SILT FENCE MAY BE USED IN LIEU OF SAFETY FENCE AND SILT FENCE.



NO.	DATE	REVISION / COMMENT / NOTE	DESIGNED BY	DRAWN BY
1	10/27/08	REVISED PER COUNTY COMMENTS	BBS	VAB
2	11/8/08	REVISED PER COUNTY COMMENTS	BBS	VAB



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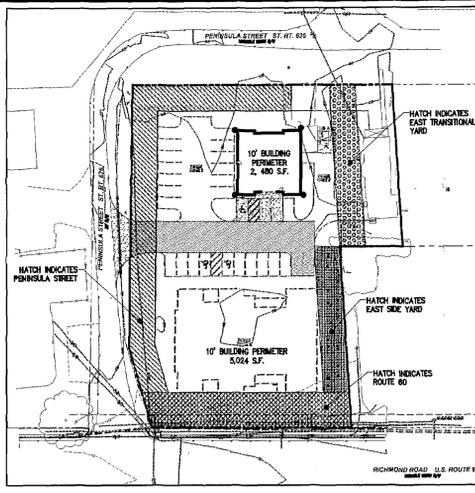
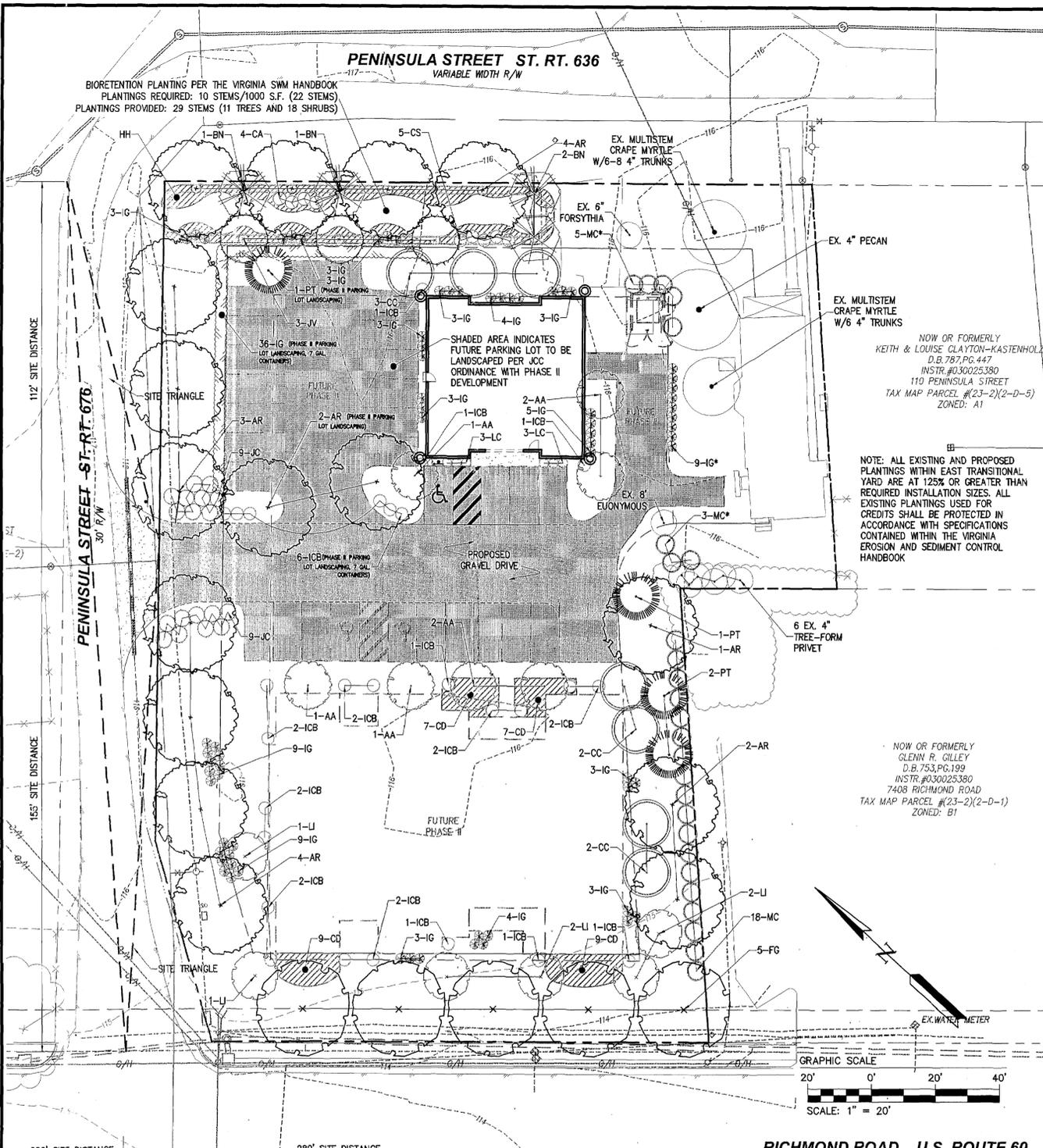
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GRADING AND EROSION CONTROL PLAN  
WILLIAMSBURG WICKER EXPANSION  
PHASE I

Designed	VAB	Drawn	BBS
Scale	1"=20'	Date	6/03/08
Project No.	9556		
Drawing No.	04		

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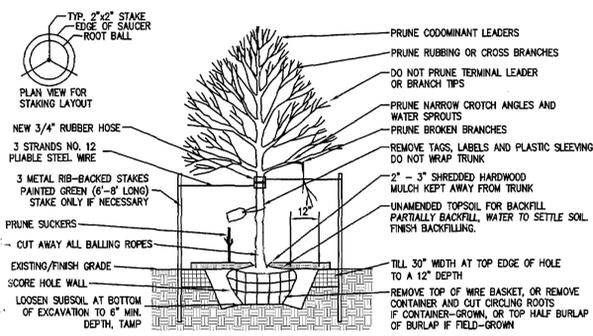




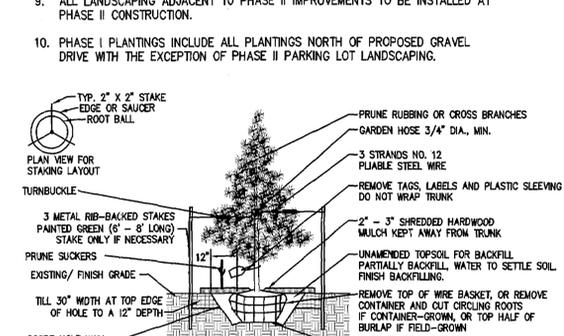
WRITTEN ENVIRONMENTAL DIVISION APPROVAL IS REQUIRED FOR ANY PLANT SUBSTITUTION WITHIN THE BIO-RETENTION AREA.

GENERAL NOTES:

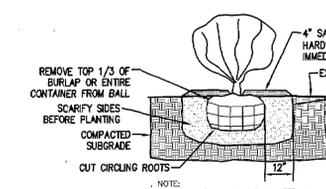
- ALL PLANT MATERIAL SHALL BE INSTALLED AS SPECIFIED IN THE VMLA STANDARDIZED LANDSCAPE SPECIFICATIONS, LATEST EDITION.
- GROUPINGS OF PLANTS SHALL BE MULCHED IN CONTINUOUS BEDS.
- AREAS NOT PLANTED, AREAS OUTSIDE EXISTING TREE LINES AND NOT COVERED IN SITE CONTRACT ARE TO BE SODED OR SEEDED WITH TURF-TYPE TALL FESCUE FROM VIRGINIA COOPERATIVE EXTENSION LIST (BELOW) OR APPROVED SUBSTITUTE:  
Biltmore, Bingo, Cochise II, Constitution, Coyote II, Crossfire II, Endeavor, Fidelity, Good-en, Grande, Greenkeeper WAF, Inferno, Kajahari, Magellan, Masterpiece, Onyx, Padre, Picasso, Penn 1901, Quest, Raptor, Rebel Exedo, Rambrod, Rendition, SR 8250, SR 8300, Tarheel, Titanium, Watchdog, Wolfpack, WPEZE.
- SINGLE STEM DECIDUOUS SHADE TREES SHALL BE STAKED AS DETAILED IN TREE PLANTING METHOD.
- PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- ALL INSTALLED PLANT MATERIAL SHALL BE SUBJECT TO REGULAR MAINTENANCE, INCLUDING FERTILIZATION, PRUNING, REPLACEMENT, INSECT AND DISEASE CONTROL, WATERING, MULCHING, AND WEED CONTROL.
- LANDSCAPING ALONG RICHMOND ROAD REFLECTS STREETSCAPE SHOWN ON CONCEPTUAL LANDSCAPE PLAN SUBMITTED WITH REZONING MASTER PLAN.
- LANDSCAPING SHOWN AT BUILDING IN FUTURE PHASE II IS BASED ON 5,024 S.F. OF 10' BUILDING PERIMETER. THIS LANDSCAPING TO BE INSTALLED WITH PHASE II CONSTRUCTION.
- ALL LANDSCAPING ADJACENT TO PHASE II IMPROVEMENTS TO BE INSTALLED AT PHASE II CONSTRUCTION.
- PHASE I PLANTINGS INCLUDE ALL PLANTINGS NORTH OF PROPOSED GRAVEL DRIVE WITH THE EXCEPTION OF PHASE II PARKING LOT LANDSCAPING.



DECIDUOUS TREE PLANTING METHOD N.T.S.



EVERGREEN TREE PLANTING METHOD N.T.S.



SHRUB PLANTING METHOD N.T.S.

PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	COMMENT
<b>TREES:</b>						
AR	16	ACER RUBRUM 'RED SUNSET'	RED SUNSET MAPLE	2-1/2" CAL.	B & B	SINGLE STEM
FG	5	CARPINUS BETULUS 'FASTIGIATA'	FASTIGATE EUROPEAN HORNBEAM	1-1/2"-2" CAL.	B & B	SINGLE STEM
JV	3	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	8' HT.	B & B	SINGLE STEM
PT	4	PINUS TAEDA	LOBLOLLY PINE	8' HT.	B & B	SINGLE STEM
<b>ORNAMENTAL TREES:</b>						
AA	7	AMELANCHIER X 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	1.25" CAL-8" HT.	B & B	SINGLE STEM
BN	4	BETULA NIGRA 'DURA HEAT'	DURA HEAT RIVER BIRCH	1.25" CAL-8" HT.	B & B	3-5 CANES
CC	7	CERCIS CANADENSIS 'FOREST PANSY'	FOREST PANSY REDBUD	1.25" CAL-8" HT.	B & B	SINGLE STEM
LI	6	LAGERSTROEMIA INDICA 'MUSKOGEE'	MUSKOGEE LAVENDER CRAPEMYRTLE	1.25" CAL-8" HT.	B & B	3-5 CANES
<b>SHRUBS:</b>						
CA	4	CLETHRA ALNIFOLIA 'RUBY SPICE'	RUBY SPICE CLETHRA	22" MIN. HT./ W	CONT.	DENSE, FULL
CD	32	COTONEASTER DAMMERI	PROSTRATE COTONEASTER	22" MIN. SPREAD	CONT.	DENSE, FULL
CS	5	CORNUS SERICEA	RED TWIG DOGWOOD	22" MIN. HT./ W	CONT.	DENSE, FULL
ICB	21	ILEX CORNUTA 'BURFORDII NANA'	DWARF BURFORD HOLLY	18-24" HT./ W	CONT.	DENSE, FULL
IG	106	ILEX GLABRA	INKBERRY HOLLY	18-24" HT./ W	CONT.	DENSE, FULL
JC	18	JUNIPERUS CHINENSIS 'FRUITLANDI'	PFITZER COMPACTA JUNIPER	18-24" HT./ W	CONT.	DENSE, FULL
LC	6	LOROPETALUM CHINENSE 'PLUM DELIGHT'	PLUM DELIGHT LOROPETALUM	18-24" HT./ W	CONT.	DENSE, FULL
MC	26	MYRTICA CERIFERA	WAX MYRTLE	18-24" HT./ W	CONT.	DENSE, FULL
<b>GROUNDCOVERS:</b>						
HH	160	HEDERA HELIX	ENGLISH IVY	PEAT POT	PEAT POT	18" O.C.

\*PROPOSED SHRUBS ALONG FUTURE PARKING LOT AND WITHIN EAST TRANSITIONAL YARD TO BE INSTALLED AT MINIMUM 28". PLANTING ALONG FUTURE PARKING LOT IN CONJUNCTION WITH GRADING TO ACHIEVE 3' SCREENING HEIGHT.

JAMES CITY COUNTY LANDSCAPE REQUIREMENTS

AREAS	TREES AND SHRUBS			
	COUNTY REQ	RATIO	MIN. NUMBER REQUIRED	PLANTINGS PROVIDED
LANDSCAPE YARD	PER MASTER PLAN		1 TREE/30 L.F.	5 TREES/30' O.C.**
ROUTE 60	7,260 S.F.**	1 TREE AND 3 SHRUBS PER 400 S.F.	18 TREES 54 SHRUBS	18 TREES 54 SHRUBS
PENINSULA STREET	2,260 S.F.**	1 TREE AND 3 SHRUBS PER 400 S.F.	6 TREES 18 SHRUBS	6 TREES 18 SHRUBS
EAST SIDE YARD	2,500 S.F.**	1 TREE AND 3 SHRUBS PER 400 S.F.*	6 TREES 19 SHRUBS	9 TREES 19 SHRUBS
EAST TRANSITIONAL YARD			35 TREES 91 SHRUBS	38 TREES 91 SHRUBS
SUBTOTAL				
PHASE I WAREHOUSE	2,480 S.F.	1 TREE OR 5 SHRUBS PER 200 S.F.	12 TREES OR 66 SHRUBS	6 TREES AND 30 SHRUBS
PHASE II FUTURE BUILDING	5,024 S.F.	1 TREE OR 5 SHRUBS PER 200 S.F.	25 TREES OR 125 SHRUBS	14 TREES AND 63 SHRUBS
PHASE II PARKING	30 SPACES	1 TREE AND 2 SHRUBS PER 10 SPACES**	3 TREES AND 6 SHRUBS	3 TREES AND 42 SHRUBS (INCLUDES 36 SCREENING SHRUBS)

\* AT 1.25% ENHANCED SIZE (INCLUDES EXISTING PLANTS).  
\*\* PER APPROVED REQUEST FOR MODIFICATIONS AND USE OF EXISTING PLANT CREDITS.  
\*\*\* INCLUDES 6 EXISTING TREE-FORM PRIVET.  
\*\*\*\* INCLUDES 1 EXISTING EVERGREEN SHRUB.  
\*\*\*\*\* INCLUDES 2 EXISTING MULTISTEM CRAPE MYRTLES.

GENERAL LANDSCAPE AREAS

DISTRIBUTION AND MIX					
%	OF	SHALL BE	REQUIRED	PROVIDED	
40	TREES	2-1/2" CAL.	14	16	
15	TREES	ORNAMENTAL	5	6****	
35	TREES	EVERGREEN	12	12***	
35	SHRUBS	EVERGREEN	32	72****	DECIDUOUS TOTAL
					19 91

REVISED PER COUNTY COMMENTS	REVISED PER COUNTY COMMENTS	REVISION / COMMENT / NOTE
2	10/27/08	
1	8/8/08	
		No.



524B Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188  
(757) 265-0040  
Fax (757) 220-8994



LANDSCAPE PLAN  
WILLIAMSBURG WICKER EXPANSION  
PHASE I  
JAMES CITY COUNTY  
DESIGNED: MRA  
DRAWN: MRA  
SCALE: 1"=20'  
DATE: 6/03/08  
PROJECT NO: 9556  
DRAWING NO: L-1

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**STORMWATER MANAGEMENT PLAN**

**FOR**

**WILLIAMSBURG WICKER EXPANSION  
PHASE I**



**SITE:**

7414 Richmond Road

**SUBMITTED TO:**

James City County

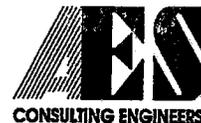
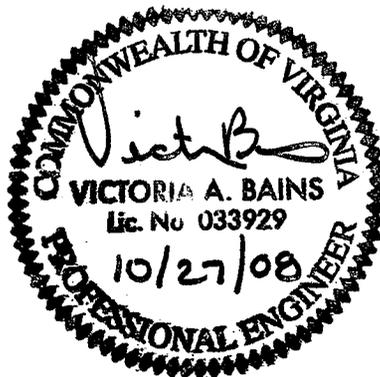
**Prepared By:**

AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

June 3, 2008  
Revised: August 6, 2006  
Revised: October 27, 2008

AES Project No. 9556-00

SP-74-08



## **Williamsburg Wicker Expansion Drainage Narrative**

### **I INTRODUCTION**

This project, known as Williamsburg Wicker Expansion is the warehouse for Williamsburg Wicker and Rattan Shoppe located across Peninsula Street (Route 676) from the original store. The drainage associated with this project will be collected into the proposed bioretention facility, which is an infiltration facility as shown in the attached calculations. During construction, erosion and sediment control measures will be utilized to limit potential of sediment leaving the project area.

### **II EXISTING SITE CONDITIONS**

This flat site is currently occupied by a house (Henry Home House) and accessory structures with the rest of the site being a grass field mowed regularly. Stormwater is currently conveyed via sheet flow and shallow concentrated flow towards Richmond Road and the existing storm system.

### **III PROPOSED STORMDRAIN SYSTEM**

The drainage from the proposed building along with the proposed gravel driveway will be conveyed via sheet flow and shallow concentrated flow to the Bioretention facility, which is a 10-point facility.

On-site stormwater facility calculations and drainage area map attached to provide information to county.

## **TABLE OF CONTENTS**

**I DRAINAGE NARRATIVE**

### **APPENDICES**

- A WORKSHEET FOR BMP POINT SYSTEM**
- B PROPOSED BIO-RETENTION CALCULATIONS**
- C PROPOSED CULVERT CALCULATIONS**
- D DRAINAGE AREA MAP**
- E GEOTECHNICAL ENGINEERING ANALYSIS**
- F GEOTECHNICAL ADDENDUM I**
- G FUTURE WQV AND DRAINAGE AREA MAP**

APPENDIX A  
WORKSHEET FOR BMP POINT SYSTEM

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM  
 Williamsburg Wicker Expansion, AES PROJECT No. 9556-00  
 TOTAL AREA = 0.41 ACRE(s)

A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Drainage Area</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u> (BMP Drainage Area/Total Area)	<u>Weighted BMP Points</u>
Bio-Retention	0.41	10	X	1.000	10.00
			X		
			X		
			X		
<b>TOTAL WEIGHTED STRUCTURAL BMP POINTS:</b>					<b>10.00</b>

B. NATURAL OPEN SPACE CREDIT

<u>Open Space Area</u>	<u>Fraction of Site</u> (Open Space Area/Total Area)	<u>Natural Open Space Credit</u> (0.1 per 1%) (0.15 per 1%)	<u>Points for Natural Open Space</u> (Fraction of Site * Natural Open Space Credit %)
			=
			=
<b>TOTAL OPEN SPACE POINTS:</b>			<b>0.00</b>

C. TOTAL WEIGHTED POINTS

10.00	+	0.00	=	10.00
Structural BMP Points		Natural Open Space Points		TOTAL

APPENDIX B  
PROPOSED BIO-RETENTION CALCULATIONS

**BMP Water Quality Volumes**

Elev.	Countour Area (in s.f.)	Storage (Between contours)	Cumulative Storage Volume
116.25	Area = 5592 s.f.		Cumulative Storage = 68.1 c.y.
		Storage = 964 c.f.= 35.7 c.y.	
116	Area = 2123 s.f.		Cumulative Storage = 32.4 c.y.
		Storage = 409 c.f.= 15.1 c.y.	
115.8	Area = 1962 s.f.		Cumulative Storage = 17.3 c.y.
		Storage = 466 c.f.= 17.3 c.y.	
115.55	Area = 1764 s.f.		Cumulative Storage = 0.0 c.y.
		Storage = 0 c.f.= 0.0 c.y.	

Water Quality Volume = 1" per acre of Impervious

Impervious Area = 0.24 acre  
 Wet WQV = 429 c.f.  
 Wet Volume Required = 858 c.f. = 32 c.y.  
 Wet WQV Volume Provided = 32.4 c.y. At Elevation 116.00  
 Wet WQV Volume Provided = 874 c.f.

Adequate Water Quality Volume is provided in BMP

**TIME OF CONCENTRATION**  
**FOR BMP**  
**FOR WILLIAMSBURG WICKER EXPANSION**

**Pre Development**

Tc = Overland Flow + Shallow Concentrated Flow

Overland Flow = Lo

Sheet Flow across parcel

Length of Flow = 61ft.

Lo = 15.0 min.(from Seelye Chart)

Shallow Concentrated Flow = Tt

Tt = L/60V

Shallow Concentrated flow across parcel

V = 1.0ft/sec (from Plate 5.2 VESCH)

L = 58ft.

Tt = 58/60(1.0) = 1.00min

Tc = 15.0min+1.0min= 16.0min

**Post Development**

Tc = Overland Flow

Overland Flow = Lo

Sheet Flow across parcel

Length of Flow = 119ft.

Lo = 18.0 min.(from Seelye Chart)

Tc = 18.0min

**Pre Development**

**WEIGHTED CURVE NUMBER**

**CN=61**

Open Space (lawns, parks, etc.) Soils B = 0.41Ac.

**CN=61**

**Post Development**

**WEIGHTED CURVE NUMBER**

**CN=75**

Open Space (lawns, parks, etc.) Soils B = 0.25Ac.  
Impervious Areas = 0.16Ac.

**CN=61**

**CN=98**

# Pond Report

Hydraflow Hydrographs by Intellisolve v9.02

Monday, Oct 27, 2008

## Pond No. 1 - Bioretention - South Pond

### Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 115.55 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	115.55	1,764	0	0
0.45	116.00	2,123	873	873
0.70	116.25	5,592	930	1,803

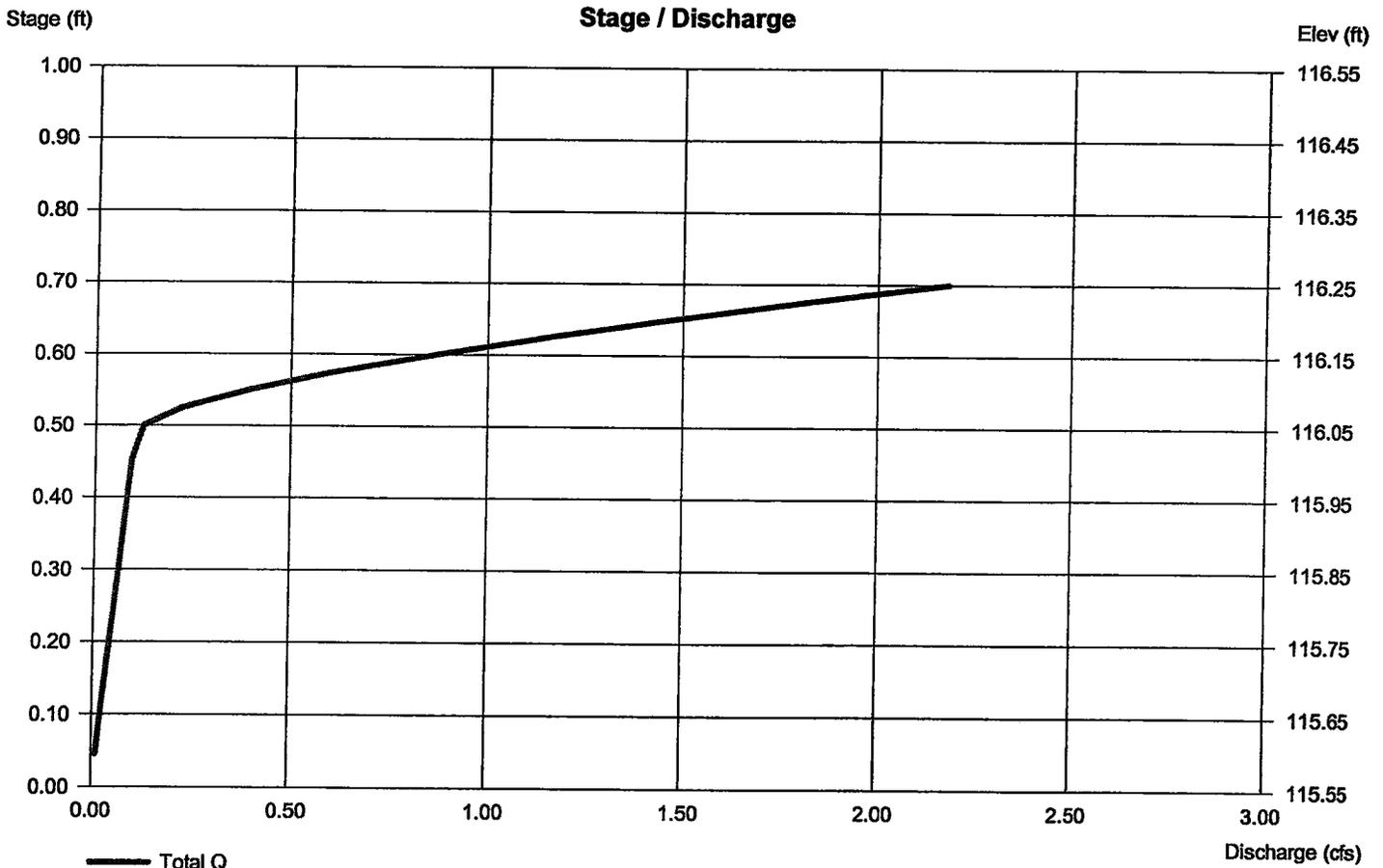
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 6.50	0.00	0.00	0.00
Crest El. (ft)	= 116.05	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil. (in/hr)	= 1.900 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description	
1	SCS Runoff	0.082	2	726	424	—	—	—	Pre-Development	
3	SCS Runoff	0.370	2	726	1,239	—	—	—	Post-Development	
5	Reservoir	0.000	2	852	0	3	115.80	491	Routing Post Develop	
9556-00-Bio-Retention-Rev-2.gpw					Return Period: 1 Year			Monday, Oct 27, 2008		

# Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Monday, Oct 27, 2008

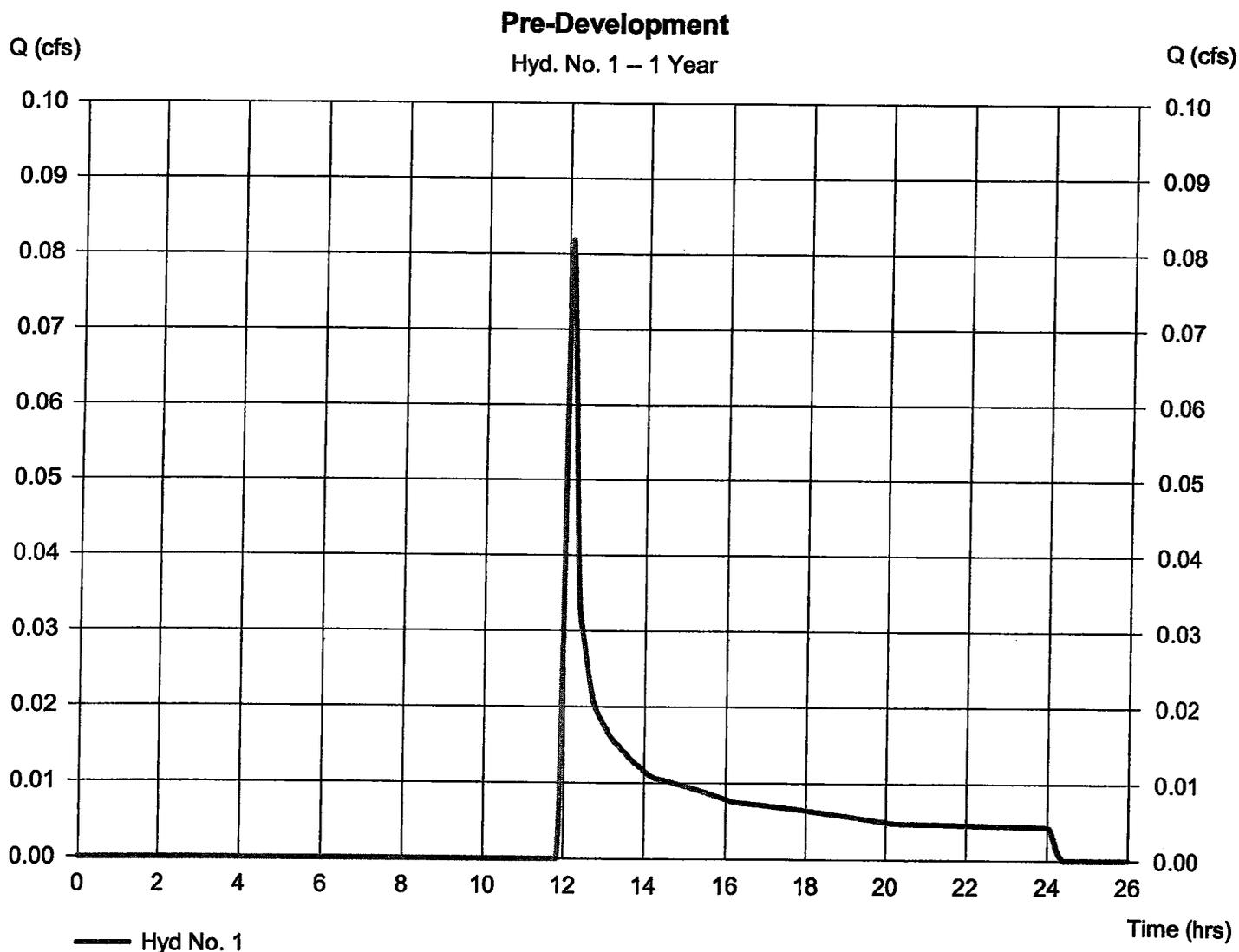
## Hyd. No. 1

### Pre-Development

Hydrograph type = SCS Runoff  
Storm frequency = 1 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 2.80 in  
Storm duration = 24 hrs

Peak discharge = 0.082 cfs  
Time to peak = 12.10 hrs  
Hyd. volume = 424 cuft  
Curve number = 61\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 16.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.410 \times 61)] / 0.410$



# Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Monday, Oct 27, 2008

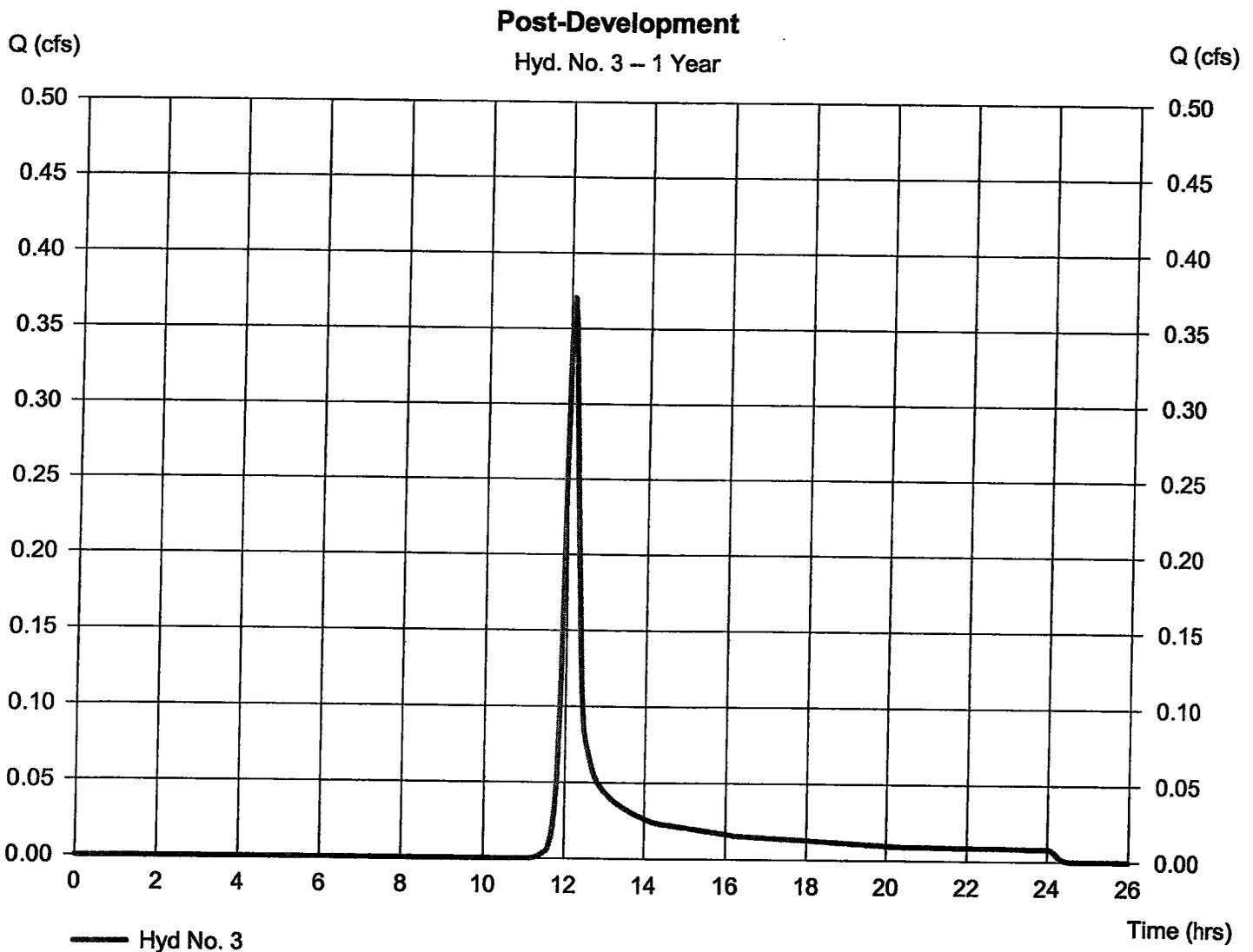
## Hyd. No. 3

### Post-Development

Hydrograph type = SCS Runoff  
Storm frequency = 1 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 2.80 in  
Storm duration = 24 hrs

Peak discharge = 0.370 cfs  
Time to peak = 12.10 hrs  
Hyd. volume = 1,239 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 18.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.250 \times 61) + (0.160 \times 98)] / 0.410$



# Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Monday, Oct 27, 2008

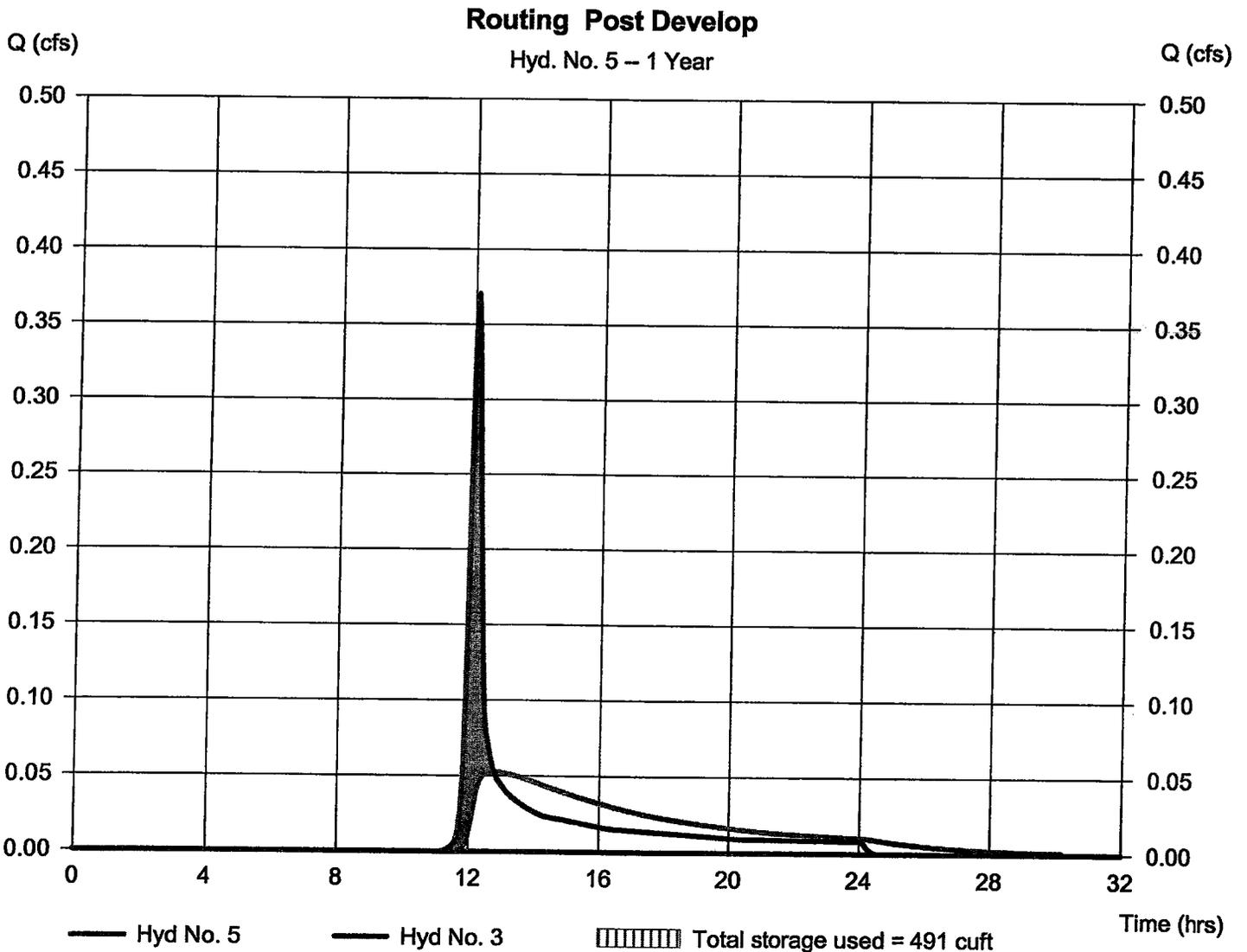
## Hyd. No. 5

Routing Post Develop

Hydrograph type = Reservoir  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyd. No. = 3 - Post-Development  
Reservoir name = Bioretention - South Pond

Peak discharge = 0.000 cfs  
Time to peak = 14.20 hrs  
Hyd. volume = 0 cuft  
Max. Elevation = 115.80 ft  
Max. Storage = 491 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelsolve v9.02

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.226	2	724	831	—	—	—	Pre-Development
3	SCS Runoff	0.600	2	726	1,937	—	—	—	Post-Development
5	Reservoir	0.000	2	730	0	3	115.97	819	Routing Post Develop

# Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Monday, Oct 27, 2008

## Hyd. No. 1

### Pre-Development

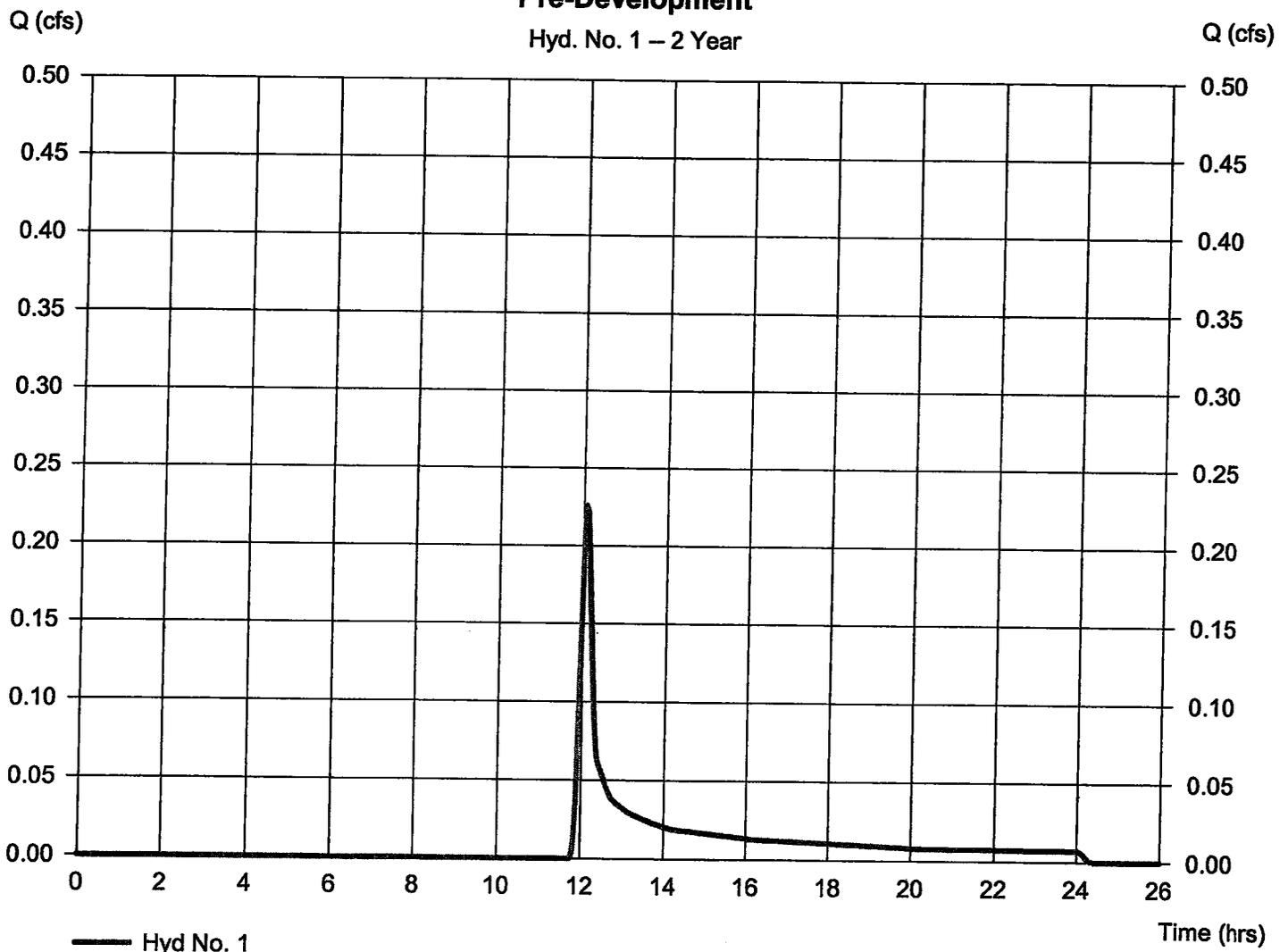
Hydrograph type = SCS Runoff  
Storm frequency = 2 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 3.50 in  
Storm duration = 24 hrs

Peak discharge = 0.226 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 831 cuft  
Curve number = 61\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 16.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.410 \times 61)] / 0.410$

### Pre-Development

Hyd. No. 1 - 2 Year



# Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Monday, Oct 27, 2008

## Hyd. No. 3

### Post-Development

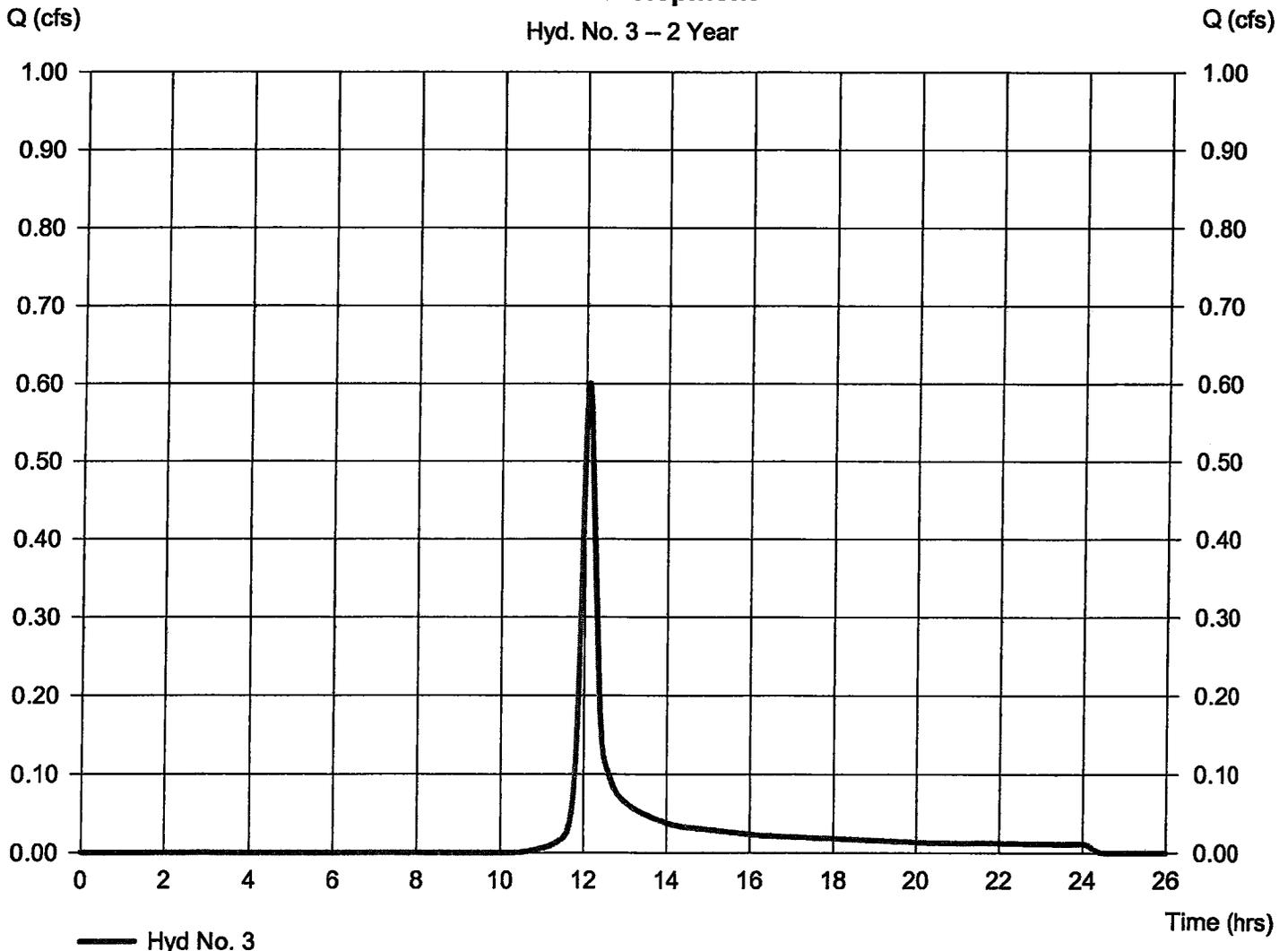
Hydrograph type = SCS Runoff  
Storm frequency = 2 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 3.50 in  
Storm duration = 24 hrs

Peak discharge = 0.600 cfs  
Time to peak = 12.10 hrs  
Hyd. volume = 1,937 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 18.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.250 \times 61) + (0.160 \times 98)] / 0.410$

### Post-Development

Hyd. No. 3 -- 2 Year



# Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Monday, Oct 27, 2008

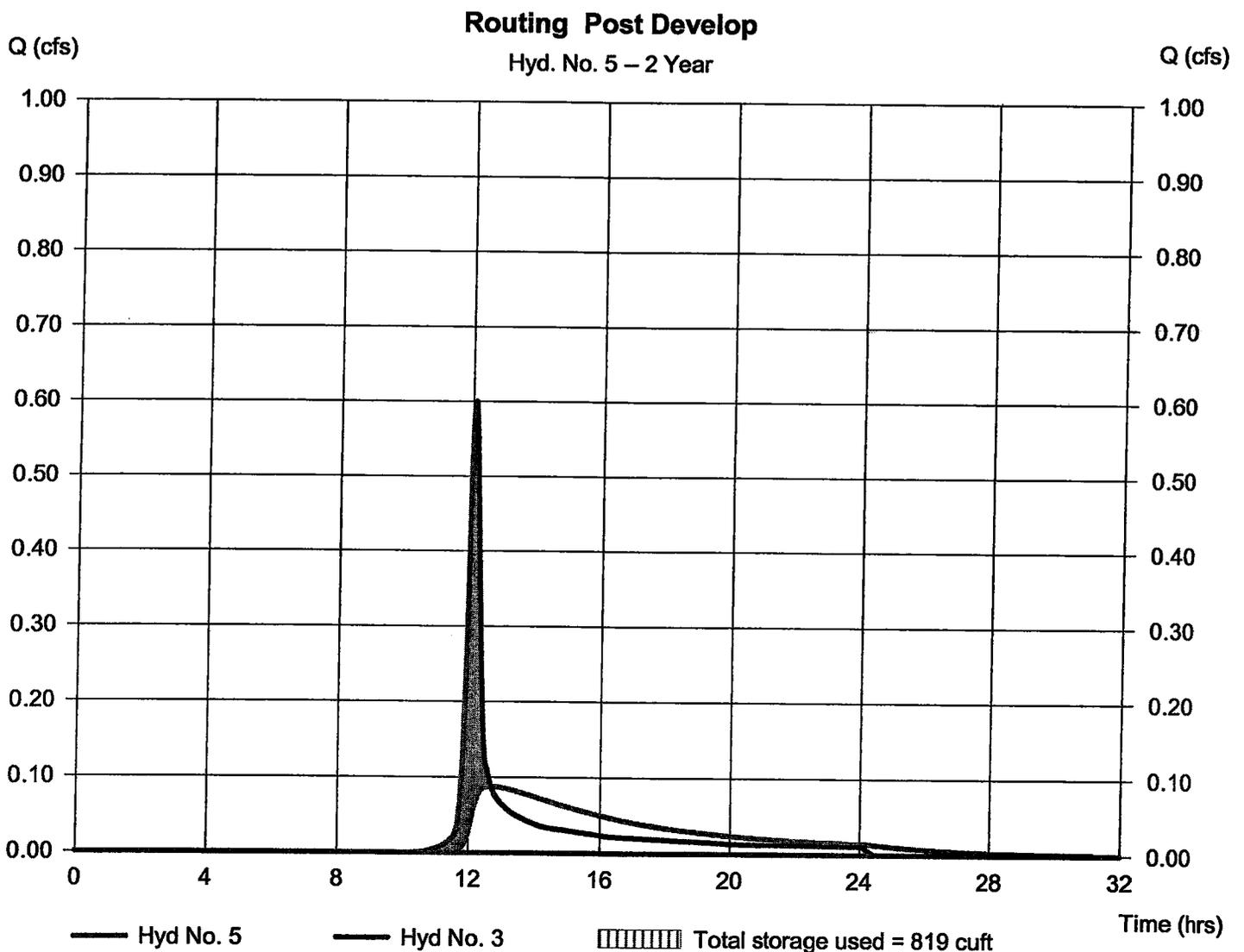
## Hyd. No. 5

### Routing Post Develop

Hydrograph type = Reservoir  
Storm frequency = 2 yrs  
Time interval = 2 min  
Inflow hyd. No. = 3 - Post-Development  
Reservoir name = Bioretention - South Pond

Peak discharge = 0.000 cfs  
Time to peak = 12.17 hrs  
Hyd. volume = 0 cuft  
Max. Elevation = 115.97 ft  
Max. Storage = 819 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve v9.02

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.928	2	724	2,718	—	—	—	Pre-Development
3	SCS Runoff	1.481	2	724	4,632	—	—	—	Post-Development
5	Reservoir	0.821	2	734	1,153	3	116.16	1,478	Routing Post Develop

# Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Monday, Oct 27, 2008

## Hyd. No. 1

### Pre-Development

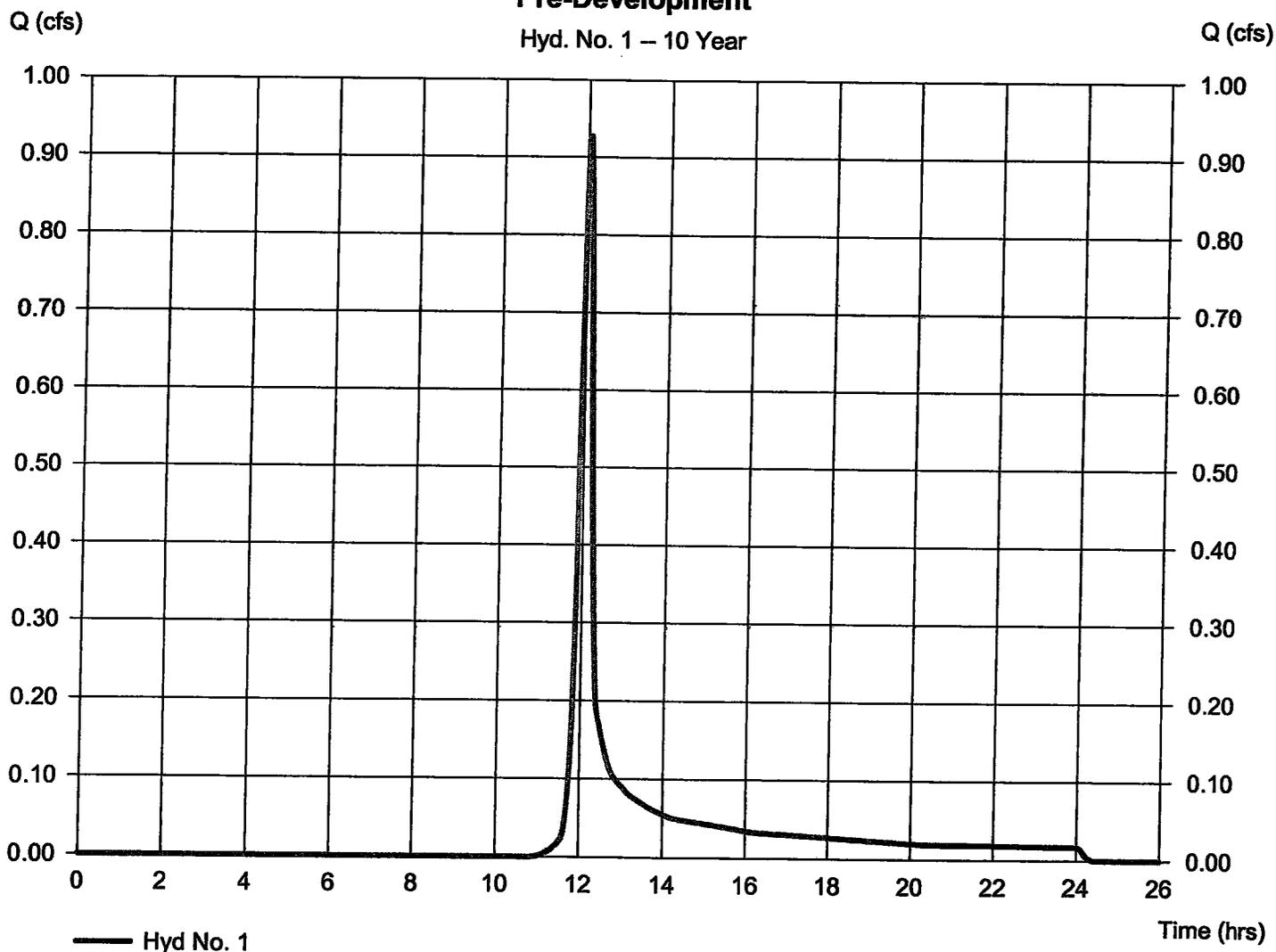
Hydrograph type = SCS Runoff  
Storm frequency = 10 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 5.80 in  
Storm duration = 24 hrs

Peak discharge = 0.928 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 2,718 cuft  
Curve number = 61\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 16.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.410 \times 61)] / 0.410$

### Pre-Development

Hyd. No. 1 - 10 Year



# Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Monday, Oct 27, 2008

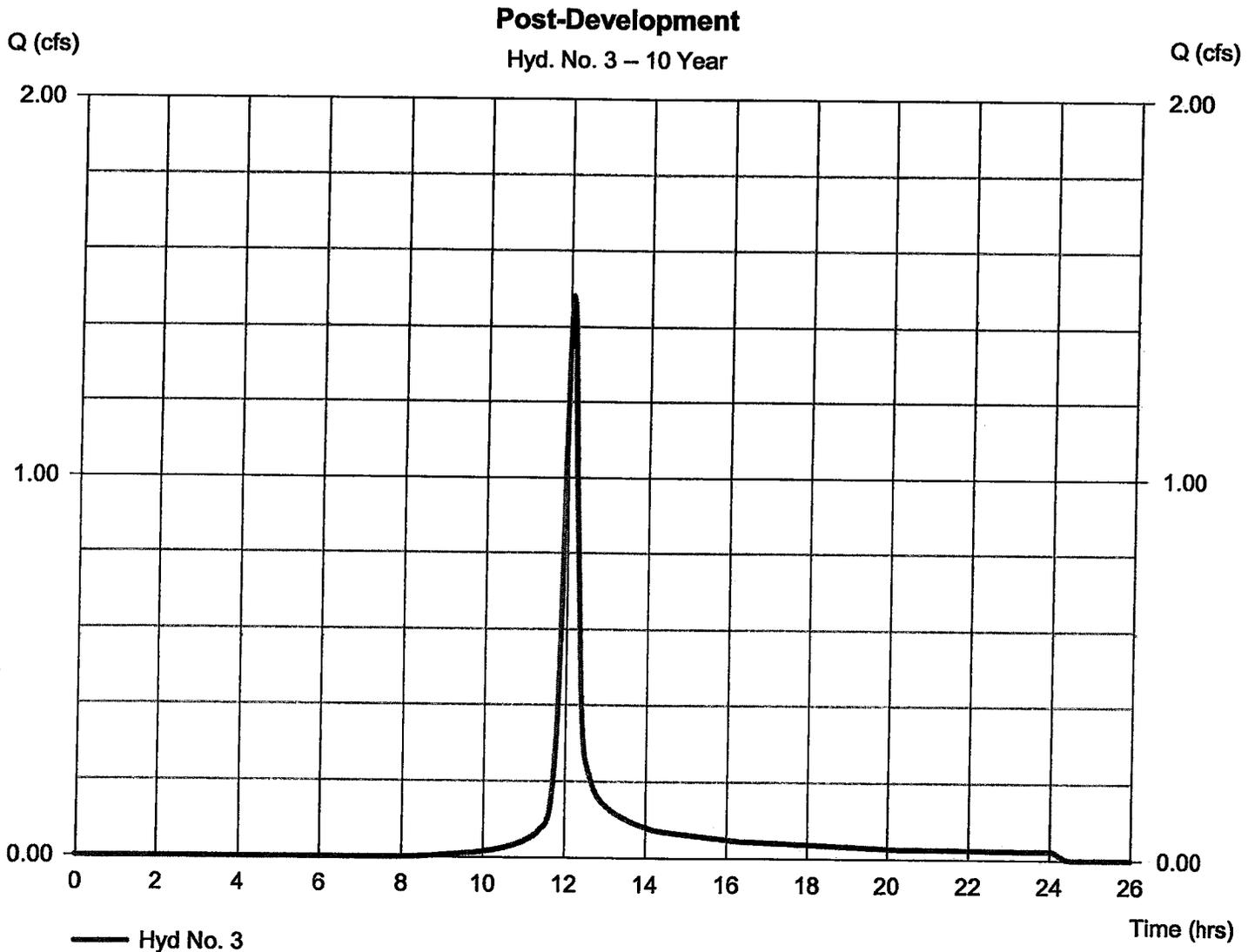
## Hyd. No. 3

### Post-Development

Hydrograph type = SCS Runoff  
Storm frequency = 10 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 5.80 in  
Storm duration = 24 hrs

Peak discharge = 1.481 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 4,632 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 18.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.250 \times 61) + (0.160 \times 98)] / 0.410$



# Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

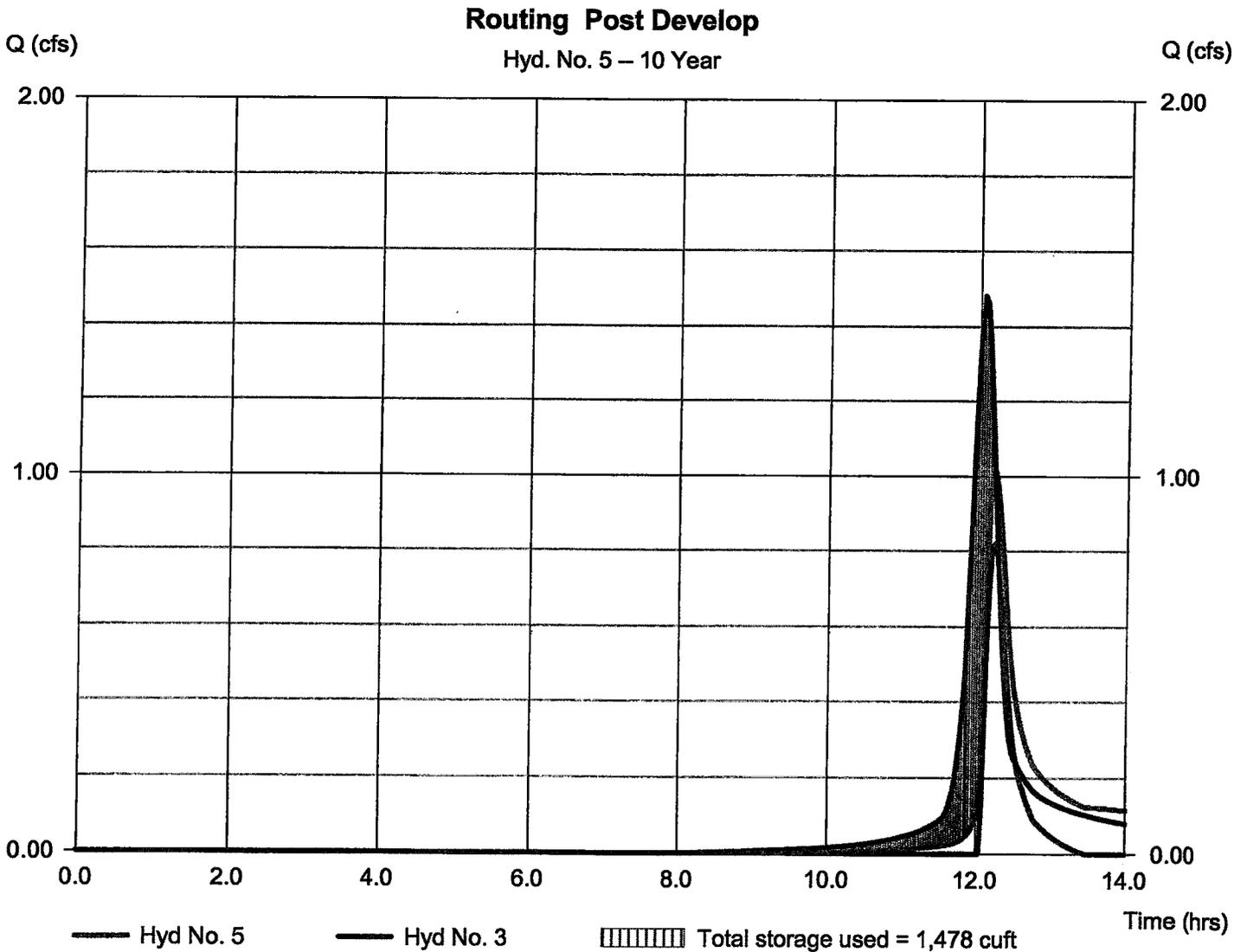
Monday, Oct 27, 2008

## Hyd. No. 5

Routing Post Develop

Hydrograph type	= Reservoir	Peak discharge	= 0.821 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 1,153 cuft
Inflow hyd. No.	= 3 - Post-Development	Max. Elevation	= 116.16 ft
Reservoir name	= Bioretention - South Pond	Max. Storage	= 1,478 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve v9.02

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.765	2	722	4,999	—	—	—	Pre-Development
3	SCS Runoff	2.392	2	724	7,504	—	—	—	Post-Development
5	Reservoir	1.849	2	728	2,962	3	116.25	1,780	Routing Post Develop

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Oct 27, 2008

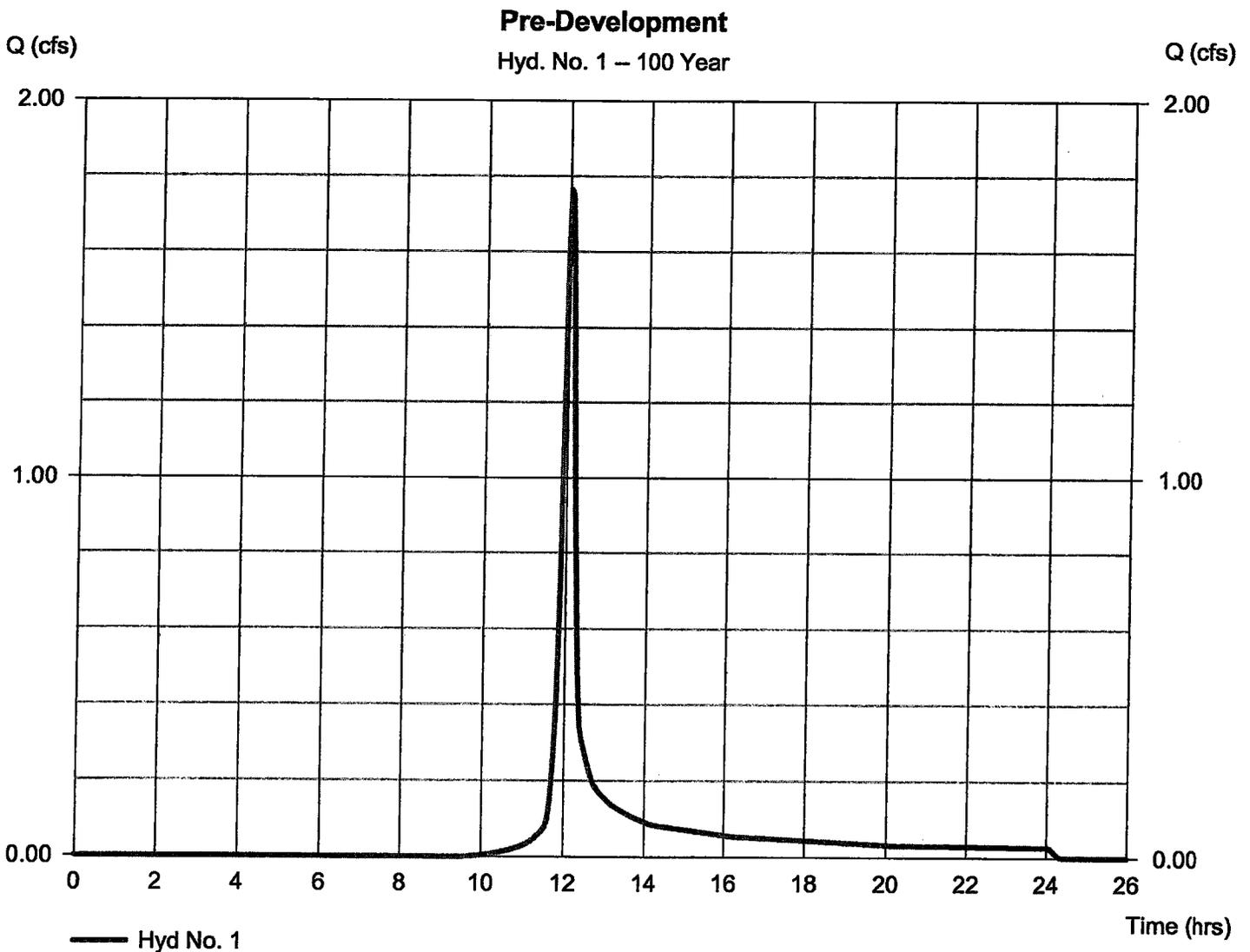
## Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff  
Storm frequency = 100 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 8.00 in  
Storm duration = 24 hrs

Peak discharge = 1.765 cfs  
Time to peak = 12.03 hrs  
Hyd. volume = 4,999 cuft  
Curve number = 61\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 16.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.410 \times 61)] / 0.410$



# Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Monday, Oct 27, 2008

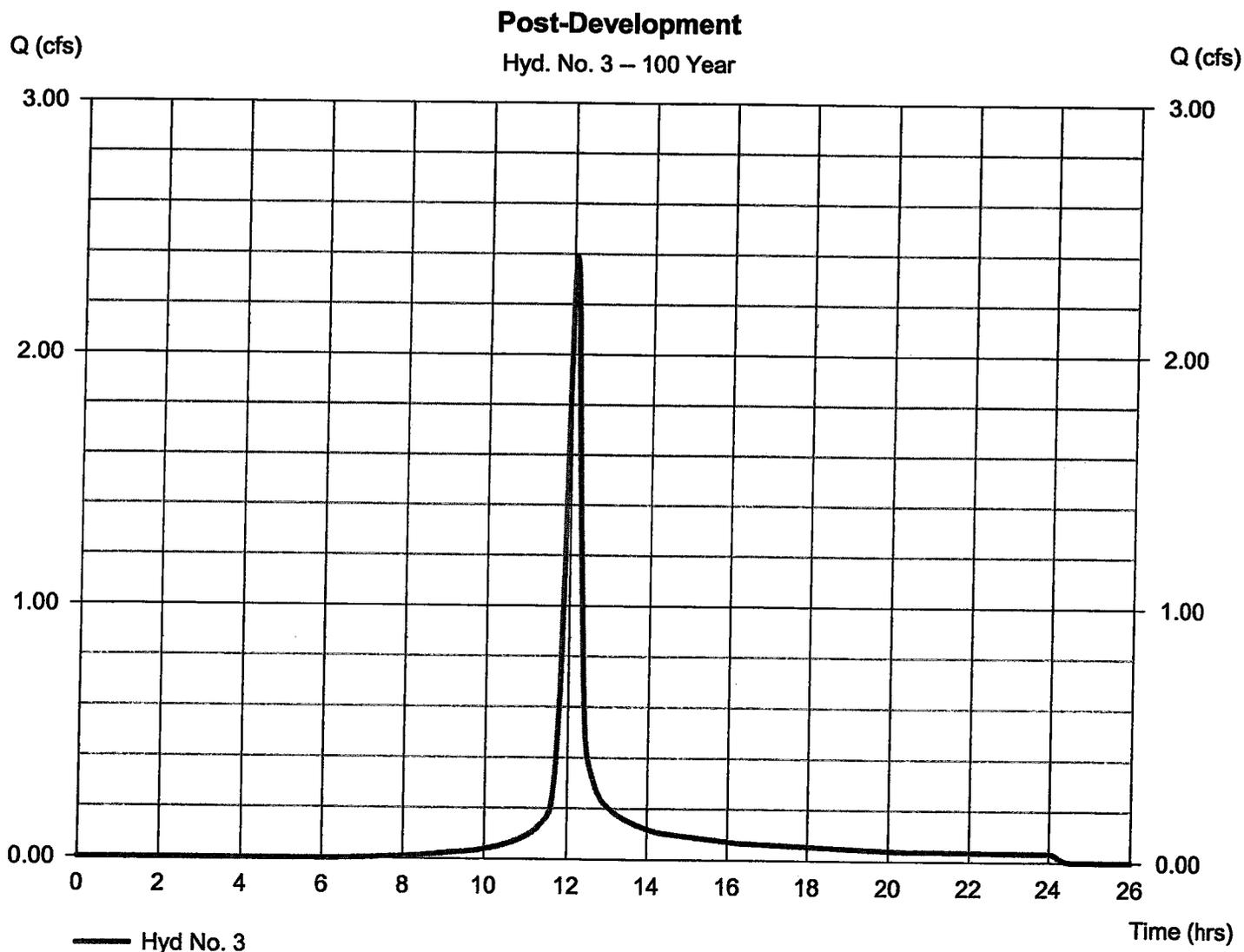
## Hyd. No. 3

### Post-Development

Hydrograph type = SCS Runoff  
Storm frequency = 100 yrs  
Time interval = 2 min  
Drainage area = 0.410 ac  
Basin Slope = 0.0 %  
Tc method = USER  
Total precip. = 8.00 in  
Storm duration = 24 hrs

Peak discharge = 2.392 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 7,504 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 18.00 min  
Distribution = Type II  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.250 \times 61) + (0.160 \times 98)] / 0.410$



# Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Monday, Oct 27, 2008

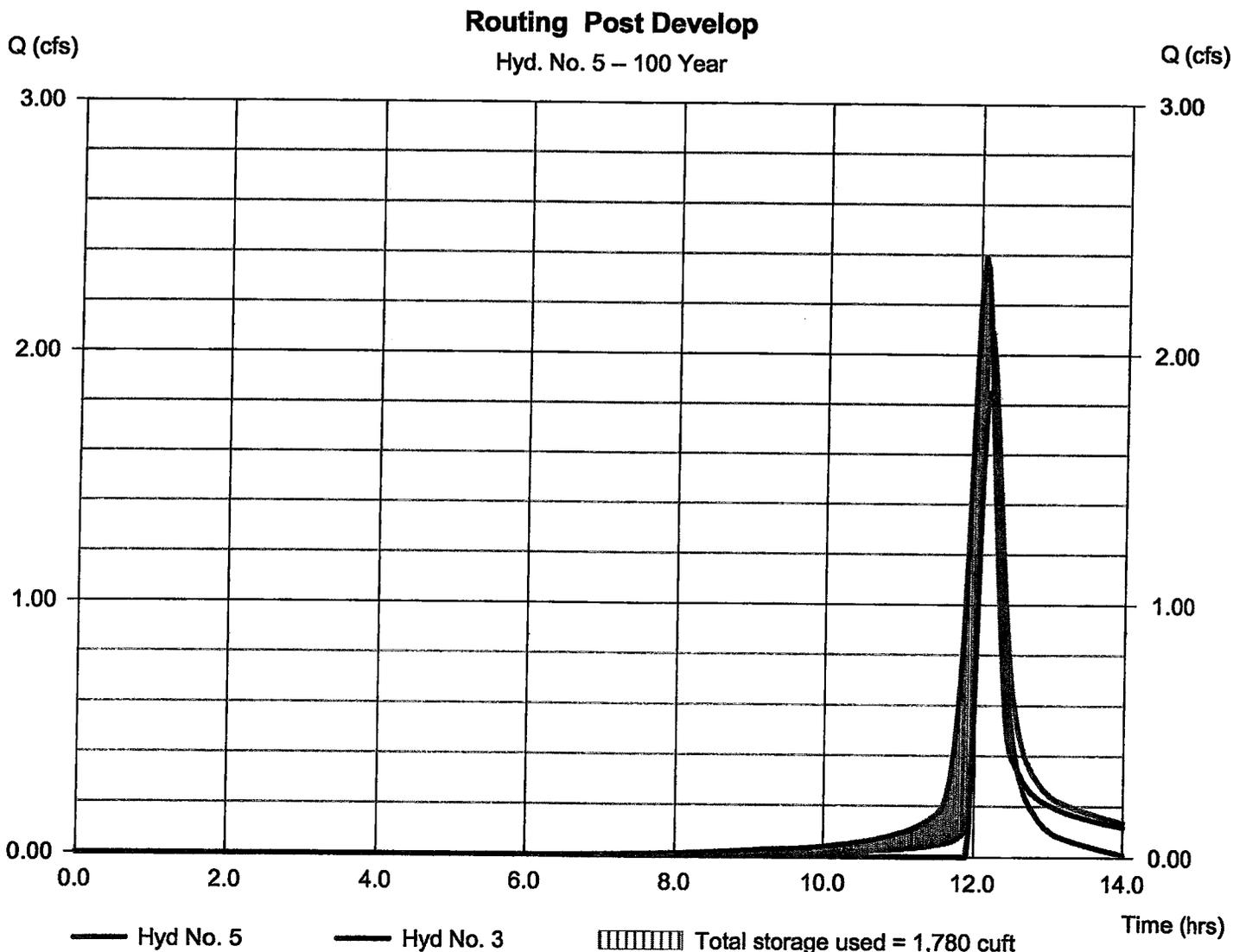
## Hyd. No. 5

Routing Post Develop

Hydrograph type = Reservoir  
Storm frequency = 100 yrs  
Time interval = 2 min  
Inflow hyd. No. = 3 - Post-Development  
Reservoir name = Bioretention - South Pond

Peak discharge = 1.849 cfs  
Time to peak = 12.13 hrs  
Hyd. volume = 2,962 cuft  
Max. Elevation = 116.25 ft  
Max. Storage = 1,780 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Return Period Recap

Hydraflow Hydrographs by Intellsolve v9.02

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	---	0.082	0.226	---	---	0.928	---	---	1.765	Pre-Development
3	SCS Runoff	---	0.370	0.600	---	---	1.481	---	---	2.392	Post-Development
5	Reservoir	3	0.000	0.000	---	---	0.821	---	---	1.849	Routing Post Develop

APPENDIX C  
PROPOSED CULVERT CALCULATIONS

# **POOR QUALITY**

**ORIGINAL(S) FOLLOW**

**THIS IS THE BEST COPY  
AVAILABLE**

***VCE  
DOCUMENT  
CONVERSION***

# Hydrology Report

Hydraflow Express by Intellsolve

Monday, Aug 25 2008, 2:3 PM

## Williamsburg Wicker Expansion

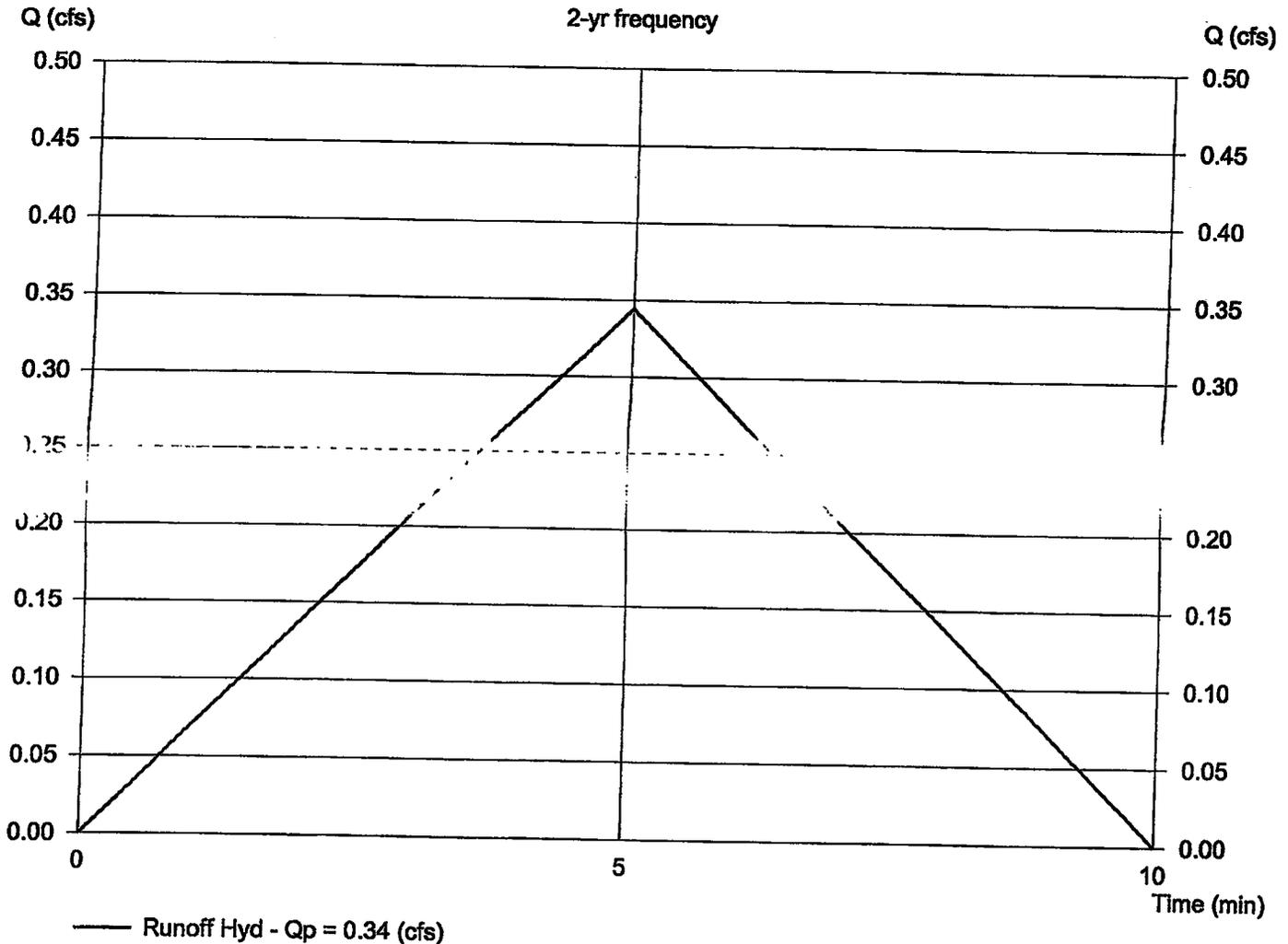
Hydrograph type = Rational  
Storm frequency (yrs) = 2  
Drainage area (ac) = 0.070  
Rainfall Inten (in/hr) = 5.783  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge (cfs) = 0.344  
Time interval (min) = 1  
Runoff coeff. (C) = 0.85  
Tc by User (min) = 5  
Rec limb factor = 1.00

Hydrograph Volume = 103 (cuft); 0.002 (acft)

### Runoff Hydrograph

2-yr frequency



# Hydrology Report

Hydraflow Express by Intelisolve

Monday, Aug 25 2008, 2:3 PM

## Williamsburg Wicker Expansion

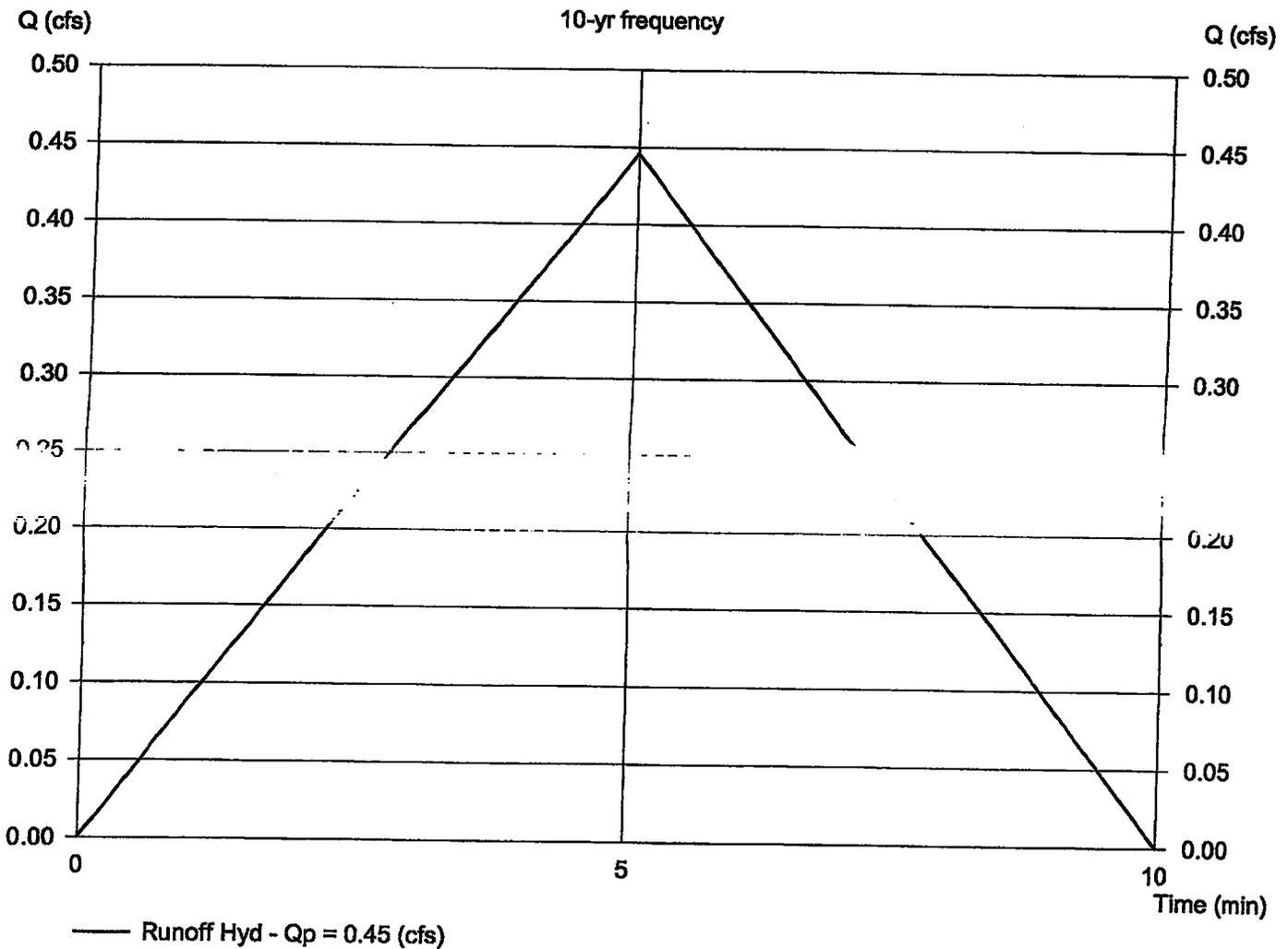
Hydrograph type = Rational  
Storm frequency (yrs) = 10  
Drainage area (ac) = 0.070  
Rainfall Inten (in/hr) = 7.496  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge (cfs) = 0.446  
Time interval (min) = 1  
Runoff coeff. (C) = 0.85  
Tc by User (min) = 5  
Rec limb factor = 1.00

Hydrograph Volume = 134 (cuft); 0.003 (acft)

### Runoff Hydrograph

10-yr frequency



# Culvert Report

2-YEAR

Hydraflow Express by Intelisolve

Monday, Aug 25 2008, 2:2 PM

## Williamsburg Wicker Expansion

Invert Elev Dn (ft) = 115.39  
 Pipe Length (ft) = 54.00  
 Slope (%) = 0.44  
 Invert Elev Up (ft) = 115.63  
 Rise (in) = 12.0  
 Shape = Cir  
 Span (in) = 12.0  
 No. Barrels = 1  
 n-Value = 0.013  
 Inlet Edge = Projecting  
 Coeff. K,M,c,Y,k = 0.0045, 2, 0.0317, 0.69, 0.5

### Calculations

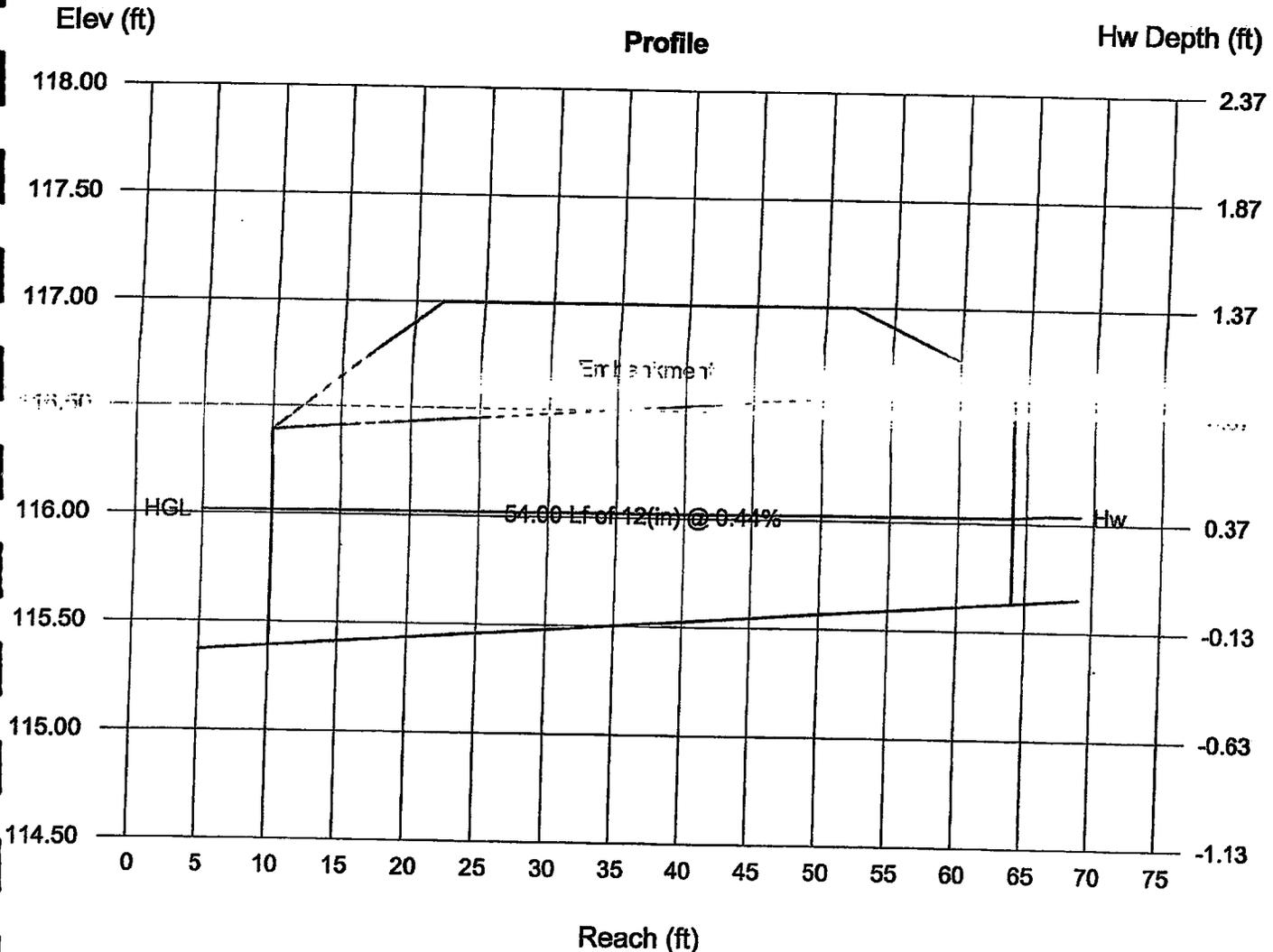
Qmin (cfs) = 0.34  
 Qmax (cfs) = 0.45  
 Tailwater Elev (ft) = (dc+D)/2

### Highlighted

Qtotal (cfs) = 0.34  
 Qpipe (cfs) = 0.34  
 Qovertop (cfs) = 0.00  
 Veloc Dn (ft/s) = 0.66  
 Veloc Up (ft/s) = 1.18  
 HGL Dn (ft) = 116.01  
 HGL Up (ft) = 116.03  
 Hw Elev (ft) = 116.04  
 Hw/D (ft) = 0.41  
 Flow Regime = Outlet Control

### Embankment

Top Elevation (ft) = 117.00  
 Top Width (ft) = 30.00  
 Crest Width (ft) = 0.00



# Culvert Report

10-YEAR

Hydraflow Express by Intellisolve

Monday, Aug 25 2008, 2:2 PM

## Williamsburg Wicker Expansion

Invert Elev Dn (ft) = 115.39  
 Pipe Length (ft) = 54.00  
 Slope (%) = 0.44  
 Invert Elev Up (ft) = 115.63  
 Rise (in) = 12.0  
 Shape = Cir  
 Span (in) = 12.0  
 No. Barrels = 1  
 n-Value = 0.013  
 Inlet Edge = Projecting  
 Coeff. K,M,c,Y,k = 0.0045, 2, 0.0317, 0.69, 0.5

### Calculations

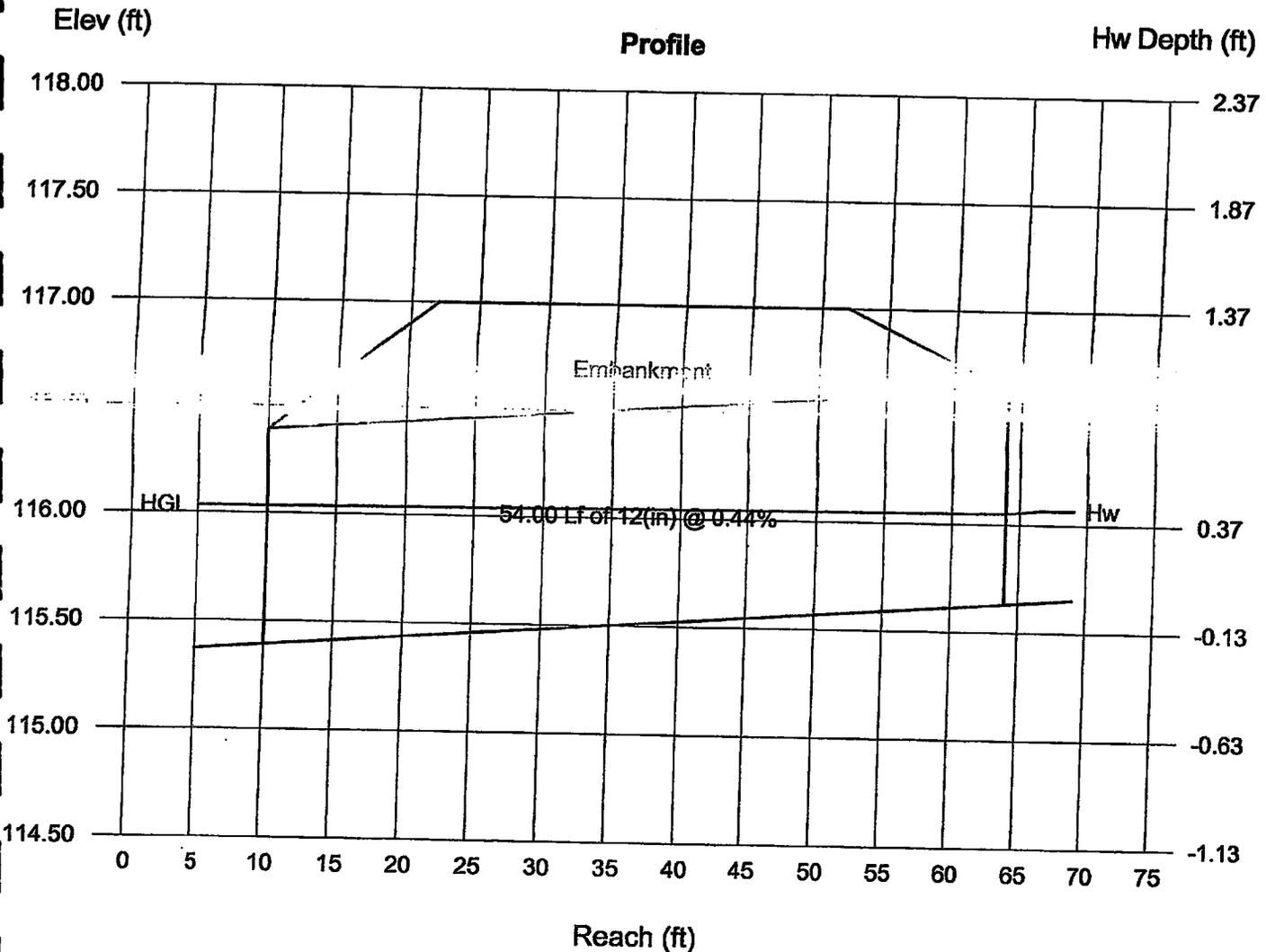
Qmin (cfs) = 0.45  
 Qmax (cfs) = 0.45  
 Tailwater Elev (ft) = (dc+D)/2

### Highlighted

Qtotal (cfs) = 0.45  
 Qpipe (cfs) = 0.45  
 Qovertop (cfs) = 0.00  
 Veloc Dn (ft/s) = 0.84  
 Veloc Up (ft/s) = 1.44  
 HGL Dn (ft) = 116.03  
 HGL Up (ft) = 116.05  
 Hw Elev (ft) = 116.07  
 Hw/D (ft) = 0.44  
 Flow Regime = Outlet Control

### Embankment

Top Elevation (ft) = 117.00  
 Top Width (ft) = 30.00  
 Crest Width (ft) = 0.00



APPENDIX D  
DRAINAGE AREA MAP

NOW OR FORMERLY  
NANCY S. BRADSHAW  
101 PENINSULA STREET  
TAX MAP PARCEL #23-2(1-20)  
ZONED: A1

NOW OR FORMERLY  
RANDOLPH C. BRIGGS  
105 PENINSULA STREET  
TAX MAP PARCEL #23-2(2-F-1)  
ZONED: A1

**EROSION AND SEDIMENTATION CONTROL LEGEND**

-  CONSTRUCTION ENTRANCE (SPEC. 3.02)
-  SILT FENCE (SPEC. 3.05)
-  CULVERT DILET PROTECTION (SPEC. 3.08-1 WITH STONE COMBR. INSTEAD OF SILT FENCE)

NOTE:  
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

NO.	DATE	REVISION / COMMENT / NOTE
2	10/27/08	REVISED PER COUNTY COMMENTS
1	8/5/08	REVISED PER COUNTY COMMENTS



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Williamsburg, Virginia 23188  
(767) 253-0040  
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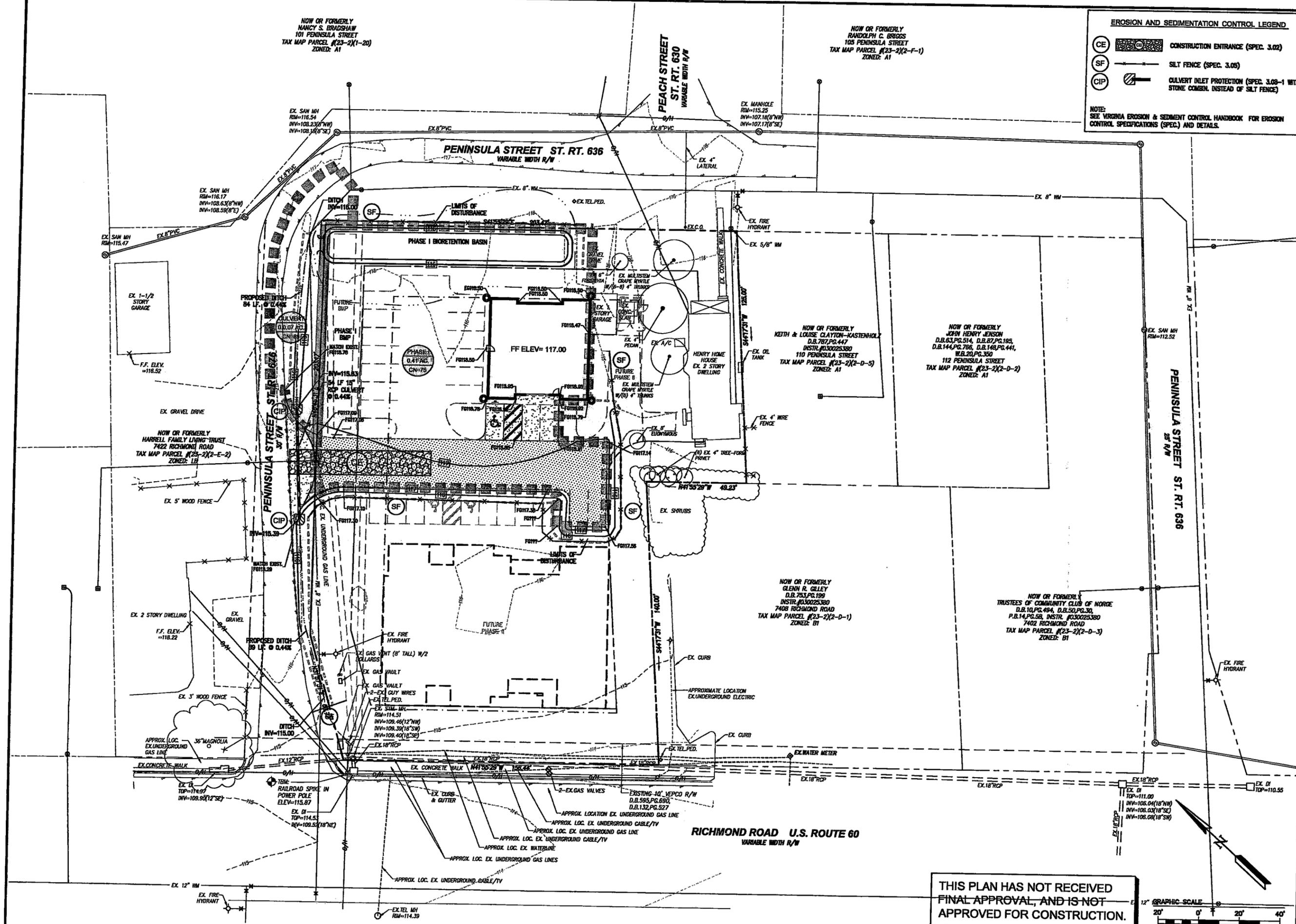


CONSULTING ENGINEERS

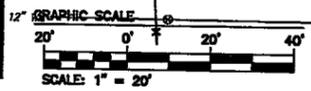
WILLIAMSBURG • RICHMOND • GLOUCESTER • FREDERICKSBURG

DRAINAGE AREA MAP  
**WILLIAMSBURG WICKER EXPANSION**  
PHASE I  
JAMES CITY COUNTY VIRGINIA  
STONEHOUSE DISTRICT

Designed VAB	Drawn BBS
Scale 1"=20'	Date 8/03/08
Project No. 9536	
Drawing No. 01	



**THIS PLAN HAS NOT RECEIVED  
FINAL APPROVAL, AND IS NOT  
APPROVED FOR CONSTRUCTION.**



APPENDIX E  
GEOTECHNICAL ENGINEERING ANALYSIS

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**SUBSURFACE EXPLORATION  
AND GEOTECHNICAL ENGINEERING ANALYSIS**

**WILLIAMSBURG WICKER WAREHOUSE  
BIORETENTION PONDS  
JAMES CITY COUNTY, VIRGINIA**

**for**

**AES Consulting Engineers  
Ms. Victoria A. Bains, P.E.**

**May 19, 2008**

**ECS Project No. 07: 9778**



# **ECS MID-ATLANTIC, LLC**

**Geotechnical • Construction Materials • Environmental • Facilities**

May 19, 2008

Ms. Victoria A. Bains, P.E.  
AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

ECS Project No. 07:9778

Reference: Subsurface Exploration and Geotechnical Engineering Analysis  
Williamsburg Wicker Warehouse Bioretention Ponds  
James City County, Virginia

Dear Ms. Bains:

ECS Mid-Atlantic, LLC has completed a subsurface exploration and engineering evaluation of the above referenced project. This report presents the results of the subsurface exploration and engineering analyses for the proposed bioretention ponds. This portion of the project has been completed in accordance with our proposal No. 07:13947 dated May 1, 2008 and signed by you.

## **Introduction:**

The project site is located near the intersection of Peninsula Street and Richmond Road in James City County, Virginia. We understand that the project will consist of a new two-story warehouse building as well as 1 to 2 bioretention ponds. We have been requested to provide subsurface exploration and geotechnical engineering analysis for the bioretention ponds only. At the time of our site visit the site contained light vegetation and was relatively level. We understand that the rear bioretention ponds will be 3 to 4 feet deep and the majority of both of the ponds will be in cut, and therefore will not require an earth dam.

The purpose of this exploration was to explore the soil and groundwater conditions at the site and to develop soils-related engineering recommendations to guide design and construction of the planned bioretention ponds. Our investigation included drilling three (3) soil borings to explore the subsurface soil and groundwater conditions, performing a site reconnaissance to observe general topography, and analyzing field data to develop appropriate geotechnical engineering recommendations regarding the planned construction. A Boring Location Plan is included in Appendix I.

## **Field Exploration Procedures:**

Three (3) soil test borings were drilled at the proposed pond locations (B-1 through B-3). The soil test borings were performed with an ATV mounted drill rig using continuous flight auger drilling techniques.

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Aberdeen, MD • Baltimore, MD • Chantilly, VA • Charlottesville, VA\* • Frederick, MD • Fredericksburg, VA • Manassas, VA  
Ocean City, MD\* • Richmond, VA • Roanoke, VA • Virginia Beach, VA • Waldorf, VA • Williamsburg, VA • Winchester, VA • York, PA

\*testing services only

Representative soil samples were obtained by means of the split-barrel sampling procedure in accordance with ASTM Specification D-1586. In this procedure, a 2-inch outside diameter split-barrel sampler is driven into the soil a distance of 24 inches by a 140-pound hammer falling 30 inches. After a 6-inch seating interval, the number of blows required to drive the sampler through the next 12-inch interval is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring log. This value can be used as a qualitative indication of the in-place relative density and relative consistency of non-cohesive soils and cohesive soils, respectively. This indication is qualitative, since many factors can significantly affect the standard penetration resistance value and prevent a direct correlation between drill crews, drill rigs, drilling procedures, and hammer-rod-sampler assemblies.

Field logs of the soils encountered in the borings were maintained by the drill crew. After recovery, each sample was removed from the sampler and visually classified. Representative portions of each sample were sealed in glass jars and delivered to our laboratory in Williamsburg, Virginia, for further visual examination and laboratory testing. A laboratory test summary is included in Appendix III

### **Subsurface Conditions:**

Experienced personnel from our office classified each soil sample in accordance with the Unified Soil Classification System (USCS). Select samples from the test borings were subjected to classification testing to confirm our visual classifications. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The geotechnical engineer grouped the various soil types into the major zones noted on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual. A brief explanation of the USCS and a Reference Notes for Boring Log sheet is provided in Appendix IV of this report.

The soil borings indicated that the ground surface was covered with approximately 7.5 to 9 inches of topsoil. Underlying the near surface topsoil, we encountered Stratum I which generally consisted of mixed deposits of very loose to loose density silty and clayey SAND (SM, SC). These soils extended to boring termination depth of 10 ft below ground surface (bgs) at boring locations B-1 and B-2. SPT N-values recorded within this layer ranged from 3 to 7 blows per foot (bpf).

Underlying the Stratum I sands we encountered Stratum II at boring location B-3. Stratum II generally consisted of medium stiff consistency sandy CLAY (CL). These soils extended to boring termination depth of 10 ft below ground surface (bgs). SPT N-value recorded within this layer was 9 bpf.

Groundwater was not encountered at the boring locations. Please note that groundwater levels are influenced by seasonal conditions and by periods of significant precipitation or prolonged drought. If ground water is encountered, we recommend it be pumped from sumps located below the bottom of foundation elevation.

### **Subgrade Preparation and Earthwork Operations:**

The depth of topsoil recorded at the boring locations ranged from 7.5 to 9 inches. Therefore, for project planning purposes, we recommend a 9 inch stripping depth for this site to remove topsoil, or organic laden material. We recommend stripping of any organic or unstable material. The stripping depth should be evaluated at the time of construction by representatives of the Geotechnical Engineer. If additional stripping becomes necessary, suitable methods should be employed to determine additional stripping depths beyond the contract depth (such as elevations determined before and after additional stripping, etc.). If undercuts are recommended and extend into large areas, the undercut volume could be reduced by the use of geotextiles or geogrids. The use of geosynthetic reinforcement should be evaluated by the geotechnical engineer. Cut and fill operations should extend a minimum of 5 feet beyond the project limits.

After stripping or cutting to the desired grade, and prior to fill placement, subgrades should be observed by the Geotechnical Engineer. In an effort to densify any loose surficial subgrade soils, the stripped area should be proofrolled with a smooth drum roller with a minimum of two passes in two perpendicular directions, provided in-situ moisture contents are within  $\pm 3\%$  of optimum in order to facilitate compaction.

Any soft or unsuitable materials encountered, which cannot be stabilized by reworking the soil, should be removed and replaced with an approved structural fill. Undercut volumes should be determined by cross-sectioning the area before and after undercut. We have found that calculating undercut volumes by truck counts is less accurate and generally results in additional expense to the owner. In order to minimize undercutting and issues during earthwork activities, we recommend earthwork operations be performed during the drier times of the year.

We recommend the contract documents include an allowance for undercutting and/or reworking soft near surface soils (if encountered) and replacement with engineered fill. Add/deduct unit prices should also be established so adjustment for the actual volume of undercut can be made.

The sandy near surface soils can be reused for structural fill if the soils are moisture conditioned to within  $\pm 3\%$  of the soils optimum moisture content. On site soils to be re-used as structural fill and all proposed select fill soils should be submitted to the geotechnical engineer for approval prior to their use on the project. We recommend imported engineered fill (select) material consisting of approved inorganic material classified as SM, SM-SP, SP, SC or better containing less than about 40% by weight Silt or Clay and free of debris. This material should be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture conditioned to within  $\pm 3\%$  of the optimum moisture content, and compacted to a minimum of 95% of the maximum dry density obtained in accordance with ASTM D-698, Standard Proctor method. Select fill slopes should be no greater than 3 horizontal to 1 vertical.

**Proposed Bioretention Ponds:**

Based on the provided plan, the borings are located within the 2 proposed Ponds. We understand the 2 pond areas utilize infiltration in their design and are intended to not maintain a permanent pool elevation. We have assumed that the Ponds will be mostly in cut areas, and there will not be a need for an earthen dam. If a dam is proposed, ECS will provide additional recommendations. In the event fill is required, we recommend that any fill material be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture conditioned to within -1% to +3% of the optimum moisture content, and compacted to a minimum 95% of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor method. Slopes should be constructed no greater than 3 horizontal to 1 vertical. Also, the side slopes should be seeded to promote vegetation growth and further add to the stability of the slopes. If a permanent pool elevation must be maintained a liner system may be needed.

**Infiltration**

For the borings within the Pond the following table summarizes estimated infiltration rates based on the USDA textural classification. Two basic soil strata consisting of three soil types were encountered at the boring locations:

- *Soil Type I: Silty Sand (SM)* – Estimated Infiltration rate is 2.41 to 0.52 inches per hour (or greater), Hydrologic Soil Grouping B.
- *Soil Type II: Clayey Sand (SC)* – Estimated Infiltration rate is 0.52 to 0.02 inches per hour, Hydrologic Soil Grouping B to C.
- *Soil Type III: Sandy Clay (CL)* – Estimated Infiltration rate is 0.02 or less inches per hour, Hydrologic Soil Grouping D.

<b>Boring Location</b>	<b>Soil type I depth (feet)</b>	<b>Soil type II Depth (feet)</b>	<b>Soil type III Depth (feet)</b>	<b>Water Table Depth (feet)</b>
B-1	0-10	-	-	-
B-2	0-2;4-10	2-4	-	-
B-3	0-2;4-8	2-4	8-10	-

*Notes: - Not encountered*

Typically, soils with the Hydrologic Soil Group designations of A and B are considered suitable for infiltration purposes. Some soils designated as C type soils are sometimes considered suitable for infiltration practices but these soils would need to be evaluated on a case specific basis. Soils with group designations of D are not considered suitable.

**Construction Considerations:**

The subgrade materials are moisture sensitive, and exposure to the environment may weaken the soils at the bearing level if the excavations remain open for too long a time; therefore, compacted structural fill should be placed the same day that the soils are excavated. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the excavation bottom immediately prior to placement of the next lift.

In a dry and undisturbed state, the soil at the site will provide good subgrade support for fill placement and construction operations; however, when wet, this soil will degrade quickly with disturbance from contractor operations. Good site drainage should be maintained during earthwork operations which would help maintain the integrity of the soil.

We did not encounter groundwater during drilling of the borings. Depending on total pond depth ground water may impact construction. If ground water is encountered, dewatering in shallow trenches may be accomplished by pumping from sumps adjacent to the construction excavations. Depending on the time of the year, well pointing may be required for dewatering. The specifications should, however, alert the contractor to the potential presence of subsurface water, and it should be incumbent on the contractor to provide the means by which to satisfactorily dewater the site.

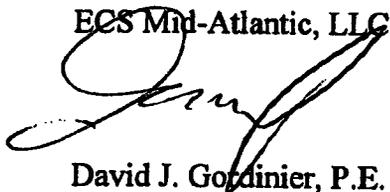
**General Comments:**

This report has been prepared in order to aid in the evaluation of this site and to assist the Contractor, Architect and Engineer in the design and planning of the project. The report scope is limited to the specific project and location described, and the project description represents our understanding of the significant aspects relevant to soil and foundation characteristics.

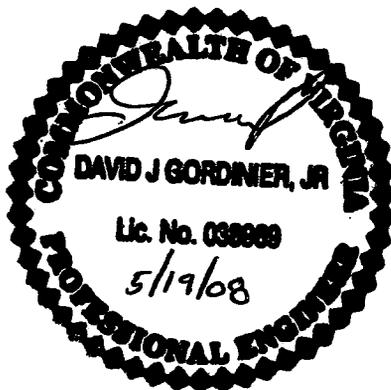
We have appreciated being of service to you during the design phase of this project and look forward to its successful construction. If you should have any questions regarding the information and recommendations contained in this report or if we can be of any further assistance, please contact our office.

Respectfully,

ECS Mid-Atlantic, LLC.



David J. Gordinier, P.E.  
Geotechnical Engineer



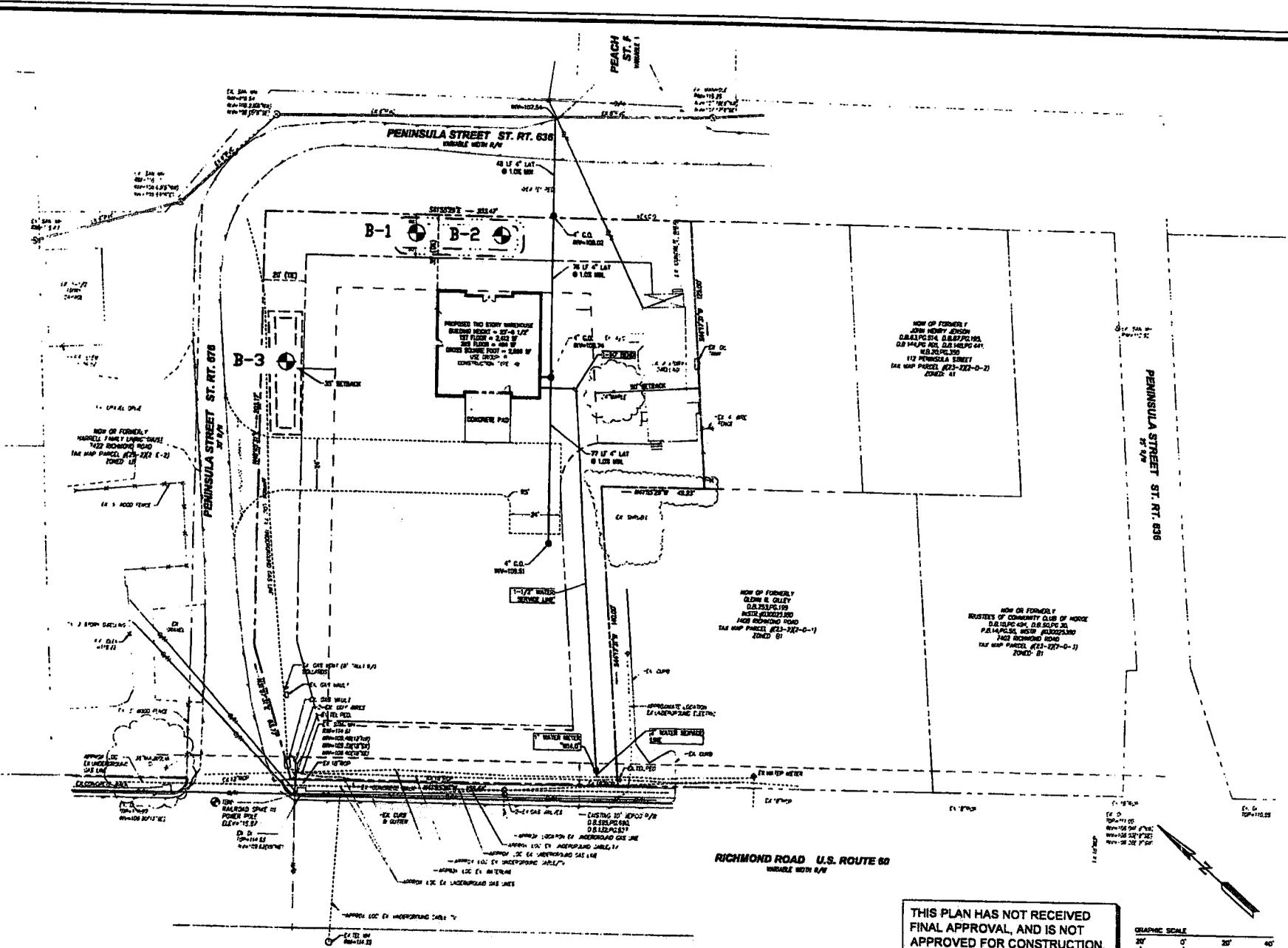
W. Lloyd Ward, P. E.  
Principal Engineer

DJG/WLW

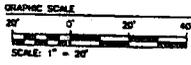
**Appendix:**

- I. **Boring Location Plan (1)**
- II. **Soil Test Boring Logs (2)**
- III. **Laboratory Testing Summary (1)**
- IV. **Unified Soil Classification System and  
Reference Notes for Boring Logs (2)**

**APPENDIX I**  
**BORING LOCATION PLAN**



THIS PLAN HAS NOT RECEIVED  
FINAL APPROVAL, AND IS NOT  
APPROVED FOR CONSTRUCTION.



**LEGEND:**  
 ⊕ - APPROX. BORING LOCATION  
 \* - Base plan provided by AES



ECS Mid-Atlantic  
 108 Ingram Road, Unit 1  
 Williamsburg, Virginia 23188  
 Ph (757) 229-6677 Fax (757) 229-9978

**BORING LOCATION PLAN**  
 Williamsburg Wicker Warehouse  
 Bioretention Pone  
 James City County, Virginia

CHECKED: D.J.G.	SCALE: Visual	DATE: 05/05/08	FIGURE: Fig. 1
DRAWN: J.A.R.		PROJECT NO. 07:9778	

**APPENDIX II**  
**SOIL TEST BORING LOGS**



CLIENT <b>AES Consulting Engineers</b>	JOB # <b>07:9778</b>	BORING # <b>B-2</b>	SHEET <b>1 OF 1</b>
PROJECT NAME <b>Williamsburg Wicker Warehouse Bioretention Pond</b>	ARCHITECT-ENGINEER <b>AES Consulting Engineers</b>		
SITE LOCATION <b>James City County, Virginia</b>			



DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)
0					TOPSOIL DEPTH 8"			
1	1	SS	24	16	Fine to Medium Silty SAND, Trace Organics Sampled as Root Fragments, Tan, Moist, Very Loose, (SM)	LOSS OF CIRCULATION 100%	ELEVATION (FT)	
2	2	SS	24	19				
3	3	SS	24	21	Fine to Medium Clayey SAND, Trace Organics Sampled as Root Fragments, Orange-Brown, Moist, Very Loose, (SC)			
4	4	SS	24	19				
5	5	SS	24	17	Fine to Medium Silty SAND, Orange-Brown to Tan, Moist, Very Loose to Loose, (SM)			
10								
					END OF BORING @ 10.00'			

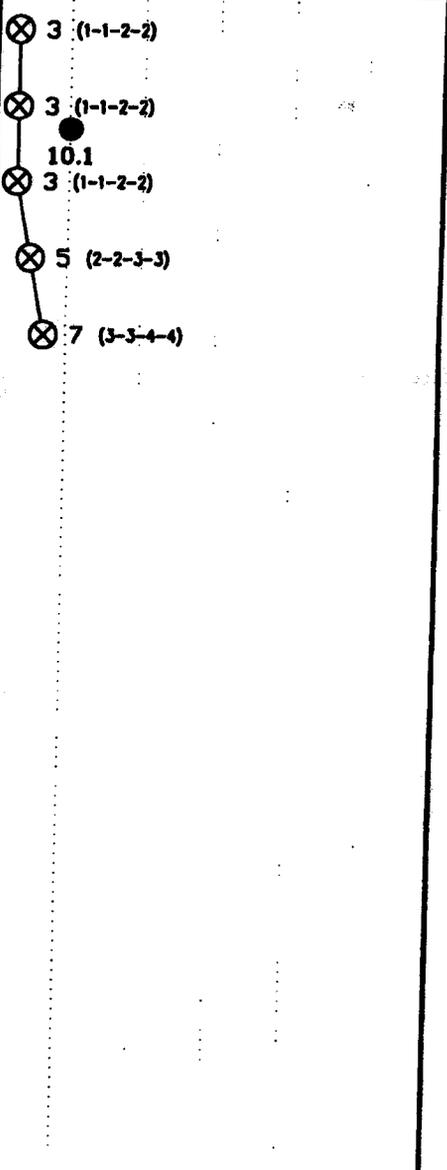
○ CALIBRATED PENETROMETER  
TONS/FT.²

1 2 3 4 5+

PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %  
X ----- ● ----- Δ

ROCK QUALITY DESIGNATION & RECOVERY  
RQD% --- REC.% ---  
20% 40% 60% 80% 100%

⊗ STANDARD PENETRATION  
BLOWS/FT.  
10 20 30 40 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL DRY	WS OR (D)	BORING STARTED	05/08/08
▽ WL (BCR)	▽ WL (ACR)	BORING COMPLETED	05/08/08
▽ WL	RIG ATV	FOREMAN SDS	DRILLING METHOD AUGER

100 (05-10-08) 100 (05-10-08) 100 (05-10-08) 100 (05-10-08) 100 (05-10-08)

SITE LOCATION  
**James City County, Virginia**

○ CALIBRATED PENETROMETER  
TONS/FT.<sup>2</sup>

1	2	3	4	5+
---	---	---	---	----

X-----●-----Δ

PLASTIC LIMIT %      WATER CONTENT %      LIQUID LIMIT %

ROCK QUALITY DESIGNATION & RECOVERY

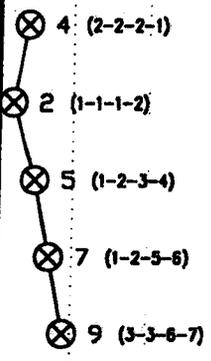
RQD% --- REC.% ---

20% 40% 60% 80% 100%

⊗ STANDARD PENETRATION BLOWS/FT.

10	20	30	40	50+
----	----	----	----	-----

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)
0					SURFACE ELEVATION			
					BOTTOM OF CASING → LOSS OF CIRCULATION 100% →			
0					TOPSOIL DEPTH 7"			
1	1	SS	24	7	Fine to Medium Silty SAND, Trace Organics Sampled as Root Fragments, Brown, Moist, Very Loose, (SM)			
2	2	SS	24	10				
5	3	SS	24	10	Fine to Medium Clayey SAND, Trace Organics Sampled as Root Fragments, Brown, Moist, Very Loose, (SC)			
4	4	SS	24	12				
10	5	SS	24	24	Fine to Medium Silty SAND, Orange-Brown, Moist, Very Loose to Loose, (SM)			
15					Sandy CLAY, Orange-Brown with Red-Brown Mottling, Moist, Medium Stiff, (CL)			
END OF BORING @ 10.00'								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.

∇ WL DRY	WS OR (TD)	BORING STARTED	5/14/08	
∇ WL(BCR)	∇ WL(ACR)	BORING COMPLETED	5/14/08	CAVE IN DEPTH ●
∇ WL		RIG ATV	FOREMAN SDS	DRILLING METHOD AUGER

AES (05-08-07) AES (05-10-07) AES (05-20-07)

**APPENDIX III**  
**LABORATORY TEST SUMMARY**



**APPENDIX IV**  
**UNIFIED SOIL CLASSIFICATION SYSTEM AND**  
**REFERENCE NOTES FOR BORING LOGS**

# Unified Soil Classification System (ASTM D-2487)

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria			
<b>Coarse-grained soils</b> (More than half of material is larger than No. 200 Sieve size)	<b>Gravels</b> (More than half of coarse fraction is larger than No. 4 sieve size)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentage of sand and gravel from grain-size curve Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent GW, GP, SW, SP More than 12 percent GM, GC, SM, SC 5 to 12 percent Border 4 line cases requiring dual symbols <sup>b</sup>	$C_u = D_{60}/D_{10}$ greater than 4 $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3		
		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW		
		GM <sup>a</sup>	d		Silty gravels, gravel-sand mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			u				
	GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits below "A" line or P.I. less than 7				
	<b>Sands</b> (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_u = D_{60}/D_{10}$ greater than 6 $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3	
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM <sup>a</sup>		d	Silty sands, sand-silt mixtures	Atterberg limits above "A" line or P.I. less than 4
	u						
	SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7		Limits plotting in CL-ML zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols		
<b>Fine-grained soils</b> (More than half material is smaller than No. 200 Sieve)	Silt and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	<div style="text-align: center;"> <b>Plasticity Chart</b> </div>			
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays				
		OL	Organic silts and organic silty clays of low plasticity				
	Silt and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
		CH	Inorganic clays of high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity, organic silts				
Pt	Peat and other highly organic soils						

<sup>a</sup> Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

<sup>b</sup> Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder. From Winterkorn and Fang, 1975.

## REFERENCE NOTES FOR BORING LOGS

### I. Drilling and Sampling Symbols:

SS	- Split Spoon Sampler	RB	- Rock Bit Drilling
ST	- Shelby Tube Sampler	BS	- Bulk Sample of Cuttings
RC	- Rock Core; NX, BX, AX	PA	- Power Auger (no sample)
PM	- Pressuremeter	HSA	- Hollow Stem Auger
DC	- Dutch Cone Penetrometer	WS	- Wash Sample

Standard Penetration Test (SPT) resistance refers to the blows per foot (bpf) of a 140 lb hammer falling 30 inches on a 2 in. O.D. split-spoon sampler as specified in ASTM D-1586. The blow count is commonly referred to as the N-value.

### II. Correlation of Penetration Resistances to Soil Properties:

#### Relative Density-Sands, Silts

<u>SPT-N (bpf)</u>	<u>Relative Density</u>
0 - 5	Very Loose
6 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
51+	Very Dense

#### Consistency of Cohesive Soils

<u>SPT-N (bpf)</u>	<u>Consistency</u>	<u>Unconfined Compressive Strength, Op. tsf</u>
0 - 3	Very Soft	Under 0.25
4 - 5	Soft	0.25 - 0.49
6 - 10	Medium Stiff	0.50 - 0.99
11 - 15	Stiff	1.00 - 1.99
16 - 30	Very Stiff	2.00 - 3.99
31 - 50	Hard	4.00 - 8.00
51+	Very Hard	Over 8.00

Weathered Rock (WR) may be defined as SPT-N values exceeding 100 bpf depending on site specific conditions. Refer carefully to boring logs.

Rock Fragments, gravel, cobbles, boulders, or debris may produce N-values that are not representative of actual soil properties.

### III. Unified Soil Classification Symbols:

GP - Poorly Graded Gravel	ML - Low Plasticity Silts
GW - Well Graded Gravel	MH - High Plasticity Silts
GM - Silty Gravel	CL - Low Plasticity Clays
GC - Clayey Gravels	CH - High Plasticity Clays
SP - Poorly Graded Sands	OL - Low Plasticity Organics
SW - Well Graded Sands	OH - High Plasticity Organics
SM - Silty Sands	CL-ML - Dual Classification (Typical)
SC - Clayey Sands	

### IV. Water Level Measurement Symbols:

WL - Water Level	BCR - Before Casing Removal
WS - While Sampling	ACR - After Casing Removal
WD - While Drilling	WCI - Wet Cave In
	DCI - Dry Cave In

The water levels are those water levels actually measured in the bore hole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in a granular soil. In clays and plastic silts, the accurate determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally required.

APPENDIX F  
GEOTECHNICAL ADDENDUM I



# **ECS MID-ATLANTIC, LLC**

**Geotechnical • Construction Materials • Environmental • Facilities**

July 25, 2008

Ms. Victoria A. Bains, P.E.  
AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

ECS Project No. 07:9778

Reference: Addendum I – Infiltration Testing  
Williamsburg Wicker Warehouse Bioretention Ponds  
James City County, Virginia

Dear Ms. Bains:

ECS Mid-Atlantic, LLC has completed a subsurface exploration and engineering evaluation of the above referenced project. This report presents the results of the subsurface exploration and engineering analyses for the proposed bioretention ponds. This portion of the project has been completed in accordance with our proposal No. 07:13947 dated May 1, 2008 and signed by you. Since the issuance of our original report James City County has required that infiltration testing be performed for the site. This addendum is for that purpose. We understand that the pond will be approximately 3 feet deep at the lowest point and will utilize infiltration in its design.

## **Infiltration**

We performed 2 infiltration tests at opposite sides of the proposed bioretention pond corresponding to locations B-1 and B-2 (see geotechnical report) at depths of 42 and 48 inches, respectively. The in-situ Field Permeability Rates were established utilizing the a constant-head device which provides a method for determining field saturated hydraulic conductivity. We observed infiltration rates ranging from 3.8 in/hr to 8.4 in/hr. During this investigation we did not encounter any lower permeability soils within the hand auger excavations. However, these soils may still be encountered at different locations across the site. If they are encountered we recommend they be removed and replaced with materials that contain less than 30 percent fines.

## **General Comments:**

This letter has been prepared in order to aid in the evaluation of this site and to assist the Contractor, Architect and Engineer in the design and planning of the project. The report scope is limited to the specific project and location described, and the project description represents our understanding of the significant aspects relevant to soil and foundation characteristics.

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\*testing services only

We have appreciated being of service to you during the design phase of this project and look forward to its successful construction. If you should have any questions regarding the information and recommendations contained in this report or if we can be of any further assistance, please contact our office.

Respectfully,

ECS MID-ATLANTIC, LLC.

*Kelleher for*

David J. Gordinier, P.E.  
Geotechnical Engineer



*[Signature]*  
Michael J. Galli, P.E.  
Principal Engineer

APPENDIX G  
FUTURE WQV AND DRAINAGE AREA MAP

**Phase II (Future) BMP Water Quality Volumes**

Elev.	Countour Area (in s.f.)	Storage (Between contours)	Cumulative Storage Volume
116	Area = 5055 s.f.		Cumulative Storage = 84.2 c.y.
		Storage = 0 c.f.= 0.0 c.y.	
116	Area = 5055 s.f.		Cumulative Storage = 84.2 c.y.
		Storage = 0 c.f.= 0.0 c.y.	
116	Area = 5055 s.f.		Cumulative Storage = 84.2 c.y.
		Storage = 0 c.f.= 0.0 c.y.	
116	Area = 5055 s.f.		Cumulative Storage = 84.2 c.y.
		Storage = 2275 c.f.= 84.2 c.y.	
115.5	Area = 4043 s.f.		Cumulative Storage = 0.0 c.y.
		Storage = 0 c.f.= 0.0 c.y.	

Water Quality Volume = 1" per acre of Impervious

Impervious Area = 0.58 acre

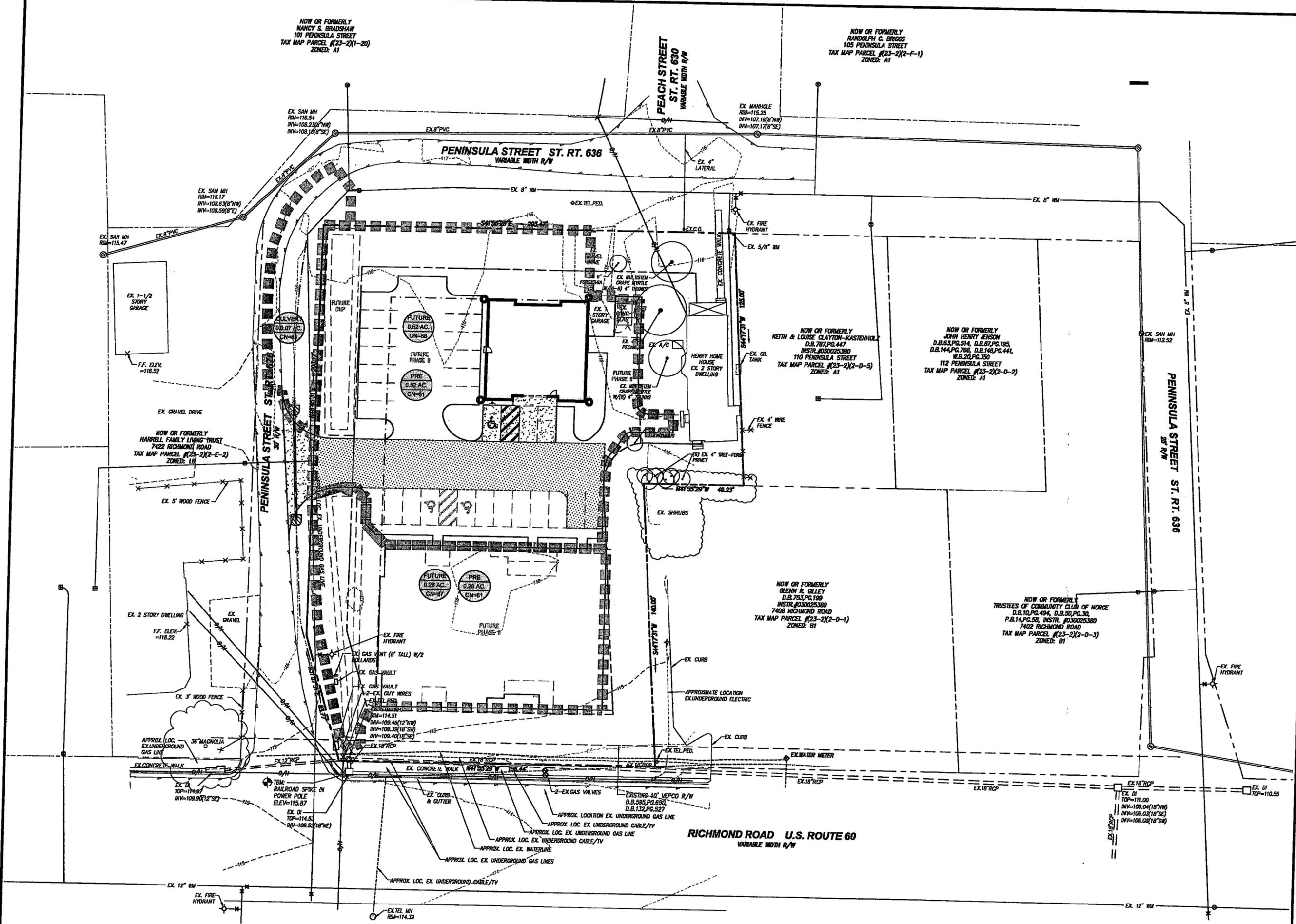
Wet WQV = 1053 c.f.

Wet Volume Required = 2106 c.f. = 78 c.y.

Wet WQV Volume Provided = 84.2 c.y. At Elevation 116.00

Wet WQV Volume Provided = 2275 c.f.

Adequate Water Quality Volume is provided in BMP



NOW OR FORMERLY  
NANCY S. BRADSHAW  
101 PENINSULA STREET  
TAX MAP PARCEL #23-2(1-20)  
ZONED: A1

NOW OR FORMERLY  
RANDOLPH C. BRIGGS  
105 PENINSULA STREET  
TAX MAP PARCEL #23-2(2-F-1)  
ZONED: A1

NOW OR FORMERLY  
KETH & LOUISE CLAYTON-KASTENHOLZ  
D.B. 787, PG. 447  
INSTR. #030025380  
110 PENINSULA STREET  
TAX MAP PARCEL #23-2(2-D-5)  
ZONED: A1

NOW OR FORMERLY  
JOHN HENRY JENSON  
D.B. 63, PG. 514, D.B. 67, PG. 195,  
D.B. 144, PG. 786, D.B. 148, PG. 441,  
W.B. 20, PG. 350  
112 PENINSULA STREET  
TAX MAP PARCEL #23-2(2-D-2)  
ZONED: A1

NOW OR FORMERLY  
GLENN R. GILLEY  
D.B. 753, PG. 199  
INSTR. #030025380  
7408 RICHMOND ROAD  
TAX MAP PARCEL #23-2(2-D-1)  
ZONED: B1

NOW OR FORMERLY  
TRUSTEES OF COMMUNITY CLUB OF HORSE  
D.B. 10, PG. 494, D.B. 50, PG. 30  
P.B. 14, PG. 58, INSTR. #030025380  
7402 RICHMOND ROAD  
TAX MAP PARCEL #23-2(2-D-3)  
ZONED: B1

REVISED BY	DATE	REVISION / COMMENT / NOTE
WAS	10/27/08	REVISED PER COUNTY COMMENTS
BBS	9/8/08	REVISED PER COUNTY COMMENTS



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CONSULTING ENGINEERS  
WILLIAMSBURG • RICHMOND • GLOUCESTER • FREDERICKSBURG

DRAINAGE AREA MAP  
WILLIAMSBURG WICKER EXPANSION  
PHASE I  
JAMES CITY COUNTY  
VIRGINIA

Designed WAS	Drawn BBS
Scale 1"=20'	Date 8/03/08
Project No. 9558	
Drawing No. 01	



**SUBSURFACE EXPLORATION  
AND GEOTECHNICAL ENGINEERING ANALYSIS**

**WILLIAMSBURG WICKER WAREHOUSE  
BIORETENTION PONDS  
JAMES CITY COUNTY, VIRGINIA**

**for**

**AES Consulting Engineers  
Ms. Victoria A. Bains, P.E.**

**May 19, 2008**

**ECS Project No. 07: 9778**



## **ECS MID-ATLANTIC, LLC**

**Geotechnical • Construction Materials • Environmental • Facilities**

May 19, 2008

Ms. Victoria A. Bains, P.E.  
AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

ECS Project No. 07:9778

**Reference: Subsurface Exploration and Geotechnical Engineering Analysis  
Williamsburg Wicker Warehouse Bioretention Ponds  
James City County, Virginia**

Dear Ms. Bains:

ECS Mid-Atlantic, LLC has completed a subsurface exploration and engineering evaluation of the above referenced project. This report presents the results of the subsurface exploration and engineering analyses for the proposed bioretention ponds. This portion of the project has been completed in accordance with our proposal No. 07:13947 dated May 1, 2008 and signed by you.

### **Introduction:**

The project site is located near the intersection of Peninsula Street and Richmond Road in James City County, Virginia. We understand that the project will consist of a new two-story warehouse building as well as 1 to 2 bioretention ponds. We have been requested to provide subsurface exploration and geotechnical engineering analysis for the bioretention ponds only. At the time of our site visit the site contained light vegetation and was relatively level. We understand that the rear bioretention ponds will be 3 to 4 feet deep and the majority of both of the ponds will be in cut, and therefore will not require an earth dam.

The purpose of this exploration was to explore the soil and groundwater conditions at the site and to develop soils-related engineering recommendations to guide design and construction of the planned bioretention ponds. Our investigation included drilling three (3) soil borings to explore the subsurface soil and groundwater conditions, performing a site reconnaissance to observe general topography, and analyzing field data to develop appropriate geotechnical engineering recommendations regarding the planned construction. A Boring Location Plan is included in Appendix I.

### **Field Exploration Procedures:**

Three (3) soil test borings were drilled at the proposed pond locations (B-1 through B-3). The soil test borings were performed with an ATV mounted drill rig using continuous flight auger drilling techniques.

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Representative soil samples were obtained by means of the split-barrel sampling procedure in accordance with ASTM Specification D-1586. In this procedure, a 2-inch outside diameter split-barrel sampler is driven into the soil a distance of 24 inches by a 140-pound hammer falling 30 inches. After a 6-inch seating interval, the number of blows required to drive the sampler through the next 12-inch interval is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring log. This value can be used as a qualitative indication of the in-place relative density and relative consistency of non-cohesive soils and cohesive soils, respectively. This indication is qualitative, since many factors can significantly affect the standard penetration resistance value and prevent a direct correlation between drill crews, drill rigs, drilling procedures, and hammer-rod-sampler assemblies.

Field logs of the soils encountered in the borings were maintained by the drill crew. After recovery, each sample was removed from the sampler and visually classified. Representative portions of each sample were sealed in glass jars and delivered to our laboratory in Williamsburg, Virginia, for further visual examination and laboratory testing. A laboratory test summary is included in Appendix III

#### **Subsurface Conditions:**

Experienced personnel from our office classified each soil sample in accordance with the Unified Soil Classification System (USCS). Select samples from the test borings were subjected to classification testing to confirm our visual classifications. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The geotechnical engineer grouped the various soil types into the major zones noted on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual. A brief explanation of the USCS and a Reference Notes for Boring Log sheet is provided in Appendix IV of this report.

The soil borings indicated that the ground surface was covered with approximately 7.5 to 9 inches of topsoil. Underlying the near surface topsoil, we encountered Stratum I which generally consisted of mixed deposits of very loose to loose density silty and clayey SAND (SM, SC). These soils extended to boring termination depth of 10 ft below ground surface (bgs) at boring locations B-1 and B-2. SPT N-values recorded within this layer ranged from 3 to 7 blows per foot (bpf).

Underlying the Stratum I sands we encountered Stratum II at boring location B-3. Stratum II generally consisted of medium stiff consistency sandy CLAY (CL). These soils extended to boring termination depth of 10 ft below ground surface (bgs). SPT N-value recorded within this layer was 9 bpf.

Groundwater was not encountered at the boring locations. Please note that groundwater levels are influenced by seasonal conditions and by periods of significant precipitation or prolonged drought. If ground water is encountered, we recommend it be pumped from sumps located below the bottom of foundation elevation.

### **Subgrade Preparation and Earthwork Operations:**

The depth of topsoil recorded at the boring locations ranged from 7.5 to 9 inches. Therefore, for project planning purposes, we recommend a 9 inch stripping depth for this site to remove topsoil, or organic laden material. We recommend stripping of any organic or unstable material. The stripping depth should be evaluated at the time of construction by representatives of the Geotechnical Engineer. If additional stripping becomes necessary, suitable methods should be employed to determine additional stripping depths beyond the contract depth (such as elevations determined before and after additional stripping, etc.). If undercuts are recommended and extend into large areas, the undercut volume could be reduced by the use of geotextiles or geogrids. The use of geosynthetic reinforcement should be evaluated by the geotechnical engineer. Cut and fill operations should extend a minimum of 5 feet beyond the project limits.

After stripping or cutting to the desired grade, and prior to fill placement, subgrades should be observed by the Geotechnical Engineer. In an effort to densify any loose surficial subgrade soils, the stripped area should be proofrolled with a smooth drum roller with a minimum of two passes in two perpendicular directions, provided in-situ moisture contents are within  $\pm 3\%$  of optimum in order to facilitate compaction.

Any soft or unsuitable materials encountered, which cannot be stabilized by reworking the soil, should be removed and replaced with an approved structural fill. Undercut volumes should be determined by cross-sectioning the area before and after undercut. We have found that calculating undercut volumes by truck counts is less accurate and generally results in additional expense to the owner. In order to minimize undercutting and issues during earthwork activities, we recommend earthwork operations be performed during the drier times of the year.

We recommend the contract documents include an allowance for undercutting and/or reworking soft near surface soils (if encountered) and replacement with engineered fill. Add/deduct unit prices should also be established so adjustment for the actual volume of undercut can be made.

The sandy near surface soils can be reused for structural fill if the soils are moisture conditioned to within  $\pm 3\%$  of the soils optimum moisture content. On site soils to be re-used as structural fill and all proposed select fill soils should be submitted to the geotechnical engineer for approval prior to their use on the project. We recommend imported engineered fill (select) material consisting of approved inorganic material classified as SM, SM-SP, SP, SC or better containing less than about 40% by weight Silt or Clay and free of debris. This material should be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture conditioned to within  $\pm 3\%$  of the optimum moisture content, and compacted to a minimum of 95% of the maximum dry density obtained in accordance with ASTM D-698, Standard Proctor method. Select fill slopes should be no greater than 3 horizontal to 1 vertical.

**Proposed Bioretention Ponds:**

Based on the provided plan, the borings are located within the 2 proposed Ponds. We understand the 2 pond areas utilize infiltration in their design and are intended to not maintain a permanent pool elevation. We have assumed that the Ponds will be mostly in cut areas, and there will not be a need for an earthen dam. If a dam is proposed, ECS will provide additional recommendations. In the event fill is required, we recommend that any fill material be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture conditioned to within -1% to +3% of the optimum moisture content, and compacted to a minimum 95% of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor method. Slopes should be constructed no greater than 3 horizontal to 1 vertical. Also, the side slopes should be seeded to promote vegetation growth and further add to the stability of the slopes. If a permanent pool elevation must be maintained a liner system may be needed.

**Infiltration**

For the borings within the Pond the following table summarizes estimated infiltration rates based on the USDA textural classification. Two basic soil strata consisting of three soil types were encountered at the boring locations:

- *Soil Type I: Silty Sand (SM)* – Estimated Infiltration rate is 2.41 to 0.52 inches per hour (or greater), Hydrologic Soil Grouping B.
- *Soil Type II: Clayey Sand (SC)* – Estimated Infiltration rate is 0.52 to 0.02 inches per hour, Hydrologic Soil Grouping B to C.
- *Soil Type III: Sandy Clay (CL)* – Estimated Infiltration rate is 0.02 or less inches per hour, Hydrologic Soil Grouping D.

Boring Location	Soil type I depth (feet)	Soil type II Depth (feet)	Soil type III Depth (feet)	Water Table Depth (feet)
B-1	0-10	-	-	-
B-2	0-2;4-10	2-4	-	-
B-3	0-2;4-8	2-4	8-10	-

Notes: - Not encountered

Typically, soils with the Hydrologic Soil Group designations of A and B are considered suitable for infiltration purposes. Some soils designated as C type soils are sometimes considered suitable for infiltration practices but these soils would need to be evaluated on a case specific basis. Soils with group designations of D are not considered suitable.

# **POOR QUALITY**

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AVAILABLE**

***VCE  
DOCUMENT  
CONVERSION***

**Construction Considerations:**

The subgrade materials are moisture sensitive, and exposure to the environment may weaken the soils at the bearing level if the excavations remain open for too long a time; therefore, compacted structural fill should be placed the same day that the soils are excavated. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the excavation bottom immediately prior to placement of the next lift.

In a dry and undisturbed state, the soil at the site will provide good subgrade support for fill placement and construction operations; however, when wet, this soil will degrade quickly with disturbance from contractor operations. Good site drainage should be maintained during earthwork operations which would help maintain the integrity of the soil.

We did not encounter groundwater during drilling of the borings. Depending on total pond depth ground water may impact construction. If ground water is encountered, dewatering in shallow trenches may be accomplished by pumping from sumps adjacent to the construction excavations. Depending on the time of the year, well pointing may be required for dewatering. The specifications should, however, alert the contractor to the potential presence of subsurface water, and it should be incumbent on the contractor to provide the means by which to satisfactorily dewater the site.

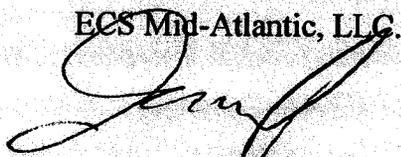
**General Comments:**

This report has been prepared in order to aid in the evaluation of this site and to assist the Contractor, Architect and Engineer in the design and planning of the project. The report scope is limited to the specific project and location described, and the project description represents our understanding of the significant aspects relevant to soil and foundation characteristics.

We have appreciated being of service to you during the design phase of this project and look forward to its successful construction. If you should have any questions regarding the information and recommendations contained in this report or if we can be of any further assistance, please contact our office.

Respectfully,

ECS Mid-Atlantic, LLC.

  
David J. Gordinier, P.E.  
Geotechnical Engineer



  
W. Lloyd Ward, P. E.  
Principal Engineer

DJG/WLW

**Appendix:**

- I. Boring Location Plan (1)
- II. Soil Test Boring Logs (2)
- III. Laboratory Testing Summary (1)
- IV. Unified Soil Classification System and  
Reference Notes for Boring Logs (2)

**APPENDIX I**  
**BORING LOCATION PLAN**



**APPENDIX II**  
**SOIL TEST BORING LOGS**

CLIENT <b>AES Consulting Engineers</b>	JOB # <b>07:9778</b>	BORING # <b>B-1</b>	SHEET <b>1 OF 1</b>	<b>ECS LLC</b> MID-ATLANTIC
PROJECT NAME <b>Williamsburg Wicker Warehouse Bioretention Pond</b>	ARCHITECT-ENGINEER <b>AES Consulting Engineers</b>			

SITE LOCATION  
**James City County, Virginia**

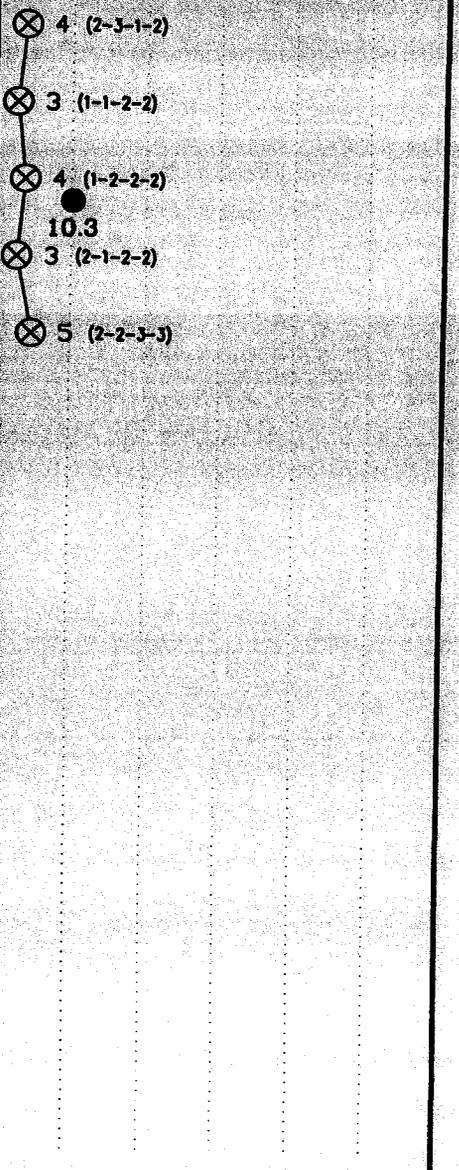
○ CALIBRATED PENETROMETER TONS/FT.<sup>2</sup>  
1 2 3 4 5+

PLASTIC LIMIT % X      WATER CONTENT % ●      LIQUID LIMIT % Δ

ROCK QUALITY DESIGNATION & RECOVERY  
ROQ% — — — REC.%  
20% — 40% — 60% — 80% — 100%

⊗ STANDARD PENETRATION BLOWS/FT.  
10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS
0					BOTTOM OF CASING	LOSS OF CIRCULATION 100%	
					SURFACE ELEVATION		
0	1	SS	24	20	TOPSOIL DEPTH 9"		
	2	SS	24	16	Fine to Medium Silty SAND, Trace Organics Sampled as Root Fragments, Brown, Moist, Very Loose, (SM)		
5	3	SS	24	21	Fine to Medium Clayey SAND, Trace Organics Sampled as Root Fragments, Brown, Moist, Very Loose, (SC)		
	4	SS	24	14			
	5	SS	24	24	Fine to Medium Silty SAND, Orange-Brown to Tan, Moist, Very Loose, (SM)		
10					END OF BORING @ 10.00'		



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

▽WL DRY	WS OR (D)	BORING STARTED	05/08/08	
▽WL(BCR)	▽WL(ACR)	BORING COMPLETED	05/08/08	CAVE IN DEPTH ●
▽WL		RIG ATV	FOREMAN SDS	DRILLING METHOD AUGER

JAR (05-09-08) JAR (05-16-08) JAR (05-20-08)





**APPENDIX III**

**LABORATORY TEST SUMMARY**



**APPENDIX IV**

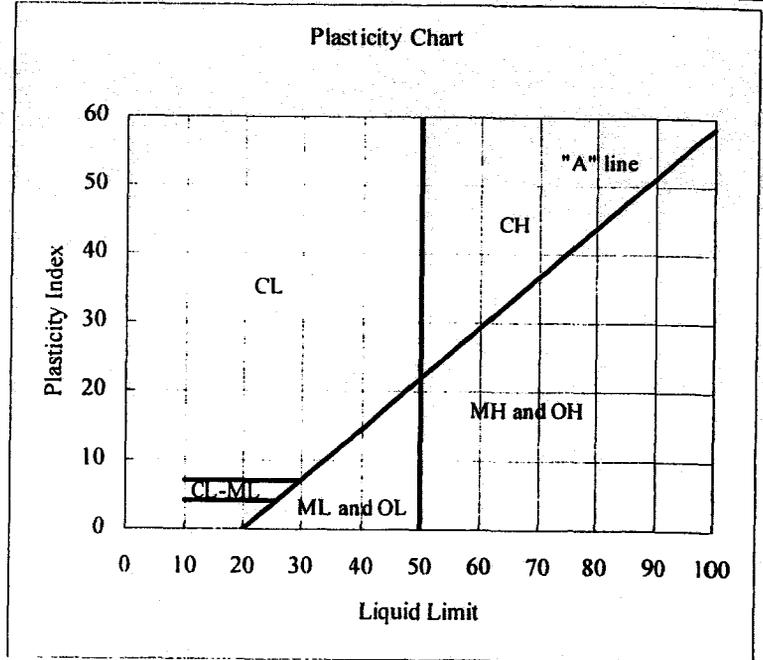
**UNIFIED SOIL CLASSIFICATION SYSTEM AND  
REFERENCE NOTES FOR BORING LOGS**

# Unified Soil Classification System (ASTM D-2487)

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria		
<b>Coarse-grained soils</b> (More than half of material is larger than No. 200 Sieve size)	<b>Gravels</b> (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = D_{60}/D_{10}$ greater than 4 $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3  Not meeting all gradation requirements for GW  Atterberg limits below "A" line or P.I. less than 4  Atterberg limits below "A" line or P.I. less than 7  $C_u = D_{60}/D_{10}$ greater than 6 $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3  Not meeting all gradation requirements for SW  Atterberg limits above "A" line or P.I. less than 4  Limits plotting in CL-ML zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols  Atterberg limits above "A" line with P.I. greater than 7	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (Appreciable amount of fines)	GM <sup>a</sup>	d		Silty gravels, gravel-sand mixtures
				u		
		GC	Clayey gravels, gravel-sand-clay mixtures			
		Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		
	SP		Poorly graded sands, gravelly sands, little or no fines			
	Sands with fines (Appreciable amount of fines)		SM <sup>a</sup>	d	Silty sands, sand-silt mixtures	
				u		
	SC	Clayey sands, sand-clay mixtures				

Determine percentage of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:  
 Less than 5 percent GW, GP, SW, SP  
 More than 5 percent GM, GC, SM, SC  
 5 to 12 percent Border 4 line cases requiring dual symbols<sup>b</sup>

<b>Fine-grained soils</b> (More than half material is smaller than No. 200 Sieve)	Silts and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays
		OL	Organic silts and organic silty clays of low plasticity
	Silts and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
	Highly Organic soils	Pt	Peat and other highly organic soils



<sup>a</sup> Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.  
<sup>b</sup> Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.  
 From Winterkorn and Fang, 1975.

## REFERENCE NOTES FOR BORING LOGS

### I. Drilling and Sampling Symbols:

SS	- Split Spoon Sampler	RB	- Rock Bit Drilling
ST	- Shelby Tube Sampler	BS	- Bulk Sample of Cuttings
RC	- Rock Core; NX, BX, AX	PA	- Power Auger (no sample)
PM	- Pressuremeter	HSA	- Hollow Stem Auger
DC	- Dutch Cone Penetrometer	WS	- Wash Sample

Standard Penetration Test (SPT) resistance refers to the blows per foot (bpf) of a 140 lb hammer falling 30 inches on a 2 in. O.D. split-spoon sampler as specified in ASTM D-1586. The blow count is commonly referred to as the N-value.

### II. Correlation of Penetration Resistances to Soil Properties:

<u>Relative Density-Sands, Silts</u>		<u>Consistency of Cohesive Soils</u>		
<u>SPT-N (bpf)</u>	<u>Relative Density</u>	<u>SPT-N (bpf)</u>	<u>Consistency</u>	<u>Unconfined Compressive Strength, <math>q_p</math>, tsf</u>
0 - 5	Very Loose	0 - 3	Very Soft	Under 0.25
6 - 10	Loose	4 - 5	Soft	0.25 - 0.49
11 - 30	Medium Dense	6 - 10	Medium Stiff	0.50 - 0.99
31 - 50	Dense	11 - 15	Stiff	1.00 - 1.99
51+	Very Dense	16 - 30	Very Stiff	2.00 - 3.99
		31 - 50	Hard	4.00 - 8.00
		51+	Very Hard	Over 8.00

Weathered Rock (WR) may be defined as SPT-N values exceeding 100 bpf depending on site specific conditions. Refer carefully to boring logs.

Rock Fragments, gravel, cobbles, boulders, or debris may produce N-values that are not representative of actual soil properties.

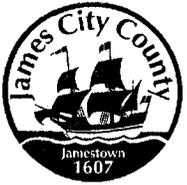
### III. Unified Soil Classification Symbols:

GP - Poorly Graded Gravel	ML - Low Plasticity Silts
GW - Well Graded Gravel	MH - High Plasticity Silts
GM - Silty Gravel	CL - Low Plasticity Clays
GC - Clayey Gravels	CH - High Plasticity Clays
SP - Poorly Graded Sands	OL - Low Plasticity Organics
SW - Well Graded Sands	OH - High Plasticity Organics
SM - Silty Sands	CL-ML - Dual Classification (Typical)
SC - Clayey Sands	

### IV. Water Level Measurement Symbols:

WL - Water Level	BCR - Before Casing Removal
WS - While Sampling	ACR - After Casing Removal
WD - While Drilling	WCI - Wet Cave In
	DCI - Dry Cave In

The water levels are those water levels actually measured in the bore hole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in a granular soil. In clays and plastic silts, the accurate determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally required.



**James City County Environmental Division  
Stormwater Management / BMP Inspection Report  
Bioretention Facilities**

County BMP ID Code (if known): YLO58  
 Name of Facility: Williamsburg Wicker BMP No.: 1 Date: 5/11/10  
 Location: 7414 Richmond Rd.  
 Name of Owner: Oscar Harrell  
 Name of Inspector: Tina Creech  
 Type of Facility: Bio-Retention  
 Weather Conditions: \_\_\_\_\_ Type:  Final Inspection  County BMP Inspection Program  Owner Inspection

If an inspection item is not applicable, mark NA, otherwise mark the appropriate column.

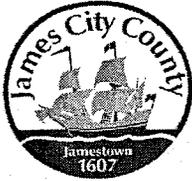
- O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory. No action required.
- Routine - The item checked requires attention, but does not present an immediate threat to the function/integrity of the BMP.
- Urgent - The item checked requires immediate attention to keep the BMP operational and prevent damage to the facility.

Provide an explanation and details in the comment column, if routine or urgent are marked.

Facility Item	O.K.	Routine	Urgent	Comments
<b>Accessibility:</b>				
Roads	✓			
Parking Areas	✓			
Gates	N/A			
Locks	N/A			
Safety Fencing	N/A			
<b>Observation Wells/Areas:</b>				
Trap Doors	N/A			
Manhole Covers	N/A			
Grates	N/A			
Steps	N/A			
<b>Pretreatment Devices:</b> <input type="checkbox"/> Inlet <input type="checkbox"/> Sump <input type="checkbox"/> Forebay <input checked="" type="checkbox"/> Other <u>6.5' weir</u>				
Sediment	✓			
Trash & Debris	✓			
Structure	✓			
Other				
<b>Inflow Structure (Describe Type/Location):</b>				

Facility Item	O.K.	Routine	Urgent	Comments
Condition	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Aesthetics		✓		minor stabilization issue
Other				
<b>Primary Infiltration (Bioretention Cell) Area:</b>				
Specialty Landscaping	✓			
Mulch Layer	✓			
Planting Soil/Sand	✓			
Subgrade Soil	✓			
Aggregate	✓			
Underdrain	✓			
Sediment	✓			
Aesthetics		✓		utility disturbance may need to be re-seeded.
<b>Overflow or Bypass Control Structure (Describe Type/Location):</b>				
Condition				
Erosion				
Trash & Debris				
Sediment				
Other				
<b>Outlet Structure (Describe Type/Location):</b>				
Condition				
Erosion				
Trash & Debris				
Sediment				
Other				
<b>Contributing Drainage Area/Perimeter Conditions:</b>				
Land Use	✓			Commercial / Warehouse
Stabilization		✓		utility area
Trash & Debris	✓			
Pollutant Hazard	✓			
Other				





BMP Number: YC058

Project Name: Williamsburg Wicker PH 1  
 Location: 7422 Richmond Road  
 Project Number: SP-074-08  
 Date of Inspection: 7/28/09 (Precon)  
 Inspector(s): Tina Creech  
 Date: 7/28/09  
 Time: 1:00 PM

**Infiltration and Filtering Practice Construction Inspection Checklist**

Development Status (Active, Inactive, Complete):

Active

Stage of Construction (Pre-Construction, Installation, etc):

Pre-construction

Key Questions		X	Comments
1. Type of facility (check all that apply)			
a. Infiltration - C1, C2, C3 or C4			
b. Filtration - D2, D3, D4, D5, or D6			
c. Bioretention - D1	X		
d. Extended detention (storage for Cpv)			
2. Facility Location			
a. Surface	X		
b. Underground			
3. Filtration Media			
a. No filtration media (e.g. dry well)			
b. Sand			
c. Bioretention soil	X		
d. Peat			
e. Other			
4. Hydraulic configuration			
a. On-line facility	X		
b. Off-line facility			
5. Type of pretreatment facility			Pretreatment must be provided
a. Sediment forebay (above ground)			
b. Sedimentation chamber			
c. Grass channel			
d. Grass filter strip	X		
e. Plunge pool			
f. Stone diaphragm			
g. Other			Type:

A. Pre-Construction				
S = Satisfactory U = Unsatisfactory N/A = Not Applicable				
Item	S	U	N/A	Comments
1. Pre-construction meeting	/			
a. Review of facility details, testing reqts and sequence of construction	/			
b. Review of required inspections, geo-tech reports, checklists & certificates	/			

**B. Site Preparation** *Must install safety fence (delineate area)*  
 S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. If infiltration practice, facility is not used for sediment control during construction	✓			
2. Stormwater runoff diverted around facility	✓			
3. Tree save and non-compaction areas	✓			
4. Facility location staked out and cleared	✓			

**C. Excavation/Grading** *once site is stabilized*  
 S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. Excavation and grading conform to plans	✓			BENCHMARK INSPECTION 3/18 & 3/19/10
a. Location, size and depth of facility are correct	✓			
2. If infiltration practice, underlying soils not compacted during excavation	✓			minor bobcat tracks (used for final grading operations) one south side of area.
3. Embankment/berm constructed according to plan			✓	
a. Suitable fill material used for construction of embankment/berm			✓	
b. Compaction completed in accordance with approved plans and specifications			✓	
c. Embankment/berm elevations, slopes and top widths are correct			✓	

**D. Installation**  
 S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. If off-line facility, flow diversion structure installed according to plans			✓	
2. Pretreatment facility installed according to approved plans	✓			
3. Inlet(s) and inlet protection installed	✓			
4. Structural components (e.g. foundation, walls) installed according to plans			✓	
5. Underground chambers or pipes installed correctly with bedding if required	✓			BENCHMARK INSPECTION
6. Liner installed correctly, if applicable			✓	BENCHMARK INSPECTION
7. Filter bed composition, depth and installation conforms to approved plans and	✓			BENCHMARK INSPECTION
8. Riser/outlet structure installed correctly			✓	
a. Location, dimensions and type of riser are correct				
b. Riser equipped with removable trash rack or maintenance access				
c. Location, dimensions and type of low flow orifice are correct				
d. Low flow orifice installed correctly and adequately protected from clogging				

e. If a filtration system, underdrain system installed correctly	<input checked="" type="checkbox"/>			
8. Emergency overflow structure/spillway installed according to plans	<input checked="" type="checkbox"/>			

E. Vegetation				
S = Satisfactory U = Unsatisfactory N/A = Not Applicable				
Item	S	U	N/A	Comments
1. Vegetation complies with approved planting plan and specifications	<input checked="" type="checkbox"/>			Verbal committed from Oscar Harrell to stabilize remaining bare area - 5/25/10 Scott

F. Final Inspection				
S = Satisfactory U = Unsatisfactory N/A = Not Applicable				
Item	S	U	N/A	Comments
1. Contributing drainage area stabilized	<input checked="" type="checkbox"/>			utility Area disturbance (re-seed)
2. If off-line facility, flow diversion installed and operational				
3. Pretreatment facility installed and operational	<input checked="" type="checkbox"/>			6.5' weir
4. Inlet(s) installed and operational				
5. Configuration, size and depth of bioretention facility conforms with approved plans	<input checked="" type="checkbox"/>			
7. Vegetation established	<input checked="" type="checkbox"/>			
8. Riser/Outlet Structure installed and operational			<input checked="" type="checkbox"/>	
9. Emergency overflow structure/spillway installed and operational			<input checked="" type="checkbox"/>	
10. Maintenance access routes provided			<input checked="" type="checkbox"/>	
11. Observation Ports Installed			<input checked="" type="checkbox"/>	
12. Flow diversions removed; runoff reaches facility			<input checked="" type="checkbox"/>	

G. Permit Approval and Documentation				
S = Satisfactory U = Unsatisfactory N/A = Not Applicable				
Item	S	U	N/A	Comments
1. Construction certification submitted	<input checked="" type="checkbox"/>			
2. As-built plans submitted and approved	<input checked="" type="checkbox"/>			
3. Performance bond status				
a. Not released				
b. Partial release				
c. Full release	<input checked="" type="checkbox"/>			
4. Certificate of completion issued				

**Additional Comments:**

<b>Actions to be Taken:</b>		<b>X</b>
1. No action necessary; continue routine inspections		
2. Correct noted deficiencies		Correct by:
a. 1st notice		
b. 2nd notice		
3. Submit modifications to project plans		Submit by:



## Certificate to Construct Stormwater Facilities

Williamsburg Wicker is hereby granted a Certificate to Construct Stormwater Facilities as shown on the approved construction documents for the project. The stormwater facilities shall be installed in accordance with the Virginia Department of Transportation Standards and Specifications, the Virginia Stormwater Management Handbook, the James City County Guidelines for Design and Construction of Stormwater Management BMPs, and the approved construction documents. The James City County Stormwater Division shall inspect these facilities for conformance with these referenced documents in accordance with Sections 19-62(d) and 24-159(3) of the County Code.

### LOCATION AND DESCRIPTION

Project: Williamsburg Wicker Expansion, Phase 1

County Plan Number: SP-0074-2008

Stormwater Management Facilities: Bioretention Basin

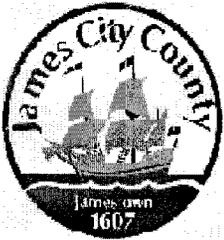
Stormwater Conveyance Facilities: All in VDOT ROW

Conditions: \_\_\_\_\_

Approved by: Daryl E Cook Date: 7/28/09

#### Note:

- **Certificate to construct is not valid without a Land Disturbing Permit.**
- **Work cannot begin until after a Preconstruction Meeting has been held onsite with the Stormwater Division.**
- **The Certificate to Construct and the approved construction plans must be onsite at all times.**



# Stormwater Facilities Inspection Fee Program Preconstruction Policy and Checklist

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## Purpose

In accordance with Chapters 19 and 24 of the James City County Code, inspections are required for stormwater facilities constructed for all development projects. This policy establishes the guidelines for the stormwater inspection program preconstruction meeting and contains necessary documentation of the meeting.

## Guidelines

1. The meeting will be held in conjunction with the Erosion and Sediment Control preconstruction meeting conducted by the Environmental Division. It is the responsibility of the owner/developer to schedule the preconstruction meeting. If a joint meeting is not possible because of unusual extenuating circumstances, then an alternate meeting can be arranged on a case-by-case basis. However, no work on any stormwater facility (BMP or storm drain pipes) can begin until the meeting is conducted.
2. Representatives of the owner/developer, general contractor, site contractor, pipe contractor, and a geotechnical engineer responsible for certifying the facilities' construction must be in attendance at the meeting. If all these representatives are not in attendance at the meeting, the meeting will be rescheduled and a Certificate to Construct stormwater Facilities will not be issued.
3. The stormwater portion of the meeting shall be conducted by the Stormwater Division (Division) representative who will inform the attendees of the minimum requirements and procedures necessary to document and certify the construction of the stormwater facilities in accordance with the approved development plans. Checklists, documentation requirements, and inspection schedules will be presented and discussed by the Division representative.
4. The approved construction plans will be reviewed at the meeting to ensure all parties are aware of the various stormwater facilities and the construction requirements including the timing of installation associated with each facility.
5. The Division representative will inform the attendees about the enforcement procedures that will be undertaken to correct any deficiencies found during the inspection process. All observations of noncompliance with the approved plans and specifications shall be documented and communicated to the contractor. If the noncompliance is not corrected immediately, the contractor and owner will be given a Notice to Comply with and appropriate time frame for correction. If the work has not been corrected, a Stop Work Order will be issued and remain in force until the problem is corrected.
6. Certification requirements will also be discussed. At the completion of the project, all stormwater facilities will require completion of a construction certification and record drawings. In addition, any temporary sediment control measure that will be converted to a permanent BMP will be required to have an interim certification completed by the geotechnical engineer.
7. The signature of each of the meeting attendees and their contact information shall be required on the checklist at the conclusion of the meeting.

# STORMWATER DIVISION

## Preconstruction Meeting

Project: Williamsburg Wicker Exp Pt 1 Date: 7/28/09

1. Is the person who will be certifying the construction of the stormwater facilities present?

YES  NO

Name: DAVID GORDINIER, P.E. / ECS MID-ATLANTIC

2. Is the contractor (s) who will be installing the stormwater facilities present?

YES  NO

Name: Michael J. Hipple Builders Inc

3. Is a representative of the owner/developer present?

YES  NO

Name: OSCAR HARRELL - OWNER

4. Is a representative of the general contractor present?

YES  NO

Name: same as above

5. A copy of the approved site plan is required to be on the project site daily.

6. Are there any proposed revisions to the approved plan pending?

YES  NO

7. Any proposed changes to the approved plan must be submitted to James City County for review and approval prior to implementation.

8. Are any representative present aware of any discrepancies, errors or deficiencies with the approved plan?

YES  NO

9. Are all representatives aware of the inspection and documentation requirements for the project?

YES  NO

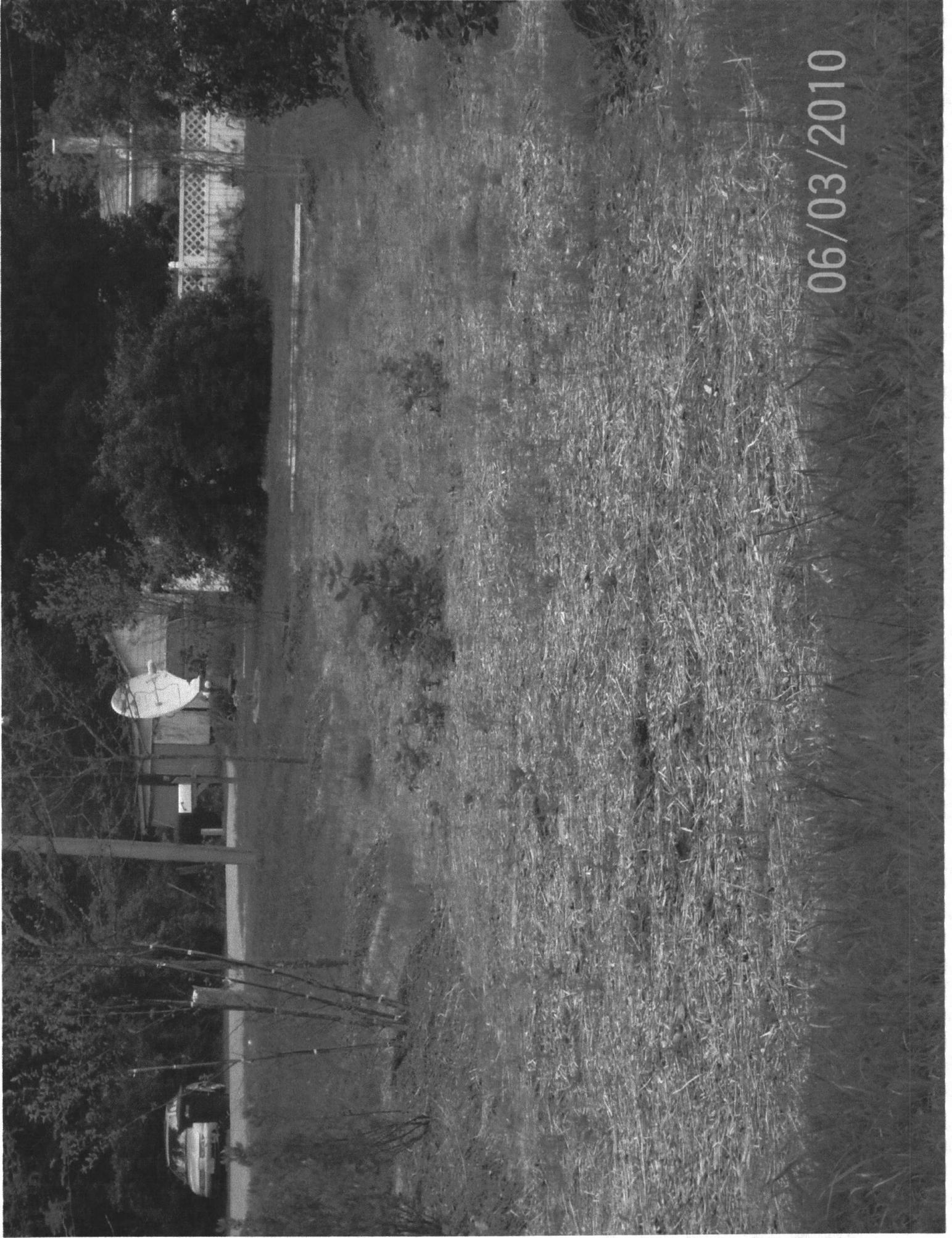
County Representative: Aina Creech



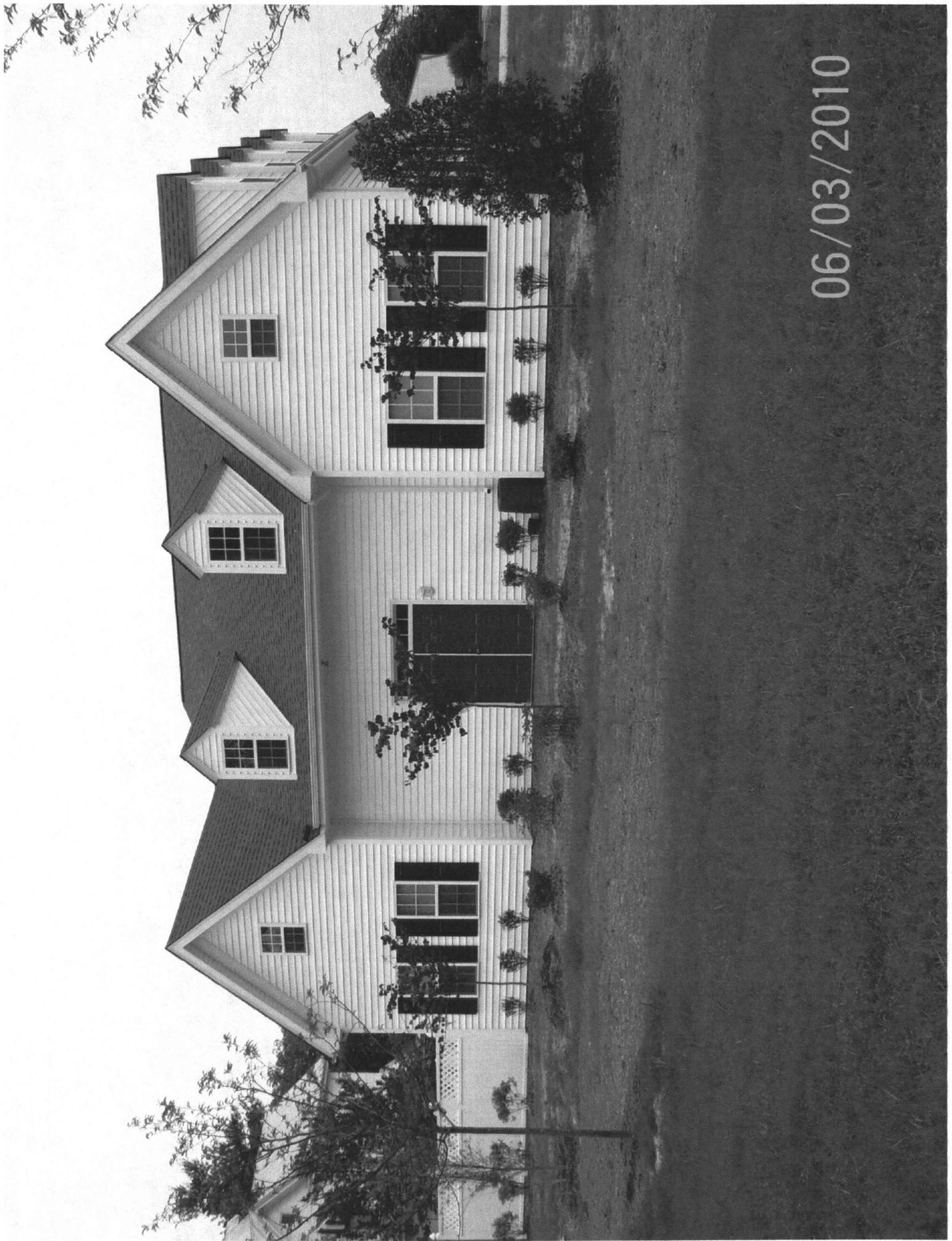




06/03/2010



06/03/2010



06/03/2010

## Tina Creech

---

**From:** Scott Thomas  
**Sent:** Tuesday, May 25, 2010 3:50 PM  
**To:** Barry Moses; Tina Creech  
**Cc:** Joe Buchite; Melanie Davis  
**Subject:** RE: SP-0074-2008

**Importance:** High

I looked at it today; talked with Oscar Harrell this afternoon. If stabilization is the issue, proceed with release of bond in full. I got verbal gentlemen's commitment from Oscar to seed the remaining bare areas and take care of it. See me if you have any issues with this.

Did we or SW responsible for asbuilts – if it was them are they ok with release?

Scott J. Thomas, P.E.  
Director  
James City County Environmental Division

Visit:  
[www.jccgov.com](http://www.jccgov.com)  
[www.protectedwithpride.org](http://www.protectedwithpride.org)

---

**From:** Barry Moses  
**Sent:** Tuesday, May 25, 2010 2:37 PM  
**To:** Tina Creech  
**Cc:** Joe Buchite; Scott Thomas  
**Subject:** RE: SP-0074-2008

Tina,

After looking at the plans and the letter you were working on, I find the main complaint on the Williamsburg Wicker site is lack of stabilization. The swale perpendicular to 60 and the area between the building and BMP are primary areas of concern.

Once I was reminded of what Mr. Harrell, Scott Whyte and I talked about for the groundcover, the plants are approximately the same number as promised, should spread and appear to be healthy at the current time. The BMP does need maintenance in the form of weeding to remove the competing species from conflict with the establishment of the groundcover. It would be a stretch to say the BMP is impacted by the sedimentation that's taken place to date. There is a small plume forming on the building side but, stabilization is the key right now. The straw mulch noted earlier does not appear to be causing a problem.

In the plan file, I noticed that approval was contingent on the p.e. certifying that the bioretention soil mix was mixed properly and of the right materials. Was that in the certification report?

Thanks,

**Barry E. Moses, P.E.**  
James City County  
Environmental Division

---

**From:** Tina Creech  
**Sent:** Tuesday, May 25, 2010 6:29 AM  
**To:** Barry Moses  
**Subject:** FW: SP-0074-2008

Give me a call when you have a chance. I also have Mr. Harrell on standby...

---

**From:** Heather Harmon [mailto:Heather@mjhbuilder.com]  
**Sent:** Monday, May 24, 2010 8:16 AM  
**To:** Tina Creech  
**Subject:** SP-0074-2008

Ms. Creech –

I spoke with Melanie last week and she suggested that we should be anticipating a letter regarding the path forward for the Wicker & Rattan project; SP-0074-2008. Can you confirm that information and whether or not that letter has been sent?

Thanks so much and hope you had a nice weekend!

Heather Harmon  
Michael J. Hipple Builder, Inc.  
PO Box 92  
Lightfoot VA 23090  
Phone:757-565-1725  
Fax:757-565-1210  
www.mjhbuilder.com



Hampton Roads | Central Virginia | Middle Peninsula  
 5248 Olde Towne Road, Suite 1, Williamsburg, Virginia 23188  
 Phone (757) 253-0040 / Fax (757) 220-8994

aesva.com

Environmental Division

MAY 06 2010

RECEIVED

**Letter of Transmittal**

ATTN: **Michael Majdeski**

CO.: JCC – Environmental

Address: 101-E Mounts Bay Road

cc:

DATE May 6, 2010	JOB NO. 9556
FROM: Bob Cosby	
RE Williamsburg Wicker BMP Certification	

WE ARE SENDING YOU THE FOLLOWING ITEMS:

- Attached  
 Under separate cover via  
 Original(s)     Print(s)     Plan(s)     Specification(s)     Change Order  
 Copy of letter(s)     Other:

COPIES	DATE	No. of Pages	DESCRIPTION
2	4/30/2010	1	Record Drawing of BMP Construction Certification
1	5/6/2010	16	

THESE ARE TRANSMITTED as checked below:

- For your approval     For your signature     For review and comment  
 For your use     As you requested     As requested by:  
 Other:

REMARKS:

VIA:  Hand Deliver     UPS Ground     UPS Next Day Air     USPS Mail     Other:

*If enclosures are not as noted, kindly notify us at once.*

## Tina Creech

---

**From:** Barry Moses  
**Sent:** Thursday, May 13, 2010 4:44 PM  
**To:** Joe Buchite; Tina Creech  
**Subject:** RE: Williamsburg Wicker Expansion SP-074-08

Joe/Tina,

Bioretention basins are ideally planted with 3 types of groundcover, shrubs and canopy trees. In this case, AES on behalf of Mr. Harrel asked that the ground cover be English ivy. After the plan was approved, Mr. Harrel came to us and asked if black-eyed susan could be used instead. We granted that permission. I believe it was by email.

According to Scott Whyte, the black-eyed susan has been installed as plugs. He said he 'approved' the plants installed as per the plan and subsequent requests of Mr. Harrel. I asked him to be careful with this language as the owner might think the BMP is approved.

One thing I notice is the bioretention does not have the mulch surface layer per plan. In fact, straw was reportedly put in when the BES was installed. The notes prohibit the use of straw as stabilization in bioretentions due to weeds.

So, IMHO we need mulch, some evidence that the black-eyed susan is thriving and the overall site needs to be stabilized.

Barry E. Moses, P.E.  
James City County  
Environmental Division

-----Original Message-----

**From:** Joe Buchite  
**Sent:** Thursday, May 13, 2010 12:34 PM  
**To:** Barry Moses; Tina Creech  
**Subject:** RE: Williamsburg Wicker Expansion SP-074-08

AM I missing something here? Do we allow for a bio-retention cell to be planted solely with ground cover or perennials? Doesn't seem to serve the purpose. Also when did Planning get the authority to approve for substitutions for a BMP without consulting with us first? What about a site plan amendment for the landscape plan?

Joe

-----Original Message-----

**From:** Barry Moses  
**Sent:** Thursday, May 13, 2010 12:27 PM  
**To:** Tina Creech; Joe Buchite  
**Subject:** FW: Williamsburg Wicker Expansion SP-074-08

-----Original Message-----

**From:** Scott Whyte  
**Sent:** Thursday, May 13, 2010 12:00 PM  
**To:** Barry Moses  
**Subject:** RE: Williamsburg Wicker Expansion SP-074-08

I always look to see if the BMP is planted, when I was there the Black Eyed Susans were just starting to sprout. They should be well sprouted out by now. I approved the BMP plantings, but always look to environmental for the proper construction of the BMP.

Scott

-----Original Message-----

From: Barry Moses  
Sent: Thursday, May 13, 2010 11:53 AM  
To: Scott Whyte  
Subject: RE: Williamsburg Wicker Expansion SP-074-08

Scott,

You did not approve the BMP plantings, did you? I did not see any black-eyed susan. Was it by seed?

-----Original Message-----

From: Scott Whyte  
Sent: Thursday, May 13, 2010 9:49 AM  
To: Tina Creech  
Cc: Barry Moses  
Subject: RE: Williamsburg Wicker Expansion SP-074-08

I have inspected the property and I have approved the landscaping for phase 1. They made a substitution of a native Black Eyed Susan for the English Ivy in the bioretention planting.

W. Scott Whyte  
Senior Landscape Planner  
James City County  
757-253-6867

-----Original Message-----

From: Tina Creech  
Sent: Thursday, May 13, 2010 9:38 AM  
To: Scott Whyte  
Subject: Williamsburg Wicker Expansion SP-074-08

Scott,

I received a request to release the bond for the above project. I have some questions about the bioretention plantings and have requested guidance from Barry concerning that but hoped you could take a look and let me know if the remaining landscape is okay with you.

Thanks,

Tina Creech  
JCC Environmental Inspector II  
(757) 253-6743

## Tina Creech

---

**From:** Scott Whyte  
**Sent:** Thursday, May 13, 2010 9:49 AM  
**To:** Tina Creech  
**Cc:** Barry Moses  
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Senior Landscape Planner  
James City County  
757-253-6867

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**Subject:** Williamsburg Wicker Expansion SP-074-08

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Thanks,

Tina Creech  
JCC Environmental Inspector II  
(757) 253-6743

050027419

PROFFERS

THESE PROFFERS are made this ~~28<sup>th</sup>~~ day of October, 2005 by OSCAR B. HARRELL and ELVA W. HARRELL, husband and wife (together with their respective successors in title and assigns, the "Owners").

RECITALS

A. Owners are the owners of those certain parcels or pieces of land located in James City County, Virginia, with an address of 7414 Richmond Road and being Tax Parcel 23202D0001A and being more particularly described on Exhibit A hereto (the "Property").

B. The Property is now zoned B-1 and A-1. The Owners have applied to rezone the Property from B-1 and A-1 to B-1, with proffers.

C. Owners have submitted to the County (i) a plan entitled "Rezoning Plan, Williamsburg Wicker & Rattan Shoppe Center" prepared by AES Consulting Engineers and dated April 25, 2005 (the "Rezoning Plan"), (ii) a plan entitled "Conceptual Landscape Plan, Williamsburg Wicker & Rattan Shoppe Center" prepared by AES Consulting Engineers and dated July 7, 2005 (the "Landscape Plan") and (iii) architectural elevations prepared by Paul White and submitted herewith (the "Architectural Elevations").

D. Owners desire to offer to the County certain conditions on the development of the Property not generally applicable to Land zoned B-1.

NOW, THEREFORE, for and in consideration of the approval of the requested rezoning, and pursuant to Section 15.2-2298 of the Code of Virginia, 1950, as amended, and the County Zoning Ordinance, Owners agree that they shall meet and comply with all of the following conditions in developing the Property. If the requested rezoning is not granted by the County, these Proffers shall be null and void.

#### CONDITIONS

1. Rezoning Plan. The Property shall be developed generally in accordance with the Rezoning Plan, with only minor changes thereto that the Development Review Committee determines do not change the basic concept or character of the development.
2. Water Conservation. The Owners shall be responsible for developing water conservation standards to be submitted to and approved by the James City Service Authority and subsequently for enforcing these standards. The standards shall address such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of approved landscaping materials and the use of water conserving fixtures and appliances to promote water conservation and minimize the use of public water resources. Irrigation wells shall be shallow wells of 100 feet or less. The standards shall be approved by the James City Service Authority prior to final site plan approval.

3. Prohibited Uses. The following uses, otherwise permitted by right in the B-1 district, shall not be permitted on the Property:

- adult daycare centers;
- automobile service stations;
- fire stations;
- health clubs, exercise clubs, fitness centers;
- hotels, motels, tourist homes and convention centers;
- indoor sports facilities
- indoor theaters
- marinas, docks, piers, yacht clubs, boat basins, and servicing, repair and sale facilities for the same;
- marine or waterfront businesses;
- public billiard parlors, arcades, pool rooms, bowling alleys, dance halls, and other indoor centers of amusement
- radio and television stations and accessory, antenna or towers or tower mounted wireless communication facilities, which are 60 feet or less in height; and
- fast food restaurants.

4. Architectural Review. Prior to the County being obligated to grant final development plan approval, there shall be prepared and submitted to the Director of Planning for approval final architectural plans for the Director of Planning to review and approve for general consistency with the Architectural Elevations. The Director of Planning shall review and either approve or provide written comments setting forth changes necessary to obtain approval within 30 days of the date of submission of the plans in question. Decisions of the

Director of Planning may be appealed to the Development Review Committee, whose decision shall be final. Completed buildings shall be consistent with the approved plans. No building on the Property shall exceed thirty-five (35) feet in height.

5. Landscape Plans. Prior to final site plan approval, the Owners shall have submitted to the Director of Planning a landscaping plan for the entire Property for the Director of Planning to review and approve for general consistency with the Landscape Plan and landscape ordinance requirements.

6. Henry Home. Owner shall retain the Henry Home house located on the Property.

7. Cash Contributions to James City Service Authority. A contribution for each non-residential building on the Property in an amount equal to \$1.53 per gallon per day of average daily sanitary sewage flow as determined by the James City Service Authority ("JCSA") based on the use of the building(s) shall be made to the JCSA at the time of final site plan approval in order to mitigate impacts on the County from the physical development and operation of the Property.

8. Screening. All dumpsters and heating and cooling units, whether ground or roof mounted, shall be screened by landscaping, fencing, walls or other alternative features providing adequate screening as determined by the Director of Planning at the time of final site plan approval.

Exhibit A

LEGAL DESCRIPTION

All those certain lots, pieces or parcels of land situate, lying and being in the County of James City, Virginia, known and designated as Lots Numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and Lot 15, in Block D, as shown on that certain plat entitled, "A SURVEY FOR CONVEYANCE TO OLD COLONY BANK & TRUST COMPANY", made by L. V. Woodson and Associates, dated March 9, 1973, and recorded in the Clerk's Office of the Circuit Court for the County of James City, Virginia, in Deed Book 143 at page 672, to which plat reference is here made.

Together with all the grantors right title and interest in and to Parcel A and the 20 foot alley adjoining the above described lots as shown and set forth on the aforementioned plat.

Together with all and singular, the buildings and improvements thereon, rights and privileges, hereditaments and tenements thereunto belonging or in anywise appertaining, and any easements or rights of way for the use thereof.

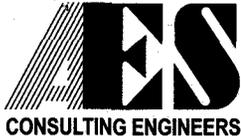
Subject, however, to all easements, rights of way, agreements, conditions and restrictions affecting the said property.

VIRGINIA: CITY OF WILLIAMSBURG & COUNTY OF JAMES CITY  
This document was admitted to record on 17th Nov. 05  
at 3:42 AM/PM. The taxes imposed by Virginia Code  
Section 58.1-801, 58.1-802 & 58.1-814 have been paid.

STATE TAX	LOCAL TAX	ADDITIONAL TAX
\$ _____	\$ _____	\$ _____

TESTE: BETSY B. WOOLRIDGE, CLERK

BY: Betsy B. Woolridge Clerk



5248 Olde Towne Road, Suite 1  
Williamsburg, VA 23188  
(757) 253-0040  
Fax (757) 220-8994  
www.aesva.com

June 3, 2008

Mr. Scott Thomas, P.E.  
Director  
James City County Environmental Division  
101-E Mounts Bay Road  
P.O. Box 8784  
Williamsburg, Virginia 23187-8784

**RE: Williamsburg Wicker Expansion Phase I - Variance Request for Modification to BMP Point Worksheet  
AES Project No. 9556-00**

Dear Mr. Thomas:

AES on behalf of Williamsburg Wicker & Rattan Shoppe respectfully request a variance to the "James City County Guidelines for Design and Construction of Stormwater Management BMPs".

The variance formally being requested by this letter is to allow for a modification to the 10-point BMP Worksheet. We currently have 0.41 acres in Phase I draining to a Bio-Retention facility, which is a 10-point facility. The 0.17 acres of impervious cover for Phase I of this project lies within the 0.41 acres drainage area. Since this project is planned to be a two-phase development, water quality has only been addressed for Phase I at this time. When the second phase of this project is designed, the retail shops along Richmond Road, Phase II shall conform to the "James City County Guidelines for Design and Construction of Stormwater Management BMPs". If granted, this will allow the portion of the site for Phase II to remain undisturbed.

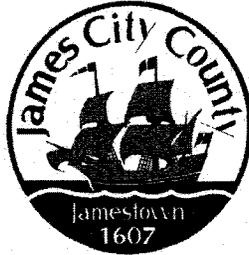
It is our sincere request for a favorable response. If you should have any questions or concerns as a result of our request, please do not hesitate to contact me at (757) 253-0040.

Sincerely,  
AES Consulting Engineers

A handwritten signature in black ink, appearing to read 'Victoria Bains', with a long, sweeping underline.

Victoria A. Bains, P.E.  
Project Engineer





James City County, Virginia  
Environmental Division

## Erosion and Sediment Control and Stormwater Management Design Plan Checklists

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#### GENERAL INFORMATION

Project Name: Williamsburg Wicker Expansion  
Owner / Applicant: Williamsburg Wicker & Rattan Shoppe  
Plan Preparer: AES Consulting Engineers/Victoria Bains Email: vbains@aesva.com  
Project Location: 7414 Richmond Road  
Tax Map / Parcel: (23-2) (2-D-1A)  
County Plan No. (if known): \_\_\_\_\_  
County BMP Type: \_\_\_\_\_ ( \_\_\_\_\_ - \_\_\_\_\_ )

Other information submitted in addition to this checklist (Check all that apply):

- Design or Construction Drawings (Plans, Profiles, Details, etc.).
- Erosion & Sediment Control Plan (Plan, Details, etc.).
- Erosion & Sediment Control Plan Design Report.
- Stormwater Management Design Plan (Plans, Profiles, Details, etc.).
- Stormwater Management Design Report.
- Other, List: \_\_\_\_\_

**Issue Date**  
**March 1, 2001**

**JAMES CITY COUNTY, VIRGINIA  
ENVIRONMENTAL DIVISION**

***EROSION AND SEDIMENT CONTROL PLAN CHECKLIST***

**I. GENERAL:**

Yes No N/A

- FAMILIARITY* with current versions of Chapter 8, Erosion and Sedimentation Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia and the Virginia Erosion and Sediment Control Handbook (VESCH).
- LAND DISTURBING PERMIT AND SILTATION AGREEMENT* with surety are required for the project.
- VARIANCE* if necessary, requested in writing, for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

**II. SITE PLAN:**

Yes No N/A

- VICINITY MAP* locating the site in relation to the surrounding area. Include any major landmarks which might assist in physically locating the site.
- INDICATE NORTH* direction in relation to the site.
- LIMITS OF CLEARING AND GRADING* for the site including that required for implementation of erosion and sediment controls, stockpile areas and utilities.
- DISTURBED AREA ESTIMATES* in acres or square feet for the project.
- EXISTING TOPOGRAPHY* or contours for the site at no more than 5 foot contour interval.
- FINAL TOPOGRAPHY*, contours or proposed site grading in accordance with the design plan which indicates changes to existing topography and drainage patterns at no more than 2 foot contour interval (or 1 foot contours where required).
- EXISTING AND PROPOSED SPOT ELEVATIONS* to supplement existing and proposed contours, topography or site grading information. Spot elevations may replace final contours in some instances, especially if terrain is in a low lying area or relatively flat.
- EXISTING VEGETATION* including existing tree lines, grassed or unique vegetation areas.

Yes No N/A

*EXISTING SITE FEATURES* including roads, buildings, homes, utilities, streams, fences, structures and other important surface features of the site.

*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia.

*ENVIRONMENTAL INVENTORY* in accordance with Section 23-10(2) of the Chesapeake Bay Preservation Ordinance of James City County. Inventory generally includes: tidal shores and wetlands, non-tidal wetlands, resource protection area, hydric soils and slopes steeper than 25 percent. For wetlands, provide a copy of issued permits or satisfactory evidence that appropriate permits are being pursued for the entire project.

*100-YEAR FLOODPLAIN LIMITS* or any special flood hazard areas or flood zones based on appropriate Federal Management Agency Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) of James City County, Virginia.

*DRAINAGE AREAS* for offsite and onsite areas, existing or proposed as applicable. Include drainage divides and directional labels for all subareas at points of interest and size (in acres), weighted runoff coefficient or curve number and times of concentration for each subarea.

*CRITICAL EROSION AREAS* which require special consideration or unique erosion and sediment control measures. Refer to the VESCH, Chapter 6 for criteria.

*DEVELOPMENT PLAN* for the site showing all improvements such as buildings, structures, parking areas, access roadways, above and below ground utilities, stormwater management and drainage facilities, trails or sidewalks, proposed vegetation and landscaping, amenities, etc.

*LOCATION OF PRACTICES* proposed for erosion and sediment control, tree protection and temporary stormwater management due to land disturbance activities at the site. Use standard abbreviations, labels and symbols consistent for plan views based on minimum standards and specifications in Chapter 3 of the VESCH.

*TEMPORARY STOCKPILE AREAS* or staging and equipment storage areas as required for onsite or offsite construction activities or indicate that none are anticipated for this project.

*OFFSITE LAND DISTURBING AREAS* including borrow sites, waste areas, utility extensions, etc. and required erosion and sediment controls. If none are anticipated for the project, then indicate on the plans by general or erosion and sediment control notes.

*DETAILS* or alternately, appropriate reference to current minimum standards and specifications of the VESCH for each measure proposed for the project. Non-modified, standard duplicated details (silt fence, diversion dikes, etc.) may be referenced to the current version of the VESCH. Specific dimensional or modified standards (basins, traps, outlet protections, check dams, etc.) require presentation on detail sheets. Schedules or tables may be used for multiple site measures such as sediment traps, basins, channels, slope drains, etc. Any modification to standard details should be clearly defined, explained and illustrated.

Yes No N/A

*MAINTENANCE PLAN* or alternately, appropriate reference to current minimum standards and specifications of the VESCH, outlining the inspection frequency and maintenance requirements for all erosion and sediment control measures proposed for the project.

*TRENCH DEWATERING* methods and erosion and sediment controls, if anticipated for the project.

*CONSTRUCTION SEQUENCE* outlining the anticipated sequence for installation of erosion and sediment controls and site, grading and utility work to be performed for the project by the site contractor.

*PHASING PLAN* if required for larger project sites that are to be developed in stages or phases.

*STANDARD COUNTY NOTES* are required to be placed on the erosion and sediment control plan. Refer to the standard James City County Erosion and Sediment Control Notes dated May 5, 1999.

*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved plans, drawings, technical reports and specifications.

### III. NARRATIVE:

Yes No N/A

*PROJECT DESCRIPTION* briefly describing the nature and purpose of the land disturbing activity and the acreage to be disturbed.

*EXISTING SITE CONDITIONS* description of existing topography, land use, cover and drainage patterns at the site.

*ADJACENT AREA* descriptions of neighboring onsite or offsite areas such as streams, lakes, property, roads, etc. and potential impacts due to concentrated flow or runoff from the land disturbing activity.

*OFFSITE DISTURBED AREA* descriptions of proposed borrow sites, water or surplus areas, utility extensions and erosion and sediment controls to be implemented.

*SOILS DESCRIPTION* briefly summarizing site, disturbed area and drainage basin soils including name, unit, hydrologic soil group (HSG) classification, surface runoff potential, erodibility, permeability, depth, texture, structure, erosion hazards, shrink-swell potential, limitations for use and anticipated depths to bedrock and the seasonal water table, as applicable.

*CRITICAL AREAS* on the site which may have potentially serious erosion and sediment control problems and special considerations required (i.e. steep slopes, hydric soils, channels, springs, sinkholes, water supply reservoirs, groundwater recharge areas, etc.)

Yes No N/A

*PROPOSED EROSION & SEDIMENT CONTROL MEASURES* inclusive to the specific erosion and sediment control plan as proposed for the land disturbing activity. Measures should be consistent with those proposed on the site drawings. Address general use, installation, limitations, sequencing and maintenance requirements for each control measure.

*STABILIZATION MEASURES* required for the site, either temporary or permanent, and during and following construction including temporary and permanent seeding and mulching, paving, stone, soil stabilization blankets and matting, sodding, landscaping or special stabilization techniques to be utilized at the site.

*STORMWATER MANAGEMENT CONSIDERATIONS* for the site, either of temporary or permanent nature, and strategies, sequences and measures required for control. May reference the stormwater management plan for the site, if prepared, for permanent stormwater management facilities and control of drainage once the site is stabilized.

IV. **CALCULATIONS:**

Yes No N/A

*CALCULATIONS AND COMPUTATIONS* associated with hydrology, hydraulics and design of proposed temporary and permanent erosion and sediment control measures including: sediment traps and basins, diversions, stormwater conveyance channels, culverts, slope drains, outlet protections, etc. Computations are not required on the construction plan and may be attached in a supplemental erosion and sediment control plan design report, if presented in a clear and organized format.

*TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET* submitted for each basin along with schematic or sketch cross-section showing applicable design and construction data, storage volumes (wet-dry), dimensions and elevations. Peak design runoff to be based on the 2- or 25-year design storm event based on maximum disturbed site conditions (existing, interim or proposed conditions) in accordance with Minimum Standard 3.14 of the VESCH.

**JAMES CITY COUNTY, VIRGINIA  
ENVIRONMENTAL DIVISION**

**STORMWATER MANAGEMENT DESIGN PLAN CHECKLIST**

**I. GENERAL:**

Yes No N/A

*FAMILIARITY* with current versions of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual; Chapter 8, Erosion and Sediment Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia; the Virginia Erosion and Sediment Control Handbook (VESCH); and the Virginia Stormwater Management Handbook (VSMH).

*WAIVER OR EXCEPTION* if necessary, requested in writing, for the plan approving authority to waive or except the requirements of Chapter 23, Chesapeake Bay Preservation ordinance in accordance with procedure established in Sections 23-14 through 23-17 of the ordinance. Applies to the review case only.

*VARIANCE REQUEST* if necessary, requested in writing for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved stormwater management plans, drawings, technical reports and specifications.

*WORKSHEET FOR BMP POINT SYSTEM* to ensure the stormwater management plan for the project attains at least 10 BMP points (New Development) or traditional pollutant load reduction computations per the Chesapeake Bay Local Assistance Manual (Redevelopment Only)

*PROPOSED CONSERVATION EASEMENT AREAS* for any natural open space points claimed in the BMP worksheet.

*INSPECTION/MAINTENANCE AGREEMENT* is required to be prepared and executed with the County for the project.

*FEMA FIRM PANEL* reference with designated special flood hazard areas or zone designations associated with the site, as applicable.

*DRAINAGE AREA MAP* at a maximum scale of 1"=200' scale showing drainage area boundaries for pre- and postdevelopment conditions and associated time of concentration flow paths. Labels to include drainage area size, runoff coefficient or curve number and time of concentration for each subarea shown on the map.

Yes No N/A

*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia with approximate locations of the project site, BMPs and applicable drainage basins.

*STORMWATER MANAGEMENT NARRATIVE* in a brief and simple format which describes the project; location; site and drainage basin soil characteristics; receiving water or drainage facility; existing site and drainage basin conditions (topography, land use, cover, slopes, etc.); proposed site development; proposed stormwater management and drainage plan including County BMP type selected; summary of hydrology and hydraulics; maintenance program; and any special assumptions utilized for development of the stormwater management and drainage design plan or computations.

*TEMPORARY STORMWATER MANAGEMENT* (if applicable) for control of stormwater runoff encountered during construction activities in addition to measures provided in the erosion and sediment control plan or stormwater management/drainage plan for the site. Adequate protection measures or sequencing provided.

*MODIFICATION PLAN* clearly defined for temporary sediment control structures which will be converted to permanent SWM/BMP structures. Includes appropriate hydrologic and hydraulic computations, conversions, sequencing and cleanout information or details. Normally related to primary control structures associated with dry detention or wet retention ponds. Normally not permitted for Group C or D categories such as bioretention, infiltration and filtering system facilities.

*STORMWATER MANAGEMENT and DRAINAGE DESIGN REPORT* in a bound 8-1/2 x 11 inch size format. Report shall generally include a title sheet, date, project identification, owner and preparer information, table of contents, narrative, summaries and computations as required. Computations may include: backwater, closed conduit, headwater, hydraulic, hydraulic grade line, hydrology, inlet, open channel, storm sewer, water quality, extended detention or stream channel protection and multi-stage storm routing calculations, as applicable, for the project. Computation data may include hand or computer generated computations, maps or schematics. All information should be presented in a clear, easy to follow format and should closely match construction plan information.

*PLAN VIEW* at 1 inch = 50 ft. scale or less (1" = 40', 1" = 30', etc.)

North arrow and plan legend.

Property lines.

Adjacent property information.

Existing site features and existing impervious cover areas.

Impervious cover tabulations.

Existing drainage facilities (natural or manmade)

Existing environmentally sensitive areas (RPA, wetlands, floodplain, steep slopes, critical soils, buffers, etc.)

Existing and proposed contours (1' or 2' contour interval) and spot elevations as necessary to define high and low topography.

Existing and proposed easement locations.

Yes	No	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed site improvements and proposed impervious cover areas.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed stormwater conveyance, drainage and management facilities with appropriate labeled construction data and information.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed landscaping and seeding plans (disturbed areas, pond interior, etc.)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed slope stabilization areas (riprap, blankets, matings, walls, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Delineation of permanent pools and the 1-, 2-, 10- and 100-year Design Water Surface Elevations.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Delineation of ponding, headwater, surcharge or backwater areas which may affect adjacent existing or proposed buildings, structures or upstream adjacent properties.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test boring locations with reference surface elevations (if known).
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Risers, barrels, underdrains, overflows and outlet protections.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Emergency spillway level section and outlet channel.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed site utilities and protection measures.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Erosion and sediment control measures (for site or BMP).
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Maintenance or access corridors to permanent stormwater management, BMP or drainage facilities.

**II. STORMWATER CONVEYANCE SYSTEMS:**

Yes	No	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>PLAN VIEWS</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Storm drain lengths, sizes, types, classes and slopes for all segments. Label directly on plan or use structure/pipe schedule.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Access structure (inlets, manholes, junctions, etc.) rim elevations, inverts, type and required grate or top unit and lengths labeled.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All structure numbers labeled.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Adequate horizontal clearance from other site utilities or structures.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>PROFILES</i> generally are not required but are encouraged to expedite review. If not provided, ensure all pipe segments have adequate minimum cover, do not exceed maximum depths of cover for the type/class of pipe specified and do not conflict with other site utilities or excavation areas.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>DETAILS</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical storm drain bedding details or reference note.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Standard details or reference note for all proposed access structure types (inlets, manholes, junctions, etc.).
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Inlet shaping detail or applicable reference note.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Step detail or applicable reference note (if depth 4 ft. or more).
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical open channel details with designation, location, shape, type, bottom width, top width, lining, slope, length, side slope, and installation depth required for construction. Channel design data as necessary may also be included.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Outlet protections at all pipe outfalls.

Yes No N/A

**STORMWATER CONVEYANCE SYSTEM COMPUTATIONS**

- Storm Sewer Design computations based on 10-year design event.
- Hydraulic Grade Line computations based on 10-year design event.
- Inlet computations based on current VDOT procedure for spread, ponding depth and grate size required.
- Culvert Headwater computations. Design based on 10-year design storm event and check only for 100-year storm event.
- Open Channel computations based on 2-year design event for velocity and 10-year design event for capacity.
- Standard outlet protection or special energy dissipators.
- Pipe thickness design computations, as required, for selected pipe type (live load, minimum cover, maximum height of cover, etc.).
- Adequate channel computations for receiving channels (based on field measured channel section data).

**III. STORMWATER MANAGEMENT/BMP FACILITIES:**

Yes No N/A

**HYDROLOGY** – An SCS based methodology is required for the design of stormwater management/BMP facilities with watersheds exceeding 20 acres. Under 20 acres, other generally accepted methodologies such as the modified rational, critical storm are allowable. Refer to Chapter 5 of the VESCH or Chapter 5 of the VSMH.

- Runoff Curve Number or Coefficient determinations: predeveloped and ultimate development land use scenarios.
- Time of concentration: predeveloped and ultimate development indicating overland, shallow concentrated, and channel flow components (200 ft. maximum length for overland flow).
- Hydrograph generation (tabular or graphical): pre- and postdevelopment conditions for the 1-, 2-, 10- and 100-year design storm events.

**FACILITY CONFIGURATION and MINIMUM SEPARATIONS**

- Screening and layout consistent with Section 24-98(d) of the Chapter 24 Zoning ordinance (landscaping, screening, visibility, etc.).
- Basic considerations for safety and unauthorized entry.
- Proper length to width ratio (Typically 2H:1V).
- Facilities with deep pools (4 feet or more in depth) provided with two benches. Fifteen (15) ft. safety bench outward from normal pool at maximum 6 percent slope and aquatic bench inward from normal shoreline below normal pool. Narrower widths may be considered on a case-by-case basis.
- Pond buffer minimum 25 feet outward from maximum design WSEL. Additional setbacks may be required to permanent structures.
- No trees, shrubs or woody plants within 15 feet of embankment toe or 25 feet from principal spillway structure.
- Infiltration and filtering system facilities generally located at least 100 feet horizontally from any water supply well; 100 feet from any downslope building; and 25 feet from any upslope buildings, unless site specific investigation allows for reduced separation.

Yes No N/A

**HYDRAULIC COMPUTATIONS**

- Elevation- or Stage-Storage curve and/or tabular data.
- Weir / Orifice Control – Extended Detention.
- Weir / Orifice Control – riser 1-year control for channel protection.
- Weir / Orifice Control – riser 2-year control for quantity (if required).
- Weir / Orifice Control – riser 10-year control for quantity (if required).
- Inlet / Outlet (barrel) control – (All Storms).
- Check for barrel control prior to riser orifice flow to prevent slug flow-water hammer conditions.
- Emergency spillway capacity and depth of flow.
- Elevation – Discharge (Outlet Rating) curve and/or table. Provide all supporting calculations and/or design assumptions.
- Adequate channel computations for receiving channel. May be waived if facility is designed based on current Stream Channel Protection criteria.

**POND or RESERVOIR ROUTING**

- Storage-Indication Routing of postdeveloped inflow hydrographs for the 1-, 2-, 10-, and 100-year design storms. Preference is for structure to discharge up to the 10-year storm through the principal spillway and pass the 100-year storm with a minimum 1 foot of freeboard through a combination principal and emergency spillways. If no emergency spillway is provided, riser must be large enough to pass the design high water flow and trash without overtopping the facility, have 3 square feet or more of cross-sectional area, contain a hood type inlet and have a minimum freeboard of 2 feet. Token spillways with minimum 8 ft. width are also recommended at or above the design 100-year storm elevation.
- Downstream hydrographs at established study points, if conditions warrant (i.e. facility discharge combined with uncontrolled bypass).

**MISCELLANEOUS COMPUTATIONS**

- Water quality volume for permanent pool based on selected BMP treatment volume (WQv).
- Water quality volume for extended detention base on selected BMP treatment volume (WQv) with drawdown computations.
- Drawdown computations for the 1-year, 24 hour detention for stream channel protection criteria.
- Pond drain computations (within 24 hours).
- Anti-seep collar design (concrete preferred) or match material type.
- Filter diaphragm design (or alternative method of controlling seepage).
- Riser / base structure flotation analyses. FS = 1.25 minimum.
- Downstream danger reach study and/or emergency action plan (if conditions warrant).
- Upstream backwater analyses onto offsite adjacent property (if conditions warrant).
- 100 year floodplain impacts (if conditions warrant).

Yes No N/A

**GEOTECHNICAL REQUIREMENTS**

- Geotechnical Report with recommendations specific to BMP facility type selected. Report prepared by a registered professional engineer. Requires submission, review and approval prior to issuance of Land Disturbance Permit.
- Initial Feasibility Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
- Concept Design Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
- Minimum Boring locations: borrow area, pool area, principal control structure, top of facility near one abutment and emergency spillway if provided.
- Boring logs with Unified Soil Classification (ASTM D2487), soils descriptions and depths to bedrock and the seasonal water table indicated.
- Standard County Record Drawing/Construction Certification note provided on plan. *Note: It is understood that preparation of record drawings and construction certifications as required for project facilities may not necessarily be performed by the plan preparer. These components may be performed by others.*

**PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS**

- EXISTING GROUND AND PROPOSED GRADE**
  - Embankment or excavation side slopes labeled (3H:1V maximum).
  - Minimum top width labeled (per VESCH or VSMH requirements).
  - Removal of unsuitable material under proposed facility (per Geotechnical Report requirements).

Yes No N/A

**CORE TRENCH**

Material (per plan or Geotechnical Report).

Bottom width (4' minimum or greater as dictated by Geotechnical Report recommendations).

Side slopes (1:1 maximum steepness)

Depth (4' minimum or greater as dictated by Geotechnical Report).

**PRINCIPAL CONTROL STRUCTURE. RISER OR SIMILAR STRUCTURE (DETAILS REQUIRED FOR ALL ITEMS)**

Durable, watertight, resistant material (concrete preferred).

Riser diameter is at least 1.25 times larger than barrel diameter.

All pertinent dimensions and elevations shown.

Control orifice or weir dimensions and elevations shown.

Trash rack – removable – for each release.

Anti-vortex device, baffle or plate.

Riser base structure with dimensions and embedment specifications (concrete preferred).

Interior access (steps, ladders, etc.) for maintenance for structures over 4 feet in height. Excessively high risers may need some form of exterior access on top portion.

Low flow orifice with trash rack device.

**PRINCIPAL CONTROL STRUCTURE OUTLET BARREL**

Material (ASTM C-361 reinforced concrete pipe) with watertight joints. Prior approval required for all other pipe material (other RCP types, CMP, CPP, PVC, etc.).

Support and bedding requirements for barrel – concrete cradles, etc. or as recommended by the Geotechnical Report.

Pipe inverts, length, size, class and slope shown.

Flared end section or endwall provided on barrel outlet.

**SEEPAGE CONTROL**

Phreatic line shown (4:1 slope measured from the intersection of the embankment and the principal spillway design high water).

**ANTI-SEEP COLLARS**

Anti-seep collar, concrete preferred.

Size – 15 percent increase in length of saturation using outside pipe diameter.

Spacing and location on barrel (located at least 2 feet from a pipe joint).

**FILTER DIAPHRAGMS**

Design based on latest NRCS design methods and certified by a professional engineer.

Yes No N/A

**ELEVATION AND DIMENSIONAL DESIGN DATA**

- Top of facility – construction height and settled height (10 percent settlement).
- Crest of principal control structure spillway at least one (1) foot below crest of emergency spillway, if provided.
- Minimum freeboard of one (1) foot above the 100-year design high water elevation for facilities with an emergency spillway.
- Minimum freeboard of two (2) feet above the 100-year design high water elevation for facilities without an emergency spillway or in accordance with the SCS National Engineering Handbook (prior approval required).
- Basin Sediment Clean-Out elevation (permanent mode). Typically 10 to 25 percent of water quality volume.

**CROSS SECTION THROUGH FACILITY**

- Existing Ground.
- Proposed grade.
- Top of facility – constructed and settled.
- Location of emergency spillway with side slopes labeled (emergency spillway in cut).
- Bottom of core trench (4' minimum).
- Location of each soil boring.
- Barrel location.
- Existing and proposed utility location/protection.

**EMERGENCY SPILLWAY PROFILE**

- Existing ground.
- Inlet, level (control) and outlet sections per SCS.
- Spillway and crest elevations.

**PRETREATMENT DEVICES** of adequate depth and properly designed using required pretreatment volumes for the selected County BMP facility type. Including, but not limited to: sediment forebays, sediment basins, sumps, grass channels, gravel diaphragms, plunge pools, chamber separators, manufactured systems or other acceptable methods.

Yes No N/A

**CONSTRUCTION SPECIFICATIONS and NOTES**

- Anticipated sequence of construction for BMP (consistent with erosion and sediment control plan).
- Provisions to control base stream or storm flow conditions encountered during construction.
- Site and subgrade preparation requirements.
- Embankment, fill and backfill material soil and placement (lift) thickness requirements.
- Compaction and soil moisture content requirements.
- Geosynthetics for drainage, filtration, moisture barrier, separation, and reinforcement purposes.
- Clay or synthetic (PVC or HDPE) pond liners.
- Storm drain, underdrain and pipe conduit requirements.
- Minimum depth of pipe cover for temporary (construction) and final cover conditions.
- Permanent shutoff valve and pond drain.
- Concrete requirements for structural components.
- Riprap and slope protection.
- Access or maintenance road surface, base, subbase.
- Temporary and permanent stabilization measures.
- Temporary or permanent safety fencing.
- BMP Landscaping (deep, shallow, fringe, perimeter, etc.)
- Dust and traffic control (if warranted).
- Construction monitoring and certification by professional.
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**MAINTENANCE PROVISIONS**

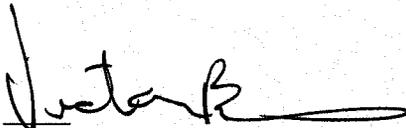
- Entity responsible for maintenance identified.
- Maintenance Plan which outlines the long-term schedule for inspection/maintenance of the facility and forebays.
- Maintenance access from public right-of-way or publicly traveled road.
- Maintenance easement provided encompassing high water pool and buffer, principal and emergency spillways, outlet structures, forebays, embankment area and possible sediment-removal stockpile areas.
- Minimum 6 foot wide public safety shelf (landing) or alternative fencing.

**IV. OUTLET PROTECTIONS:**

Yes	No	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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- Sized for maximum design release (generally 10-year storm).
- Flared end section or endwall.
- Dimensions.
- Rock or riprap size, quantity and placement thickness.
- Slope at 0 percent (Level Grade).
- Geotextiles (nonwoven).
- Special energy dissipators are required for design discharge velocities that exceed eighteen (18) feet per second; or if use of standard outlet protection would result in velocities exceeding permissible channel velocities; or if space restricts or limits their use.

**IV. ADDITIONAL COMMENTS OR INFORMATION SPECIFIC TO THE PLAN:**

Plan Preparer:   
Date: 6/3/08

**ENVIRONMENTAL DIVISION REVIEW COMMENTS****The Williamsburg Wicker Expansion (Phase 1)****SP-074-2008***September 4, 2008***Stormwater Management / Drainage:**

1. SSC Criteria. Previous comment #13 has not been adequately addressed. According to the SSC guidance document the chosen SSC measure #29 Rain Barrels/Cisterns requires detail as to the treatment level (site wide) and manufacturer's recommendation for storage device proposed.
2. BMP/Water Quality Points. Previous comment #14 maintained that a master plan (as recommended in the March 2008 concept plan comments) must be provided to illustrate how 10 BMP points will be achieved for the entire site. During a July 11, 2008 meeting between County staff and the Applicant, it was clearly discussed and agreed that the owner's current intention was to develop only those items shown on Dwg. No. 4 and that stormwater management would be provided for the developed area only. To avoid future confusion, provide a prominent boxed note on the cover sheet of the site plan which indicates that only those Phase I clearing, building, pavement, stormwater management BMP's, and ditch grading shown on Dwg. No. 4 will be approved with this site plan. Additional parking and buildings as part of future phases will require submission and approval of an additional site plan.
3. BMP Points. Previous comment #15 not adequately addressed. Assigned BMP point values indicated in Table 1 of the County BMP manual assume all features consistent with the manual are provided such as pretreatment forebays, aquatic shelves, stream channel protection volume, pond buffers, etc. As full point credit value is being taken for the BMP in the calculation worksheet, all applicable design features must be present. Major concerns with the proposed plan include but, are not limited to:
  - a. Lack of pretreatment. The response to previous comment #15 a. indicates that sheet flow will be maintained on site and during the meeting it was discussed that the grassed areas will provide pretreatment. Be advised, this may be adequate for the development Phase I, however, future Phase II parking areas as shown on Dwg. No. 3 will be in close proximity to the bioretention basin and may require additional pretreatment measures.
  - b. Lack of consideration of incoming runoff velocity and the need for energy dissipating structures. Previous comment #15b. not adequately addressed. With the additional detail provided on Dwg. No. 5 and resolution of E&SC comment #9 Bio-retention Cell, it is now apparent that the proposed bioretention basin will be approximately 3 ft deep. Runoff entering facilities with this geometry has been observed to cause erosion on the sideslopes, especially at the corners.
  - c. Lack of a mulch specification. Previous comment #15c. not adequately addressed. While a mulch specification has been added to Dwg. No. 5, hardwood bark mulch has been required in

recent plans to minimize the possibility of mulch loss due to floating, please revise the specification

- d. Lack of plant number and diversity shown in a separate BMP planting plan. Previous comment #15d. not addressed. The plan still does not provide the density of canopy, understory and ground cover required by VSMH Minimum Standard 3.11. Also, provide a note that written Environmental Division approval is required prior to plant substitution within the bioretention area (including perimeter). Straw mulch, and other deleterious weed encouraging materials, are to be prohibited from use in the bioretention area. Immediate stabilization with sod is preferred.
- e. Lack of engineered soil mix.

For further guidance see the County BMP Guidelines, VSMH Minimum Standard 3.11 and other recently approved AES projects incorporating bioretention BMP's.

- 4. Pond WSEL's. In response to previous comment #19, the design 1-, 2-, 10- and 100-year design water surface elevations are shown in the bioretention basin on Dwg. No. 5. The revised detail provided on Dwg. No. 5 clearly shows that the bioretention basin design does not meet the ponding depth limitations provided in VSMH MS 3.11. The ponding depth for bioretention basins using native soil infiltration is limited to 6 inches. 9-12 inch ponding depths are permitted where underdrains are provided. The storage volume, geometry and lack of planting types and density suggests a County Type C-2 Infiltration Trench BMP. However, certain features are lacking from this perspective for a VSMH and County Guideline designed infiltration trench (i.e. stone diaphragm, observation wells, etc.). The design features must be complete and clearly recognizable for the proposed BMP whether it is a bioretention basin or, an infiltration trench.

8/14/08

Barry,

NO FURTHER E+S, see

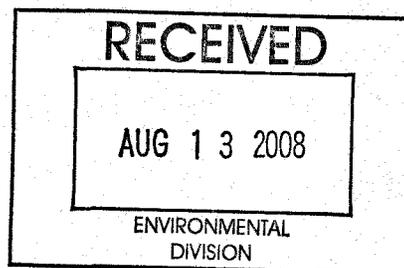
SP-074-08.1

THX,  
MIKE

**TRANSMITTAL**

**DATE: August 13, 2008**

**TO:** Environmental Division  
JCSA  
VDOT  
County Engineer  
Landscape Planner



**FROM:** Jose Ribeiro, Planner

**SUBJECT:** SP-0074-2008, The Williamsburg Wicker Expansion (Phase I)

**ITEMS**

**ATTACHED:** Site Plan- All Plan Reviewers  
Response Letter-All Plan Reviewers  
Water & Sanitary Sewer System Design Checklist-JCSA  
Water Data Sheet-JCSA  
Sanitary Sewer System Data Sheet-JCSA  
Stormwater Management Plan-Environmental Division (3 copies)

**NOTE:** This site plan is associated with approved case Z-0008-20005. The Master Plan indicates the construction of a Storage Warehouse, Furniture Shop, Retail Shop, and Retail Shop. The site plan is for the development of the Storage Warehouse only (Phase I).

**ACTION:** Please review and return comments no later than **August 25, 2008**

---

2<sup>nd</sup> revision

Thank you for your review,  
José-Ricardo Linhares Ribeiro  
JCC Planner

4. Per previous comment: The Applicant shall provide a Water Data Sheet and Sanitary Sewer Data Sheet with the resubmittal of this project (even if there is no flow). A downloadable version of the forms is available at [http://www.jamescity.va.us/jcsastandards2005/SS\\_index.html](http://www.jamescity.va.us/jcsastandards2005/SS_index.html).  
**Response: Attached Water Data Sheet and Sewer Data Sheet.**
5. Per previous comment: The fire hydrant location will need to be reviewed and approved by the James City Fire Department.  
**Response: So noted.**
6. Per the proffers, the Applicant shall be responsible for developing water conservation standards to be submitted to and approved by the James City Service Authority prior to final plan approval. Please contact Mrs. Beth Davis, JCSA Environmental Education Coordinator at (757) 253-6859 for coordination as early in the design process as possible.  
**Response: The Water Conservation Agreement has been submitted and approved by JCSA and is awaiting signatures.**

Sheet 03:

1. Label size of existing water line that is shown along Richmond Road.  
**Response: Revised plans by adding labels for existing utilities, which were found on JCSA Record Drawings for this area.**
2. Show and label 8" water line that encircles Peninsula Street.  
**Response: Revised plans by adding labels for existing utilities, which were found on JCSA Record Drawings for this area.**
3. Show and label 12" water line in Richmond Road.  
**Response: Revised plans by adding labels for existing utilities, which were found on JCSA Record Drawings for this area.**
4. Show a third fire hydrant. There is an existing fire hydrant on the corner of Richmond Road and Farmville Lane.  
**Response: Revised plans by adding labels for existing utilities, which were found on JCSA Record Drawings for this area.**
5. Show the sewer line extending down Peninsula Street. Labeling of the additional existing manhole rims and inverts are not required.  
**Response: Revised plans by adding labels for existing utilities, which were found on JCSA Record Drawings for this area.**

Environmental Division Review Comments:

*June 26, 2008*

General:

1. A Land-Disturbing Permit and Siltation Agreement, with surety, are required for this project.  
**Response: So noted. ✓**

2. A Standard Inspection / Maintenance agreement is required to be executed with the County due to the proposed stormwater conveyance systems and Stormwater Management/BMP facilities associated with this project.  
**Response:** So noted. ✓
3. Record Drawing and Construction Certification. The stormwater management/BMP facility as proposed for this project will require submission, review, and approval of a record drawing (as-built) and construction certification prior to release of the posted bond/surety. Provide notes on the plan accordingly to ensure this activity is adequately coordinated and performed before, during and following construction in accordance with current County guidelines.  
**Response:** Revised plans by adding the required note to the Grading, Drainage, and Erosion & Sediment Control Plan. ✓
4. Plan Number. Please reference the assigned County plan number on all subsequent submissions.  
**Response:** Revised plans added James City County project number to Cover Sheet. ✓
5. Yarmouth Creek. This project is situated in the Yarmouth Creek watershed. Please note the James City County Board of Supervisors, by resolution dated October 14, 2003, adopted six (6) goals and fourteen (14) priorities associated with the contents of that plan. The owner, applicant, developer and plan preparer should be advised of and completely review the goals, priorities (tools) and entire contents of this study, including sub-watershed maps, as layout and design of the proposed project could be affected by and should remain consistent with these items. Refer to the draft watershed management plan and the associated sub-watershed maps for environmental sensitive areas, features and/or recommendations that may apply to the sub-watershed in which the project area is situated. Specific items that may apply include: special stormwater criteria; potential stream restoration sites; potential stormwater BMP retrofit sites; identified RTE species; and identified shell-marl deposits.  
**Response:** Revised plans by adding the SSC note to the Grading, Drainage, and Erosion & Sediment Control Plan stating the requirements and implementation of requirements. ✓

Erosion & Sediment Control Plans:

6. E&SC Narrative. Revise the current narrative to reflect that permanent seeding, not temporary; be utilized following finished grading unless evidence can be provided that work on the next phase is to begin within one year of completion of Phase One.  
**Response:** Revised plans by replacing temporary seeding with permanent seeding within the E&SC Narrative. ✓
7. Limits of Work. Ensure that all erosion and sediment controls are located within the limits of work. There is currently silt fence that is proposed in areas that are outside the limits. Ensure disturbed area estimates match land-disturbance inclusive within the limits of work. Please revise this information within the next submittal.  
**Response:** Revised plans by assuring all construction activities are located within the limits of work. ✓
8. Sequence of Construction. Revise the current sequence of construction to state that the bio-retention cell should not be installed until all up-slope areas are properly stabilized. Installation of the cell prior to site stabilization may result in contamination of the cell and maintenance issues.

**Response:** Revised plans by stating site needs to be stabilized before bio-retention cell is installed. ✓

9. Bio-Retention Cell. If the proposed bio-retention cell is not to be used as a temporary erosion and sediment control feature, it will need to be enclosed with silt fence to prevent sediment run-off and heavy equipment access into this area. Please clarify this information within the next submittal. Additionally, please see the comment regarding the sequence of construction for further information in respect to the proper sequencing of installation of the cell.

**Response:** Revised plans by enclosing bio-retention area with silt fence during construction. ✓

10. Slope Stabilization. The proposed bio-retention cell in Phase One currently calls for 3:1 slopes. Although not required, EC-2 matting is recommended in these areas to minimize erosion and to avoid the extra costs of re-stabilization of these areas that may be required when standard seeding and mulching practices are not adequate.

**Response:** Revised plans by adding EC-2 matting to side slopes of bio-retention cell. ✓

11. Safety Fence. Use of orange colored safety fence in accordance with VESCH Minimum Standard & Spec. 3.01 of the VESCH may be warranted along the frontage of the site to maintain pedestrian safety around the perimeter of the site.

**Response:** Revised plans by adding note to E&SC Plan that "International Orange" silt fence could be used in lieu of safety fence and silt fence. ✓

12. Dust Control. Add dust control measures in accordance with Minimum Standard 3.39 of the VESCH to the erosion and sediment control plan for the site. Dust control may be warranted due to the proximity of work along (Describe Roadway) and to ensure traffic safety.

**Response:** Revised plans by adding dust control to the E&SC Plan. ✓

Stormwater Management/Drainage:

13. SSC Criteria. Based on the proposed site's location in the Yarmouth Creek watershed, this plan of development is subject to Special Stormwater Criteria (SSC) as adopted by the Board of Supervisors on December 14, 2004. Please show how SSC is being achieved for this site using the SSC guidance document.

**Response:** Revised plans by adding the SSC note to the Grading, Drainage, and Erosion & Sediment Control Plan stating the requirements and implementation of requirements.

14. BMP/Water Quality Points. The standard Worksheet for BMP Point System as provided shows the Phase I site stormwater management plan achieves a total of 3.64 points based on use of 10 point Bio-retention Basin, County type D-I BMP without natural open space. This does not satisfy the 10-point BMP requirement. A written variance request specifying the need for relief was provided. The waiver request states that the 10-point BMP requirement will be met when the remainder of the site is developed. A master plan (as recommended in the March 2008 concept plan comments) must be provided which illustrates how this will be achieved prior to further consideration of the 'waiver request.

**Response:** BMP/Water Quality Points Worksheet calculation has been modified as agreed upon with Barry Moses and Bill Cain at our meeting on July 11, 2008.

How to  
IMPLEMENT  
RAIN BARRIERS

15. **BMP Points.** Assigned BMP point values indicated in Table 1 of the County BMP manual assume all features consistent with the manual are provided such as pretreatment forebays, aquatic shelves, stream channel protection volume, pond buffers, etc. As full point credit value is being taken for the BMP in the calculation worksheet, all applicable design features must be present. Major concerns with the proposed plan include but, are not limited to:

- a. Lack of pretreatment.
- b. Lack of consideration of incoming runoff velocity and the need for energy dissipating structures.
- c. Lack of a mulch specification. Note, hardwood bark mulch has been required in recent plans to minimize the possibility of mulch loss due to floating.
- d. Lack of plant number and diversity shown in a separate BMP planting plan. Provide a note that written Environmental Division approval is required prior to plant substitution within the bio-retention area (including perimeter). Also, straw mulch, and other deleterious weed encouraging materials, are to be prohibited from use in the bio-retention area. Immediate stabilization with sod is preferred.

For further guidance, see the County BMP Guidelines, VSMH Minimum Standard 3.11 and other recently approved AES projects incorporating bio-retention BMP's.

**Response:** BMP/Water Quality Points Worksheet calculation has been modified as agreed upon with Barry Moses and Bill Cain at our meeting on July 11, 2008. Also as discussed at our meeting SSC is met by maintaining sheet flow in turn reducing runoff velocity by not allowing concentrated flow, added mulch specification to detail, and added note to Landscape Plan.

*D.R.*  
Stormwater Hotspot. Please provide further information pertaining to anticipated uses at the site. Certain use or activities are restricted in conjunction with use of infiltration-type BMP facilities. Refer to the stormwater hotspot section in Appendix F of the County BMP manual.

**Response:** Revised plans by adding prohibited uses for this parcel per proffers with rezoning instrument number 050027419.

17. *PER MTG WICKER BASKET STORAGE*  
Site Hydrology. Provide the calculation sheet for the SCS curve number and time of concentration used in the analysis.

**Response:** Revised the drainage calculations by providing CN and Tc calculation sheets.

18. Maintenance Plan. The maintenance plan provided lacks detail compared to recently approved projects using bio-retention BMP's. See other recently approved AES bio-retention maintenance plans or, Contact Barry Moses at 757/253-6672 for further information.

**Response:** Revised plans by adding additional notes and specifications taken from a recently approved AES bio-retention maintenance plan.

19. Pond WSEL's. Show the design 1-, 2-, 10- and 100-year design water surface elevations.

**Response:** Revised plans by adding water surface elevations to the bio-retention cell detail.

20. Infiltration Practice Separations. Current guidelines of the JCC BMP manual require an infiltration practice to have a 100-foot separation horizontally from any water supply well. In addition, Minimum Standard & Spec. 3.10 of the Virginia Stormwater Management Handbook requires a 100-foot separation between an infiltration practice and any down gradient building. Also infiltration facilities cannot cause water problems to downgrade properties. A 100 foot separation from this facility extends onto an offsite property (n/f Name), Please confirm existing downstream off-site property uses to ensure no existing buildings or wells are present within 100 foot of the infiltration facility. It may be prudent to coordinate with the adjacent owner prior to observing features on that site and to discuss potential limitations and restrictions that may be imposed for development of buildings or water wells due to use of this type of SWIM/BMP facility.

**Response: There are no existing or proposed wells within 100 feet of this facility.**

21. Adequate Outfall. It does not appear nor was any information provided in regards to an adequate outfall channel for excess stormwater that may leave the bio-retention area during severe storm events. Although, by the proposed design, complete stormwater infiltration is anticipated within the bio-retention cell, the lack of sufficient geotechnical data combined with numerous currently unforeseen field issues could cause the bioretention cell to malfunction resulting in the potential for flooding of adjacent areas.

**Response: Attached an addendum for the geotechnical report containing the results for the on site infiltration test. However from the infiltration calculations only the 100-yr storm and greater would overflow the facility and flow into the roadside ditch on Peninsula Street.**

22. Overflow Path. Show the general anticipated overflow path should the storm drain system or BMP fail or become clogged or if the design storm is exceeded. The path should be a safe escape route that will not impact downstream property or structures.

**Response: The overflow path for the bio-retention cell is the proposed roadside ditch on Peninsula Street that flows to the existing storm system on Richmond Road (Rt. 60).**

23. Geotechnical. Insufficient data was submitted to substantiate design infiltration-percolation rates for the infiltration or filtering type BMP. Actual field infiltration rates must be determined through field testing in accordance with the Appendix E of the JCC BMP manual.

**Response: Attached an addendum for the geotechnical report containing the results for the on site infiltration test.**

**VDOT:**  
*June 17, 2008*

1. A standard commercial entrance should be shown at the connection to Route 676. It should be paved within the VDOT right-of-way with a pavement detail.

**Response: Revised plans by adding callout and detail for VDOT standard commercial entrance (CG-13) and pavement section.**

2. A proposed entrance profile should be provided from the centerline of Peninsula Street to the back of the entrance, or at least just beyond the right-of-way.

**Response: Revised plans by adding section A-A at the entrance.**

**ENVIRONMENTAL DIVISION REVIEW COMMENTS****The Williamsburg Wicker Expansion (Phase 1)****SP-074-2008***June 26, 2008*

*The site plan in its current form does not address several specific comments that were issued during the conceptual plan review phase of the project in March 2008. Of primary concern is how this plan will address Minimum Standard 19 of the Virginia Erosion and Sediment Control Regulations. It does not appear nor was any information provided in regards to an adequate outfall channel for excess stormwater that may leave the bio-retention area during severe storm events. Although, by the proposed design, complete stormwater infiltration is anticipated within the bio-retention cell, the lack of sufficient geotechnical data combined with numerous currently unforeseen field issues could cause the bioretention cell to malfunction resulting in the potential for flooding of adjacent areas. This issue will need to be addressed prior to the approval of this plan.*

**General:**

1. A Land-Disturbing Permit and Siltation Agreement, with surety, are required for this project.
2. A Standard Inspection / Maintenance agreement is required to be executed with the County due to the proposed stormwater conveyance systems and Stormwater Management/BMP facilities associated with this project.
3. Record Drawing and Construction Certification. The stormwater management/BMP facility as proposed for this project will require submission, review and approval of a record drawing (as-built) and construction certification prior to release of the posted bond/surety. Provide notes on the plan accordingly to ensure this activity is adequately coordinated and performed before, during and following construction in accordance with current County guidelines.
4. Plan Number. Please reference the assigned County plan number on all subsequent submissions.
5. Yarmouth Creek. This project is situated in the Yarmouth Creek watershed. Please note the James City County Board of Supervisors, by resolution dated October 14<sup>th</sup> 2003, adopted six (6) goals and fourteen (14) priorities associated with the contents of that plan. The owner, applicant, developer and plan preparer should be advised of and completely review the goals, priorities (tools) and entire contents of this study, including sub-watershed maps, as layout and design of the proposed project could be affected by and should remain consistent with these items. Refer to the draft watershed management plan and the associated sub-watershed maps for environmental sensitive areas, features and/or recommendations that may apply to the sub-watershed in which the project area is situated. Specific items that may apply include: *special stormwater criteria; potential stream restoration sites; potential stormwater BMP retrofit sites; identified RTE species; and identified shell-marl deposits.*

**Erosion & Sediment Control Plan:**

6. E&SC Narrative. Revise the current narrative to reflect that permanent seeding, not temporary, be utilized following finished grading unless evidence can be provided that work on the next phase is to begin within one year of completion of Phase One.
7. Limits of Work. Ensure that all erosion and sediment controls are located within the limits of work. There is currently silt fence that is proposed in areas that are outside the limits. Ensure disturbed area estimates match land-disturbance inclusive within the limits of work. Please revise this information within the next submittal.
8. Sequence of Construction. Revise the current sequence of construction to state that the bio-retention cell should not be installed until all up-slope areas are properly stabilized. Installation of the cell prior to site stabilization may result in contamination of the cell and maintenance issues.
9. Bio-Retention Cell. If the proposed bio-retention cell is not to be used as a temporary erosion and sediment control feature, it will need to be enclosed with silt fence to prevent sediment run-off and heavy equipment access into this area. Please clarify this information within the next submittal. Additionally, please see the comment regarding the sequence of construction for further information in respect to the proper sequencing of installation of the cell.
10. Slope Stabilization. The proposed bio-retention cell in Phase One currently calls for 3:1 slopes. Although not required, EC-2 matting is recommended in these areas to minimize erosion and to avoid the extra costs of re-stabilization of these areas that may be required when standard seeding and mulching practices are not adequate.
11. Safety Fence. Use of orange colored safety fence in accordance with VESCH Minimum Standard & Spec. 3.01 of the VESCH may be warranted along the frontage of the site to maintain pedestrian safety around the perimeter of the site.
12. Dust Control. Add dust control measures in accordance with Minimum Standard 3.39 of the VESCH to the erosion and sediment control plan for the site. Dust control may be warranted due to the proximity of work along {Describe Roadway} and to ensure traffic safety.

**Stormwater Management / Drainage:**

13. SSC Criteria. Based on the proposed site's location in the Yarmouth Creek watershed, this plan of development is subject to Special Stormwater Criteria (SSC) as adopted by the Board of Supervisors on December 14, 2004. Please show how SSC is being achieved for this site using the SSC guidance document.

14. **BMP/Water Quality Points.** The standard Worksheet for BMP Point System as provided shows the Phase I site stormwater management plan achieves a total of 3.64 points based on use of 10 *point Bioretention Basin, County type D-1* BMP without natural open space. This does not satisfy the 10-point BMP requirement. A written variance request specifying the need for relief was provided. The waiver request states that the 10-point BMP requirement will be met when the remainder of the site is developed. A master plan (as recommended in the March 2008 concept plan comments) must be provided which illustrates how this will be achieved prior to further consideration of the waiver request.
  
15. **BMP Points.** Assigned BMP point values indicated in Table 1 of the County BMP manual assume all features consistent with the manual are provided such as pretreatment forebays, aquatic shelves, stream channel protection volume, pond buffers, etc. As full point credit value is being taken for the BMP in the calculation worksheet, all applicable design features must be present. Major concerns with the proposed plan include but, are not limited to:
  - a. Lack of pretreatment,
  - b. Lack of consideration of incoming runoff velocity and the need for energy dissipating structures,
  - c. Lack of a mulch specification. Note, hardwood bark mulch has been required in recent plans to minimize the possibility of mulch loss due to floating,
  - d. Lack of plant number and diversity shown in a separate BMP planting plan. Provide a note that written Environmental Division approval is required prior to plant substitution within the bioretention area (including perimeter). Also, straw mulch, and other deleterious weed encouraging materials, are to be prohibited from use in the bioretention area. Immediate stabilization with sod is preferred.

For further guidance see the County BMP Guidelines, VSMH Minimum Standard 3.11 and other recently approved AES projects incorporating bioretention BMP's.

16. **Stormwater Hotspot.** Please provide further information pertaining to anticipated uses at the site. Certain use or activities are restricted in conjunction with use of infiltration-type BMP facilities. Refer to the stormwater hotspot section in Appendix F of the County BMP manual.
17. **Site Hydrology.** Provide the calculation sheet for the SCS curve number and time of concentration used in the analysis.
18. **Maintenance Plan.** The maintenance plan provided lacks detail compared to recently approved projects using bioretention BMP's. See other recently approved AES bioretention maintenance plans or, Contact Barry Moses at 757/253-6672 for further information.
19. **Pond WSEL's.** Show the design 1-, 2-, 10- and 100-year design water surface elevations.

20. **Infiltration Practice Separations.** Current guidelines of the JCC BMP manual require an infiltration practice to have a 100 foot separation horizontally from any water supply well. In addition, Minimum Standard & Spec. 3.10 of the Virginia Stormwater Management Handbook, requires a 100 foot separation between an infiltration practice and any down gradient building. Also infiltration facilities cannot cause water problems to downgrade properties. A 100 foot separation from this facility extends onto an offsite property (n/f *Name*). Please confirm existing downstream offsite property uses to ensure no existing buildings or wells are present within 100 foot of the infiltration facility. It may be prudent to coordinate with the adjacent owner prior to observing features on that site and to discuss potential limitations and restrictions that may be imposed for development of buildings or water wells due to use of this type of SWM/BMP facility.
21. **Adequate Outfall.** It does not appear nor was any information provided in regards to an adequate outfall channel for excess stormwater that may leave the bio-retention area during severe storm events. Although, by the proposed design, complete stormwater infiltration is anticipated within the bio-retention cell, the lack of sufficient geotechnical data combined with numerous currently unforeseen field issues could cause the bioretention cell to malfunction resulting in the potential for flooding of adjacent areas.
22. **Overflow Path.** Show the general anticipated overflow path should the storm drain system or BMP fail or become clogged or if the design storm is exceeded. The path should be a safe escape route that will not impact downstream property or structures.
23. **Geotechnical.** Insufficient data was submitted to substantiate design infiltration-percolation rates for the infiltration or filtering type BMP. Actual field infiltration rates must be determined through field testing in accordance with the Appendix E of the JCC BMP manual.

# Community Impact Study

*For The*

## WILLIAMSBURG WICKER AND RATTAN RETAIL CENTER

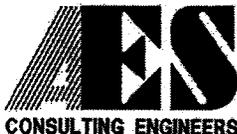
For

Oscar B. & Elva W. Harrell  
105 John Paine  
Williamsburg, VA 23185

April 25, 2005  
AES Project # 9556

Prepared By

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5248 Old Towne Road, Suite 1  
Williamsburg, Virginia 23188  
(757) 253-0040  
Fax (757) 220-8994

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	2. Schools Student Generators and Capacity .....	4

## I. INTRODUCTION

Mr. Oscar Harrell proposes a Rezoning for approximately 0.5 acres of land in the Norge area of James City County, Virginia. This parcel is within the area surrounded by Peninsula Street along with the Williamsburg Clocks and Century 21 Realty office. Mr. Harrell currently owns and operates the Williamsburg Wicker and Rattan Shoppe on the corner of Peninsula and Richmond Road. Recently Mr. Harrell bought approximately 1.1 acres in order to expand his current business. Approximately half of the property is zoned B1 and the remainder, subject to this rezoning is currently zoned A1. The new Williamsburg Wicker and Rattan Shoppe would be located on this property along with additional retail and storage for his retail business. There currently exists a single house on the property. It is currently rented and is occupied. It is not known at this time if it is economically feasible to improve this structure or to remove it. If it remains, it will become a non-conforming use if the property is rezoned and if the structure loses its non-conforming status it will be rented to an employee or caretaker for the property. The total proposed commercial area will consist of approximately 8,300 square feet of retail and commercial Gross Floor Area. The 0.5 acre area subject to this rezoning is proposed to be approximately 3,000 square feet of commercial/storage, parking and possibly saving the existing residential structure as an apartment or living quarters for a caretaker.

## II. THE PROJECT TEAM

The following organizations are involved in the planning and development of the property.

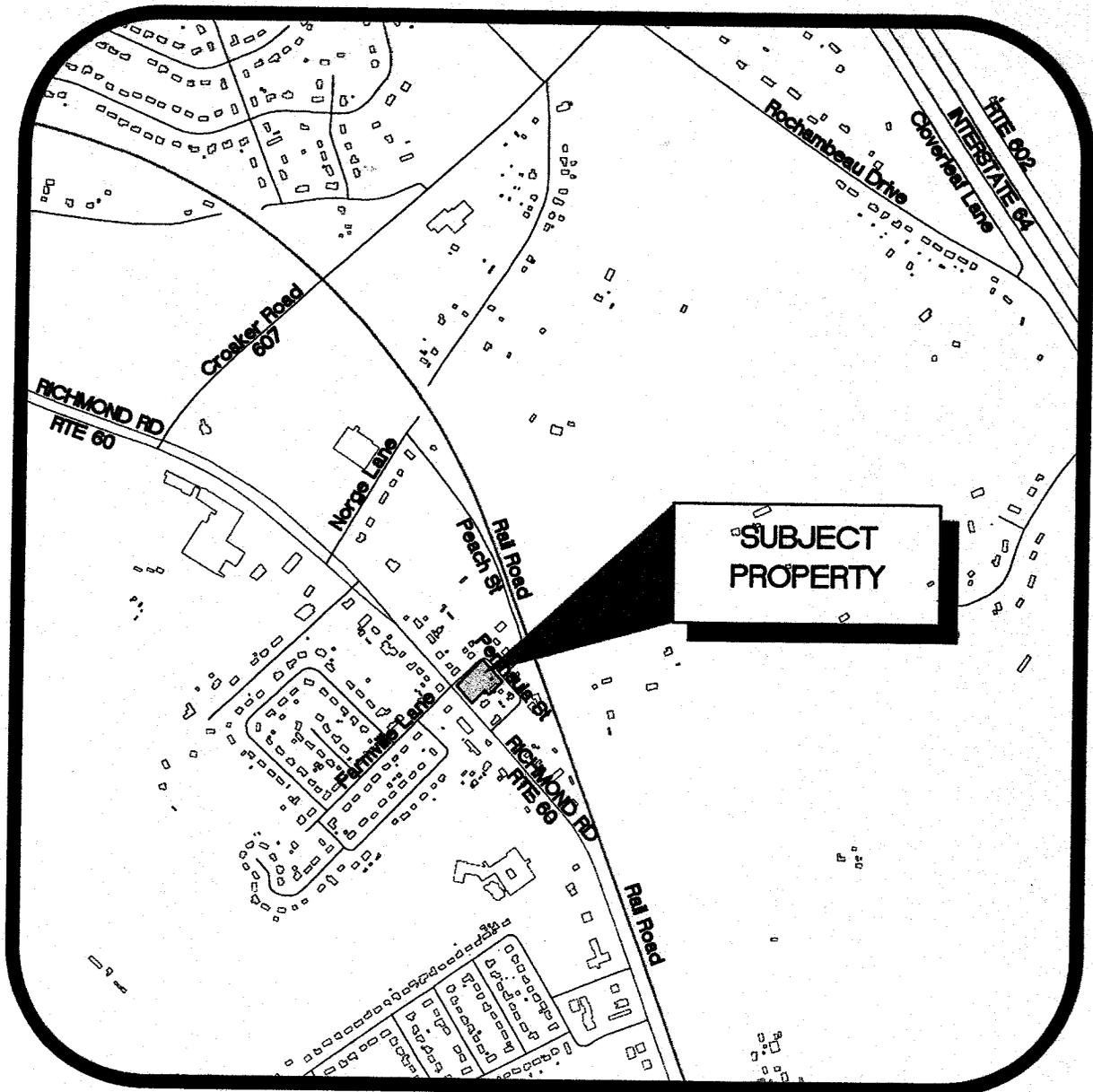
- Developer                      Oscar Harrell Williamsburg, Virginia
- Legal Counsel                Geddy, Harris, Franck, and Hickman - Williamsburg, Virginia
- Civil Engineer                AES Consulting Engineers - Williamsburg, Virginia
- Land Planning/  
Landscape Architecture        AES Consulting Engineers - Williamsburg, Virginia

## COMPANION REPORTS & DOCUMENTS

1. Photographs of the existing site and adjacent Norge area

Exhibit 1 illustrates the general location of the 1.1 acre site at the intersection of Peninsula Street and Richmond Road (Route 60) in the Norge Area.

(EXHIBIT 1)



VICINITY MAP  
APPROX. SCALE: 1" = 1000'

Electricity is supplied by Dominion / Virginia Power. The power lines are currently on utility poles along the property frontage with Route 60.

#### IV. ENVIRONMENTAL STUDIES

##### 1. Introduction

AES inventoried the resources by analyzing the best available offsite reference material, including James City County base mapping, U. S. Geological Survey (USGS) 7.5 minute topographic mapping, Natural Resources Conservation Service (NRCS) soil surveys, Federal Emergency Management Agency (FEMA) floodplain mapping, aerial photography, and information from the Virginia Department of Conservation and Recreation (DCR) database. This information was corroborated with site inspections performed by AES on April 20, 2005.

During the offsite and onsite reviews, AES evaluated the Williamsburg Wicker and Rattan Shoppe center for the following resources: topography, soils, surface water, wetlands, floodplains, Chesapeake Bay Preservation Areas, vegetation, wildlife, rare, threatened, and endangered species, unique and environmentally sensitive areas, and cultural resources.

##### 2. Description of Existing Environment

The Peninsula Street area harbors very little environmental resources related to physiography, drainage, vegetation cover, and limited historical land use. This site shows evidence of being cleared in the past, and most of the site has been mowed regularly. What little environmental attributes of the Peninsula Street area remain are described in the sections that follow.

##### a. Topography

The Peninsula Street area of Williamsburg property is located in the Coastal Plain physiographic province in Virginia. The land in the Coastal Plain Province is generally level and this site is flat as can be seen on the Master Plan and in the photography section of this report. There are no drainage ways on the property. Elevations on the property range from 117 feet mean sea level (msl) in the center of the site approximately 114 feet above mean sea level in the southeastern portion of the site near Route 60.

b. Soils

The *Soil Survey of James City and York Counties and the City of Williamsburg, Virginia* (USDA 1985) maps two soil types within the Peninsula Street area of Williamsburg property boundary. The soils are 8B Caroline fine sandy loam and 20B Kenansville loamy fine sand. The Peninsula Street area is predominantly situated on well-drained soils of Carolina and Kenansville. Shrink-swell potential is low to moderate in all soils mapped within the site boundary, and the erosion hazard potential is slight in all soils. There may be a concern of a high water table with the Kenansville soil that will be dealt with during construction.

c. Surface Water

This site is flat and rainwater drains towards Route 60 and Peach Street. A portion of this site drains to the York River and a portion drains to the Yarmouth Creek Sub watershed S-104. See Figure 2 on the next page for more detail.



e. **Wetland Information**

There are no wetlands on this site

f. **Floodplains**

General limits of the 100-year floodplain are derived from the Flood Insurance Rate Map for James City County, Virginia. This site lies at the top of the ridge that flows both to the James River and York River. No portions of the Peninsula Street area within the FEMA determined 100-year floodplain limits.

g. **Chesapeake Bay Preservation Areas**

This site lies at the top of the ridge that flows both to the James River and York River. There are no RPA areas on this site.

h. **Vegetation**

This site shows evidence of being cleared in the past, and most of the site has been mowed regularly. There is no discernable natural vegetation. ?

i. **Cultural Resources**

AES has reviewed the James City County cultural sensitivity maps for this area. Based on that investigation, there are no known and/or potential archaeological and architectural sites in the general vicinity of the project site.

### **Stormwater Management**

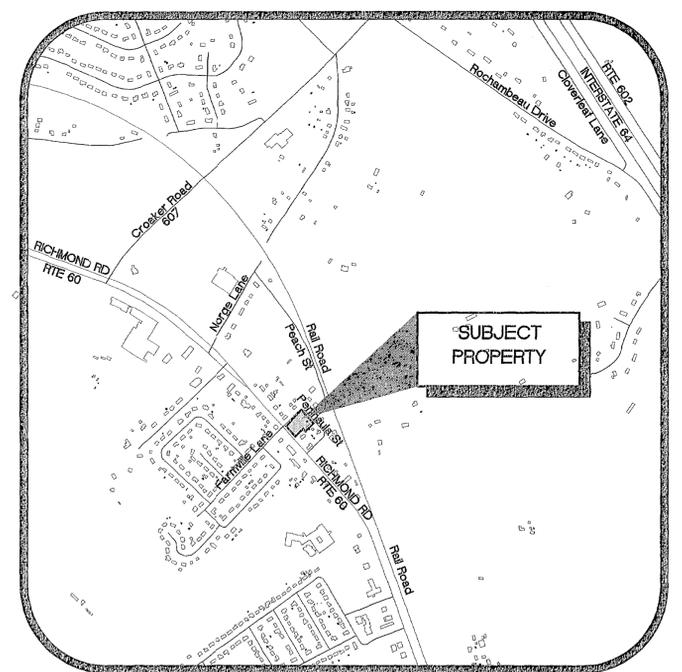
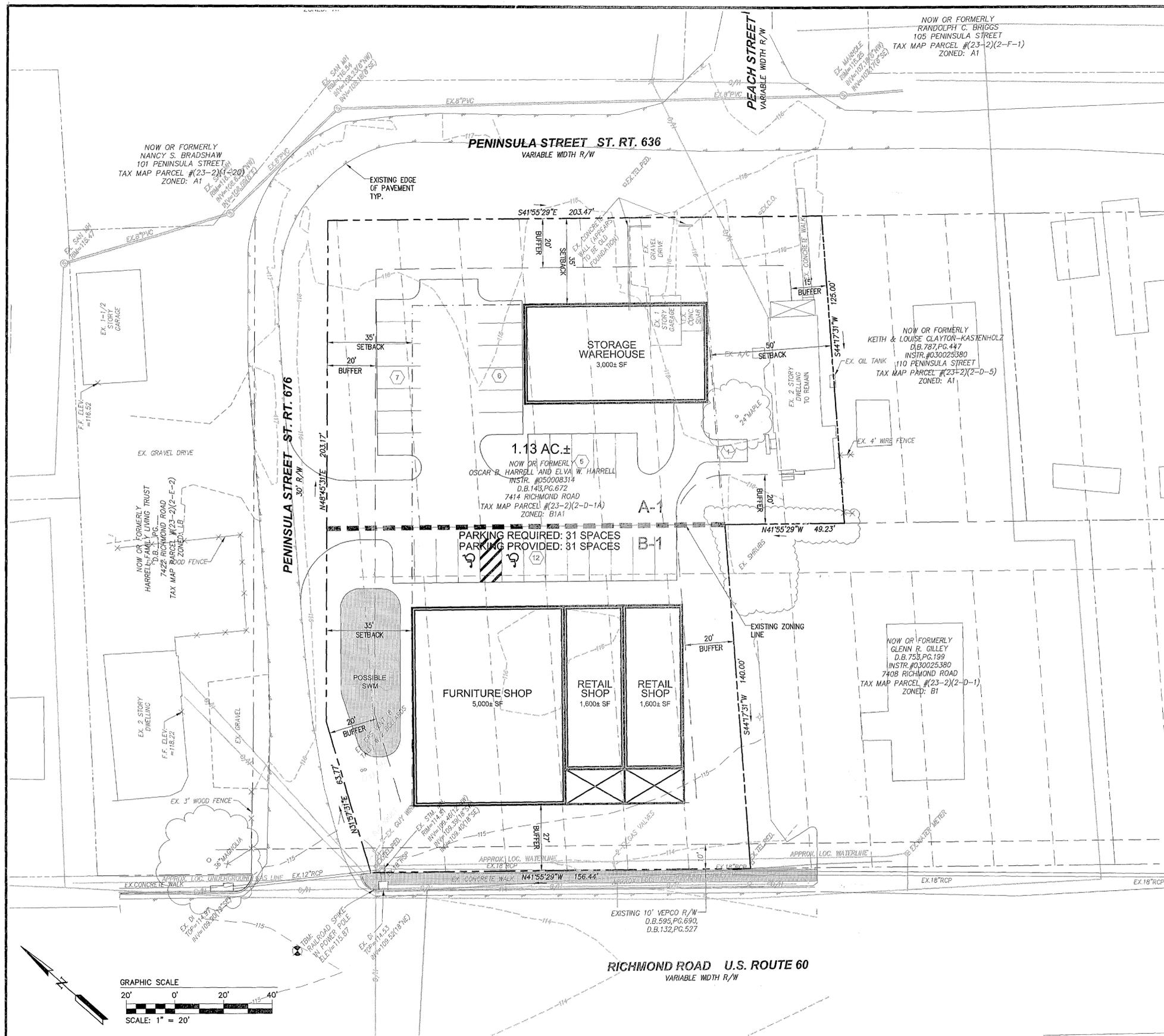
The area is urban in character with a grid street system and an older storm collection system that predates the stormwater and water quality ordinances that exist today. If a regional stormwater pond system is not to be constructed in the future by James City County for this area with a cost sharing vehicle then a storm system will be provided on site. This site consists of well drained sandy loam that may support stormwater management system utilizing a bio filter or infiltration system. The stormwater system will be handled at site plan.

### References

FEMA, February 6, 1991. Floodplain location map, James City County, Virginia.

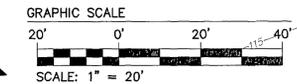
USDA (United States Department of Agriculture). 1985. *Soil Survey of James City and York Counties and the City of Williamsburg, Virginia*. Soil Conservation Service.

USGS (United States Geological Survey). 604. 7.5 minute series topographic quadrangle map. Norge, Virginia



- GENERAL NOTES:**
- CURRENT OWNER: MR. OSCAR B. & ELVA W. HARRELL
  - PROPERTY ADDRESS: 7414 RICHMOND ROAD
  - PARCEL ID #: L-1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 & PARCEL A OF BLOCK D OF NORVALIA SUBDIVISION
  - TOTAL AREA: 1.13± ACRES
  - ZONING: EXISTING: A-1 & B-1  
PROPOSED: B-1 WITH PROFFERS  
(PROPOSED USES: FURNITURE STORE, RETAIL, STORAGE BUILDING, AND AN APARTMENT)
  - THE BOUNDARY SHOWN HEREON IS FROM A BOUNDARY SURVEY BY AES, APRIL 2005
  - TOPOGRAPHY SHOWN HEREON IS 1-FOOT CONTOUR INTERVAL FROM AN AES SURVEY, APRIL 2005
  - ACCORDING TO FEMA MAPPING PANEL 510201 0020B DATED FEB. 6, 1991, THERE IS NO 100-YEAR FLOOD PLAIN ON THIS PROPERTY
  - THERE IS NO MAPPED RSPA ON THIS SITE
  - THERE ARE NO EVIDENT SHEDS ON THIS PROPERTY ACCORDING TO JAMES CITY COUNTY MAPPING
  - ACCORDING TO JAMES CITY COUNTY HISTORICAL SENSITIVITY MAP, THERE ARE NO IDENTIFIED SITES ON THIS PROPERTY.

- DEVELOPMENT NOTES AND TABULATIONS:**
- MINIMUM LOT SIZE: NONE
  - SITE AREA: 1.13± ACRES
  - PROPOSED ZONING: B-1 WITH PROFFERS
  - MINIMUM LOT WIDTH: NONE
  - THIS SITE FRONTS ON A COMMUNITY CHARACTER CORRIDOR AND IS WITHIN A COMMUNITY CHARACTER AREA
  - SETBACKS:  
FRONT: 27' COMMUNITY CHARACTER CORRIDOR BUFFER (\*10% OF LOT DEPTH)  
SIDE: 20'  
REAR: 50' NEXT TO RESIDENTIAL ZONING & DESIGNATED RESIDENTIAL ON THE COMPREHENSIVE PLAN
  - MAXIMUM BUILDING HEIGHT: 60'
  - PROPOSED USE:  
5,000± SF FURNITURE STORE  
3,300± SF RETAIL  
3,000± SF STORAGE  
2,400± SF RENTAL UNIT
  - PROPOSED F.A.R.: 0.28
  - PARKING TABULATION:
- |                                    | REQUIRED  | PROVIDED  |
|------------------------------------|-----------|-----------|
| FURNITURE STORE (1400 GFA):        | 13        | 13        |
| RETAIL (1200 GFA):                 | 16        | 16        |
| WAREHOUSE/STORAGE (1/2 EMPLOYEES): | 1         | 1         |
| APARTMENT:                         | 1         | 1         |
| <b>TOTAL</b>                       | <b>31</b> | <b>31</b> |
- NO LOADING SPACE IS REQUIRED FOR BUILDINGS UNDER 5,001 S.F.
  - OPEN SPACE REQUIREMENTS:  
OPEN SPACE REQUIRED: 30%  
PROVIDED: 50%  
THE MAXIMUM IMPERVIOUS COVERAGE IS 60%  
-ACCORDING TO SECTION 24-99(C) LANDSCAPE AREAS SHALL BE 15'  
SIDE AND REAR LANDSCAPE YARDS CAN BE REDUCED TO 10'  
-ACCORDING TO SECTION 24-99(D)(3)(B) A 10' WIDE LANDSCAPE AREA SHALL BE ALONG 50% OF THE BUILDING PERIMETER
  - EXISTING OVERHEAD UTILITY LINES TO REMAIN AS IS.
  - THIS LAYOUT IS WITHOUT THE BENEFIT OF FINAL ENGINEERING AND MAY VARY WITH FINAL SITE PLANS



No.	DATE	REVISION / COMMENT / NOTE	REVISOR	REVIEWED BY

**AEVA**  
ENGINEERS  
SURVEYORS  
PLANNERS  
LANDSCAPE ARCHITECTS  
CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1  
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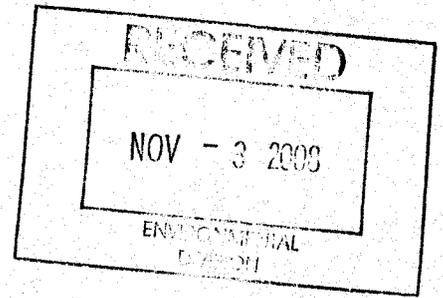
WILLIAMSBURG • RICHMOND

**REZONING PLAN**  
**WILLIAMSBURG WICKER & RATTAN SHOPPE CENTER**  
FOR  
**OSCAR B. & ELVA W. HARRELL**

STONEHOUSE B DISTRICT JAMES CITY COUNTY VIRGINIA

Designed TWD	Drawn GRR
Scale 1"=20'	Date 4/25/05
Project No. 9556-00	
Drawing No. 1 OF 1	

TRANSMITTAL



DATE: November 03, 2008

TO: JCSA  
Environmental Division ←  
VDOT  
Senior Landscape Planner  
County Engineer

FROM: Jose Ribeiro, Planner

SUBJECT: SP-0074-2008, The Williamsburg Wicker Expansion (Phase I)

ITEMS

ATTACHED:

- ❖ Annotated Response Letter
- ❖ Water & Sanitary Sewer System Design Checklist
- ❖ Stormwater Management Plan (3 copies)

ACTION: Please review and return no later than November 17, 2008

---

This is the 3<sup>rd</sup> review of this plan

Thank you for your review,  
José-Ricardo Linhares Ribeiro  
JCC Planner

*Plan is approved subject to the following condition:*

The professional engineer providing construction inspection (per note 4 Bioretention Basin Dwg. No. 5) shall specifically observe the mixing of topsoil with in situ soil to: 1.) verify complete mixing has been provided, 2.) that the resulting mix is appropriate per VSMH requirements and that 3.) deleterious materials are not present in quantities which will affect the basin's performance.

*A Land-Disturbing Permit, with surety, is required for this project.*

*Auth Thomas 11-24-08*



104 NORGE LANE

127 PEACH STREET

255 PEACH STREET

7450 RICHMOND ROAD

101 PENINSULA ST

220 PEACH STREET

7445 RICHMOND ROAD

240 PEACH STREET

7414 RICHMOND ROAD

255 PEACH STREET

7364 RICHMOND ROAD

7381 RICHMOND ROAD

7345 RICHMOND ROAD

7311 RICHMOND ROAD

5. Show and label the contour lines.

**Response:** The existing and proposed contours are shown and labeled on the Grading, Drainage, and Erosion & Sediment Control Plan sheet 4.

Water and Sewer Data Sheets:

1. Include the adequacy calculations/data for the existing dwelling, proposed warehouse and the future phase 2 building. Show the water meter sizing calculations that include the future phase 2 building. State how the existing structure is to be used (residence, office, demolished, etc).

**Response:** Revised data sheets including the existing residential home.

Environmental Division Review Comments:

Stormwater Management /Drainage:

1. SSC Criteria. Previous comment #13 has, not been adequately addressed. According to the SSC guidance document the chosen SSC measure #29 Rain Barrels/Cisterns requires detail as to the treatment level (site wide) and manufacturer's recommendation for storage device proposed.

**Response:** There is a note on the site plan within our SSC calculations that the rain barrels will be used site wide for Phase I. SSC for Phase II will be evaluated with the design and site plans for Phase II. Revised plans by adding a note to the grading plan stating that a minimum of four 55-gallon rain barrels are used at the corners of the building.

2. BMP/Water Quality Points. Previous comment #14 maintained that a master plan (as recommended in the March 2008 concept plan comments) must be provided to illustrate how 10 BMP points will be achieved for the entire site. During a July 11, 2008 meeting between County staff and the Applicant, it was clearly discussed and agreed that the owner's current intention was to develop only those items shown on Dwg. No. 4 and that stormwater management would be provided for the developed area only. To avoid future confusion, provide a prominent boxed note on the cover sheet of the site plan which indicates that only those Phase I clearing, building, pavement, stormwater management BMP's, and ditch grading shown on Dwg. No. 4 will be approved with this site plan. Additional parking and buildings as part of future phases will require submission and approval of an additional site plan.

**Response:** Revised plans by adding note to the Cover Sheet.

3. BMP Points. Previous comment #15 not adequately addressed. Assigned BMP point values indicated in Table 1 of the County BMP manual assume all features consistent with the manual are provided such as pretreatment forebays, aquatic shelves, stream channel protection volume, pond buffers, etc. As full point credit value is being taken for the BMP in the calculation worksheet, all applicable design features must be present. Major concerns with the proposed plan include but, are not limited to:

- a. Lack of pretreatment. The response to previous comment #15 a. indicates that sheet flow will be maintained on site and during the meeting it was discussed that the grassed areas will provide pretreatment. Be advised, this may be adequate for the development Phase I, however, future Phase II parking areas as shown on Dwg. No. 3 will be in close proximity to the bio-retention basin and may require additional pretreatment measures.

**Response:** So noted, grass area is being used for pretreatment for Phase I and pretreatment will be re-evaluated when Phase II is designed.

- b. Lack of consideration of incoming runoff velocity and the need for energy dissipating structures. Previous comment #15b. not adequately addressed. With the additional detail provided on Dwg. No. 5 and resolution of E&SC comment #9 Bio-retention cell, it is now apparent that the proposed bio-retention basin will be approximately 3 ft deep. Runoff entering facilities with this geometry has been observed to cause erosion on the sideslopes, especially at the corners.  
**Response:** The bio-retention basin has been redesigned to a 6 inch depth and side slopes are to be protected by EC-2 matting until stabilized by vegetation.
- c. Lack of a mulch specification. Previous comment #15c. not adequately addressed. While a mulch specification has been added to Dwg. No. 5, hardwood bark mulch has been required in recent plans to minimize the possibility of mulch loss due to floating, please revise the specification.  
**Response:** Shredded hardwood mulch or shredded hardwood chips are specified in the detail. However, added to the specification that the mulch will be free of weed seeds, soil, roots, or any other substance not consisting of either bole or branch wood and bark as stated in VSMH minimum standard 3.11.
- d. Lack of plant number and diversity shown in a separate BMP planting plan. Previous comment #15d. not addressed. The plan still does not provide the density of canopy, understory and ground cover required by VSMH Minimum Standard 3.11. Also, provide a note that written Environmental Division approval is required prior to plant substitution within the bio-retention area (including perimeter). Straw mulch, and other deleterious weed encouraging materials, are to be prohibited from use in the bio-retention area. Immediate stabilization with sod is preferred.  
**Response:** Landscaping for the Bio-Retention Basin has been modified to meet the VSMH specifications.
- e. Lack of engineered soil mix.  
**Response:** Note has been added to the Bio-Retention Basin's Detail stating that topsoil/organic mix will be mixed into the existing soil.

For further guidance see the County BMP Guidelines, VSMH Minimum Standard 3.11 and other recently approved AES projects incorporating bio-retention BMP's.

4. Pond WSEL's. In response to previous comment #19, the design 1-, 2-, 10- and 100-year design water surface elevations are shown in the bio-retention basin on Dwg. No. 5. The revised detail provided on Dwg. No. 5 clearly shows that the bio-retention basin design does not meet the ponding depth limitations provided in VSMH MS 3.11. The ponding depth for bio-retention basins using native soil infiltration is limited to 6 inches. 9-12 inch ponding depths are permitted where underdrains are provided. The storage volume, geometry and lack of planting types and density suggests a County Type C-2 Infiltration Trench BMP. However, certain features are lacking from this perspective for a VSMH and County Guideline designed infiltration trench (i.e. stone diaphragm, observation wells, etc.). The design features must be complete and clearly recognizable for the proposed BMP whether it is a bio-retention basin or, an infiltration trench.

**Response:** Revised design of bioretention basin to meet VSMH and County requirements, ponding depth of 6 inches and attenuating the 10-yr storm back to pre development rates. In addition, calculations for future development shows that the water quality volume will be achieved on site and the existing storm system appears to be adequate with no flooding problems reported or observed. However, Phase II stormwater management facility will be designed with the Phase II site plan.

**VDOT:**

*August 25, 2008*

1. Conditional approval is recommended provided that a smoother transition at the entrance is provided. The entrance profile on sheet 6 should show either the culvert pipe sunk a few inches or a non-standard elliptical pipe installed to allow for a smooth grade between Route 676 and the proposed entrance. The grade slope should be labeled.

**Response:** Revised plans by lowering the culvert pipe three inches and maintaining the ditch inverts. All slopes have been labeled on the section view

**County Engineer Review Comments**

*August 18, 2008*

*Floodplain*

1. Note 1 on sheet 2 needs to be modified to reference the new floodplain map consistent with Note 4 on sheet 1. The correct map information is Map Number 51095C, Panel O11OC, for Community Number 510201, dated September 28, 2007.

**Response:** Revised plans by correcting the note for the floodplain map information on Sheet 2.

**Fire Department Review Comments**

*June 11, 2008*

Approved as site plan only.

**Landscaping Department Review Comments**

*July 18, 2008*

1. Staff has waited until the site plan stage to approve landscape modifications. Therefore all modification requests must be resubmitted, so staff can have a record of these changes.

**Response:** Request for Modifications has been submitted and approved.

2. Staff is willing to accept the modification to reduce the setbacks. However the reduced buffers that remain have to be landscaped to the requirements found in ordinance 24-94, and the modifications for the transitional screening and building landscape were contingent on the applicant providing enhanced landscaping above ordinance size. Please revise.

**Response:** Plans have been revised based on approved Request for Modifications and comments received at meetings on September 30, 2008 October 13, 2008.



YC058

YC005

Farmville Ln

Richmond Rd

Peninsula St

Peach St

Powhatan Dr

MDW/WAE

ENVIRONMENTAL DIVISION REVIEW COMMENTS  
WILLIAMSBURG WICKER AND RATTAN RETAIL CENTER ✓  
COUNTY PLAN NO. Z-08-05  
May 2, 2005

**General:**

1. Our Division has no major comments on the narrative and master plan drawing as submitted for the rezoning; however, Be advised that both stormwater quality and quantity must be addressed and all provisions of the James City County Guidelines for Design and Construction of Stormwater Management BMP's and state minimum standards #19 will apply.

## Barry Moses

---

**From:** Bains, Victoria A. [tory.bains@aesva.com]  
**Sent:** Thursday, September 18, 2008 3:33 PM  
**To:** Barry Moses  
**Cc:** Cosby, Bob  
**Subject:** RE: Williamsburg Wicker Expansion

Barry,

Please note that this is a small site (approximate one acre) a large BMP is not warranted or appropriate in this location. The V-ditch style of pond is appropriate to this site, fits within the site constraints, and compliments the ultimate layout of the Master Plan for this property. While a stone filled trench is more typical this creates a storage system, which is not visible. By allowing surface ponding that is visible should the native soil on site begin to clog, any failure or reduction in infiltration rate is clearly visible and more easily maintained or repaired.

We would also like to note that during the water quality event (one inch per impervious area) the water depth in this structure is less than 6 inches. To provide a better environmental design we have opted to over design the water storage and store the majority of the 100-yr storm, at a depth of less than three feet. While less storage could be provided and the minimal roadside ditch utilized to accept the overflow. It was felt that this site, James City County, and the environment would be better served to allow the majority of runoff to be infiltrated into native soils and ultimately the groundwater system.

I believe we are having difficulty with terminology (bio-retention, infiltration, dry swale). These practices all operate under the same principal of collecting the runoff and allowing it to infiltrate into the ground. We need to agree on whatever terminology James City County wishes to utilize on this structure. Our basis of design is to fully capture the water quality event and infiltrate. The 10-yr storm must be reduced to pre-developed levels, in accordance with MS-19. We have chosen to collect and infiltrate the 10-yr storm 100% thereby eliminating surface runoff from this small drainage area. We have once again collected a major portion (over 95%) of the runoff from the 100-yr design event and infiltrated into native soils.

As the water quality volume is infiltrated, the 10-yr storm is infiltrated, and a majority of the 100-yr storm is infiltrated this would appear that this facility is an infiltration basin. We could add some additional landscaping and consider this a bio-retention, which during water quality events has 6 inches or less ponding in accordance with the recommendations. However, during extreme events the water is up to three feet deep to store and treat the 100-yr design event.

If this ponding depth during these large storm events is unacceptable to James City County then our next design alternative will be to abandon the over design concept and providing only water quality volume and minimal protection for the 10-yr storm. This will permit runoff from this site during the 10-yr and 100-yr events and reduce the potential for infiltrated volume. I feel that the current design is far superior, but ultimately all that is required is to meet the regulations.

Please let us know what terminology you will accept for the facility as designed or we will need to reduce the infiltrated volume to more closely meet the depth and flat bottom recommendations while meeting the minimum requirements instead of vastly exceeding those minimum requirements per the previous design.

Thank you for your prompt attention to this matter.

Tory

**Victoria (Tory) A. Bains, P.E.**

Project Engineer

**AES Consulting Engineers**

Williamsburg | Richmond | Gloucester | Fredericksburg

(757) 253-0040

www.aesva.com

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---

**From:** Barry Moses [mailto:BMoses@james-city.va.us]

**Sent:** Monday, September 15, 2008 5:12 PM

**To:** Bains, Victoria A.

**Cc:** Scott Whyte; José Ribeiro

**Subject:** RE: Williamsburg Wicker Expansion

Tory,

I wanted to let you know that I had received your email and I am still considering your responses. I had the following initial comments on BMP type and the proposed rain barrels.

**BMP Type.** If I understand correctly, you are proposing that the BMP will be an infiltration basin. As a first observation, infiltration basins typically are large surface area structures with flat bottoms. The grading for BMP shown in the plans is a v-ditch with 3:1 sideslopes. An infiltration trench with gravel wrapped stone would be a more typical installation in the proposed area and also avoid the possibility of 3' of standing water should the system fail.

Note, either infiltration measure will have to be screened from adjacent dwellings and traffic along the nearby street in accordance with County Guidelines and Zoning Ordinance. All that being said, a bioretention basin BMP would be preferable to our Division as it would seem to provide a more attractive and robust design as a BMP which does not solely rely on infiltration for water quality improvements.

**Rain barrels.** I talked with Scott Thomas and what you propose is adequate assuming the two rainbarrels collect runoff from the entire roof. As applied, site-wide would be the building roof.

Call me if you would like to discuss this further 757/253-6672.

Best Wishes,

**Barry E. Moses, P.E.**

James City County

Environmental Division

---

**From:** Bains, Victoria A. [mailto:tory.bains@aesva.com]

**Sent:** Friday, September 12, 2008 4:09 PM

**To:** Barry Moses

**Subject:** Williamsburg Wicker Expansion

Barry,

Based on the VSMH MS 3.11 and your comment #4 a bio-retention basin only allows 6" of ponding. However, VSMH MS 3.10 an infiltration basin recommends 2.0' of ponding but does not state it is a maximum. Based on the infiltration rate we have for this area and equation 3.10-3  $d_{max} = f_d * T_{max}$ ,  $f_d = 1.9$  in/hr,  $T_{max} = 48$  hr. So  $d_{max} = 1.9$  in/hr \* 48 hr = 91.2 in = 7.6 feet at the 10-yr storm the depth is 2.4 feet well within the  $d_{max}$  from VSMH calculations. Observation wells have been added as required with VSMH MS 3.10 and a stone diaphragm is not warranted at this time.

In addition, based on your comment #1 there is a note on the site plan within our SSC calculations that the rain barrels will be used site wide for Phase I. SSC for Phase II will be evaluated with the design and site plans for Phase II. In addition, with the part of the comment "and manufacturer's recommendation for storage device proposed" there are so many manufactures for this item and I asked other engineers here at AES what they have used in the past and found they have used a note stating size and location for the rain barrels on site. Therefore, I have added a note to the grading plan stating that a minimum of two 50-gallon rain barrels be used at the rear of the building.

Please let me know at your earliest convenience if these items meet you satisfaction. In addition, if you have any questions or concerns please feel free to contact me.

Thank you for your attention to this matter.

Tory

**Victoria (Tory) A. Bains, P.E.**  
Project Engineer

**AES Consulting Engineers**  
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9-25-08

WILLIAMSBURG  
WICKER

PER REZONING:

TOTAL SITE AREA = 1.13 AC. = 49,223 SQ. FT.

ACTUAL IMPERVIOUS AREA = ?

- MAX. IMPERVIOUS AREA = 60% (49,223 SQ. FT.)  
= 29,534 SQ. FT.

APPROXIMATE SIZE OF BIORETENTION BMP

ON MASTERPLAN = 15 FT X 62 FT  
= 930 SQ. FT.

VSDMH BIORETENTION SIZING "RULE OF THUMB"

= 4% OF IMPERVIOUS AREA IF  
1" PER IMPERVIOUS AREA IS  
COLLECTED (10-POINT REQUIREMENT)

PROPOSED TOTAL IMPERVIOUS AREA

PER SP-0074-08 = 24,460 SQ. FT.  
≈ 50%

4% OF 24,460 SQ. FT. = 978 SQ. FT.

1" INCH PER IMPERVIOUS AREA  
AS PROPOSED

$$1 \text{ IN} \cdot \frac{1 \text{ FT}}{12 \text{ IN}} \cdot \underbrace{24,460 \text{ SQ. FT}}_{50\% \text{ IMP}} = 2038 \text{ CU. FT}$$

FOOT PRINT

ⓐ 6" DEPTH AREA REQ'D  
 $= \frac{2038 \text{ FT}^3}{6 \text{ IN} \cdot \left(\frac{1 \text{ FT}}{12 \text{ IN}}\right)} = \underline{4076 \text{ SQ. FT.}}$

ⓑ 12" DEPTH = 2038 SQ. FT ( $\frac{1}{2}$  6" DEPTH)

## Barry Moses

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To: Bains, Victoria A.  
Subject: RE: Williamsburg Wicker Expansion

Tory,

I do note that this is a small site and, as is often the case, it is often difficult to site adequate BMP's on small sites. I think we are beginning to lose track in the design/review process of the big picture surrounding the development of this approximately 1 acre parcel.

The approved rezoning master plan (Z-008-05) and the conceptual plan (C-018-08) provided for the May 2008 roundtable meeting indicated a single bioretention basin for the entire site located to be located along Peninsula Street south of the proposed entrance. As stated in the concept plan comments:

*5. Stormwater management BMP's would be required for water quality if impervious cover for the site(s) exceeds 10 percent. It is recommended that stormwater management be provided in a master planned configuration to cover the storage warehouse site and the future furniture and warehouse shops so that multiple BMPs are not needed.*

However, the plan submitted under SP-074-08 in June 2008 proposed a bioretention basin on the north edge of the site for an initial phase of construction. This bioretention basin design was and remains incomplete, lacking in plants, planting soil, mulch, etc.

In the initial round of site plan comments (June 2008) the master plan recommendation was reiterated. At a meeting July 11, between Staff, the Applicant and the Owner, the Owner requested that a phased development be approved. It was explained that there simply was not enough detail to master plan for the entire site development and that the time frame for this development was very uncertain and likely a long time in the future.

Therefore, it was agreed during this meeting that the Phase I bioretention basin would treat only the developed impervious areas of Phase I. Any future development would require additional site plan submittals and additional BMP's. These future BMP's appear to be shaded in on the Site Plan Layout and occupy most of the Peninsula Street frontage. This decision was a departure from the approved rezoning master plan that may have bigger implications than initially realized. However, at the time, it was decided that bioretention basins in landscape buffers have generally been accepted on other projects as the required plantings can generally substitute for the screening plants. As such, additional bioretention basins would likely not be noticed. I would also point out that a bioretention basin not only infiltrates but, has multiple treatment systems in operation due to the interaction of the planting soil, mulch and plants thus providing a more robust design in most cases.

The latest round of Division comments (September 2008) noted that the bioretention basin (as labeled in plan and detail) still did not contain the required components to achieve a complete bioretention basin design. It was pointed out that the design appeared to approximate an infiltration basin and if that is the case, then sufficient appropriate detail must be provided for this design for Staff to evaluate it as such. Your email of Sept. 12 and 18, 2008, seem to indicate that the infiltration basin approach is currently your desired approach. [At this point in my discussion, I would point out there is no confusion, as you suggest in your email, as to County terminology about which BMP is proposed. The proposed BMP is not, and has not been, either a complete bioretention basin or, an infiltration basin design.]

As you indicate in your Sept. 18 email, the proposed v-ditch infiltration basin is designed to infiltrate runoff from storms which exceeds channel adequacy and water quality treatment requirements. However, as you stated in your first sentence, this is a small site and it's becoming apparent that this approach may unduly affect the development of this site and the competing restraints of the ordinances and the approved rezoning. Furthermore, infiltration and bioretention basins are not generally designed to infiltrate larger design storms. There are practical limits on the range

of runoff producing events that these empirically developed infiltration/LID features can be expected to accommodate. In other words, accommodating large storm events extrapolates performance beyond the bounds considered in design.

After due consideration, I believe, at this time, the project has begun to depart further and further from both the sense and content of the approved rezoning master plan. Multiple bioretention basin's were initially acceptable in part because plant intensive BMP's can augment, or replace, the perimeter landscaping. Multiple open ditch type infiltration basins will not.

Based on the considerations listed above, it is my conclusion that the BMP should be a bioretention basin, designed within normal tolerances for ponding depth, etc. The overall compliance of the multiple BMP's with the master plan and the requirements of Proffer #5 Landscape Plans must also be considered. For questions concerning the master plan, contact Jose Ribeiro, 757/253-6890, and for landscaping plan questions contact Scott Whyte, 757/2543-6867.

Sincerely,

**Barry E. Moses, P.E.**  
James City County  
Environmental Division

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**From:** Bains, Victoria A. [mailto:tory.bains@aesva.com]  
**Sent:** Thursday, September 18, 2008 3:33 PM  
**To:** Barry Moses  
**Cc:** Cosby, Bob  
**Subject:** RE: Williamsburg Wicker Expansion

Barry,

Please note that this is a small site (approximate one acre) a large BMP is not warranted or appropriate in this location. The V-ditch style of pond is appropriate to this site, fits within the site constraints, and compliments the ultimate layout of the Master Plan for this property. While a stone filled trench is more typical this creates a storage system, which is not visible. By allowing surface ponding that is visible should the native soil on site begin to clog, any failure or reduction in infiltration rate is clearly visible and more easily maintained or repaired.

We would also like to note that during the water quality event (one inch per impervious area) the water depth in this structure is less than 6 inches. To provide a better environmental design we have opted to over design the water storage and store the majority of the 100-yr storm, at a depth of less than three feet. While less storage could be provided and the minimal roadside ditch utilized to accept the overflow. It was felt that this site, James City County, and the environment would be better served to allow the majority of runoff to be infiltrated into native soils and ultimately the groundwater system.

I believe we are having difficulty with terminology (bio-retention, infiltration, dry swale). These practices all operate under the same principal of collecting the runoff and allowing it to infiltrate into the ground. We need to agree on whatever terminology James City County wishes to utilize on this structure. Our basis of design is to fully capture the water quality event and infiltrate. The 10-yr storm must be reduced to pre-developed levels, in accordance with MS-19. We have chosen to collect and infiltrate the 10-yr storm 100% thereby eliminating

surface runoff from this small drainage area. We have once again collected a major portion (over 95%) of the runoff from the 100-yr design event and infiltrated into native soils.

As the water quality volume is infiltrated, the 10-yr storm is infiltrated, and a majority of the 100-yr storm is infiltrated this would appear that this facility is an infiltration basin. We could add some additional landscaping and consider this a bio-retention, which during water quality events has 6 inches or less ponding in accordance with the recommendations. However, during extreme events the water is up to three feet deep to store and treat the 100-yr design event.

If this ponding depth during these large storm events is unacceptable to James City County then our next design alternative will be to abandon the over design concept and providing only water quality volume and minimal protection for the 10-yr storm. This will permit runoff from this site during the 10-yr and 100-yr events and reduce the potential for infiltrated volume. I feel that the current design is far superior, but ultimately all that is required is to meet the regulations.

Please let us know what terminology you will accept for the facility as designed or we will need to reduce the infiltrated volume to more closely meet the depth and flat bottom recommendations while meeting the minimum requirements instead of vastly exceeding those minimum requirements per the previous design.

Thank you for your prompt attention to this matter.

Tory

**Victoria (Tory) A. Bains, P.E.**  
Project Engineer

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**From:** Barry Moses [mailto:BMoses@james-city.va.us]  
**Sent:** Monday, September 15, 2008 5:12 PM  
**To:** Bains, Victoria A.  
**Cc:** Scott Whyte; José Ribeiro  
**Subject:** RE: Williamsburg Wicker Expansion

Tory,

I wanted to let you know that I had received your email and I am still considering your responses. I had the following initial comments on BMP type and the proposed rain barrels.

BMP Type. If I understand correctly, you are proposing that the BMP will be an infiltration basin. As a first observation, infiltration basins typically are large surface area structures with flat bottoms. The grading for BMP shown in the plans is a v-ditch with 3:1 sideslopes. An infiltration trench with gravel wrapped stone would be a more typical installation in the proposed area and also avoid the possibility of 3' of standing water should the system fail.

Note, either infiltration measure will have to be screened from adjacent dwellings and traffic along the nearby street in accordance with County Guidelines and Zoning Ordinance. All that being said, a bioretention basin BMP would be preferable to our Division as it would seem to provide a more attractive and robust design as a BMP which does not solely rely on infiltration for water quality improvements.

Rain barrels. I talked with Scott Thomas and what you propose is adequate assuming the two rainbarrels collect runoff from the entire roof. As applied, site-wide would be the building roof.

Call me if you would like to discuss this further 757/253-6672.

Best Wishes,

**Barry E. Moses, P.E.**  
James City County  
Environmental Division

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**From:** Bains, Victoria A. [mailto:tory.bains@aesva.com]  
**Sent:** Friday, September 12, 2008 4:09 PM  
**To:** Barry Moses  
**Subject:** Williamsburg Wicker Expansion

Barry,

Based on the VSMH MS 3.11 and your comment #4 a bio-retention basin only allows 6" of ponding. However, VSMH MS 3.10 an infiltration basin recommends 2.0' of ponding but does not state it is a maximum. Based on the infiltration rate we have for this area and equation 3.10-3  $d_{max} = f_d * T_{max}$ ,  $f_d = 1.9$  in/hr,  $T_{max} = 48$  hr. So  $d_{max} = 1.9$  in/hr \* 48 hr = 91.2 in = 7.6 feet at the 10-yr storm the depth is 2.4 feet well within the  $d_{max}$  from VSMH calculations. Observation wells have been added as required with VSMH MS 3.10 and a stone diaphragm is not warranted at this time.

In addition, based on your comment #1 there is a note on the site plan within our SSC calculations that the rain barrels will be used site wide for Phase I. SSC for Phase II will be evaluated with the design and site plans for Phase II. In addition, with the part of the comment "and manufacturer's recommendation for storage device proposed" there are so many manufactures for this item and I asked other engineers here at AES what they have used in the past and found they have used a note stating size and location for the rain barrels on site. Therefore, I have added a note to the grading plan stating that a minimum of two 50-gallon rain barrels be used at the rear of the building.

Please let me know at your earliest convenience if these items meet you satisfaction. In addition, if you have any questions or concerns please feel free to contact me.

Thank you for your attention to this matter.

Tory

**Victoria (Tory) A. Bains, P.E.**  
Project Engineer

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