



CERTIFICATE OF AUTHENTICITY

THIS IS TO CERTIFY THAT THE FOLLOWING ELECTRONIC RECORDS ARE TRUE AND ACCURATE REPRODUCTIONS OF THE ORIGINAL RECORDS OF JAMES CITY COUNTY GENERAL SERVICES DEPARTMENT- STORMWATER DIVISION; WERE SCANNED IN THE REGULAR COURSE OF BUSINESS PURSUANT TO GUIDELINES ESTABLISHED BY THE LIBRARY OF VIRGINIA AND ARCHIVES; AND HAVE BEEN VERIFIED IN THE CUSTODY OF THE INDIVIDUAL LISTED BELOW.

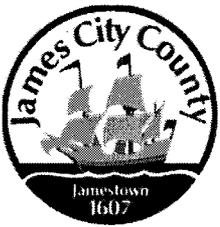
BMP NUMBER: JR042

DATE VERIFIED: June 13, 2012

QUALITY ASSURANCE TECHNICIAN: Leah Hardenbergh

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA



Stormwater Division

MEMORANDUM

DATE: March 11, 2010
TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services
FROM: Jo Anna Ripley, Stormwater
PO: 270712
RE: Files Approved for Scanning

General File ID or BMP ID: JR042

PIN: 4310700001B

Subdivision, Tract, Business or Owner

Name (if known):

Governors Land

Property Description:

Major Open Space 39 Barrets Pointe

Site Address:

(For internal use only)

Box 16

Drawer: 7

Agreements: (in file as of scan date) N

Book or Doc#: 980017248

Page:

501

498-501

Comments

JR-042

Contents for Stormwater Management Facilities As-built Files

Each file is to contain:

- ① As-built plan
- ② Completed construction certification
3. Construction Plan
- ④ Design Calculations
- ⑤ Watershed Map
- ⑥ Maintenance Agreement
7. Correspondence with owners
- ⑧ Inspection Records
9. Enforcement Actions

80017248

DECLARATION OF COVENANTS

INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

Governor's Land Associates

THIS DECLARATION, made this 18th day of August, 1998, between Governor's Land Associates, and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the following property: Barret's Point subdivision, being part of the Governor's Land Development, recorded in, Deed Book 501, Page No. 498-501 or Instrument No. _____, and James City County, Virginia, hereinafter referred to as the "COUNTY."

WITNESSETH:

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, 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.
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.

SEP 10 98 01 174

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this 18th day of August, 1998.

COVENANTOR(S)

Governor's Land Associates
W. Allen Ball
W. Allen Ball President

ATTEST:

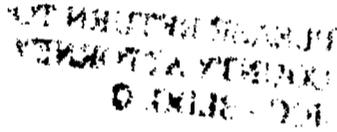
COVENANTOR(S)

ATTEST:

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF James City

I hereby certify that on this 18th day of August, 1998, before the subscribed, a Notary Public of the State of Virginia, and for the County of James City, aforesaid personally appeared W. Allen Ball and did acknowledge the foregoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 18th day of August, 1998.



J. McFarland
Notary Public

My Commission expires: September 30, 2002

Approved as to form:

Leo P. Logan

SEP 10 2001 175

VIRGINIA: City of Williamsburg and County of James City, to Wit:
In the Clerk's Office of the Circuit Court of the City of Williamsburg and County of James City the 18 day of August, 1998. This Declaration of Covenants was presented with certificate annexed and admitted to record at 12:40 o'clock
Teste: Helene S. Ward, Clerk
by [Signature]
Deputy Clerk

This Declaration of Covenants prepared by:

Raymond E Keeney
(Print Name)

V.P.
(Title)

2700 Two Rivers Rd
(Address) Va.

Williamsburg, Va 23185
(City) (State) (Zip)

980 017083

Prepared by Governor's Land Associates
2700 Two Rivers Road
Williamsburg, VA 23185

EXEMPT FROM RECORDATION TAX
UNDER VIRGINIA CODE SECTION 58.1-811(A)(6), AS AMENDED

DEED OF EASEMENT
FOR NATURAL OPEN SPACE
BARRET'S POINTE

THIS DEED OF EASEMENT, made as of August 25th, 1998, by and among GOVERNOR'S LAND ASSOCIATES, a Virginia general partnership and its heirs, successors and assigns ("Grantor"); and COUNTY OF JAMES CITY, VIRGINIA ("Grantee").

WHEREAS, the Grantor has adopted the owner of certain property known as Barret's Pointe, The Governor's Land At Two Rivers (the "Property");

WHEREAS, Grantee has adopted the Chesapeake Bay Preservation Ordinance, Chapter 23 of the James City County Code, as required by Chapter 21 of Title 10.1 of the Code of Virginia, to protect the Chesapeake Bay and its tributaries from nonpoint source pollution from land uses or appurtenances within the Chesapeake Bay drainage area;

WHEREAS, Grantor wishes to preserve portions of the Property as an open space as part of Grantor's efforts to improve the quality of stormwater runoff from the Property.

NOW THEREFORE, in recognition of the foregoing and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Grantor does hereby grant and convey to Grantee an easement in perpetuity in gross, with the right in perpetuity to restrict the use as described below, of the portion herein described of that certain tract, lot, piece or parcel of land with improvements thereon ("Easement Property"), containing 1.158 acres (Open Space #1) and 6.917 acres (Major Open Space #39) more or less, to wit:

Open Space #1, containing 1.158 acres, and Major Open Space #39, containing 6.917 acres, BARRET'S POINTE, THE GOVERNOR'S LAND AT TWO RIVERS, as the same appears duly dedicated, platted and subdivided on the Plat attached hereto and recorded simultaneously with this Easement in Plat Book 70 at Pages 56 through 58 in the Office of the Clerk of the Circuit Court for the City of Williamsburg and the County of James City, Virginia.

SEP-08 0047

The restrictions hereby imposed on the use of the Easement Property, the acts which the Grantor covenants to do or not to do and the restrictions which the Grantee is hereby entitled to enforce, shall be as follows:

1. The Easement Property shall be kept free and clear of any junk, trash, rubbish and other unsightly or offensive material.
2. No building shall be permitted on or lots platted within the Easement Property.
3. No roads or other structures (excluding utility lines, drainage facilities, paths and trails or signs approved in accordance with Paragraph 4 below) shall be built or maintained on the Easement Property other than such road or structure approved in writing by the County Engineer and the Planning Commission. Any roads shall be generally as shown on the approved Master Plan for The Governor's Land at Two Rivers.
4. No signs (including billboards or outdoor advertising), paths or trails, utility lines, irrigation systems or drainage facilities shall be placed on the Easement Property without the expressed written consent of the County Engineer and the Planning Commission or in accordance with a signage plan, path or trail plan, drainage plan, irrigation plan or utility plan approved in writing by the County Engineer and the Planning Commission.
5. The Easement Property shall be used as a storm water retention area, and otherwise, shall remain in its natural condition with respect to natural leaf litter or other ground covering vegetation, understory vegetation or shrub layer, and tree canopy. Except for the use thereof as a storm water retention area, the activities of Grantor within the Easement Property shall be limited to those activities which do not remove or damage any significant amount of healthy vegetation or materially disturb any soil except as approved by the County Engineer under this paragraph or in connection with approvals obtained in accordance with Paragraphs 3 and 4 above. Grantor may remove dead, diseased, poisonous or invasive vegetation or the Grantor may use hand tools (such as chain saws, wood chippers and stump grinders) for selective trimming and pruning and the clearing of understory which would not alter the natural character of the Easement Property only in a location and manner approved by the County Engineer.
6. Grantee and its representatives may enter upon the Easement Property from time to time for inspection, to enforce the terms of this Easement and to post a sign or marker identifying Grantee's interest in the Easement Property as open area. In the event of a violation of the terms of this Easement, the Grantee shall have the right to seek all appropriate legal and equitable relief, provided that Grantee shall notify Grantor at least thirty days in advance of any proposed action with respect to the Easement Property, describing the condition Grantee considers a violation.

SEP-08 08:00

Grantor shall have a reasonable opportunity to cure prior to Grantee's exercise of its rights hereunder.

- 7. Grantee and Grantor may amend the provisions hereof or terminate this Easement by a written instrument signed by both parties.
- 8. Although this easement in gross will benefit the public in the ways recited above, nothing herein shall be construed to convey a right to the public of access to or use of the Easement Property and the Grantor shall retain exclusive right to such access and use, subject only to the provisions herein recited.

WITNESS the following signatures and seals as of the date first above written.

GOVERNOR'S LAND ASSOCIATES,
a Virginia general partnership

By: **DOMINION LAND MANAGEMENT
COMPANY - WILLIAMSBURG**
a Virginia corporation,
its Attorney-in-Fact

By: 
 Name: W. Allen Ball
 Title: President

SEP-88 0049

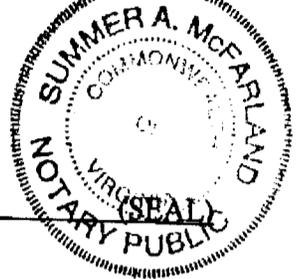
State OF Virginia
County OF James City

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I, the undersigned, a Notary Public in and for the jurisdiction aforesaid, do hereby certify that W. ALLEN BALL, President of DOMINION LAND MANAGEMENT COMPANY - WILLIAMSBURG, a Virginia corporation, Attorney-in-Fact for GOVERNOR'S LAND ASSOCIATES, a Virginia general partnership, whose name is signed to the foregoing Deed, has acknowledged the same before me in the aforesaid jurisdiction as an authorized officer of the corporation on behalf of the partnership.

GIVEN under my hand and seal on August 25, 1998.

Summer A. McFarland
Notary Public



My Commission Expires: 9.30.2002

SEP-88 0050

The form of this Deed of Easement is approved and, pursuant to Resolution of the Board of Supervisors of James City County, Virginia, duly executed on the 17th day of ~~August~~ May, 1998, this conveyance is hereby accepted on behalf of said County.

8/31/98
DATE

Leo P. Rogers
COUNTY ATTORNEY

Commonwealth OF Virginia
County OF James City

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I, the undersigned, a Notary Public in and for the jurisdiction aforesaid, do hereby certify that Leo P. Rogers, County Attorney for the COUNTY OF JAMES CITY, VIRGINIA, whose name is signed to the foregoing Deed of Easement, has acknowledged the same before me in the aforesaid jurisdiction on behalf of the County.

GIVEN under my hand and seal on August 31, 1998.



Mary Frances Rieger (SEAL)
Notary Public

My Commission Expires: Oct. 31, 2001

SEP-88 0051

VIRGINIA: City of Williamsburg and County of James City, to Wit:
In the Clerk's Office at the Circuit Court for the City of Williamsburg and County of James City the 17 day of May, 19 98, this Deed Easement was presented with the certificate annexed and admitted to record at 10:00 o'clock.
Teste: Helene S. Ward, Clerk
By: Cherish Johnson
Deputy Clerk

PLAT RECORDED IN
P.B. NO. 70 PAGE 56-58

Construction Certification for Stormwater Management/BMP Facilities

Governors Land BMP Facility #6 (Barrett's Pointe)
James City County, Virginia

Prepared By:

Robert C. Moss, PE
Earthworks Consulting Engineers, Inc.
4305 Cutshaw Ave.
Richmond, Virginia 23230
Phone: (804) 355-4567
Fax: (804) 355-5958

Prepared For:

James H. Bennett, PE
Governor's Land Associates
120 Tredegar Street
Richmond, Virginia 23219
Phone: (804) 819-2352
Fax: (804) 819-2209

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

This certification pertains to the stability and content of the facility's earthen embankment, whose construction was not monitored but was later investigated by an engineer utilizing handauger borings.

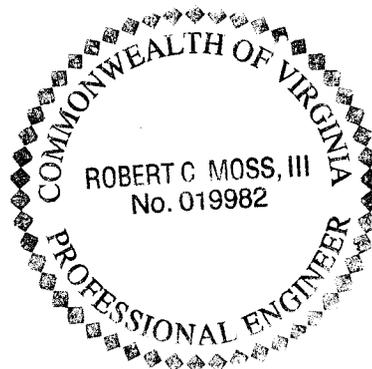
Exception: The upper portion of the west end of the embankment has been disturbed and is excessively narrow above 18 inches over the normal pool elevation. The Civil Engineer is to review this to determine that adequate embankment width exists within the design dimensions of the embankment.

By:



Robert C. Moss, PE
Earthworks Consulting Engineers, Inc.

Dated: 3/31/03



North of

James City County, Virginia
Environmental Division

Stormwater Management/BMP Facilities
Record Drawing/Construction Certification
Review Tracking Form

County Plan No.: S-42-98
Project Name: GOVERNORS LAND
Stormwater Management Facility: BARRETTS POINTE

Phase: I II III
 Information Received. Date: MARCH 20 2002 AES
 Administrative Check.
 Record Drawing Date: 3/18/02 CERT; 01/02/01 DWG.
 Construction Certification Date: _____
 RD/CC Standard Forms (Required after Feb 1st 2001 Only)
 Insp/Maint Agreement Info: 0980017248 9/10/98 0174
 BMP Maintenance Plan Location: No
 Other: _____

Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review file.
 Yes No Location: Sheet 10, note 18, sheet 6 box
 Assign County BMP ID Code Code: UR 042

Log into Division's "As-Built" Tracking Log
 Add Location to GIS Database Map. Obtain GIS site information (GPIN, Owner, Site Area, Address, etc.)
 Preliminary Log into BMP Database (BMP ID #, Site Plan #, GPIN, Project Name)
 Active Project File Review (correspondence, H&H, etc.).
 Initial As-Built File setup (label, copy hydraulics, BMP information, etc.).
 Inspector Check of RD/CC.

Pre-Inspection Drawing Review - Approved Plan (Quick look prior to field inspection).
 Final Inspection (FI) Performed Date: Nov 14 2002 (RH)
 Record Drawing (RD) Review Date: Nov 13
 Construction Certification (CC) Review Date: Nov 13

Actions:
 No comments.
 Comments. Letter Forwarded. Date: Dec 04 2002

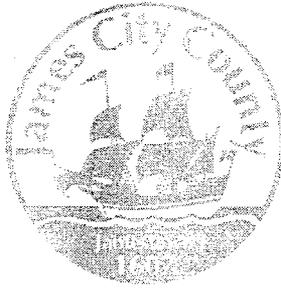
Record Drawing (RD)
 Construction Certification (CC)
 Construction-Related (CR)
 Site Issues (SI)
 Other : Reinspect 6-2-03

Second Submission: AB 4/25/03
 Third Submission: _____

Acceptable for stormwater management facility purposes (RD/CC/CR/Other). Proceed with bond release.
 Notify Darryl/Joan/Pat of acceptability using email (preferred), form or verbal.
 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.
 Digital Photographs obtained.
 Add to JCC Hydrology & Hydraulic database (optional).

BMP Certification Information Acceptable

Plan Reviewer: [Signature] Date: 6/18/03



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: GOVERNOR'S LAND AT TWO RIVERS - BARRETT'S POINTE
Structure/BMP Name: NONE
Project Location: WEST END OF GOVERNOR'S LAND PROJECT
BMP Location: JUST EAST OF CUL-DE-SAC OF BARRETT'S POINTE ROAD
County Plan No.: S - 42 - 98
Project Type: [X] Residential [] Business [] Commercial [] Office [] Institutional [] Industrial [] Public [] Roadway [] Other
Tax Map/Parcel No.: (431 0700031B)
BMP ID Code (if known): JR042
Zoning District: POWHATAN DISTRICT
Land Use: RESIDENTIAL
Site Area (sf or acres):

Brief Description of Stormwater Management/BMP Facility: WEST POND (MINOR STORMWATER ATTENUATION)

Nearest Visible Landmark to SWM/BMP Facility: CUL-DE-SAC OF BARRETT'S POINTE ROAD

Nearest Vertical Ground Control (if known):
[X] JCC Geodetic Ground Control [] USGS [] Temporary [] Arbitrary [] Other
Station Number or Name: 348
Datum or Reference Elevation: 12.79
Control Description: JCC MAIN STATION
Control Location from Subject Facility: 7000 FEET DUE NORTH

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: FALL 1998
Facility Monitored by County Representative during Construction: Yes No Unknown
Name of Site Work Contractor Who Constructed Facility: HENDERSON, INC.
Name of Professional Firm Who Routinely Monitored Construction: _____
Date of Completion for SWM/BMP Facility: SPRING 1999
Date of Record Drawing/Construction Certification Submittal: MARCH 2002

(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: GOVERNOR'S LAND ASSOCIATES
Mailing Address: 9701 MILL POND RUN
TOANO, VIRGINIA
Business Phone: 757-234-5000 Fax: 757-234-5111
Contact Person: MR. JAMES H. BENNETT Title: VICE PRESIDENT - DEVELOPMENT

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: V. MARC BENNETT
Title: SENIOR PROJECT MANAGER
Plan Name: BARRETT'S POINTE
Firm's Project No. 7173-4-3
Plan Date: MAY 1998
Sheet No.'s Applicable to SWM/BMP Facility: 6 / 10 / 1 / 1

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

Name: HENDERSON, INC.
Mailing Address: 5800 MARKETOWN ROAD
WILLIAMSBURG, VIRGINIA 231
Business Phone: 757-565-1090
Fax: _____
Contact Person: _____
Site Foreman/Supervisor: _____
Specialty Subcontractors & Purpose (for BMP Construction Only): _____

Section 4 - Professional Certifications:

Certifying Professionals: (Note: A Registered Professional Engineer or 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 RD, SUITE 1
WILLIAMSBURG VIRGINIA 23108
Business Phone: 757-253-0040
Fax: 757-220-8994

Name: V. MARC BENNETT
Title: SENIOR PROJECT MANAGER
Signature: [Signature]
Date: 3/19/02

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.

Construction Certification

Firm Name: _____
Mailing Address: _____
Business Phone: _____
Fax: _____

Name: _____
Title: _____
Signature: _____
Date: _____

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.

[Signature] (Seal)

Virginia Registered Professional Engineer
or Certified Land Surveyor

_____ (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 plan 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.
- XX 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.
- INC 4. Top widths, berm widths and embankment side slopes.
- INC 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.
- INC 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.
- INC 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.

- XY 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.**
- XY 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- XY 15. Outlet barrel diameter, length, slope, ~~type and thickness class of material~~ and type of flared end sections, headwall or endwall.
- INC 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
- N/A 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
- N/A 18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- N/A 19. Fencing location and type, if applicable to facility.
- XY 20. BMP vicinity properly cleaned of stockpiles and construction debris.
- XY 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- XY 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.)

- INC A1. All requirements of Section II, Minimum Standards, apply to Group A facilities.
- XY A2. Principal spillway consists of reinforced concrete pipe with ~~O-Ring gaskets for watertight joint construction.~~
- INC A3. Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.
- INC 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.
- INC A5. Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.
- INC 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.
- INC 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).
- XY A8. No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.
- INC A9. Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
- INC A10. Low flow orifice has a non-clogging mechanism.
- N/A ~~INC~~ A11. A pond drain pipe with valve was provided.
- XY A12. Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.
- N/A 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)

- | | | |
|------------|-----|--|
| <u>N/A</u> | 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 (1/2) of the wetland surface area is planted. |
| | B7. | Topsoil or wetland mulch provided to support vigorous growth of wetland plants. |
| <u>N/A</u> | 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)

- N/A 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.
- N/A 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)

- | | | |
|------------|------|--|
| <u>N/A</u> | D1. | All requirements of Section II, Minimum Standards, apply to Group D facilities. |
| | D2. | Sediment pretreatment devices provided. |
| | 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. |
| | 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. |
| | 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. |
| | D6. | No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed . |
| | D7. | Filtering system is off-line from storm drainage conveyance system. |
| | D8. | Overflow outlet has adequate erosion protection. |
| | D9. | Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure. |
| | D10. | Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility. |
| | 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. |
| | D12. | Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility. |
| | D13. | No visual signs of erosion or channel degradation immediately downstream of facility. |
| <u>N/A</u> | D14. | Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance. |

**STORMWATER MANAGEMENT / BMP FACILITIES
AS-BUILT PLAN 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)

- N/A 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.
- N/A 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)*

- N/A 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.
- N/A 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)

- | | | |
|------------|-----|---|
| <u>N/A</u> | 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. |
| <u>N/A</u> | 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.
- SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.
- SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).
- SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.
- P/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 .)

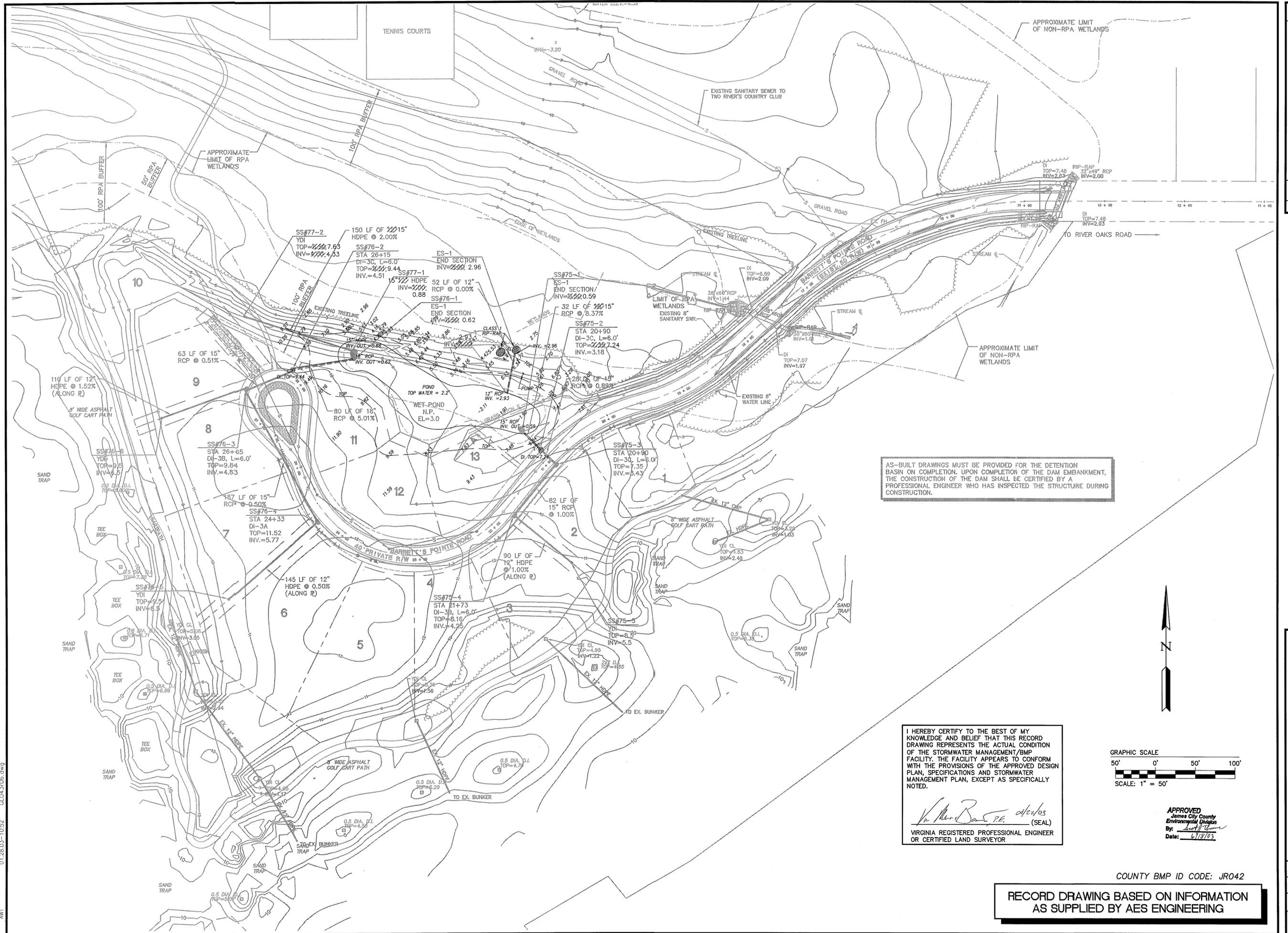
- N/A O1. All requirements of Section II, Minimum Standards, apply to this section.
- N/A O2. Certification criteria to be determined on a case-by-case basis by the Environmental Division specific to the proposed SWM/BMP facility.

**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.

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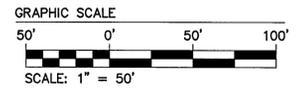
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AWT

AS-BUILT DRAWINGS MUST BE PROVIDED FOR THE DETENTION BASIN ON COMPLETION. UPON COMPLETION OF THE DAM EMBANKMENT, THE CONSTRUCTION OF THE DAM SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER WHO HAS INSPECTED THE STRUCTURE DURING CONSTRUCTION.

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.

W. Michael Bane, P.E. 6/18/03
 (SEAL)
 VIRGINIA REGISTERED PROFESSIONAL ENGINEER OR CERTIFIED LAND SURVEYOR



COUNTY BMP ID CODE: JR042

RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES ENGINEERING

NO.	DATE	REVISION / COMMENT / NOTE	BY
2	03/02/03	REVISIONS AS PER JAMES CITY COUNTY REVIEW	WMB
1	01/02/01	RECORD DRAWINGS	WMB

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

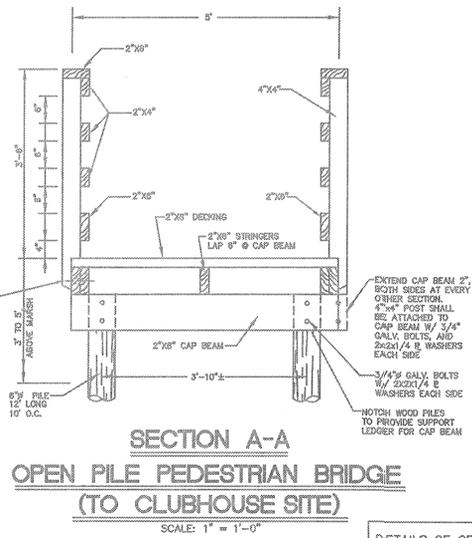


DRAINAGE PLAN
 BARRETT'S POINTE
 THE
 GOVERNOR'S LAND
W. Michael Bane, P.E.
 JAMES CITY COUNTY

DESIGNED: WMB/DPW
 SCALE: 1"=50'
 DRAWN: SCL
 DATE: 5/98

Project No. 7173-4-3
 Drawing No. 6

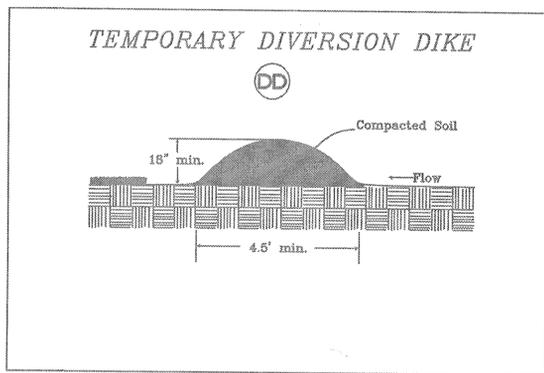
POWhatan DISTRICT
 JAMES CITY COUNTY



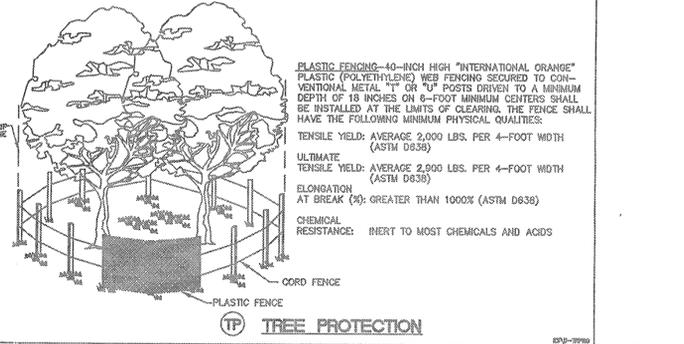
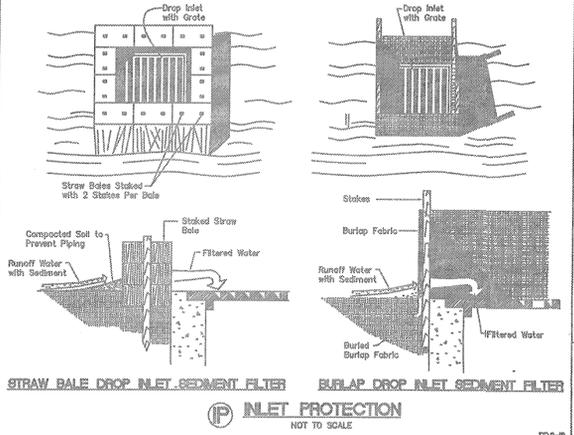
DETAILS OF OPEN PILE PEDESTRIAN BRIDGE PROVIDED BY: CEDARCREST MARINE INC.

- GENERAL NOTES - PEDESTRIAN BRIDGE
- ATTEMPTS SHALL BE MADE TO POSITION TRAILS SO THAT SLOPES THAT EXCEED 10% WILL OCCUR INFREQUENTLY BY MINIMAL GRADING, OR BENCHING TRAIL INTO EXISTING GROUND SLOPE. IN THOSE AREAS WHERE THE TRAIL SLOPE EXCEEDS 10%, A HARD SURFACE OR STEPS SHALL BE PROVIDED ("HARD SURFACE" IMPLIES ASPHALT OR CONCRETE PATH).
 - ALL PILING SHOULD BE CLEAN-PEELED, PRESSURE TREATED, SOUTHERN YELLOW PINE CONFORMING TO ASTM D25. PROVIDE 6" MINIMUM DIAMETER PILES.
 - PRESSURE TREAT ALL PILING WITH WATER BORNE PRESERVATIVE (ACA OR COA) TO 2.5 LB./CU.FT. RETENTION IN ACCORDANCE WITH AWPA C1 AND C3.
 - PILING SHALL BE DRIVEN TO REFUSAL AND THE TIP ELEVATION INDICATED. DO NOT OVER-DRIVE. DO NOT AUGER, SPUD OR JET. CONTRACTOR SHALL VERIFY PILE CAPACITY WITH OWNER.
 - WOOD TIMBERS, FRAMING, AND DECKING SHALL BE PRESSURE TREATED (ACA OR COA) SOUTHERN YELLOW PINE STRESS-RATED IN ACCORDANCE WITH NFPA "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION" (1989) MEETING MINIMUM REQUIREMENTS AS FOLLOWS:

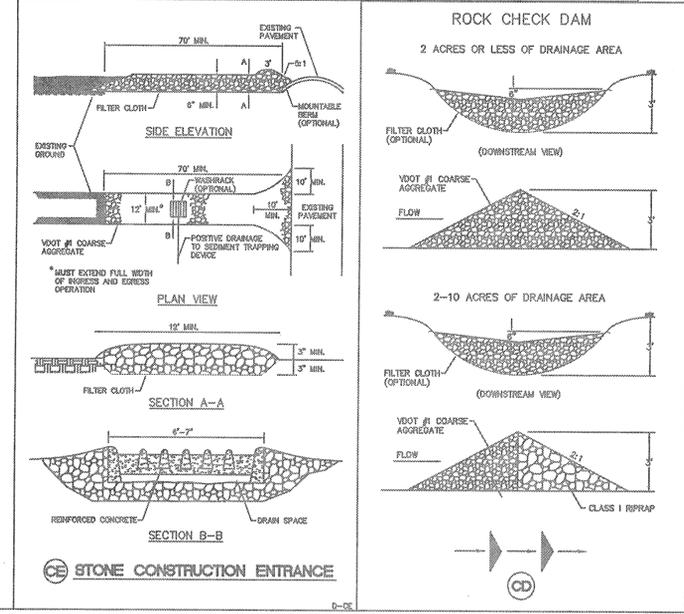
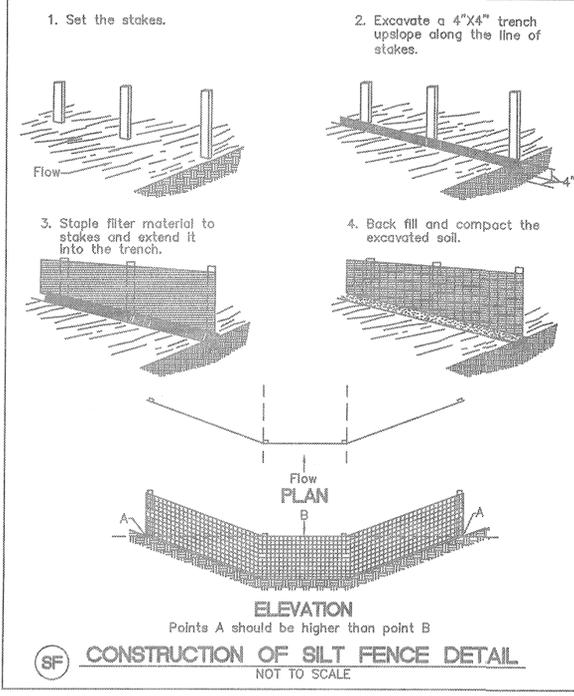
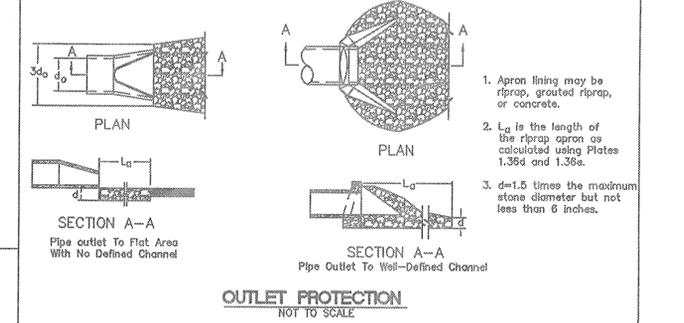
TYPE	GRADE	RETENTION (LB./C.U. FT.) MINIMUM
STRINGER'S, RAIL PICKETS	NO. 2	0.4
STRINGERS FOR BOARDWALKS	NO. 2	0.4
CAP BEAMS	NO. 2	0.4
2 X 6 DECKING	NO. 2	0.4
RAIL CAP, NEWEL POSTS AND RAIL MEMBERS	NO. 2	0.4
OTHER THAN PICKETS	NO. 2	0.4
BLOCKING AND OTHER LUMBER NOT NOTED ABOVE	NO. 2	0.4
 - EROSION CONTROL MEASURES SHALL BE INSTALLED AS NEEDED AND DIRECTED BY THE CODE COMPLIANCE INSPECTORS.
 - TREES, IF ANY, IN PATH OF CONSTRUCTION WILL BE HAND CLEARED. PILES TO BE DRIVEN FROM BRIDGE DECK. PLYWOOD MATS WILL BE UTILIZED BY WORKERS IN WETLANDS. ALL DISTURBED AREAS WILL BE PROMPTLY BAKED AND SEEDED. DAMAGED WETLANDS WILL BE REGRADED AND SPRIGGED. ALL DEBRIS WILL BE PROMPTLY REMOVED FROM JURISDICTIONAL AREAS.
 - PER CORRESPONDENCE DATED JULY 18, 1995 FROM JACQUELINE M. WHITE, JAMES CITY COUNTY CODE COMPLIANCE OFFICER, SINCE TRAIL WALKWAY/BRIDGES ARE OPEN PILE CONSTRUCTION NO WETLAND PERMIT SHOULD BE REQUIRED FROM THE JAMES CITY COUNTY WETLANDS BOARD.
 - BECAUSE OF OPEN PILE CONSTRUCTION OF PEDESTRIAN BRIDGES, NO PERMIT SHOULD BE REQUIRED FROM CORPS OF ENGINEERS PER CORRESPONDENCE FROM CORPS OF ENGINEERS DATED AUGUST 10, 1995.



- STANDARD EROSION AND SEDIMENT CONTROL NOTES FOR JAMES CITY COUNTY, VIRGINIA REVISED 4/7/97
- THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FIELD INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE APPROPRIATE MODIFICATIONS WILL BE MADE TO CORRECT ANY PLAN DEFICIENCIES. IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS SHALL APPLY TO THIS PROJECT.
- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK". THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.
 - ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS. AN ENTRANCE PERMIT FROM VDOT IS REQUIRED PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN STATE RIGHTS-OF-WAYS. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE THOROUGHLY CLEANED AT THE END OF EACH DAY.
 - A PRECONSTRUCTION MEETING SHALL BE HELD ON SITE BETWEEN THE COUNTY, THE DEVELOPER, THE PROJECT ENGINEER, AND THE CONTRACTOR PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY FOR APPROVAL PRIOR TO THE INDIVIDUAL WHO WILL BE RESPONSIBLE FOR ENSURING MAINTENANCE OF INSTALLED MEASURES ON A DAILY BASIS.
 - SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT ON-SITE MUST BE CONSTRUCTED AS A FIRST STEP IN GRADING AND BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER INSTALLATION. PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES SHALL BE MADE TO ASSESS THEIR CONDITION. ANY NECESSARY MAINTENANCE OF THE MEASURES SHALL BE ACCOMPLISHED IMMEDIATELY UPON NOTIFICATION BY THE COUNTY AND SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES.
 - SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS, OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 3.10) SHALL BE INSTALLED PRIOR TO THE END OF EACH WORKING DAY.
 - SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT TIME OF CONSTRUCTION TO INSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. ENVIRONMENTAL DIVISION APPROVAL WILL BE REQUIRED FOR OTHER DEVIATIONS FROM THE APPROVED PLANS.
 - THE CONTRACTOR SHALL PLACE SOIL STOCKPILES AT THE LOCATIONS SHOWN ON THIS PLAN OR AS DIRECTED BY THE ENGINEER. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE ENVIRONMENTAL DIVISION PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
 - THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. THE INSTALLATION OF DRAINAGE FACILITIES SHALL TAKE PRECEDENCE OVER ALL UNDERGROUND UTILITIES. OUTFALL DITCHES FROM DRAINAGE STRUCTURES SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION OF SAME. THIS INCLUDES INSTALLATION OF EROSION CONTROL STONE OR PAVED DITCHES WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING OR UTILITY INSTALLATION BEGINS.
 - PERMANENT OR TEMPORARY SOIL STABILIZATION MUST BE APPLIED TO ALL DENUDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. SOIL STABILIZATION MUST ALSO BE APPLIED TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. SOIL STABILIZATION MEASURES INCLUDE VEGETATIVE ESTABLISHMENT, MULCHING AND THE EARLY APPLICATION OF GRAVEL BASE MATERIAL ON AREAS TO BE PAVED.
 - NO MORE THAN 300 FEET OF SANITARY SEWER, STORM SEWER, WATERLINES, OR UNDERGROUND UTILITY LINES ARE TO BE OPEN AT ONE TIME. FOLLOWING INSTALLATION OF ANY PORTION OF THESE ITEMS, ALL DISTURBED AREAS ARE TO BE IMMEDIATELY STABILIZED (I.E., THE SAME DAY).
 - IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH SPECIFICATION 3.35. SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.
 - THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION, ON THIS SITE PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIED AMOUNTS OF SEED, LIME, AND FERTILIZER IN ACCORDANCE WITH SPECIFICATION 3.32. PERMANENT SEEDING, IRRIGATION SHALL BE REQUIRED AS NECESSARY TO ENSURE ESTABLISHMENT OF GRASS COVER.
 - ALL SLOPES STEEPER THAN 3:1 SHALL REQUIRE THE USE OF EROSION CONTROL BLANKETS SUCH AS EXCELSIOR BLANKETS TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. INSTALLATION SHALL BE IN ACCORDANCE WITH SPECIFICATION 3.35. MULCHING AND MANUFACTURER'S INSTRUCTIONS. NO SLOPES SHALL BE CREATED STEEPER THAN 2:1.
 - INLET PROTECTION IN ACCORDANCE WITH SPECIFICATION 3.07 SHALL BE PROVIDED FOR ALL STORM DRAIN INLETS AS SOON AS PRACTICAL FOLLOWING CONSTRUCTION OF SAME.
 - TEMPORARY LINERS, SUCH AS POLYETHYLENE SHEETS, SHALL BE PROVIDED FOR ALL PAVED DITCHES UNTIL THE PERMANENT CONCRETE LINER IS INSTALLED.
 - PAVED DITCHES SHALL BE REQUIRED WHEREVER EROSION IS EVIDENT. PARTICULAR ATTENTION SHALL BE PAID TO THOSE AREAS WHERE GRADES EXCEED 3 PERCENT.
 - TEMPORARY EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. AFTER STABILIZATION IS COMPLETE, ALL MEASURES SHALL BE REMOVED WITHIN 30 DAYS. TRAPPED SEDIMENT SHALL BE SPREAD AND SEEDED.
 - AS-BUILT DRAWINGS MUST BE PROVIDED FOR ALL DETENTION/BMP FACILITIES. ALSO UPON COMPLETION, THE CONSTRUCTION OF ALL DETENTION/BMP FACILITIES SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER WHO INSPECTED THE STRUCTURE DURING CONSTRUCTION. THE CERTIFICATION SHALL STATE THAT TO THE BEST OF HIS/HER JUDGMENT, KNOWLEDGE, AND BELIEF, THE STRUCTURE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVAL PLANS AND SPECIFICATIONS.



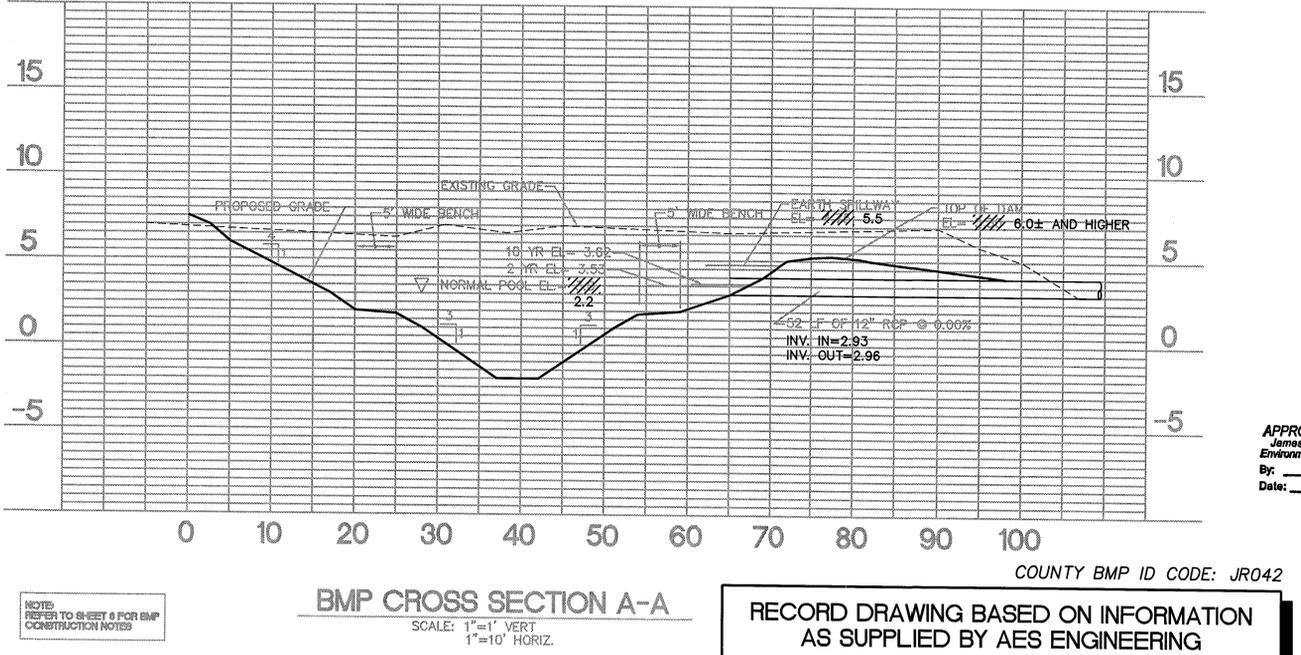
PERMANENT SEEDING
 PERMANENT SEEDING TO BE APPLIED TO ALL DISTURBED AREAS NOT OTHERWISE STABILIZED. SEE LANDSCAPE SHEETS FOR CLARIFICATION.
 SHENANDOAH TALL FESCUE OR WINCHESTER TALL FESCUE
 APPLICATION RATE = 175-200 LBS. PER ACRE
 SEE SEEDING SPECIFICATIONS FOR APPLICATION RATES AND FURTHER DETAILS.



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.

Virginia Registered Professional Engineer or Certified Land Surveyor

VIRGINIA REGISTERED PROFESSIONAL ENGINEER OR CERTIFIED LAND SURVEYOR



RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES ENGINEERING

NO.	DATE	REVISION / COMMENT / NOTE
1	7/98	REVISIONS AS PER JAMES CITY COUNTY REVIEW
2	1/02/01	RECORD DRAWINGS
3	5/2/03	REVISIONS AS PER JAMES CITY COUNTY REVIEW

5248 Old Towne Road, Suite 1
 Williamsburg, Virginia 23188
 (804) 253-0040
 Fax (804) 220-8994

CONSULTING ENGINEERS

NOTES AND DETAILS
 BARRETT'S POINTE
 THE
 GOVERNOR'S LAND
St. Ives Plantation
 JAMES CITY COUNTY, VIRGINIA

APPROVED
 James City County
 Environmental Division
 By: _____
 Date: _____

Designed VMB Drawn _____
 Scale AS NOTED Date 5/98
 Project No. 7173-4-3
 Drawing No. 10

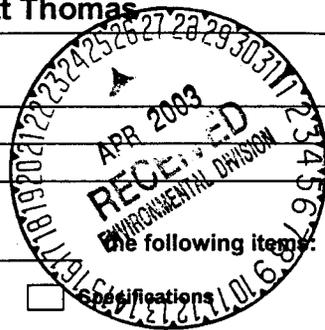
AES CONSULTING ENGINEERS

Engineering, Surveying and Planning
 5248 Olde Towne Road, Suite 1
 Williamsburg, Virginia 23188
 Phone: (757) 253-0040
 Fax: (757) 220-8994

LETTER OF TRANSMITTAL

TO : James City County
 Environmental Division
 101 Mounts Bay Road
 Williamsburg, VA 23187

DATE: 23-Apr-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE : Governor's Land	



WE ARE SENDING YOU:

- Attached Under separate cover via _____
 Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	4-23-03		As-Built drawing (Mylar) - Wingfield Lake JR017
1	4-23-03		As-Built drawing (Black line) - Wingfield Lake JR017
1	4-23-03		Memo responding to letter from County - Wingfield Lake JR017
1	4-23-03		As-Built drawing (Mylar) - Cypress Isle JR041
1	4-23-03		As-Built drawing (Black line) - Cypress Isle JR041
1	4-23-03		Memo responding to letter from County - Cypress Isle JR041
1	4-23-03		Routing computations using As-Built information JR041
1	4-23-03		As-Built drawing (Mylar) - Barrett's Point Pond JR042
1	4-23-03		As-Built drawing (Black line) - Barrett's Point Pond JR042
1	4-23-03		Memo responding to letter from County - Barrett's Point Pond JR042
1	4-23-03		As-Built drawing (Mylar) - Wythe-Hamlet Dry Pond JR040
1	4-23-03		As-Built drawing (Black line) - Wythe-Hamlet Dry Pond JR040
1	4-23-03		Memo responding to letter from County - Wythe-Hamlet Dry Pond JR040
1	4-23-03		As-Built drawing (Mylar) - Travis Pond Dry Pond #2
1	4-23-03		As-Built drawing (Black line) - Travis Pond Dry Pond #2
1	4-23-03		Memo responding to letter from County - Travis Pond Dry Pond #2
1	4-23-03		As-Built drawing (Mylar) - Two Rivers Point Timber Structure JR036
1	4-23-03		As-Built drawing (Black line) - Two Rivers Point Timber Structure JR036
1	4-23-03		Memo responding to letter from County - Two Rivers Point Timber Structure JR036
1	4-23-03		As-Built drawing (Mylar) - Wingfield Lake Timber Structure JR031
1	4-23-03		As-Built drawing (Black line) - Wingfield Lake Timber Structure JR031
1	4-23-03		Memo responding to letter from County - Wingfield Lake Timber Structure JR031

THESE ARE TRANSMITTED as checked below:

- For Approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ Corrected prints
 For review and comment For Signature _____
 FOR BIDS DUE _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS:

If you have any questions please contact me. Thank you.

COPIES TO: file

SIGNED: _____

Victoria Bains
 Victoria Bains

(757) 253-0040
 FAX (757) 220-8994

DATE <i>MARCH 19, 2002</i>	JOB NO. <i>7173-00</i>
ATTENTION <i>MR. MIKE WOODSON</i>	
RE: <i>Governor's CMO</i>	

TO *JAMES CITY COUNTY ENVIRONMENTAL DIVISION*



WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

Shop drawings Prints Plans Samples Specifications

Copy of letter Change order *Record Drawings*

COPIES	DATE	NO.	DESCRIPTION
<i>2</i>			<i>RECORD DRAWINGS FOR BMP @ BARRETT'S POINT (JR042)</i>
<i>2</i>			<i>" " " " @ RIVER ONE NORTH (JR034)</i>
<i>1</i>			<i>UPDATE OVERALL BMP MAP</i>
			<i>S-24-98</i> <i>JR042</i>

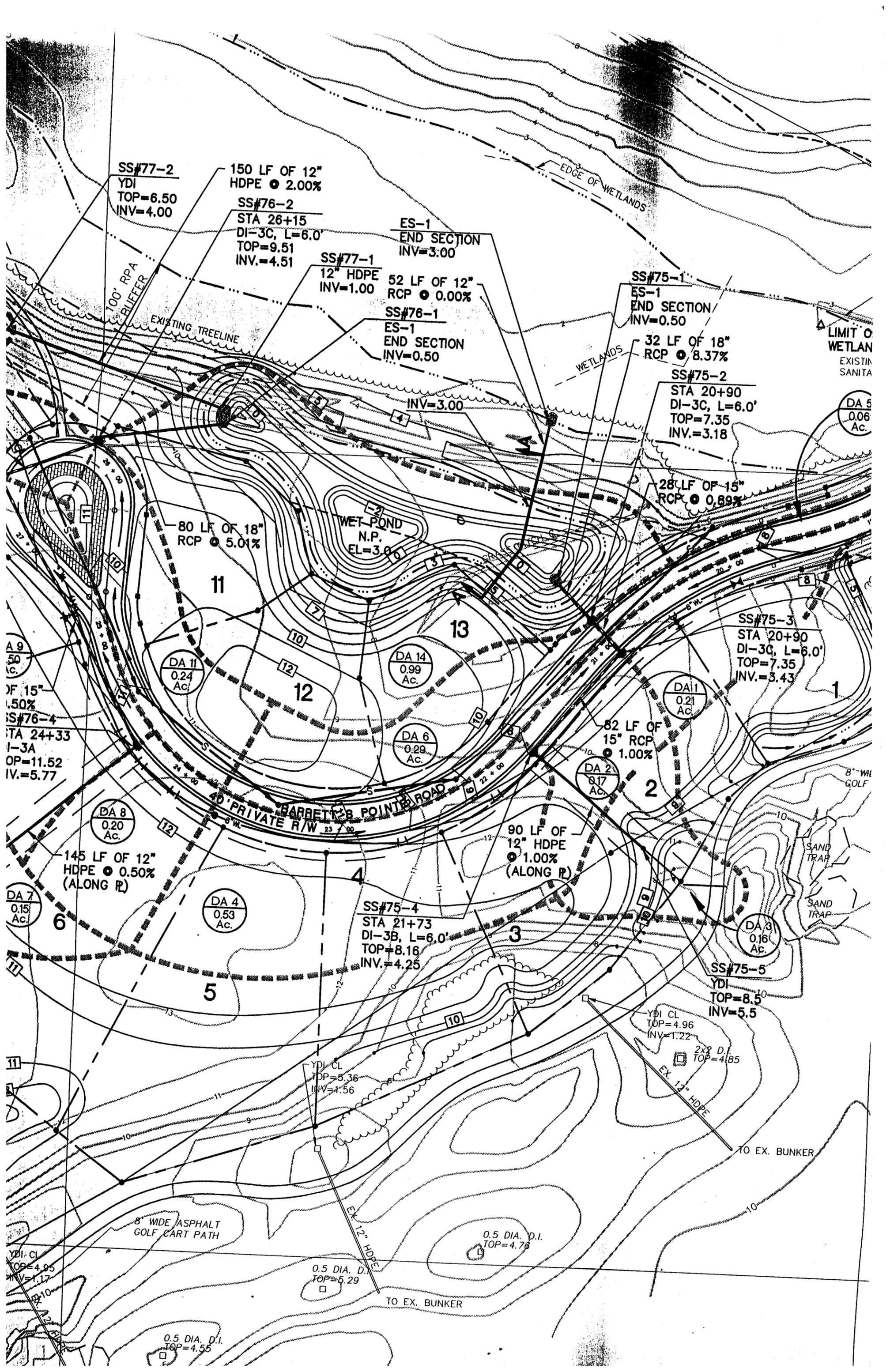
THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
- For your use Approved as noted Submit _____ copies for distribution
- As requested Returned for corrections Return _____ corrected prints
- For review and comment _____
- FOR BIDS DUE _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO _____

SIGNED: *V. Marc B...*



**DRAINAGE CALCULATIONS
FOR
BARRETT'S POINTE
IN
THE GOVERNOR'S LAND**



5-24-98
JR 042

Prepared By:
AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, VA 23188
Job # 7173-4-3

Project Overview

The project site naturally flows to the adjacent wetland areas located to the north. Following development, a wet pond will provide stormwater management as well as an aesthetically pleasing amenity for the residents. The required volume for a 9-point BMP wet pond has been exceeded in order to lessen the impact of development on the adjacent wetlands. This BMP contains a combination of emergent marsh and open water. The outlet structure is a single culvert which will release flows at non-erosive velocities. The emergency outlet is the earth spillway. The following calculations detail the design process for the pond and accompanying storm sewer systems.

Storm Sewer Systems

Three storm sewer systems convey stormwater to the pond. The first, #75, is located on the east side of the project area and serves drainage areas (DA) 1- 6. System #76 is located on the west side of the project area and serves drainage areas 7- 12. Both systems include yard drains along property lines to collect flow before it reaches the golf course area. Several yard drains exist in the gold course area. These drains shall remain and continue to serve the area. System #77 is located along the northwest edge of the project site and serves drainage area 13. The calculations and schematic of all three systems are located in the appendix. Also included in the appendix is the spread calculation sheet for this road.

Rip rap (Class I) has been included at the outlet of each pipe discharging into the pond. The discharge points have been further excavated to provide forebays which will encourage sedimentation. These forebay areas provide an additional 200 CY of storage (approximately) and will require routine cleanings.

Wet Pond

The pre-development area of 2.15 acres is pictured in the appendix. The discharges prior to construction are 3.84 CFS (2-year) and 4.68 CFS (10-year). The pond has been designed to attenuate the post-development flows to rates lower than the pre-development rates.

The post-development area draining to the pond totals 3.94 acres and a picture of this area is located in the appendix. Of this total, 0.99 acres (DA 14) sheet flows into the pond. The remainder of the total area is conveyed to the pond via the previously discussed storm sewer systems. The following calculation procedure details the determination of the required normal pool volume for the pond.

Total Drainage Area (DA) = 3.94 AC

Proposed Impervious Area = 1.71 AC

Total Prop. Bldgs = 37,600 SF

Total Prop. Drives = 17,150 SF

Total Prop. Road = 19,920 SF

Total Imp. Area = 74,670 SF

(this number is an estimate based on renderings of the developed area)

Percent Impervious (% Imp) = 43.40%

Runoff Coeff. (R_v) = $[0.05 + 0.009(\% \text{ Imp})]$
 = $[0.05 + 0.009(43.40)]$
 = 0.44

Mean Storm Runoff (V_r) = $(1/2"/\text{AC})(\text{DA})(R_v)$
 = $[(1/2"/\text{AC})(3.94 \text{ AC})(0.44)]/(12"/1')$
 = 0.072 AC-FT

Required Storage for
 Normal Pool of Pond (V_{pool}) = $4.0(V_r)$
 (Design 7, 9 point BMP) = $4.0(0.072 \text{ AC-FT})(43,560 \text{ SF/AC})$
 = 12,545 CF

The Normal Pool elevation is set at 3.00, which yields a storage capacity of 18,437 CF plus the additional storage of the forebay areas. This far exceeds the required volume, but serves to lessen the impact of development on the adjacent wetlands. Additionally, by placing the pond outlet device at elevation 3.00, the existing tree line is not disturbed. The normal pool area does not encroach the 50' buffer zone.

The top of the dam is set at 5.30, with the emergency earthen spillway at 4.75. As seen in the pond routing calculations found in the appendix, the 2 yr, 10 yr, 25 yr, and 100 yr storms are held below the emergency spillway. The outlet pipe, a 12" RCP, discharges flow at rates of 1.2 CFS (2 yr) and 1.5 CFS (10 yr), which are significantly below the pre-development rates.

Temporary Construction Sediment Basin

The pond area shall act as a sediment basin during construction activities. To ensure the adjacent treed areas are not negatively impacted, no additional outlet devices are provided for construction purposes. The pond has been sized to accommodate construction activities. (4 AC @ 134 CY/ AC = 536 CY required volume for sediment basin. Storage provided at the normal pool elevation of 3.00 is approximately 880 CY, including the three forebay areas.) Accumulated sediment in the pond area shall be removed regularly and properly disposed.

APPENDIX

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
 Rainfall file: JCCN

Run Date: 07-07-1998
 File: 7173-75.ST3

LINE 1 / Q = 4.19 / HT = 18 / WID = 18 / N = .013 / L = 32 / JLC = .75

75-1 - 75-2 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.62	18.00	0.50	2.37	3.71	0.00	-1.5	1.77
UPSTRM	3.96	9.38	3.18	4.51	4.28	17.98	2.66	0.93

Drainage area (ac) =	0.35	Slope of invert (%) =	8.3750
Runoff coefficient =	0.57	Slope energy grade line (%) =	1.7788
Time of conc (min) =	11.11	Critical depth (in) =	9.38
Inlet time (min) =	5.00	Natural ground elev. (ft) =	7.35
Intensity (in/hr) =	5.52	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.76	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	4.19	Line capacity (cfs) =	30.39
<hr/>			
Q catchment (cfs) =	1.39	Inlet length (ft) =	6.00
Q carryover (cfs) =	1.23	Gutter slope (ft/ft) =	0.0010
Q captured (cfs) =	1.68	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	0.94	Ponding width (ft) =	N/A

LINE 2 / Q = 3.11 / HT = 15 / WID = 15 / N = .013 / L = 28 / JLC = .75

75-2 - 75-3 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.20	12.21	3.18	2.91	4.33	13.54	2.91	1.07
UPSTRM	4.18	8.98	3.43	4.05	4.43	14.70	2.66	0.77

Drainage area (ac) =	0.38	Slope of invert (%) =	0.8929
Runoff coefficient =	0.54	Slope energy grade line (%) =	0.3740
Time of conc (min) =	10.96	Critical depth (in) =	8.47
Inlet time (min) =	5.00	Natural ground elev. (ft) =	7.35
Intensity (in/hr) =	5.54	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.56	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.11	Line capacity (cfs) =	6.10
<hr/>			
Q catchment (cfs) =	1.43	Inlet length (ft) =	6.00
Q carryover (cfs) =	1.69	Gutter slope (ft/ft) =	0.0010
Q captured (cfs) =	1.89	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	1.23	Ponding width (ft) =	N/A

LINE 3 / Q = 2.00 / HT = 15 / WID = 15 / N = .013 / L = 82 / JLC = 1.2

75-3 - 75-4 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.37	11.28	3.43	2.02	4.43	13.01	2.66	0.99
UPSTRM	4.82	6.79	4.25	3.71	5.03	14.93	2.65	0.54

Drainage area (ac) =	0.53	Slope of invert (%) =	1.0000
Runoff coefficient =	0.52	Slope energy grade line (%) =	0.7268
Time of conc (min) =	10.50	Critical depth (in) =	6.79
Inlet time (min) =	5.00	Natural ground elev. (ft) =	8.16
Intensity (in/hr) =	5.63	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.36	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	2.00	Line capacity (cfs) =	6.46

Q catchment (cfs) =	1.92	Inlet length (ft) =	6.00
Q carryover (cfs) =	0.46	Gutter slope (ft/ft) =	0.0251
Q captured (cfs) =	0.68	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	1.69	Ponding width (ft) =	N/A

LINE 4 / Q = 0.46 / HT = 12 / WID = 12 / N = .013 / L = 90 / JLC = 1.25

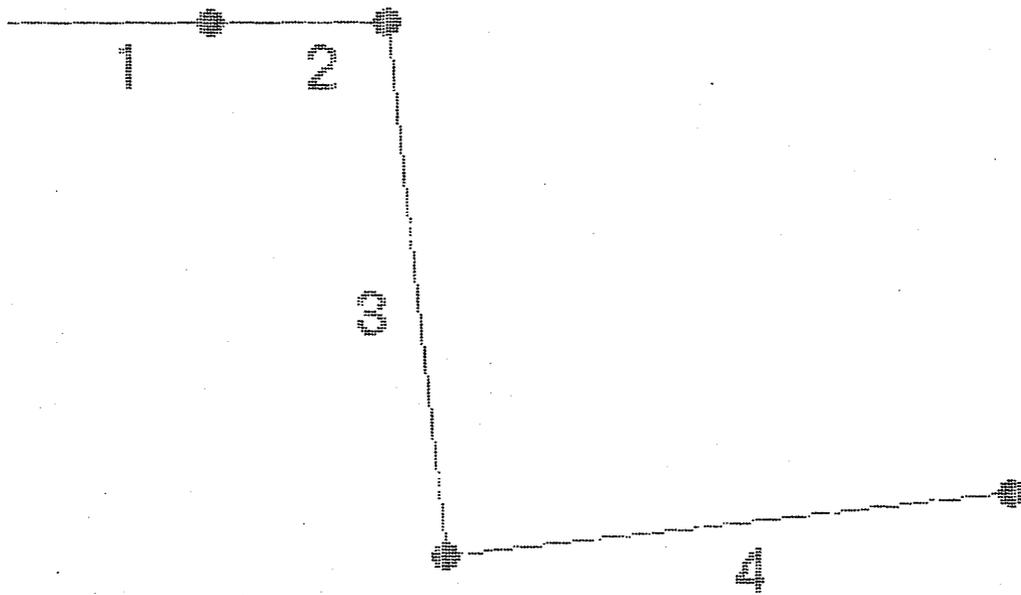
75-4 - 75-5 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	5.07	9.86	4.25	0.66	5.08	10.88	2.9	0.69
UPSTRM	5.90	3.44	5.50	2.46	6.00	10.86	2	0.19

Drainage area (ac) =	0.16	Slope of invert (%) =	1.3889
Runoff coefficient =	0.50	Slope energy grade line (%) =	0.8911
Time of conc (min) =	10.00	Critical depth (in) =	3.44
Inlet time (min) =	10.00	Natural ground elev. (ft) =	8.50
Intensity (in/hr) =	5.72	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.08	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.46	Line capacity (cfs) =	4.20

Q catchment (cfs) =	0.46	Inlet length (ft) =	1.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.46	Ponding width (ft) =	N/A

30'



GL: BERRETT'S PONTE SYS # 75

[← ↑ → ↓] Move

[Space] Label's

[Home] Res

[PgUp] Enlarge

[PgDn] Reduce

[Esc] E

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
 Rainfall file: JCCN

Run Date: 07-07-1998
 File: 7173-76.ST3

LINE 1 / Q = 3.73 / HT = 15 / WID = 15 / N = .013 / L = 80 / JLC = .75

76-1 - 76-2 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.62	15.00	0.50	3.04	3.76	0.00	.25	1.23
UPSTRM	5.28	9.27	4.51	4.68	5.62	14.57	3.75	0.80

Drainage area (ac) =	0.40	Slope of invert (%) =	5.0125
Runoff coefficient =	0.54	Slope energy grade line (%) =	2.3248
Time of conc (min) =	12.19	Critical depth (in) =	9.27
Inlet time (min) =	5.00	Natural ground elev. (ft) =	9.51
Intensity (in/hr) =	5.33	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.70	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.73	Line capacity (cfs) =	14.46

Q catchment (cfs) =	1.51	Inlet length (ft) =	6.00
Q carryover (cfs) =	1.94	Gutter slope (ft/ft) =	0.0010
Q captured (cfs) =	2.02	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	1.43	Ponding width (ft) =	N/A

LINE 2 / Q = 2.61 / HT = 15 / WID = 15 / N = .013 / L = 63 / JLC = .75

76-2 - 76-3 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	5.54	12.34	4.51	2.41	5.63	13.60	3.75	1.08
UPSTRM	5.62	9.46	4.83	3.20	5.78	14.48	3.76	0.81

Drainage area (ac) =	0.50	Slope of invert (%) =	0.5079
Runoff coefficient =	0.52	Slope energy grade line (%) =	0.2352
Time of conc (min) =	11.84	Critical depth (in) =	7.75
Inlet time (min) =	5.00	Natural ground elev. (ft) =	9.84
Intensity (in/hr) =	5.39	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.48	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	2.61	Line capacity (cfs) =	4.60

Q catchment (cfs) =	1.81	Inlet length (ft) =	6.00
Q carryover (cfs) =	1.22	Gutter slope (ft/ft) =	0.0079
Q captured (cfs) =	1.09	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	1.94	Ponding width (ft) =	N/A

LINE 3 / Q = 0.26 / HT = 12 / WID = 12 / N = .013 / L = 110 / JLC = .75

76-3 - 76-6 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	5.74	10.89	4.83	0.34	5.74	11.43	4.01	0.75
UPSTRM	6.77	2.58	6.50	2.07	6.83	9.86	2	0.12

Drainage area (ac) =	0.09	Slope of invert (%) =	1.5182
Runoff coefficient =	0.50	Slope energy grade line (%) =	0.9938
Time of conc (min) =	10.00	Critical depth (in) =	2.58
Inlet time (min) =	10.00	Natural ground elev. (ft) =	9.50
Intensity (in/hr) =	5.72	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.05	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.26	Line capacity (cfs) =	4.39

Q catchment (cfs) =	0.26	Inlet length (ft) =	1.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.26	Ponding width (ft) =	N/A

LINE 4 / Q = 1.00 / HT = 15 / WID = 15 / N = .013 / L = 187 / JLC = 1.3

76-3 - 76-4 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	5.74	10.89	4.83	1.05	5.75	12.78	3.76	0.95
UPSTRM	6.17	4.79	5.77	2.95	6.30	13.99	4.5	0.34

Drainage area (ac) =	0.20	Slope of invert (%) =	0.5027
Runoff coefficient =	0.52	Slope energy grade line (%) =	0.2944
Time of conc (min) =	10.81	Critical depth (in) =	4.79
Inlet time (min) =	5.00	Natural ground elev. (ft) =	11.52
Intensity (in/hr) =	5.57	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.18	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	1.00	Line capacity (cfs) =	4.58

Q catchment (cfs) =	0.73	Inlet length (ft) =	2.00
Q carryover (cfs) =	0.43	Gutter slope (ft/ft) =	0.0121
Q captured (cfs) =	0.19	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	0.96	Ponding width (ft) =	N/A

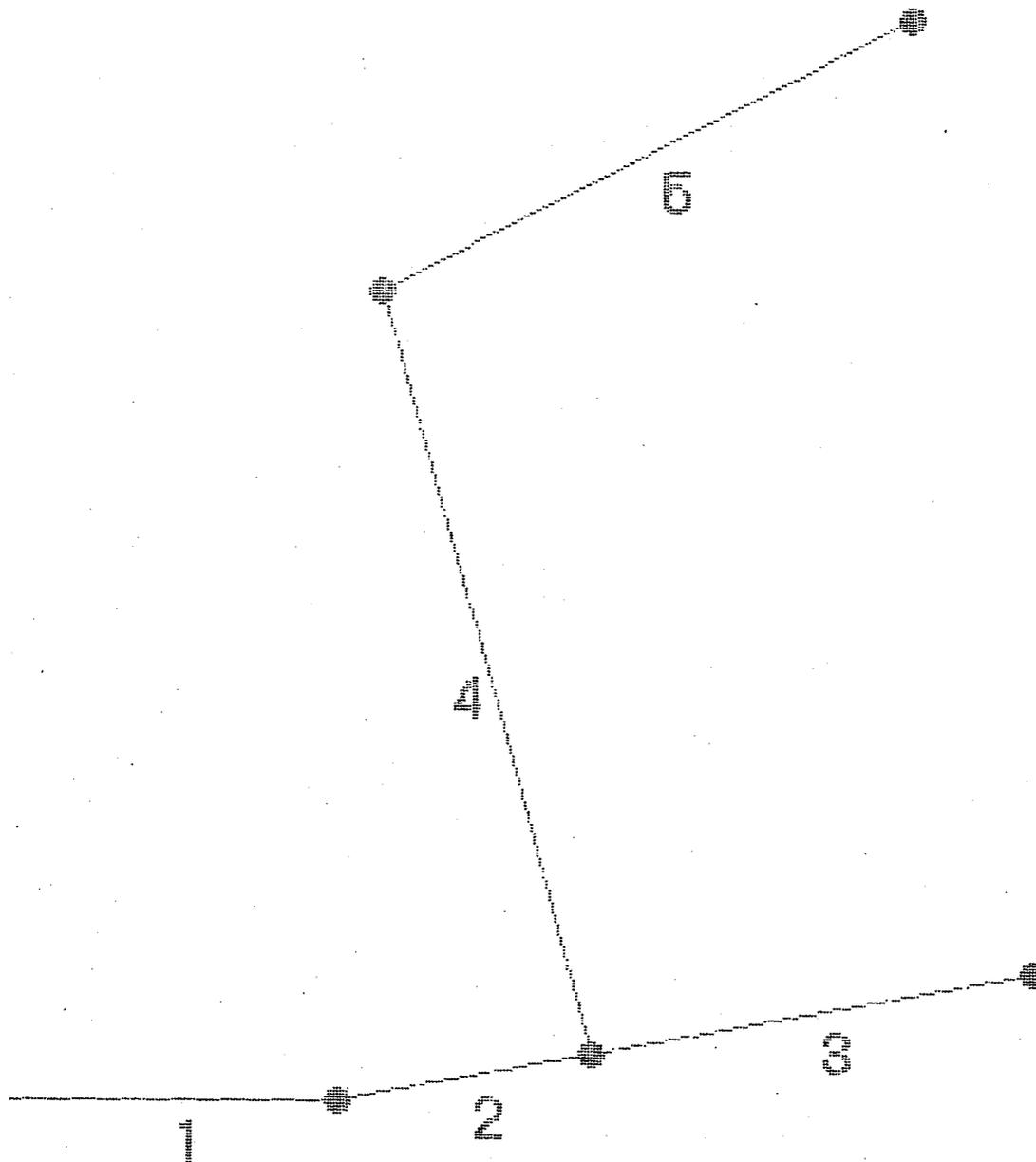
LINE 5 / Q = 0.43 / HT = 12 / WID = 12 / N = .013 / L = 145 / JLC = 1.2

76-4 - 76-5 / DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	6.35	6.90	5.77	0.92	6.36	9.10	4.75	0.47
UPSTRM	6.89	3.33	6.50	2.41	6.98	10.75	2	0.18

Drainage area (ac) =	0.15	Slope of invert (%) =	0.5034
Runoff coefficient =	0.50	Slope energy grade line (%) =	0.3515
Time of conc (min) =	10.00	Critical depth (in) =	3.33
Inlet time (min) =	10.00	Natural ground elev. (ft) =	9.50
Intensity (in/hr) =	5.72	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.08	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.43	Line capacity (cfs) =	2.53

Q catchment (cfs) =	0.43	Inlet length (ft) =	1.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.43	Ponding width (ft) =	N/A



30'

GL: BERRETT'S PT SYS #76

[←] [↑] [→] [↓] Move

[Space] Label's

[Home] Rest

[PgUp] Enlarge

[PgDn] Reduce

[Esc] Exit

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
 Rainfall file: JCCN

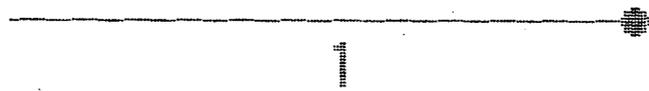
Run Date: 07-07-1998
 File: 7173-77.ST3

LINE 1 / Q = 0.54 / HT = 12 / WID = 12 / N = .013 / L = 150 / JLC = .75

77-1 - 77-2 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.62	12.00	0.75	0.69	3.63	0.00	-.75	0.79
UPSTRM	4.39	3.75	4.00	2.59	4.50	11.13	1.5	0.21

Drainage area (ac) =	0.19	Slope of invert (%) =	2.1667
Runoff coefficient =	0.50	Slope energy grade line (%) =	0.5263
Time of conc (min) =	10.00	Critical depth (in) =	3.75
Inlet time (min) =	10.00	Natural ground elev. (ft) =	6.50
Intensity (in/hr) =	5.72	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.09	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.54	Line capacity (cfs) =	5.24
<hr/>			
Q catchment (cfs) =	0.54	Inlet length (ft) =	1.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.54	Ponding width (ft) =	N/A



GL: BERRETT'S POINTS SYS # 77

[← ↑ → ↓] Move

[Space] Label's

[Home] Res

[PgUp] Enlarge

[PgDn] Reduce

[Esc] Es

ALLOWABLE SPREAD
25/4 = 6.25'

STORM WATER INLET COMPUTATIONS

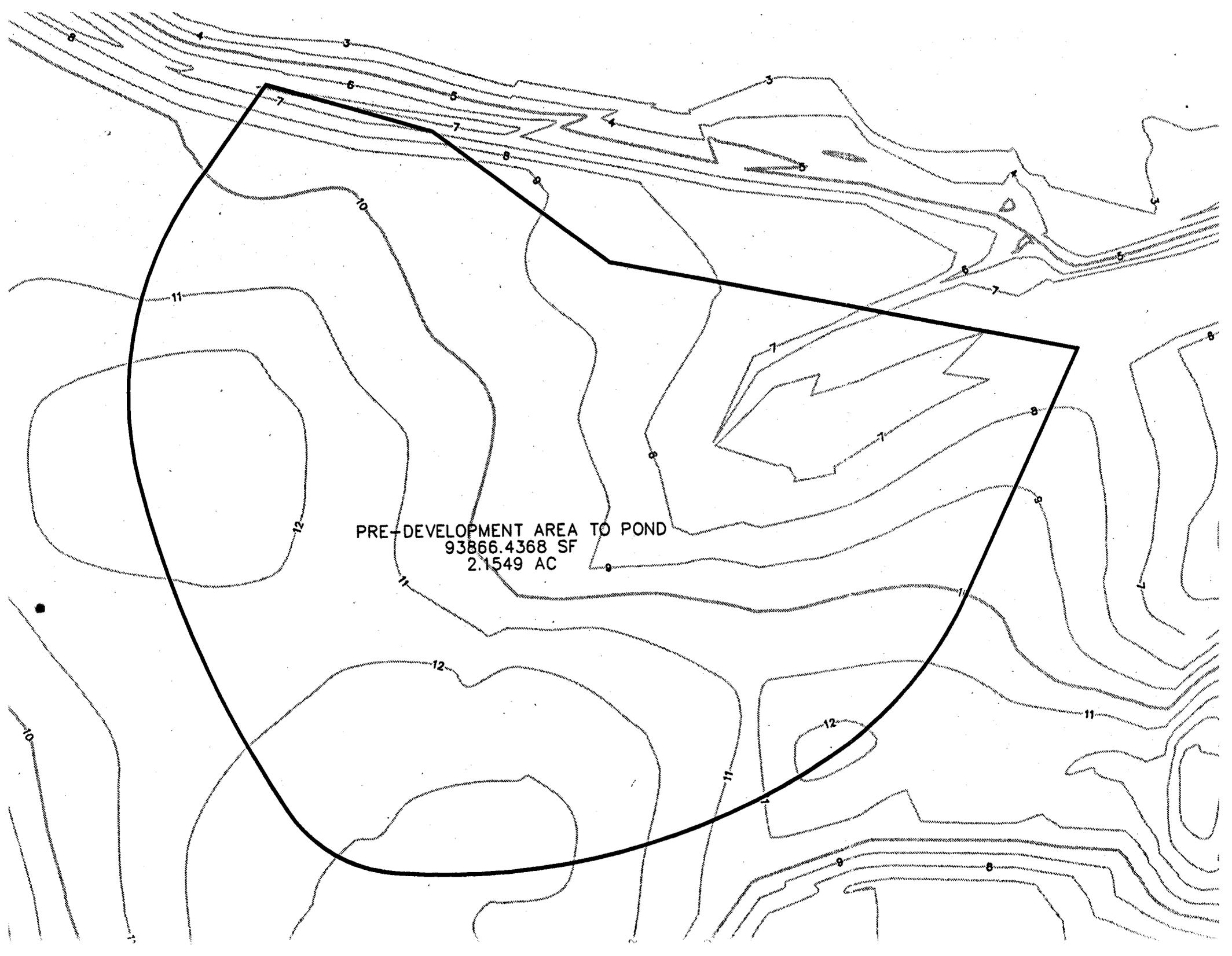
FORM LD 204
REV 6-85

RTE BERRETT'S POINTE RD

PROJECT NAME GL: BERRETT'S POINTE

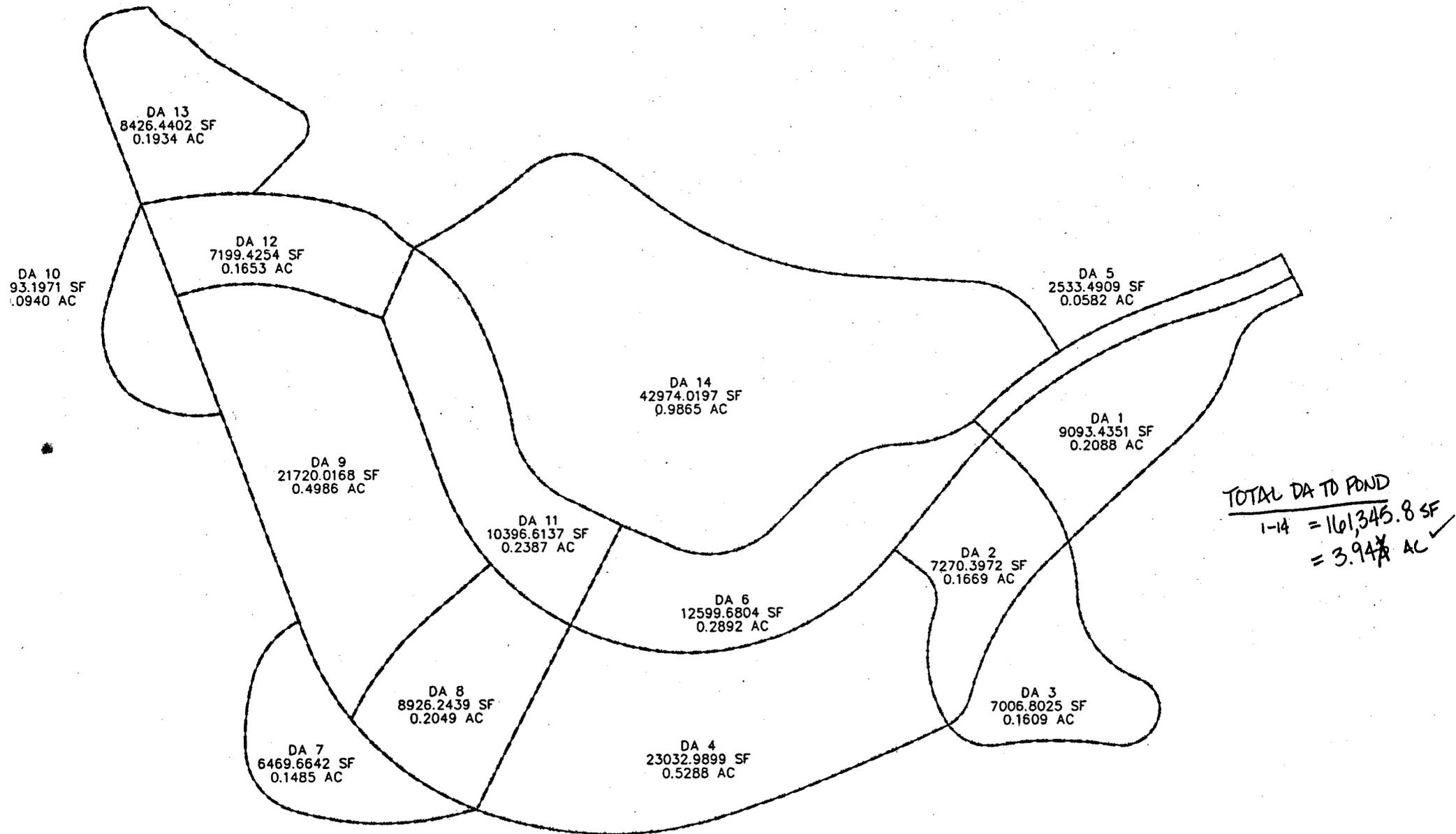
DATE 5-3-98
AES PROJ # 7173-4-3

INLET		NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	I (IN/HR)	Q INCR (CFS)	Q CARRY OVER (CFS)	Q1 GUTTER FLOW (CFS)	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T SPREAD	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw = a/12W	Se = Sx+SwEo (FT/FT)	Lt (FT)	P EFFECT (FT)	L/Lt	d (FT)	E (#16)	h (FT)	Q: INTRCPT (CFS)	d/h	Qb: CARRY OVER (CFS)	T SPREAD @ SAG (FT)	REMARKS		
SUMP		75-	2 3C	6	20+90 R	0.06	0.7	.04	3.5	.14	-	.14	.001	.0208	(3.6)																					
		75-	2 3C	6	20+90 R	0.29	.55	.16	3.5	.56	-	.56	.001	.0208	(7.0)																					
			TOTAL							.70		.70	.001	.0208		2		.0833						9.6		.125	.27	.46		10.01 < 6.25				OK		
GRD		75-	4 3B	6	21+73 L	.53	.52	.28	3.5	.98	-	.98	.0251	.0208	3.8	2	.53	.0833	4	.95	3.5	.1458	.159	7.38		.813	95.11	.93		Qb = 0.05						
SUMP		75-	3 3C	6	20+90 L	0.21	.56	.12	3.5	.42	-	.42	.001	.0208	(6.3)																					
					20+90 L	0.17	.52	.09	3.5	.31	.05	.36	.001	.0208	(5.6)																					
			TOTAL							.78		.78	.001	.0208		2		.0833						9.6		.13	.27	.48		10.25 = 6.25				OK		
GRD		76-	4 3A	2.5	24+33 L	0.20	.52	.10	3.5	.35	-	.35	.0121	.0208	1.9	2	1.05	.0833	4	1.0	3.5	.1458	.167	3.73		.670	80.40	.30		Qb = 0.05						
GRD		76-	3 3B	6	26+65 R	.50	.52	.26	3.5	.91	.05	.96	.0079	.0208	5.5	2	.36	.0833	4	.85	3.5	.1458	.145	5.56		1.08	1	.96		-				OK		
SUMP		76-	2 3C	6	26+15 R	.24	.55	.13	3.5	.46	-	.46	.001	.0208	(6.4)																					
		76-	2 3C	6	26+15 R	.16	.53	.08	3.5	.30	-	.30	.001	.0208	(5.0)																					
			TOTAL							.76		.76	.001	.0208		2		.0833						9.6		.128	.27	.47		6.15 < 6.25				OK		



PRE-DEVELOPMENT AREA TO POND
93866.4368 SF
2.1549 AC

POST-DEVELOPMENT



1. RESERVOIR No = 1. 2. RESERVOIR NAME = STORAGE POND
 3. $S = K_s * Z^b$
 $K_s = 0$ $b = 0$
 START ELEV = 0 INCREMENT = 0 ...

STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	5873.....	0	0
5	0.95	7611.....	6404	6404
6	1.00	10633....	456	6860
7	2.00	12522....	11577	18437
8	3.00	15220....	13871	32308
9	3.75	17261....	12180	44488 + 200CY ±
10	0.00	0.....	0	0 FOREBAYS
11	0.00	0.....	0	0
12	0.00	0.....	0	0
13	0.00	0.....	0	0
14	0.00	0.....	0	0

Change item number: 0

└ to cont

1. RESERVOIR No = 2. 2. RESERVOIR NAME = ROUTE POND..
 3. $S = K_s * Z^b$
 $K_s = 0.....$ $b = 0.....$
 START ELEV = 0..... INCREMENT = 0...

STAGE	ELEVATION	CO AREA	INC STORAGE	TOT STORAGE
ft	ft	sq ft	cu ft	cu ft
4	0.00	3.00. 12522...	0	0
5	1.00	4.00. 15220...	13871	13871
6	1.75	4.75. 17261...	12180	26051
7	0.00	0.00. 0.....	0	0
8	0.00	0.00. 0.....	0	0
9	0.00	0.00. 0.....	0	0
10	0.00	0.00. 0.....	0	0
11	0.00	0.00. 0.....	0	0
12	0.00	0.00. 0.....	0	0
13	0.00	0.00. 0.....	0	0
14	0.00	0.00. 0.....	0	0

CULVERT STRUC A. $Q = CoA[2gh/k]^{.5}$ CULVERT STRUC B. $Q = CoA[2gh/k]^{.5}$

1. WIDTH (in) = 12. 9. WIDTH (in) = 0..
 2. HEIGHT (in) = 12. 10. HEIGHT (in) = 0..
 3. No. BARRELS = 1.. 11. No. BARRELS = 0..
 4. INVERT ELEV. = 3..... 12. INVERT ELEV. = 0.....
 5. $Co = 0.60$ 13. $Co = 0.60$
 6. CULVERT LENGTH (ft) = 52.. 14. CULVERT LENGTH (ft) = 0..
 7. CULVERT SLOPE (%) = 0... 15. CULVERT SLOPE (%) = 0..
 8. MANNING'S N-VALUE = .013 16. MANNING'S N-VALUE = .013
 17. MULTI-STAGE OPTION ? (Y/N) N

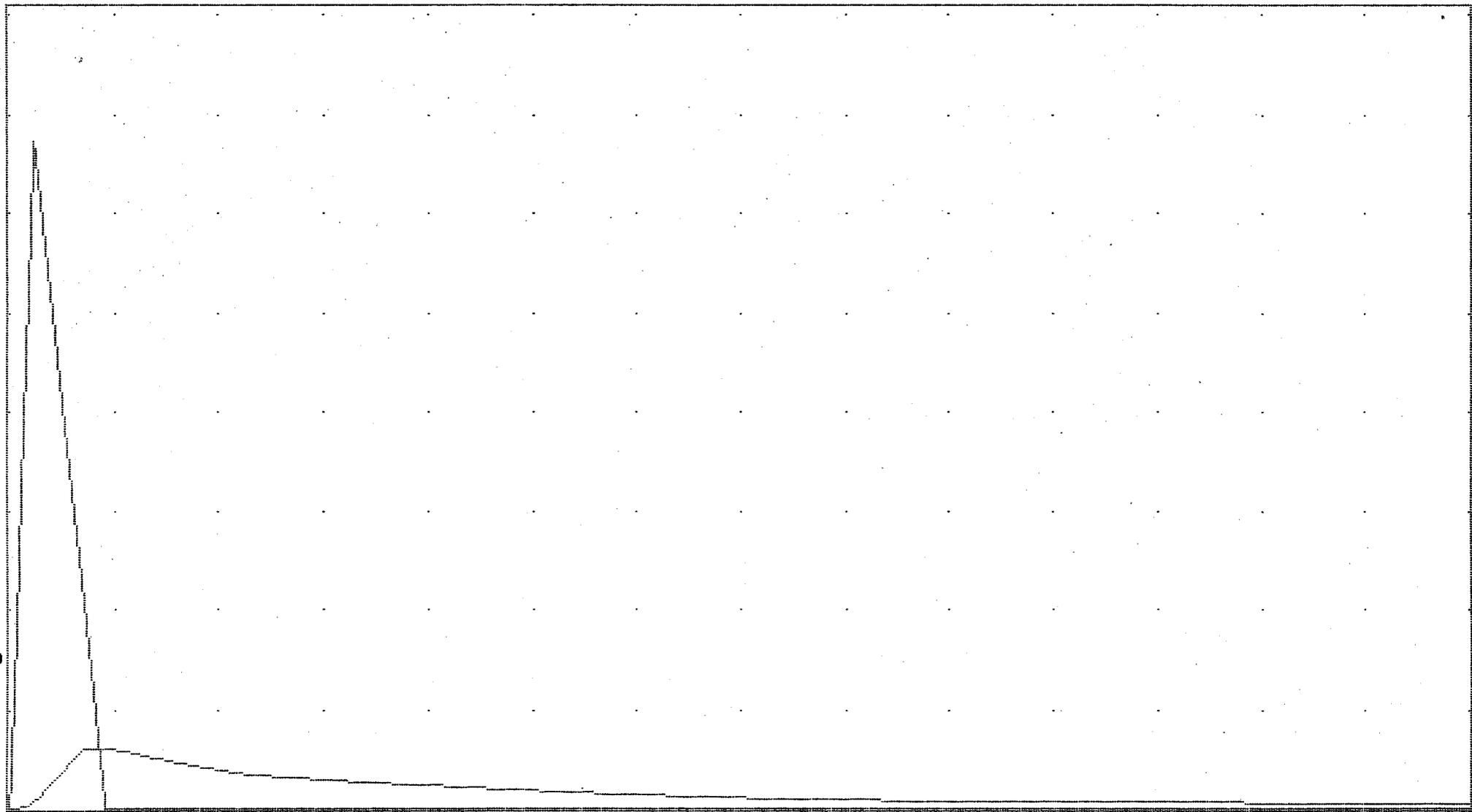
WEIR STRUCTURE A. $Q = CwLH^{EXP}$ WEIR STRUCTURE B. $Q = CwLH^{EXP}$

18. CREST LENGTH (ft) = 0..... 23. CREST LENGTH (ft) = 65.....
 19. CREST ELEVATION = 0..... 24. CREST ELEVATION = 4.75...
 20. $Cw = 3.00$ 25. $Cw = 3.00$
 21. $EXP = 1.50$ 26. $EXP = 1.50$
 22. MULTI-STAGE OPTION ? (Y/N) N 27. MULTI-STAGE OPTION ? (Y/N) N

Qp = 1.2

RESERVOIR ROUTE

2 Yr



HGU = 22 min

5

UGU = 2.0 cfs

MAX STORAGE = 7368

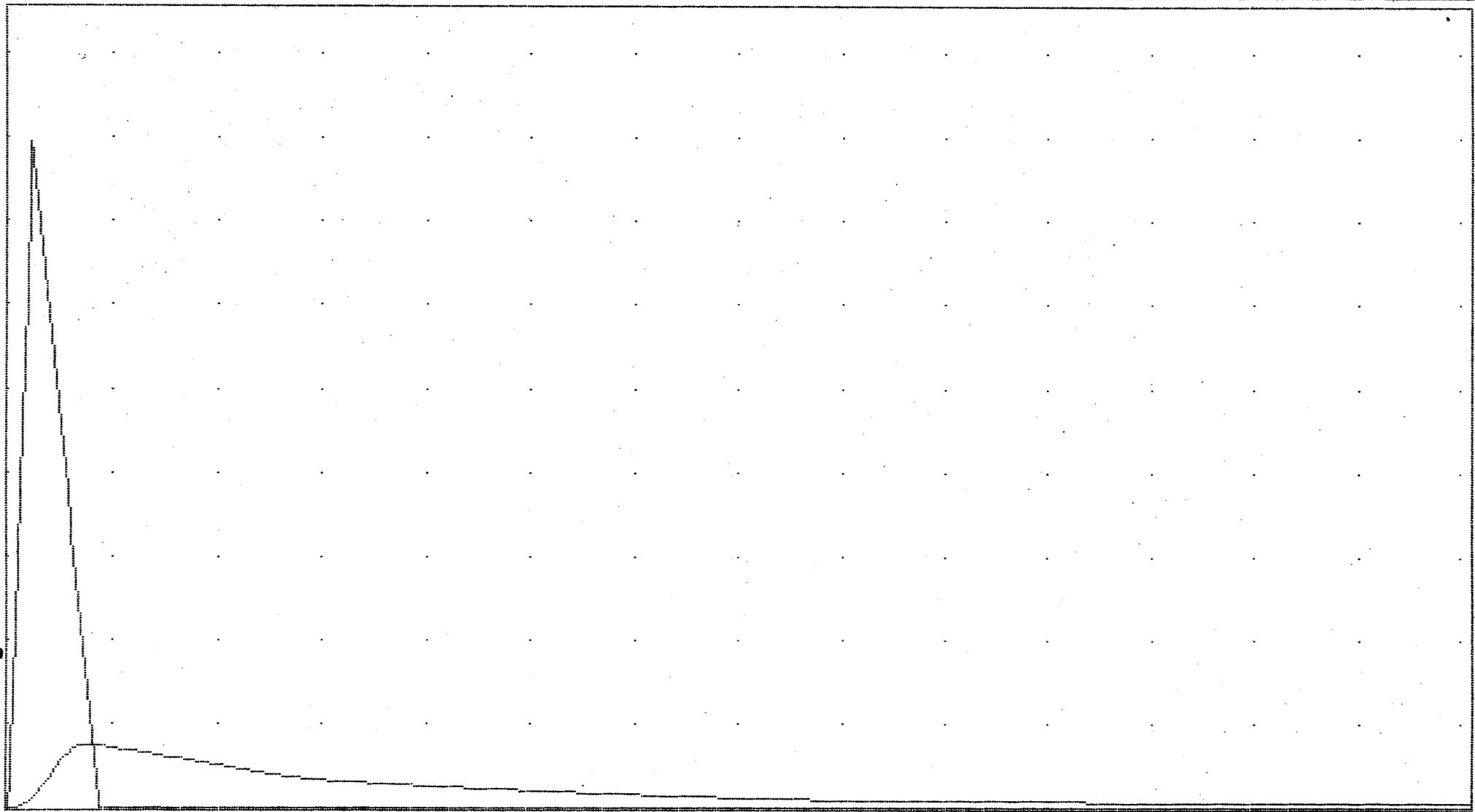
MAX ELEVATION = 3.53

2-YR

Qp = 1.5

RESERVOIR ROUTE

10 Yr



HGU = 23 min

6

UGU = 2.0 cfs

MAX STORAGE = 8634

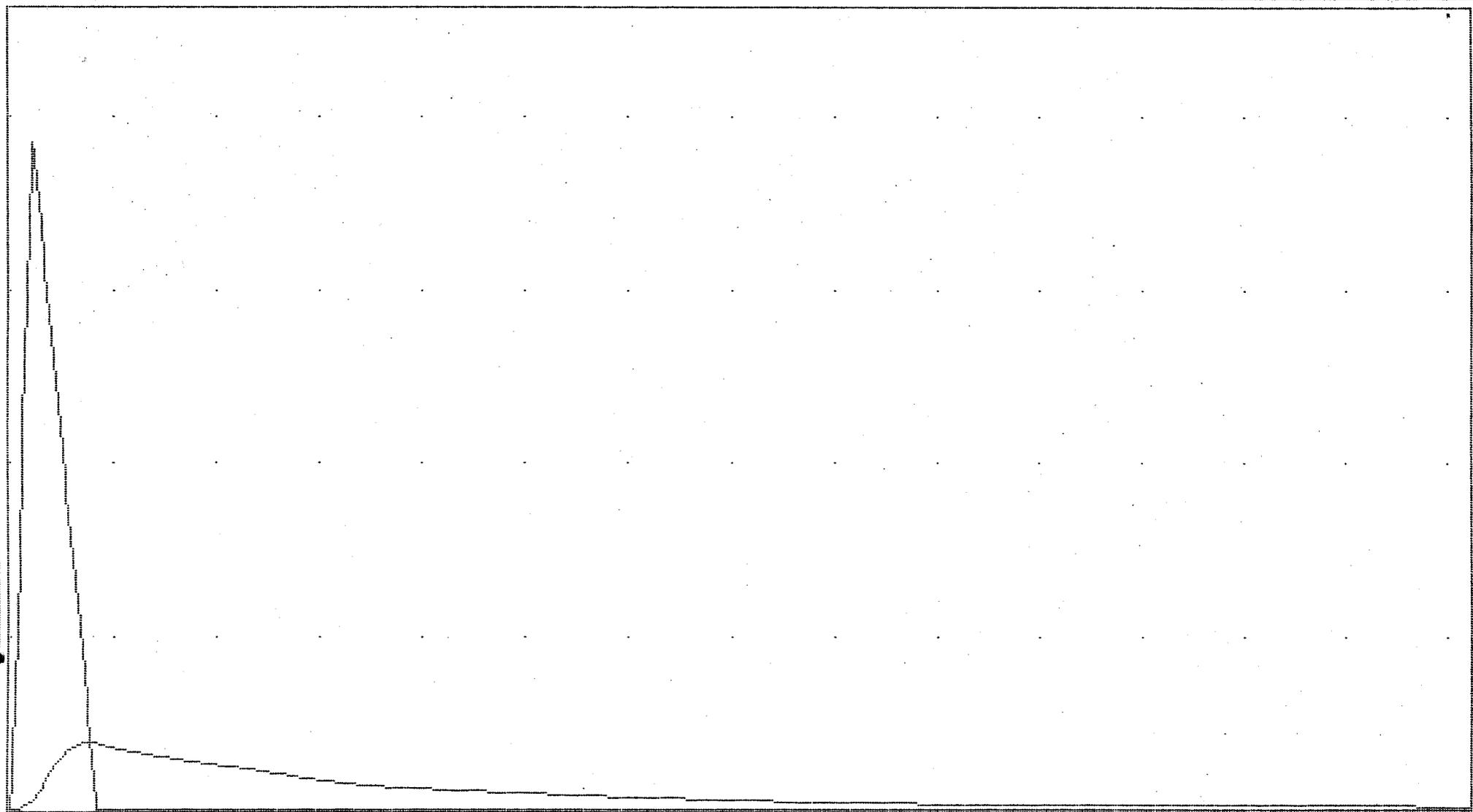
MAX ELEVATION = 3.62

10-YEAR

Qp = 1.9

RESERVOIR ROUTE

25 Yr



HGU = 24 min

9

UGU = 5.0 cfs

MAX STORAGE = 10361

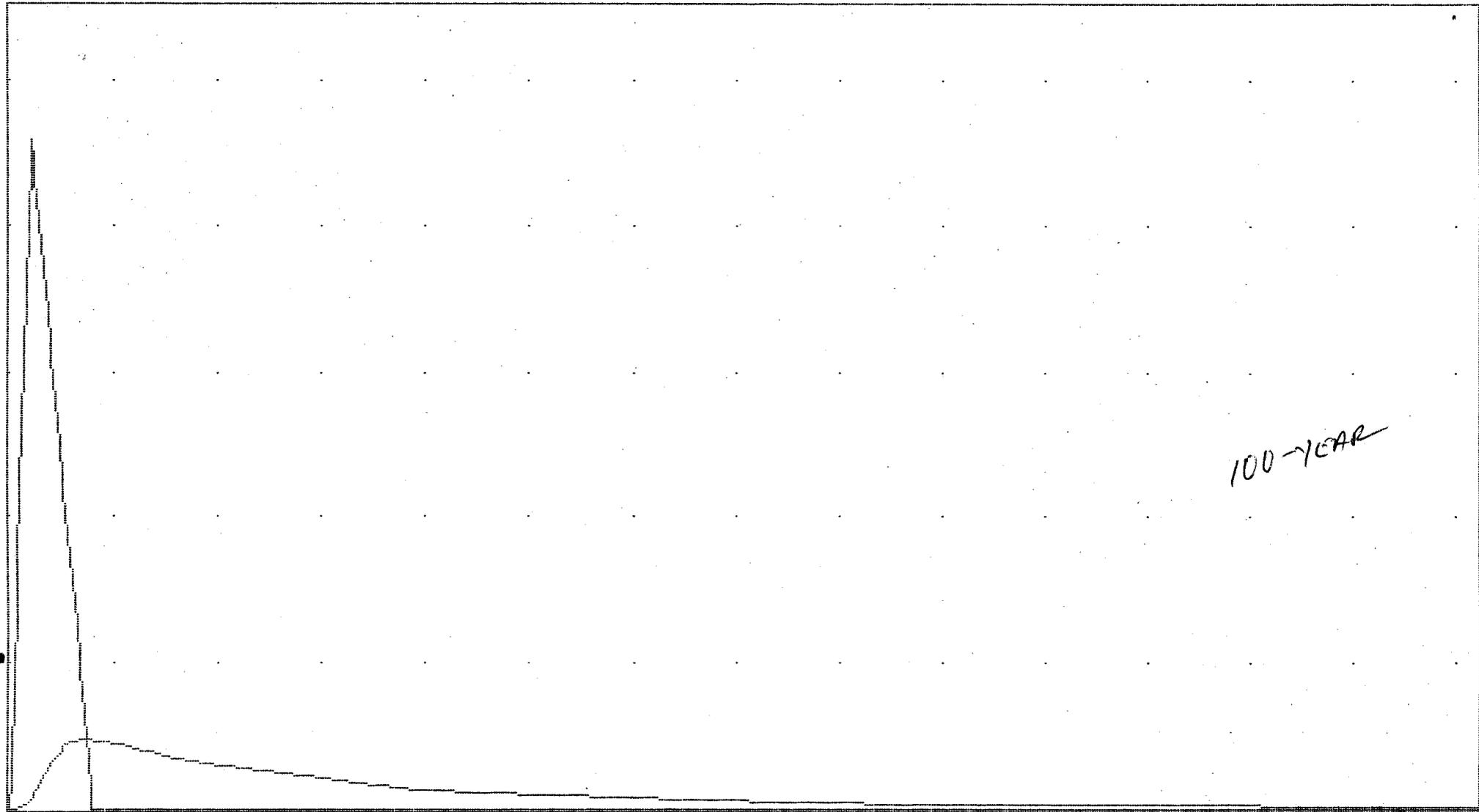
MAX ELEVATION = 3.75

25-YEAR

Qp = 2.4

RESERVOIR ROUTE

100 Yr



HGU = 25 min

10

UGU = 5.0 cfs

MAX STORAGE = 12265

MAX ELEVATION = 3.88

HYDROLOGICAL REPORT

2 YEAR PRE-DEVELOP....

HYD. No. 1

Hydrograph type = RATIONAL
 Storm frequency = 2 yr
 Time of conc. = 15 min
 Runoff coeff. = .5

Peak discharge = 3.84 cfs
 Time interval = 1 min
 Intensity = 3.57 in/hr
 Basin area = 2.15 ac

TIME--OUTFLOW	TIME--OUTFLOW	TIME--OUTFLOW	TIME--OUTFLOW
min cfs	min cfs	min cfs	min cfs
1.00	0.26	2.00	0.51
5.00	1.28	6.00	1.54
9.00	2.31	10.00	2.56
13.00	3.33	14.00	3.59
17.00	3.67	18.00	3.59
21.00	3.33	22.00	3.24
25.00	2.99	26.00	2.90
		27.00	2.82
		28.00	2.73

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[Esc] to cancel

HYDROLOGICAL REPORT

2 YEAR POST-DEVELOP...

HYD. No. 2

Hydrograph type = RATIONAL
 Storm frequency = 2 yr
 Time of conc. = 5 min
 Runoff coeff. = .6

Peak discharge = 13.47 cfs
 Time interval = 1 min
 Intensity = 5.70 in/hr
 Basin area = 3.94 ac

TIME--OUTFLOW	TIME--OUTFLOW	TIME--OUTFLOW	TIME--OUTFLOW
min cfs	min cfs	min cfs	min cfs
1.00	2.69	2.00	5.39
5.00	13.47	6.00	12.57
9.00	9.88	10.00	8.98
13.00	6.29	14.00	5.39
17.00	2.69	18.00	1.80
		19.00	0.90
		20.00	0.00

[] to continue

[Esc] to cancel

HYDROLOGICAL REPORT

10 YR PRE-DEVELOP.....

HYD. No. 3

Hydrograph type = RATIONAL
 Storm frequency = 10 yr
 Time of conc. = 15 min
 Runoff coeff. = .5

Peak discharge = 4.68 cfs
 Time interval = 1 min
 Intensity = 4.35 in/hr
 Basin area = 2.15 ac

TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW	
min	cfs	min	cfs	min	cfs	min	cfs
1.00	0.31	2.00	0.62	3.00	0.94	4.00	1.25
5.00	1.56	6.00	1.87	7.00	2.18	8.00	2.50
9.00	2.81	10.00	3.12	11.00	3.43	12.00	3.74
13.00	4.06	14.00	4.37	15.00	4.68	16.00	4.58
17.00	4.47	18.00	4.37	19.00	4.26	20.00	4.16
21.00	4.06	22.00	3.95	23.00	3.85	24.00	3.74
25.00	3.64	26.00	3.54	27.00	3.43	28.00	3.33

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[Esc] to cancel

HYDROLOGICAL REPORT

10 YR POST-DEVELOP.....

HYD. No. 4

Hydrograph type = RATIONAL
 Storm frequency = 10 yr
 Time of conc. = 5 min
 Runoff coeff. = .6

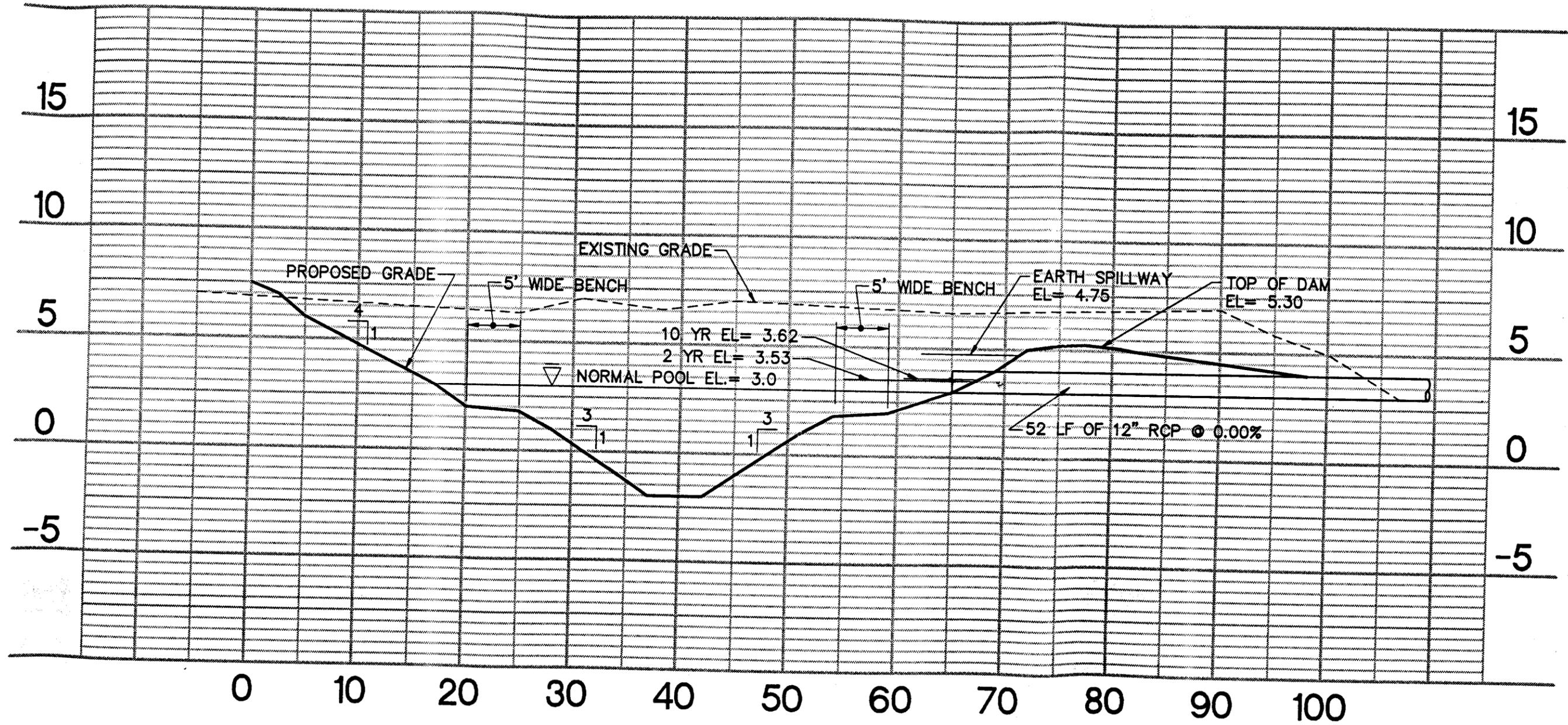
Peak discharge = 15.91 cfs
 Time interval = 1 min
 Intensity = 6.73 in/hr
 Basin area = 3.94 ac

TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW	
min	cfs	min	cfs	min	cfs	min	cfs
1.00	3.18	2.00	6.36	3.00	9.55	4.00	12.73
5.00	15.91	6.00	14.85	7.00	13.79	8.00	12.73
9.00	11.67	10.00	10.61	11.00	9.55	12.00	8.49
13.00	7.43	14.00	6.36	15.00	5.30	16.00	4.24
17.00	3.18	18.00	2.12	19.00	1.06	20.00	0.00

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17. TEMPORARY EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. AFTER STABILIZATION IS COMPLETE, ALL MEASURES SHALL BE REMOVED WITHIN 30 DAYS. TRAPPED SEDIMENT SHALL BE SPREAD AND SEEDING.
18. AS-BUILT DRAWINGS MUST BE PROVIDED FOR ALL DETENTION/BMP FACILITIES. ALSO UPON COMPLETION, THE CONSTRUCTION OF ALL DETENTION/BMP FACILITIES SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER WHO INSPECTED THE STRUCTURE DURING CONSTRUCTION. THE CERTIFICATION SHALL STATE THAT TO THE BEST OF HIS/HER JUDGMENT, KNOWLEDGE, AND BELIEF, THE STRUCTURE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVAL PLANS AND SPECIFICATIONS.



NOTE:
REFER TO SHEET 8 FOR BMP
CONSTRUCTION NOTES

BMP CROSS SECTION A-A

SCALE: 1"=1' VERT
1"=10' HORIZ.

Memorandum

DATE: April 23, 2003
TO: Scott Thomas
FROM: Victoria Bains
SUBJECT: Barrett's Point Pond, County BMP ID Code: JR042

In response to your letter dated December 9, 2002 AES Consulting Engineers has taken several actions.

Construction Certification:

Being provided by Earthworks Consulting Engineers, Inc.

Record Drawings:

Spot elevations for the bottom of the pond were added to plan view of the drawings. From this information, there is no significant sediment accumulation in this pond.

Elevations of inverts for the 15-inch HDPE were added to the plan view of the drawings.

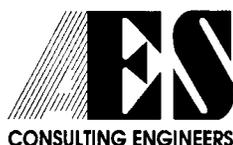
Elevations for the emergency spillway were corrected on sheet 10 and added the class of riprap to sheet 6.

Seals were added to each sheet of the drawings.

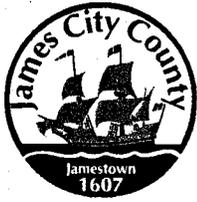
Added County identifiers to drawing.

Construction – Related Items:

Trash and debris was cleared from entire facility. Depressions above inflow pipe from DI on the southeast corner of facility were filled. Bare areas had topsoil added then seeded and mulched to stabilize area.



5248 Olde Towne Road • Suite 1 • Williamsburg, Virginia 23188
(757) 253-0040 • Fax (757) 220-8994 • E-mail aes@aesva.com



DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
 (757) 253-6671 Fax: (757) 253-6850 E-MAIL: devtman@james-city.va.us

CODE COMPLIANCE
 (757) 253-6626
 codecomp@james-city.va.us

ENVIRONMENTAL DIVISION
 (757) 253-6670
 environ@james-city.va.us

PLANNING
 (757) 253-6685
 planning@james-city.va.us

COUNTY ENGINEER
 (757) 253-6678
 INTEGRATED PEST MANAGEMENT
 (757) 253-2620

December 4, 2002

Mr. James H. Bennett
 Governors Land Associates
 9701 Mill Pond Run
 Toano, Va. 23168

Re: Governor's Land - Barretts Pointe
 County Plan No. SP-42-98
 Stormwater Management Facility
 County BMP ID Code: JR 042

Dear Mr. Bennett:

The Environmental Division has reviewed a record drawing as submitted to our office on March 20th 2002 for the above referenced project. The record drawing provides as-built information for a wet pond with a single barrel outlet situated in the north end of the development behind Lots 11 through 13.

Based on our review of the project and a concurrent field inspection as performed on November 14th 2002, the following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility at the site:

Construction Certification:

1. In accordance with the Note # 18 on Sheet 10 and the "boxed" note on Sheet 6 of the approved plan, construction certification for the stormwater management/BMP facility is required. None was provided. This is especially important since the facility has an engineered and compacted earthen embankment along the north side. The certification can be in letter format or by use of the certification statements in Section 4 of the *James City County, Stormwater Management / BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions*.

Record Drawing:

2. Provide additional bottom of pond spot elevations to determine that proper depth/volume was achieved in the main portion of the BMP and that the micropools (low marshes) were constructed in accordance with the approved plan. Proposed bottom of pond elevation was at El. 0 and three micropool areas approximately 2 ft. in depth were to be provided in the west, center and east ends of the basin.

3. Label as-built data for the proposed 12-inch HDPE drain which enters the basin at the northwest corner. This storm drain collects runoff from Lots 9 and 10 and conveys it to the basin.
4. Show the following additional information on Sheet 6 of the record drawing: label the approximate location and crest elevation of the emergency (earth) spillway and class of riprap used for outlet protection at the end of the culvert through the dam.
5. A professional seal is required on each of the record drawings.
6. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number S-42-98 and BMP ID Code: JR 042.

Construction - Related Items:

7. Bare soil areas were present on the dam embankment, especially the downstream face. Seed and mulch or use matting to provide adequate stabilization.

Once this work is satisfactorily completed, contact our office appropriately. We can then proceed with final release of the surety on the project. One reproducible and one blue/black line set of the record drawings will be required once the above items are adequately addressed.

Please contact me at 757-253-6639 or the assigned Environmental Division inspector, Joe Buchite at 757-253-6643 if you have any further comments or questions.

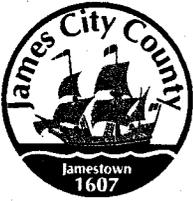
Sincerely



Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett, AES - via fax
Joe Buchite, JCC Environmental Division Inspector

SJT File



DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671 Fax: (757) 253-6850 E-MAIL: devtman@james-city.va.us

CODE COMPLIANCE
(757) 253-6626
codecomp@james-city.va.us

ENVIRONMENTAL DIVISION
(757) 253-6670
environ@james-city.va.us

PLANNING
(757) 253-6685
planning@james-city.va.us

COUNTY ENGINEER
(757) 253-6678
INTEGRATED PEST MANAGEMENT
(757) 253-2620

December 4, 2002

Mr. James H. Bennett
Governors Land Associates
9701 Mill Pond Run
Toano, Va. 23168

Reinspect
6-2-03

Re: Governor's Land - Barretts Pointe
County Plan No. SP-42-98
Stormwater Management Facility
County BMP ID Code: JR 042

Dear Mr. Bennett:

The Environmental Division has reviewed a record drawing as submitted to our office on March 20th 2002 for the above referenced project. The record drawing provides as-built information for a wet pond with a single barrel outlet situated in the north end of the development behind Lots 11 through 13.

Based on our review of the project and a concurrent field inspection as performed on November 14th 2002, the following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility at the site:

Construction Certification:

✓
OK
Robert
3/31/03

1. In accordance with the Note # 18 on Sheet 10 and the "boxed" note on Sheet 6 of the approved plan, construction certification for the stormwater management/BMP facility is required. None was provided. This is especially important since the facility has an engineered and compacted earthen embankment along the north side. The certification can be in letter format or by use of the certification statements in Section 4 of the *James City County, Stormwater Management / BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.*

Record Drawing:

✓
OK
6-18-03

2. Provide additional bottom of pond spot elevations to determine that proper depth/volume was achieved in the main portion of the BMP and that the micropools (low marshes) were constructed in accordance with the approved plan. Proposed bottom of pond elevation was at El. 0 and three micropool areas approximately 2 ft. in depth were to be provided in the west, center and east ends of the basin.

15"

✓
OK
6-18-03

3. Label as-built data for the proposed 12-inch HDPE drain which enters the basin at the northwest corner. This storm drain collects runoff from Lots 9 and 10 and conveys it to the basin.

✓
OK
6-18-03

4. Show the following additional information on Sheet 6 of the record drawing: label the approximate location and crest elevation of the emergency (earth) spillway and class of riprap used for outlet protection at the end of the culvert through the dam.

✓
OK
6-18-03

5. A professional seal is required on each of the record drawings. *SIGNED + DATED*

✓
OK
6-18-03

6. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number S-42-98 and BMP ID Code: JR 042.

Construction - Related Items:

✓
OK
6-2-03

7. Bare soil areas were present on the dam embankment, especially the downstream face. Seed and mulch or use matting to provide adequate stabilization.

Once this work is satisfactorily completed, contact our office appropriately. We can then proceed with final release of the surety on the project. One reproducible and one blue/black line set of the record drawings will be required once the above items are adequately addressed.

Please contact me at 757-253-6639 or the assigned Environmental Division inspector, Joe Buchite at 757-253-6643 if you have any further comments or questions.

Sincerely

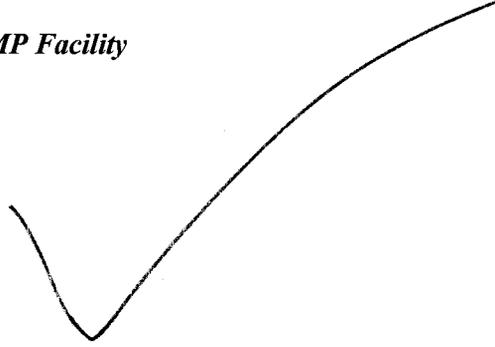

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett, AES - via fax
Joe Buchite, JCC Environmental Division Inspector

Record Drawing/Construction Certification Submittal for a BMP Facility

Date: April 30 2002

Inspector: Pat Menichino
 Gerry Lewis
 Beth Davis
 Mike Woolson
 Joe Buchite
 Other: _____



Project: GOVERNORS LAND
BMP Facility: Barretts Pointe
Plan No. S-42-98
BMP ID Code: JR 042

I have received a transmittal for a Record Drawing and Construction Certification for the above referenced facility on MARCH 20 2002. Prior to full engineering review of these items and a field inspection, I am first forwarding the items to you to cursory review in case any major field changes were performed that I should be aware of and/or to ensure the record drawing accurately portrays what you saw in the field. Please review the drawing and return to me promptly so I can proceed with the review for certification purposes.

During my review, I will look at issues related to the BMP and its primary inflow and outflow conveyance systems, and will make comment in the following areas: Record Drawing (RD), Construction Certification (CC) and Construction-Related (CR) punch list items. If you have any other related non-BMP site issues such as erosion, stabilization, removal of erosion & sediment controls, etc. that are not related to the BMP, I can easily add these items to any comment letter that I may forward to the Owner/Engineer. Let me know if any outstanding site issues remain.

If I don't hear from you I will ask you if any other outstanding issues remain before I forward any letters to the Owner/Engineer.

Scott

Record Drawing/Construction Certification Submittal for a BMP Facility

Date:

11/02/02

Inspector:

- Pat Menichino
- Gerry Lewis
- Beth Davis
- Mike Woolson
- Joe Buchite
- Other: _____

Project:

Governors Land - Barretts Pointe

BMP Facility:

Wet Pond

Plan No.:

SP-42-48

BMP ID Code:

JR 042

I have received a transmittal for a Record Drawing and Construction Certification for the above referenced facility on MAR 20 02. Prior to full engineering review of these items and a field inspection, I am first forwarding the items to you to cursory review in case any major field changes were performed that I should be aware of and/or to ensure the record drawing accurately portrays what you saw in the field. Please review the drawing and return to me promptly so I can proceed with the review for certification purposes.

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If I don't hear from you I will ask you if any other outstanding issues remain before I forward any letters to the Owner/Engineer.

Scott

Scott,
I don't see any thing
different on the Record
Drawing

Joe



**James City County Environmental Division
Stormwater Management / BMP Inspection Report
Detention and Retention Pond Facilities**

42
GPIN 5-~~21~~-98
4310700001B

County BMP ID Code (if known): JR-042

Name of Facility: Barrett's Pointe BMP No.: 1 of 1 Date: 11/14/02

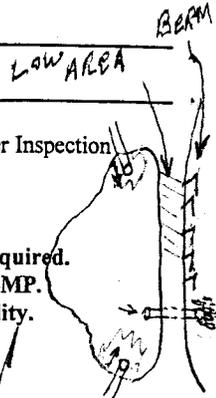
Location: GOVERNORS LAND

Name of Owner: GOVERNORS LAND ASSOCIATES

Name of Inspector: RICK HALL

Type of Facility: Wet Pond

Weather Conditions: SUNNY 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 to 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
Embankments and Side Slopes:				
Grass Height	✓			
Vegetation Condition		✓		BARE AREAS NEED SEEDING - SMALL TREES BACK SLOPE -
Tree Growth		✓		
Erosion	✓			
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches	NA			
Interior Landscaping/Planted Areas: <input type="checkbox"/> None <input type="checkbox"/> Constructed Wetland/Shallow Marsh <input checked="" type="checkbox"/> Naturally Established Vegetation				
Vegetated Conditions	✓			
Trash & Debris	✓			
Floating Material	✓			
Erosion	✓			
Sediment	✓			
Dead Plant	✓			
Aesthetics	✓			
Other				
Notes:				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools: <input checked="" type="checkbox"/> Permanent Pool (Retention Basin) <input type="checkbox"/> Shallow Marsh (Detention Basin) <input type="checkbox"/> None, Dry (Detention Basin)				
Shoreline Erosion	✓			
Algae	✓			
Trash & Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Inflows (Describe Types/Locations): <i>15" RCP - EAST end also at North end ✓</i>				
Condition of Structure	✓			<i>could not observe outlet</i>
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Outlet Protection	✓			
Other				
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type): <i>None - straight pipe - barrel</i>				
Condition of Structure				
Corrosion				
Trash and Debris				
Sediment				
Vegetation				
Other				
Principal Outlet Structure - Barrel, Conduit, etc.: <i>12" RCP w/ Flange, R.P.-RMP</i>				
Condition of Structure	✓			
Settlement	✓			
Trash & Debris	✓			
Erosion/Sediment	✓			
Outlet Protection	✓			
Other				
Emergency Spillway (Overflow): <i>None</i>				
Vegetation				
Lining				
Erosion				
Trash & Debris				
Other				
Notes:				

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	✓			
Animal Burrows	✓			
Graffiti	✓			
Other				
Surrounding Perimeter Conditions:				
Land Uses	✓			
Vegetation	✓			
Trash & Debris	✓			
Aesthetics	✓			
Access /Maintenance Roads or Paths	✓			
Other				

Remarks:

1. LOW AREA at NW end of embankment but NO defined spillway per se.
2. Secondary berm along back edge of embankment approx. 2-3 feet high and 3-4 feet base width.
3. Aeration pump with 4 heads.

Overall Environmental Division Internal Rating: 3

Signature: *Steve Hall*
 Title: Environmental Specialist

Date: 11/14/02

WATERSHED	JR	MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Barrel
BMP ID NO	042	SITE AREA acre	14.43	CTRL STRUC SIZE inches	12
PLAN NO	S-42-98	LAND USE	R4 Res Planned Co	OTLT BARRL DESC	RCP Barrel
TAX PARCEL	(43-01)(07-1B)	old BMP TYP	Wet Pond	OTLT BARRL SIZE inch	12
PIN NO	4310700001B	JCC BMP CODE			
CONSTRUCTION DATE	3/1/1999	POINT VALUE	9	EMERG SPILLWAY	Yes
PROJECT NAME	Governors Land-Barretts Pointe			DESIGN HW ELEV	3.88
FACILITY LOCATION	North of 2908 Barretts Pointe			PERM POOL ELE	2.2
CITY-STATE	Williamsburg, Va 23185	SVC DRAIN AREA acres	3.94	2-YR OUTFLOW cfs	2.00
CURRENT OWNER	Governor's Land Foundation			10-YR OUTFLOW cfs	2.00
OWNER ADDRESS	2700 Two Rivers Road			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCR	Single Family Lots & Roadways		
CITY-STATE-ZIP CODE	Williamsburg, VA 23185	IMPERV AREA acres	1.71	CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of James River		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	11/14/2002
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	0.288	INTERNAL RATING	3
		CHAN PROT CTRL	No	MISC/COMMENTS	Single culvert barrel. 2 micropools.
		CHAN PROT VOL acre-ft	0		
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu

BMP #11 (JR036)
TIMBER STRUCTURE
RECORD DRAWING PREPARED: 11/01

BMP #7 (JR034)
RIVER OAKS NORTH BMP
RECORD DRAWING PREPARED:

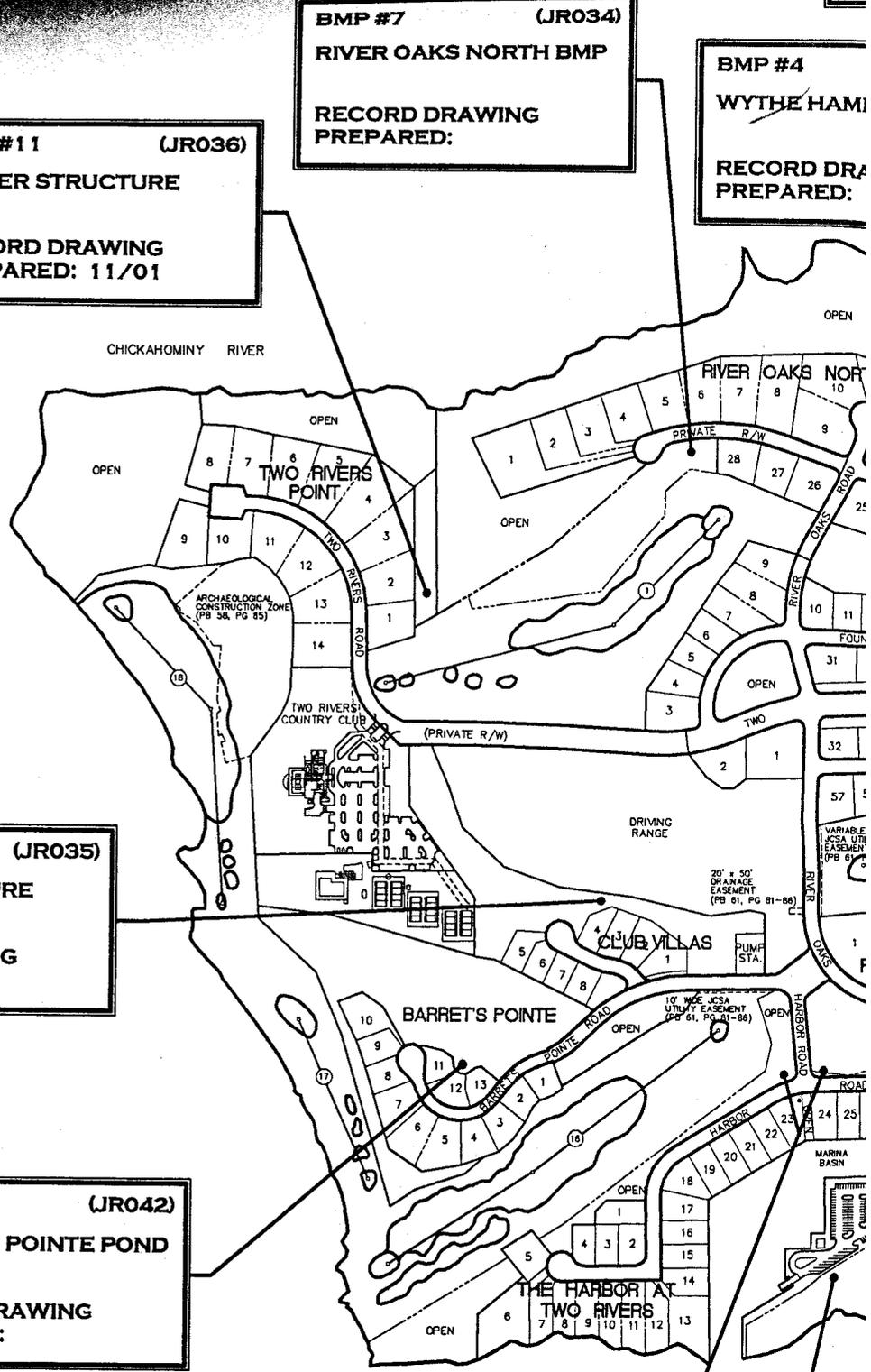
BMP #4
WYTHE HAMP
RECORD DRAWING PREPARED:

BMP #15 (JR035)
TIMBER STRUCTURE (GOLF CLUB)
RECORD DRAWING PREPARED: 3/02

BMP #6 (JR042)
BARRETT'S POINTE POND
RECORD DRAWING PREPARED:

BMP #24 (JR033)
MARSH AUGMENTED BMP
RECORD DRAWING PREPARED:

BMP #25 (JR032)
MARSH AUGMENTED BMP
RECORD DRAWING PREPARED:



BMP #7 (JR034)

RIVER OAKS NORTH BMP

**RECORD DRAWING
PREPARED:**

BMP #4

WYTHE HAM

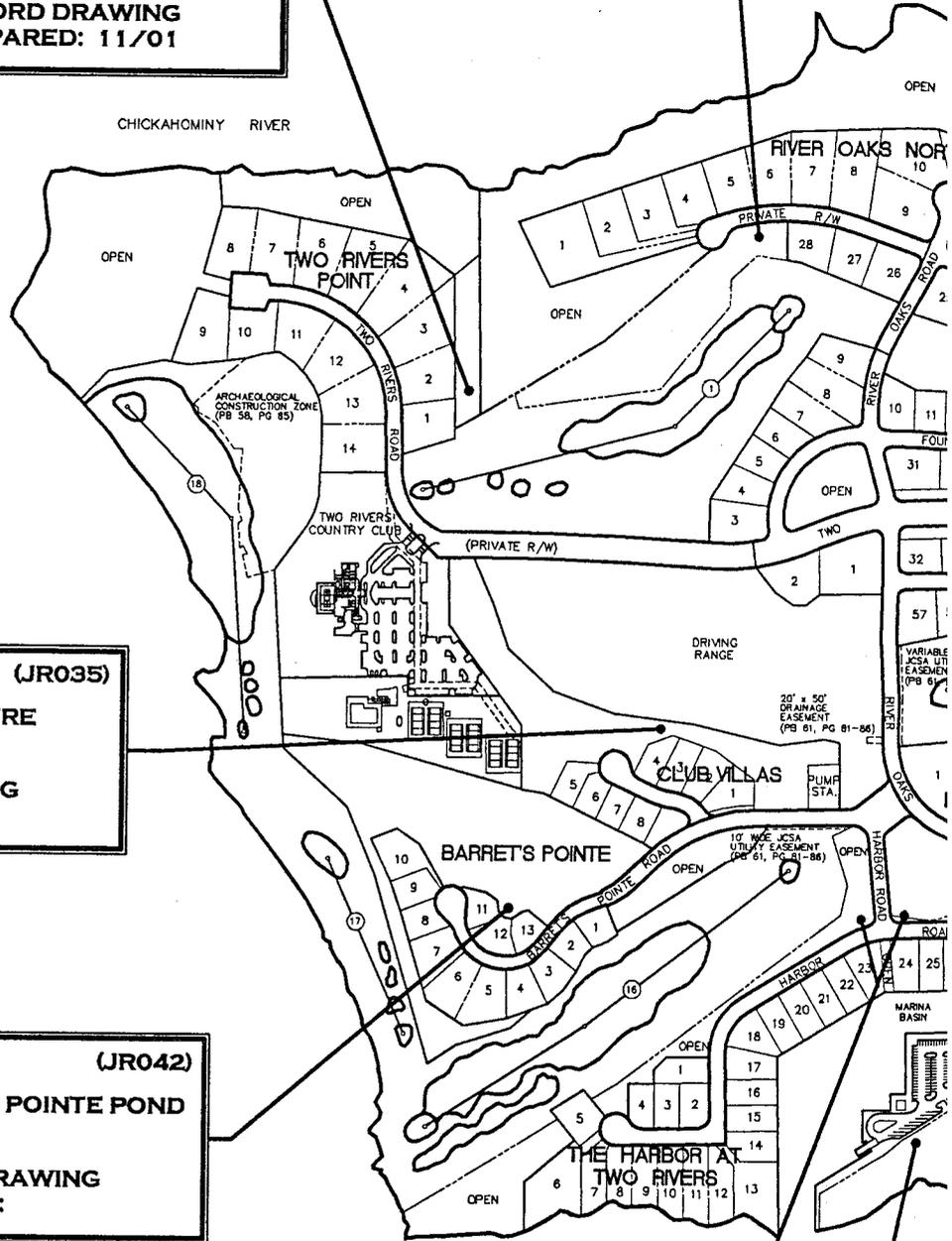
**RECORD DR
PREPARED:**

BMP #11 (JR036)

TIMBER STRUCTURE

**RECORD DRAWING
PREPARED: 11/01**

CHICKAHOMINY RIVER



BMP #15 (JR035)

**TIMBER STRUCTURE
(GOLF CLUB)**

**RECORD DRAWING
PREPARED: 3/02**

BMP #6 (JR042)

BARRETT'S POINTE POND

**RECORD DRAWING
PREPARED:**

BMP #24 (JR033)

MARSH AUGMENTED BMP

**RECORD DRAWING
PREPARED:**

BMP #25 (JR032)

MARSH AUGMENTED BMP

**RECORD DRAWING
PREPARED:**