



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.

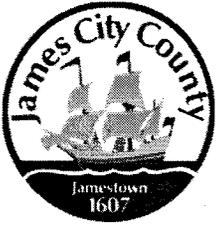
BMP NUMBER: PC098

DATE VERIFIED: July 5, 2012

QUALITY ASSURANCE TECHNICIAN: Leah Hardenbergh



LOCATION: WILLIAMSBURG, VIRGINIA



Stormwater Division

MEMORANDUM

DATE: March 13, 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: PC098

PIN: 4640700001E

Subdivision, Tract, Business or Owner

Name (if known):

Landfall at Jamestown

Property Description:

Conservation Area Phase 5

Site Address:

(For internal use only)

Box 2

Drawer: 2

Agreements: (in file as of scan date)

Y

Book or Doc#:

813

Page:

553

809

323

Comments

Wet pond

DECLARATION OF COVENANTS

COPY

INSPECTION/MAINTENANCE OF RUNOFF CONTROL FACILITY

THIS DECLARATION, made this 9th day of OCTOBER, 1996, between McCALE DEV. - LANDFALL LLC, and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the following property: JAMESTOWN LANDFALL @ JAMESTOWN CONSISTING OF 104 SINGLE FAMILY RESIDENTIAL LOTS, Deed Book 809, Page No. 323, 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 runoff control facility, hereinafter referred to as the "FACILITY," located on and serving the above-described property to ensure that the FACILITY is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations.

2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the FACILITY to ensure that the FACILITY is properly maintained.

3. The COVENANTOR(S) shall provide and maintain perpetual access from public rights-of-way to the FACILITY 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 FACILITY for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the FACILITY.

5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the FACILITY 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 owners of property served by the FACILITY 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 FACILITY.

7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S)' responsibilities for the FACILITY. 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 FACILITY.

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

960015616
10/29/96

Book 813
Page 553

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this _____ day of _____, 19____.

COVENANTOR(S)

ATTEST:

Lewis A. McMurrain III
LEWIS A. MCMURRAN, III

COVENANTOR(S)

ATTEST:

COMMONWEALTH OF VIRGINIA

COUNTY OF James City

I hereby certify that on this 21 day of October 1996, before the subscribed, a Notary Public of the State of Virginia, and for the County of James City, aforesaid personally appeared Lewis A. McMurrain III and did acknowledge the foregoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 21 day of October, 1996.

Mary S. Casken
Notary Public

My Commission expires: August 31, 2000

Approved as to form:

Leo P. Rogers

This Declaration of Covenants prepared by:

LEWIS A. MCMURRAN III
(Print Name)

PRESIDENT
(Title)

729 THIMBLE SHOAL BLVD. - BLDG. 4-A.
(Address)

NEWPORT NEWS VA 23606
(City) (State) (Zip)

0261U.wpf
Revised 9/96

Leo Rogers
JCC Attorney

COMMONWEALTH OF VIRGINIA



(114-3-028 (5/96))

OFFICIAL RECEIPT
WILLIAMSBURG/JAMES CITY COUNTY CIRCUIT
DEED RECEIPT

DATE: 10/29/96 TIME: 14:32:45 ACCOUNT: 830CLR960015616 RECEIPT: 96000026042
CASHIER: CSF REG: WB04 TYPE: DEC PAYMENT: FULL PAYMENT
INSTRUMENT : 960015616 BOOK: 0 PAGE: 0 RECORDED: 10/29/96 AT 14:32
GRANTOR NAME : MCCAULEY DEV-LANDFALL LLC EX: N LOCALITY: CO
GRANTEE NAME : JAMES CITY COUNTY OF EX: N PERCENT: 100%
AND ADDRESS : N/A
RECEIVED OF : JAMES CITY COUNTY DATE OF DEED: 10/09/96
CHECK : \$13.00

DESCRIPTION 1: DB 809 PG 323
2:
CONSIDERATION: .00 ASSUME/VAL: .00 MAP: PAID
CODE DESCRIPTION PAID CODE DESCRIPTION PAID
301 DEEDS 12.00 145 VSLF 1.00
TENDERED : 13.00
AMOUNT PAID: 13.00
CHANGE AMT : .00

87681

CLERK OF COURT: HELENE S. WARD

DC-18 (5/96)

[Faint, mostly illegible text and stamps at the bottom of the page, possibly including a signature or official seal.]

015616

DECLARATION OF COVENANTS

COPY

INSPECTION/MAINTENANCE OF RUNOFF CONTROL FACILITY

THIS DECLARATION, made this 9th day of OCTOBER, 1996, between McCALE DEV. - LANDFALL LLC, and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the following property: LANDFALL @ JAMESTOWN CONSISTING OF 104 SINGLE FAMILY RESIDENTIAL LOTS, Deed Book 809, Page No. 323, 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 runoff control facility, hereinafter referred to as the "FACILITY," located on and serving the above-described property to ensure that the FACILITY is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations.
2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the FACILITY to ensure that the FACILITY is properly maintained.
3. The COVENANTOR(S) shall provide and maintain perpetual access from public rights-of-way to the FACILITY for the COUNTY, its agent and its contractor.
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5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the FACILITY 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 owners of property served by the FACILITY 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 FACILITY.
7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S)' responsibilities for the FACILITY. 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 FACILITY.
9. This COVENANT shall be recorded in the County Land Records.

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this 21st day of October, 1996.

COVENANTOR(S)

ATTEST:

Lewis A. McMurrain III
LEWIS. A. MCMURRAN, III

COVENANTOR(S)

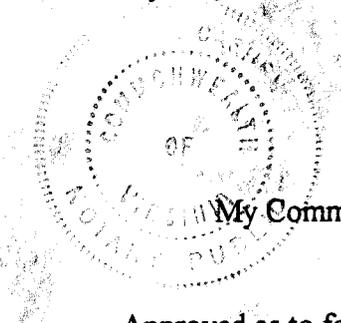
ATTEST:

COMMONWEALTH OF VIRGINIA
COUNTY OF James City

I hereby certify that on this 21 day of October 1996, before the subscribed, a Notary Public of the State of Virginia, and for the County of James City, aforesaid personally appeared Lewis A. McMurrain III and did acknowledge the foregoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 21 day of October, 1996.

Mary S. Casken
Notary Public



My Commission expires: August 31, 2000

Approved as to form:

Leo P. Rogers

This Declaration of Covenants prepared by:

LEWIS A. MCMURRAN III
(Print Name)

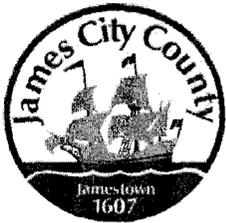
PRESIDENT
(Title)

729 THIMBLESHOAL BLVD. - BLDG. 4-A.
(Address)

NEWPORT NEWS VA 23606
(City) (State) (Zip)

0261U.wpf
Revised 9/96

VIRGINIA: City of Williamsburg and County of James City, to Wit:
Page 2 of 2 In the Clerk's Office of the Circuit Court of the City of Williamsburg and County of James City the 29 day of October, 1996. This Declaration was presented with certificate annexed and admitted to record at 2:32 o'clock
Teste: Helene S. Ward, Clerk
by [Signature]
Deputy Clerk



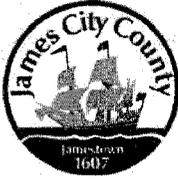
**James City County Environmental Division
Stormwater Management/BMP Record Drawing &
Construction Certification Review
Tracking Form**

Project Name: Landfall at Jamestown
 County Plan No.: S-14-96
 Stormwater Management Facility: Wet Pond
 BMP Phase #: I II III
 Information Package Received. Date/By: 10/24/07
 Completeness Check:
 Record Drawing Date/By: 10/17/07
 Construction Certification Date/By: 10/26/07 Donald N. Jennings
 RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001 Only)
 Insp/Maint Agreement # / Date: 960015616 10/24/96
 BMP Maintenance Plan Location: None
 Other: _____
 Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review
 Yes No Location: _____
 Assign County BMP ID Code #: _____ Code: PC098
 Preliminary Input/Log into Division's "As-Built Tracking Log"
 Add Location to GIS Map. Obtain basic site information (GPIN, Owner, Address, etc.) *Needs information added*
 Preliminary Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)
 Active Project File Review (correspondence, H&H, design computations, etc.)
 Initial As-Built File setup (File label, folder, copy plan/details/design information, etc.)
 Inspector Check of RD/CC (forward to Inspector using transmittal for cursory review).
 Pre-Inspection Drawing Review of Approved Plan (Quick look prior to Field Inspection).
 Final Inspection (FI) Performed Date: 11/9/2007
 Record Drawing (RD) Review Date: 11/6/2007
 Construction Certification (CC) Review Date: 11/9/2007
 Actions:
 No comments.
 Comments. Letter Forwarded. Date: 11/27/07
 Record Drawing (RD)
 Construction Certification (CC)
 Construction-Related (CR)
 Site Issues (SI)
 Other: _____
 Second Submission: NA
 Reinspection (if necessary): 1/16/08
 Acceptable for SWM Purposes (RD/CC/CR/Other). Ok to proceed with bond release.
 Complete "Surety Request Form".
 Check/Clean active file of any remaining material and finish "As-Built" file.
 Add to County BMP Inventory/Inspection schedule (Phase I, II or III).
 Copy Final Inspection Report into County BMP Inspection Program file.
 Obtain Digital Photographs of BMP and save into County BMP Inventory.
 Request mylar/reproducible from As-Built plan preparer.
 Complete "As-built Tracking Log".
 Last check of BMP Access Database (County BMP Inventory).
 Add BMP to JCC Hydrology & Hydraulic database (optional).
 Add BMP to Municipal BMP list (if a County-owned facility)
 Add BMP to PRIDE BMP ratings database.

Final Sign-Off

Inspector: Date: _____
 Chief Engineer: _____ Date: _____

*** See separate checklist, if needed.



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

Project Name: Landfall at Jamestown PH 1 (formerly Firstbitlers)
County Plan No.: S-14-96

Stormwater Management Facility: Wet Pond

BMP Phase #: I II III

Information Package Received. Date/By: _____

Completeness Check:

Record Drawing Date/By: _____

Construction Certification Date/By: 10/20/98 SLEMM & ASSOC.

RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001 Only)

Insp/Maint Agreement # / Date: DB 813 p 553

BMP Maintenance Plan Location: None

Other: _____

Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review

Yes No Location: Comm #5 dated 3/21/96; Note #18 sheet 12

Assign County BMP ID Code #: _____ Code: _____

Preliminary Input/Log into Division's "As-Built Tracking Log"

Add Location to GIS Map. Obtain basic site information (GPIN, Owner, Address, etc.)

Preliminary Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)

Active Project File Review (correspondence, H&H, design computations, etc.)

Initial As-Built File setup (File label, folder, copy plan/details/design information, etc.)

Inspector Check of RD/CC (forward to Inspector using transmittal for cursory review).

Pre-Inspection Drawing Review of Approved Plan (Quick look prior to Field Inspection).

Final Inspection (FI) Performed Date: _____

Record Drawing (RD) Review Date: _____

Construction Certification (CC) Review Date: _____

Actions:

No comments.

Comments. Letter Forwarded. Date: _____

Record Drawing (RD)

Construction Certification (CC)

Construction-Related (CR)

Site Issues (SI)

Other: _____

Second Submission: _____

Reinspection (if necessary): _____

Acceptable for SWM Purposes (RD/CC/CR/Other). Ok to proceed with bond release.

Complete "Surety Request Form".

Check/Clean active file of any remaining material and finish "As-Built" file.

Add to County BMP Inventory/Inspection schedule (Phase I, II or III).

Copy Final Inspection Report into County BMP Inspection Program file.

Obtain Digital Photographs of BMP and save into County BMP Inventory.

Request mylar/reproducible from As-Built plan preparer.

Complete "As-built Tracking Log".

Last check of BMP Access Database (County BMP Inventory).

Add BMP to JCC Hydrology & Hydraulic database (optional).

Add BMP to Municipal BMP list (if a County-owned facility)

Add BMP to PRIDE BMP ratings database.

Final Sign-Off

Plan Reviewer: _____

Date: _____

*** See separate checklist, if needed.

*PH 5
SP-77-97
Comm # 5*

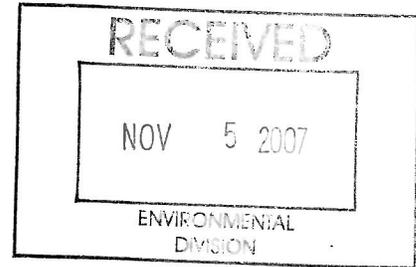
*PH 2 S-10-97
NO BMP Upgrade*

*PH 2 B S-95-05
LANDFALL VILLAGE
WET POND
NO BMP*

Phase 4 S-100-97

*NO BMP
NO BMP Upgrade*

*PHASE 5
S-77-97*



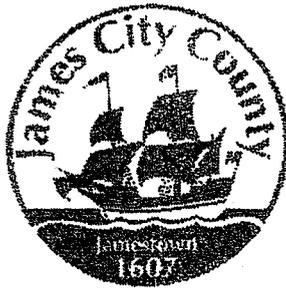
James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities Record Drawing and Construction Certification

Standard Forms & Instructions

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Issue Date
February 1, 2001



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: LANDFALL AT JAMESTOWN
Structure/BMP Name: WET RETENTION POND
Project Location: LANDFALL AT JAMESTOWN (NORTH OF JAMESTOWN ROAD)
BMP Location: BETWEEN ROBERT FENTON RD AND LANDFALL DRIVE
County Plan No.: 5 - 14 - 96 (FORMERLY IDENTIFIED AS 'FIRST SETTLERS SUBDIVISION')

Project Type: Residential Business Commercial Office Institutional Industrial Public Roadway Other
Tax Map/Parcel No.: 4640700001E
BMP ID Code (if known): _____
Zoning District: R2
Land Use: RESIDENTIAL CONSERVATION EASEMENT
Site Area (sf or acres): 8.63 AC

Brief Description of Stormwater Management/BMP Facility: THE SUBJECT STORMWATER MANAGEMENT FACILITY IS A WET RETENTION POND THAT WAS CONSTRUCTED IN 199 AS PART OF THE FIRST SETTLERS SUBDIVISION. THE POND IS NOW WELL ESTABLISHED WITH A VEGETATED PERIMETER AND APPEARS TO BE FUNCTIONING PROPERLY AT THIS TIME.

Nearest Visible Landmark to SWM/BMP Facility: LANDFALL AT JAMESTOWN TENN'S COURT

Nearest Vertical Ground Control (if known):
 JCC Geodetic Ground Control USGS Temporary Arbitrary Other
Station Number or Name: #317
Datum or Reference Elevation: NGVD (1929) STATION ELEV = 31.01'
Control Description: JCC GEODETIC MONUMENT - 3" DISK SET IN CONCRETE
Control Location from Subject Facility: 2800' N/W

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: _____
Facility Monitored by County Representative during Construction: Yes No Unknown
Name of Site Work Contractor Who Constructed Facility: DUDLEY S. WALTRIP & SONS, INC
Name of Professional Firm Who Routinely Monitored Construction: N/A
Date of Completion for SWM/BMP Facility: FEB 1997
Date of Record Drawing/Construction Certification Submittal: OCTOBER 30, 2007

(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: MCCALE DEVELOPMENT CORPORATION
Mailing Address: 729 THIMBLE SHOALS BOULEVARD, SUITE 3C
NEWPORT NEWS, VA 23606
Business Phone: 873-0011 Fax: 873-0651
Contact Person: EASON PARK Title: PROJECT COORDINATION MANAGER

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: SLEDD AND ASSOCIATES
Mailing Address: 11832 ROCK LANDING DRIVE, SUITE 207
Business Phone: 873-3386
Fax: 873-0757
Responsible Plan Preparer: ALVIN D. SLEDD, P.E.
Title: PRINCIPAL
Plan Name: FIRST SETTLERS SUBDIVISION, PHASE I
Firm's Project No. 95010
Plan Date: 2/22/96
Sheet No.'s Applicable to SWM/BMP Facility: 4 / 11 / / /

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

Name: DUDLEY S. WALTRIP AND SONS, INC.
Mailing Address: 2892 LAKE POWELL ROAD
WILLIAMSBURG, VA 23185
Business Phone: 253-0642
Fax: 253-0537
Contact Person: TIMMY WALTRIP
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: _____
 Mailing Address: _____
 _____ **SAME →** _____
 Business Phone: _____
 Fax: _____
 Name: DAVID W. ANDREA
 Title: SURVEY MANAGER
 Signature: David W. Andrea
 Date: 10/26/07

Construction Certification

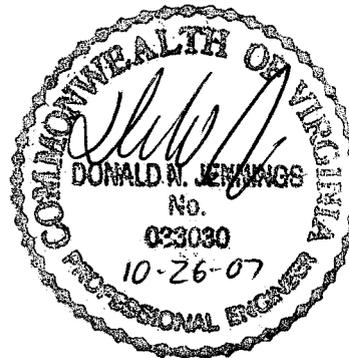
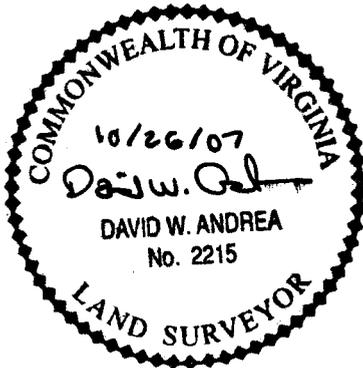
Firm Name: VANASSE HANGEN BRUSTLIN, INC.
 Mailing Address: 11832 ROCK LANDING DRIVE, SUITE 207
 _____ NEWPORT NEWS, VA 23606 _____
 Business Phone: 873-3386
 Fax: 873-0757
 Name: DONALD N. JENNINGS, P.E.
 Title: PROJECT MANAGER
 Signature: [Signature]
 Date: 10-26-07

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.

SAME →

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.

*** NOTE: CONSTRUCTION OF THIS FACILITY TOOK PLACE PRIOR TO THE COUNTY'S ADOPTION OF THE CURRENT STORMWATER MANAGEMENT GUIDELINES.**



 (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.

N/A
REFER TO
NOTE (*) ON
PAGE 3

- 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.

N/A
REFER TO
NOTE (*)
ON PAGE 3

- 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.

REFER TO
NOTE (*)
ON PAGE 3

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

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

† REFER TO NOTE (*) ON PAGE 3

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.)

- XX A1. All requirements of Section II, Minimum Standards, apply to Group A facilities.
- N/A† A2. Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- N/A† A3. Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.
- XX 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. *NOTE: ACCESS TO POND IS AVAILABLE - FOREBAYS WERE NOT REQUIRED WHEN THIS FACILITY WAS CONSTRUCTED.*
- N/A A5. Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes. *SEE NOTE FOR A4. (ABOVE).*
- N/A 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.
- N/A 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). *SEE NOTE FOR A4. (ABOVE).*
- INC A8. No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure. *NOTE: SEVERAL SMALL TREES ARE PRESENT NEAR EXISTING EDGE OF WATER*
- XX A9. Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
- N/A A10. Low flow orifice has a non-clogging mechanism.
- N/A A11. A pond drain pipe with valve was provided.
- XX 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.

† REFER TO NOTE (*) ON PAGE 3.

**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)

- N/A B1. Same requirements as Group A Wet Ponds.
- N/A B2. Minimum 2:1 length to width flow path provided across the facility.
- N/A B3. Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
- N/A 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.
- N/A B5. Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
- N/A B6. No more than one-half (½) of the wetland surface area is planted.
- N/A B7. Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
- N/A 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)

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)

- N/A D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.
- N/A D2. Sediment pretreatment devices provided.
- N/A 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.
- N/A 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.
- N/A 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.
- N/A D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .
- N/A D7. Filtering system is off-line from storm drainage conveyance system.
- N/A D8. Overflow outlet has adequate erosion protection.
- N/A D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
- N/A D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
- N/A 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.
- N/A D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- N/A D13. No visual signs of erosion or channel degradation immediately downstream of facility.
- N/A 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.
- N/A E2. Open channel system has constructed longitudinal slope of less than four (4) percent.
- N/A E3. No visual signs of erosion in the open channel system's soil and/or vegetative cover.
- N/A E4. Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
- N/A 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).
- N/A E6. For E-2 BMPs (Dry Swales), an underdrain system was provided.
- N/A E7. Treated timber or rock check dams provided as pretreatment devices for the open channel system.
- N/A E8. Gravel diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.
- N/A 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.
- N/A E10. Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
- N/A 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.
- N/A 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.
- N/A E13. For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
- N/A E14. For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
- N/A 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.
- N/A F2. Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.
- N/A F3. Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)
- N/A F4. Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
- N/A F5. A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging.
- N/A F6. Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- N/A F7. Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.
- N/A 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.
- N/A F9. Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.
- N/A F10. Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.
- N/A F11. Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.
- N/A F12. Stilling basin or standard outlet protection provided at principal spillway outlet.
- N/A 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.
- N/A F14. No visual signs of undercutting of timber walls or clogging of the low orifice were present.
- N/A 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)

- N/A G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.
- N/A 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.
- N/A G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.
- N/A G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).
- N/A G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.
- N/A 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.)

- XX SD1. All requirements of Section II, Minimum Standards, apply to Storm Drainage Systems.
- XX SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.
- XX SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).
- XX SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.
- XX 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.

File: Shared\SWMProg\BMP\CertifRDCC.wpd

DETECTION BASIN STORMWATER MANAGEMENT FACILITY MAINTENANCE

THE OWNER SHALL BE RESPONSIBLE FOR ESTABLISHING THE SCHEDULED MAINTENANCE PLAN OF THE ON-SITE DETECTION BASIN STORMWATER MANAGEMENT FACILITY. THE MAINTENANCE REQUIREMENTS ARE TO BE PERFORMED BY THE OWNER OR ITS DESIGNATED REPRESENTATIVE. THE OWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE WRITTEN RECORDS OF INSPECTIONS PERFORMED. THE RECORDS SHALL DOCUMENT ROUTINE AND NON-ROUTINE MAINTENANCE AND/OR REPAIRS. THE MINIMUM MAINTENANCE REQUIREMENTS ARE OUTLINED AS FOLLOWS:

FACILITY DESCRIPTION:

THIS FACILITY IS A WET RETENTION POND SERVING THE LANDFALL AT JAMESTOWN RESIDENTIAL SUBDIVISION. THE PRINCIPAL SPILLWAY IS A TWIN 24" RCP PIPE.

ROUTINE MAINTENANCE:

A. MOWING - THE BASIN'S SIDE SLOPES SHALL BE MOWED TO DISCOURAGE WOODY GROWTH AND TO CONTROL WEEDS. THE FREQUENCY OF MOWING SHALL DEPEND ON VISUAL INSPECTIONS PERFORMED AT LEAST FOUR TIMES A YEAR. TREES AND SHRUBS SHALL NOT BE PERMITTED TO GROW ON ANY PART OF THE GRADED EMBANKMENTS. VEGETATED AREAS SHALL BE RESEED AS NECESSARY TO MAINTAIN STABILIZED VEGETATIVE COVER.

B. INSPECTIONS - THE ENTIRE BASIN AREA AND EMBANKMENT SLOPES SHALL BE INSPECTED ON AN ANNUAL BASIS. INSPECTION PRIORITIES SHALL, AT A MINIMUM, INCLUDE CHECKING FOR SIDE SLOPE OR EMBANKMENT EROSION; EVIDENCE OF ANIMAL BURROWS, TREE AND SHRUB GROWTH; CONDITION OF THE OUTLET PIPES AND THE ACCUMULATION OF SEDIMENT, DEBRIS OR CLOGGING OF THE OUTLET PIPES. ANY EMBANKMENT EROSION SHALL BE REPAIRED AND STABILIZED, ANY TREE/SHRUB GROWTH SHALL BE REMOVED AND THE AREA BACKFILLED AND STABILIZED, AND ANY ANIMAL BURROWS SHALL BE FILLED. AT LEAST ONCE PER YEAR, THE OUTLET PIPES SHALL BE CLEANED OF ANY ACCUMULATED SEDIMENT.

C. DEBRIS AND LITTER REMOVAL - ANY ACCUMULATION OF DEBRIS AND LITTER, PARTICULARLY FLOATABLE DEBRIS, SHALL BE REMOVED DURING SCHEDULED MOWING OPERATIONS OR AS NEEDED. SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE FACILITY AND DISPOSED OF IN A MANNER ACCEPTABLE BY THE OWNER.

NON-ROUTINE MAINTENANCE:

A. STRUCTURAL REPAIRS AND REPLACEMENT - REPAIRS OR REPLACEMENT OF THE EMBANKMENT AND OUTLET CONTROL STRUCTURES SHALL BE PERFORMED ON AN AS-NEEDED BASIS TO INSURE PROPER OPERATION.

B. SEDIMENT REMOVAL - AFTER EACH SIGNIFICANT RAINFALL (ONE INCH OR MORE WITHIN A 24-HOUR PERIOD), THE BASIN AREAS SHALL BE INSPECTED FOR ACCUMULATION OF SEDIMENT OR DEBRIS WHICH MAY HINDER THE PERFORMANCE OF THE OUTLET CONTROL STRUCTURE.

NON-TIDAL WETLANDS

AREA OF LAND DISTURBING ACTIVITIES

12' x 10' RIP-RAP

OUTFALL DITCH @ 0.0%
(SEE TYPICAL CROSS-SECTION SHEET 5)

(2) 36" VDOT ES-1
INV=4.28' (A)

40' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOC.

100' BUFFER

20' DRAINAGE EASEMENT CONVEYED TO THE LANDFALL HOMEOWNERS ASSOCIATION (P.B. 68, PGS. 51-54)

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

20' DRAINAGE EASEMENT CONVEYED TO THE LANDFALL HOMEOWNERS ASSOCIATION (P.B. 68, PGS. 51-54)

VDOT JB-1
RIM=9.94' (A)
INV=4.69' (A)

VDOT JB-1
RIM=11.13' (A)
INV=5.08' (A)

VDOT DI-39
R=12.25' (A)
INV IN=7.12' (A)
INV IN=7.65' (A)
INV OUT=7.12' (A)

VDOT MH-1
R=13.49' (A)
I=6.60' (A)

20' DRAINAGE EASEMENT CONVEYED TO THE LANDFALL HOMEOWNERS ASSOCIATION (P.B. 68, PGS. 64-66)

I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS DRAWING REPRESENTS THE ACTUAL CONDITION OF THE STORMWATER/BMP FACILITY. THE FACILITY GENERALLY APPEARS TO CONFORM WITH THE APPROVED SITE PLAN.

DAVID W. ANDREA, LS #002215

12/14/07
DATE

DESIGN DATA

- (16) (2) 36" VDOT ES-1
INV=6.00' (D)
- (18) VDOT JB-1
RIM=12.00' (D)
INV=5.31' (D)
- (19) VDOT JB-1
RIM=10.60' (D)
INV=4.92' (D)
- (20) (2) 36" VDOT ES-1
INV=4.50' (D)

CURB INLET
R=9.34' (A)
I=4.55' (A)

CURB INLET
R=9.37' (A)
I=4.64' (A)

VARIABLE WIDTH DRAINAGE EASEMENT CONVEYED TO THE LANDFALL HOMEOWNERS ASSOCIATION (P.B. 68, PGS. 64-66)

TEMPORARY PIPE. NOTE FOR PIPE TO BE PLUGGED AT BOTH ENDS WITH PHASE 5 DEVELOPMENT PLANS, SHEET 2 OF 9.

WATER SURFACE ELEV.=6.0

CONSERVATION AREA H

ROBERT FENTON DRIVE

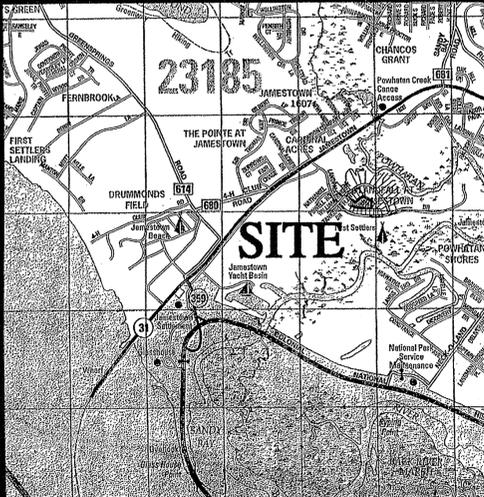
ROBERT FENTON DRIVE

LANDFALL DRIVE

LANDFALL DRIVE

PROPOSED BMP DATA		
DESCRIPTION	SURFACE ELEV.	VOLUME (C.Y.)
WET STORAGE	ELEV=5.63'	4,557 C.Y.
DRY STORAGE	ELEV=7.40'	7,466 C.Y.
TOTAL STORAGE	ELEV=9.40'	11,297 C.Y.

EXISTING BMP DATA		
DESCRIPTION	SURFACE ELEV.	VOLUME (C.Y.)
WET STORAGE	ELEV=5.63'	4,673 C.Y.
DRY STORAGE	ELEV=7.40'	7,619 C.Y.
TOTAL STORAGE	ELEV=9.40'	11,416 C.Y.



COPYRIGHT ADC THE MAP PEOPLE PERMITTED USE NUMBER 20409135
VICINITY MAP: 1" = 2000'

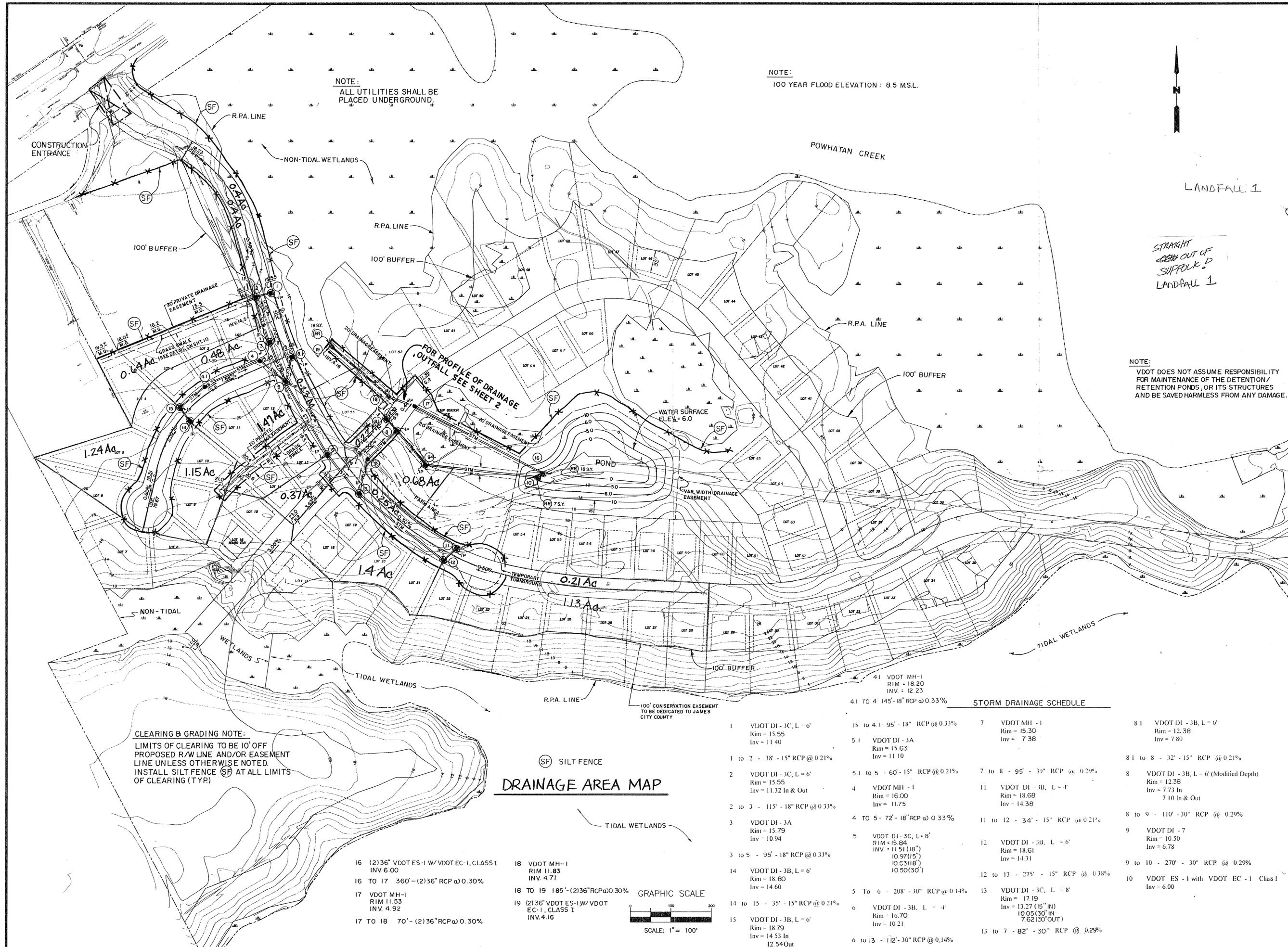
SM-96
Vanasse Hangen Brustlin, Inc.
11832 Rock Landing Drive, Suite 207
Newport News, Virginia 23606
757-873-3886 - FAX 757-873-0757



COMMONWEALTH OF VIRGINIA
12/14/07
David W. Andrea
Lic. No. 215
LAND SURVEYOR

LANDFALL AT JAMESTOWN
PHASE ONE (JCC S-14-96)
JAMES CITY COUNTY, VIRGINIA
BMP RECORD DRAWING

SCALE: 1"=50'
DATE: 10/17/07
TOPO BY:
DRAWN: M.R.G.
CHECKED: A.D.S.
PROJECT NO. 31825.01
SHEET NO. 1 OF 1



4-15-96 REV. PER UCC COMMENT

CFL

NO. DATE

REVISIONS

BY

SLEDD & ASSOCIATES, P.C.
ENGINEERS PLANNERS SURVEYORS
11832 ROCK LANDING DRIVE, SUITE 203
NEWPORT NEWS, VIRGINIA 23606
(804) 873-3386

SA

COMMONWEALTH OF VIRGINIA
A.W. SLEDD, JR.
No. 6758
PROFESSIONAL ENGINEER

**FIRST SETTLERS SUBDIVISION
PHASE ONE
JAMES CITY COUNTY, VIRGINIA
AREA DRAINAGE MAP
LOT GRADING PLAN**

SCALE: 1"=100'

DATE: 2/22/96

DESIGNED: CFL

DRAWN: PWM/WLR

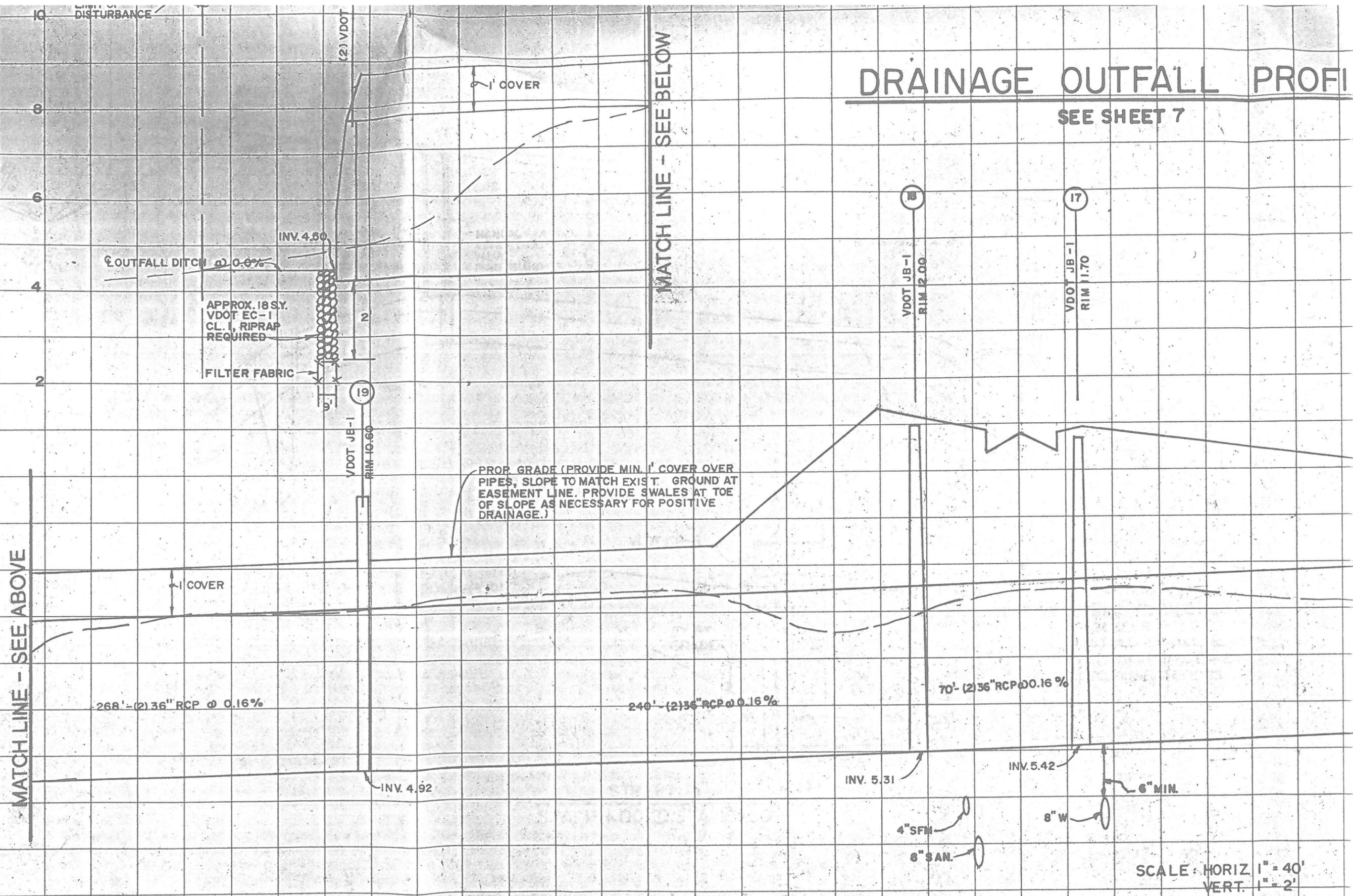
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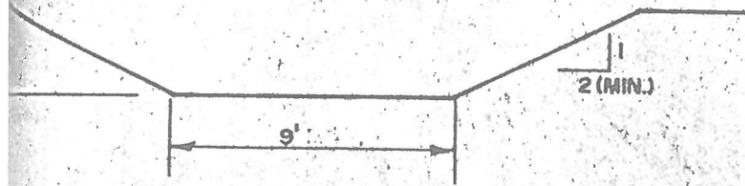
PROJECT NO.: 95-010

SHEET NO.: 4 OF 12

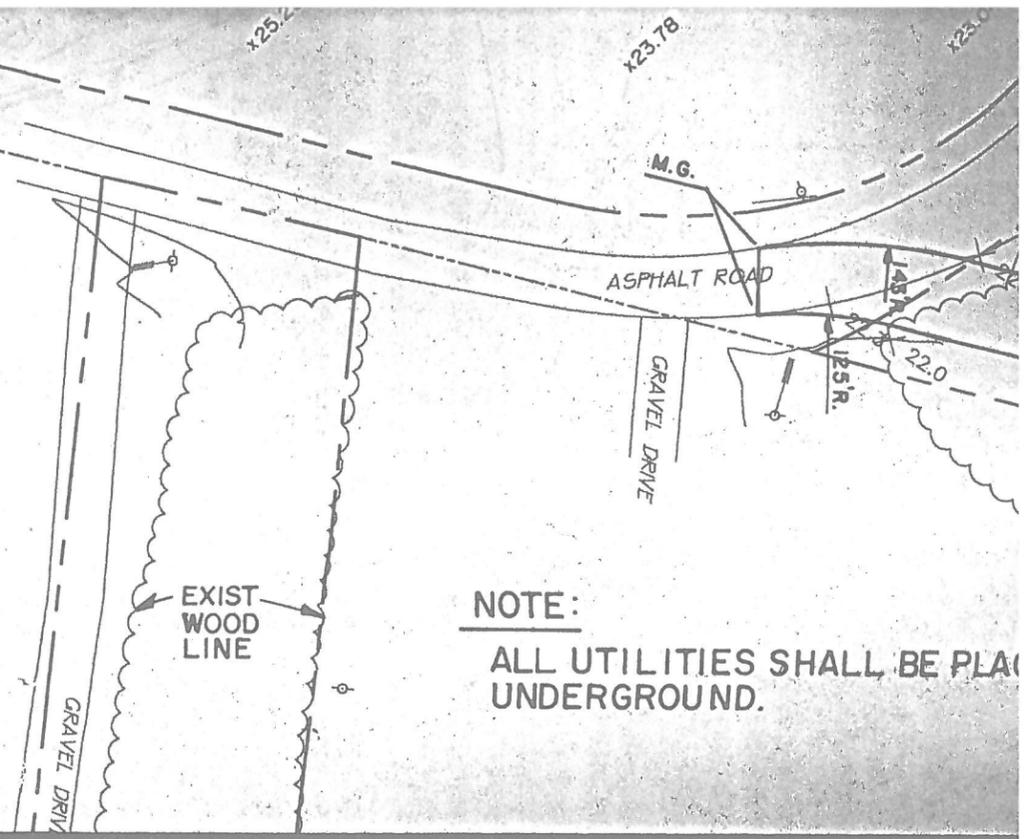
DRAINAGE OUTFALL PROFILE

SEE SHEET 7



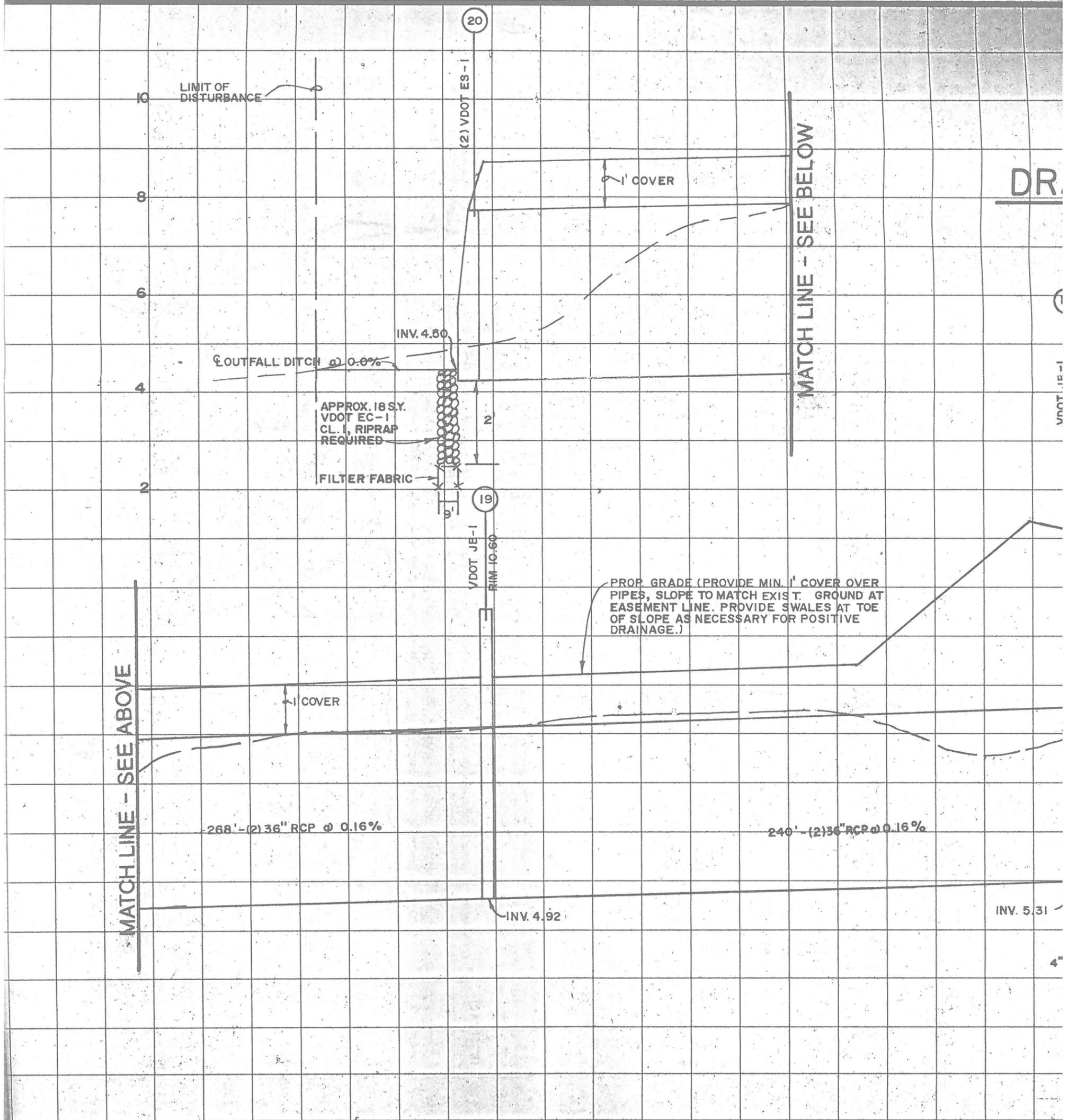


TYPICAL SECTION OUTFALL DITCH FROM DRAINAGE STRUCTURE 20



NOTE:

ALL UTILITIES SHALL BE PLACED UNDERGROUND.



MATCH LINE - SEE ABOVE

MATCH LINE - SEE BELOW

LIMIT OF DISTURBANCE

(2) VDOT ES-1

VDOT JE-1
RIM 10.60

268' - (2) 36" RCP @ 0.16%

240' - (2) 36" RCP @ 0.16%

INV. 4.92

INV. 5.31

INV. 4.50

OUTFALL DITCH @ 0.0%

APPROX. 18 SQ. YD. VDOT EC-1 CL. I, RIPRAP REQUIRED

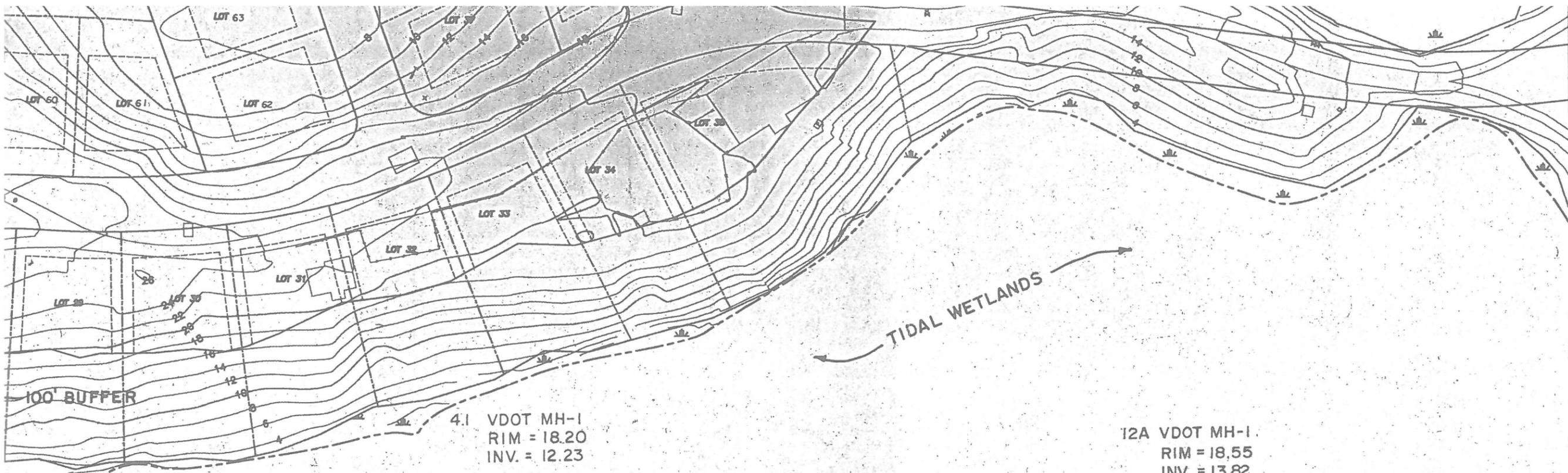
FILTER FABRIC

PROP. GRADE (PROVIDE MIN. 1' COVER OVER PIPES, SLOPE TO MATCH EXIST. GROUND AT EASEMENT LINE. PROVIDE SWALES AT TOE OF SLOPE AS NECESSARY FOR POSITIVE DRAINAGE.)

1' COVER

1' COVER

DR.



4.1 VDOT MH-1
RIM = 18.20
INV. = 12.23

12A VDOT MH-1
RIM = 18.55
INV. = 13.82

4.1 TO 4 - 145' - 18" RCP @ 0.33%

12A TO 13 - 145' - 15" RCP @ 0.38%

STORM DRAINAGE SCHEDULE

1 VDOT DI - 3C, L = 6'
Rim = 15.55
Inv = 11.40

15. to 4.1 - 95' - 18" RCP @ 0.33%

7 VDOT MH - 1
Rim = 15.30
Inv = 7.38

8.1 VDOT DI - 3B, L = 6'
Rim = 12.27
Inv = 7.80

1 to 2 - 38' - 15" RCP @ 0.21%

5.1 VDOT DI - 3A
Rim = 15.63
Inv = 11.10

7 to 8 - 95' - 30" RCP @ 0.29%

8.1 to 8 - 32' - 15" RCP @ 0.21%

2 VDOT DI - 3C, L = 6'
Rim = 15.55
Inv = 11.32 In & Out

5.1 to 5 - 60' - 15" RCP @ 0.21%

11 VDOT DI - 3B, L = 4'
Rim = 18.60
Inv = 14.38

8 VDOT DI - 3B, L = 6' (Modified Depth)
Rim = 12.27
Inv = 7.73 In
7.10 In & Out

2 to 3 - 115' - 18" RCP @ 0.33%

4 VDOT MH - 1
Rim = 16.00
Inv = 11.75

11 to 12 - 34' - 15" RCP @ 0.21%

8 to 9 - 110' - 30" RCP @ 0.29%

3 VDOT DI - 3A
Rim = 15.79
Inv = 10.94

4 TO 5 - 72' - 18" RCP @ 0.33%

12 VDOT DI - 3B, L = 6'
Rim = 18.51
Inv = 14.31

9 VDOT MH - 1
Rim = 11.1
Inv = 6.78 (30")
8.10 (15")

3 to 5 - 95' - 18" RCP @ 0.38%

5 VDOT DI - 3C, L = 8'
RIM = 15.84
INV. = 11.51 (18")
10.97 (15")
10.58 (18")
10.50 (30")

12 to 12A - 130' - 15" RCP @ 0.38%

9 to 10 - 270' - 30" RCP @ 0.29%

14 VDOT DI - 3B, L = 6'
Rim = 18.71
Inv = 14.60

5 To 6 - 208' - 30" RCP @ 0.14%

13 VDOT DI - 3C, L = 8'
Rim = 17.02
Inv = 13.27 (15" IN)
10.05 (30" IN)
7.82 (30" OUT)

10 VDOT ES - 1
Inv = 6.00
APPROX. 75Y VDOT EC-1, CLASS 1
RIPRAP REQ'D L=9', W+2D=15', T=2'

14 to 15 - 35' - 15" RCP @ 0.21%

6 VDOT DI - 3B, L = 4'
Rim = 16.70
Inv = 10.21

13 to 7 - 82' - 30" RCP @ 0.29%

9.1 to 9 - 4' - 15" RCP @ 5%

15 VDOT DI - 3B, L = 6'
Rim = 18.68
Inv = 14.53 In
12.54 Out

6 to 13 - 112' - 30" RCP @ 0.14%

9.1 VDOT ES - 1
INV = 8.5

**FIRST SETTLERS SUBDIVISION
PHASE ONE**
 JAMES CITY COUNTY, VIRGINIA
LOT GRADING PLAN

SCALE	1" = 100'
DATE	2/22/96
DESIGNED	CFL
DRAWN	PWM/WLR
CHECKED	CFL
PROJECT NO.	95-010
SHEET NO.	4 OF 13

POWHATAN CREEK

WETLANDS

INV. MATCH EXIST. GRADE
OUTFALL DITCH @ 0.0%
(SEE TYPICAL CROSS-SECTION SHEET 5)

R.P.A. LINE

40' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOC.

100' BUFFER

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

R.P.A. LINE

FOR PROFILE OF DRAINAGE
OUTFALL SEE SHEET 5

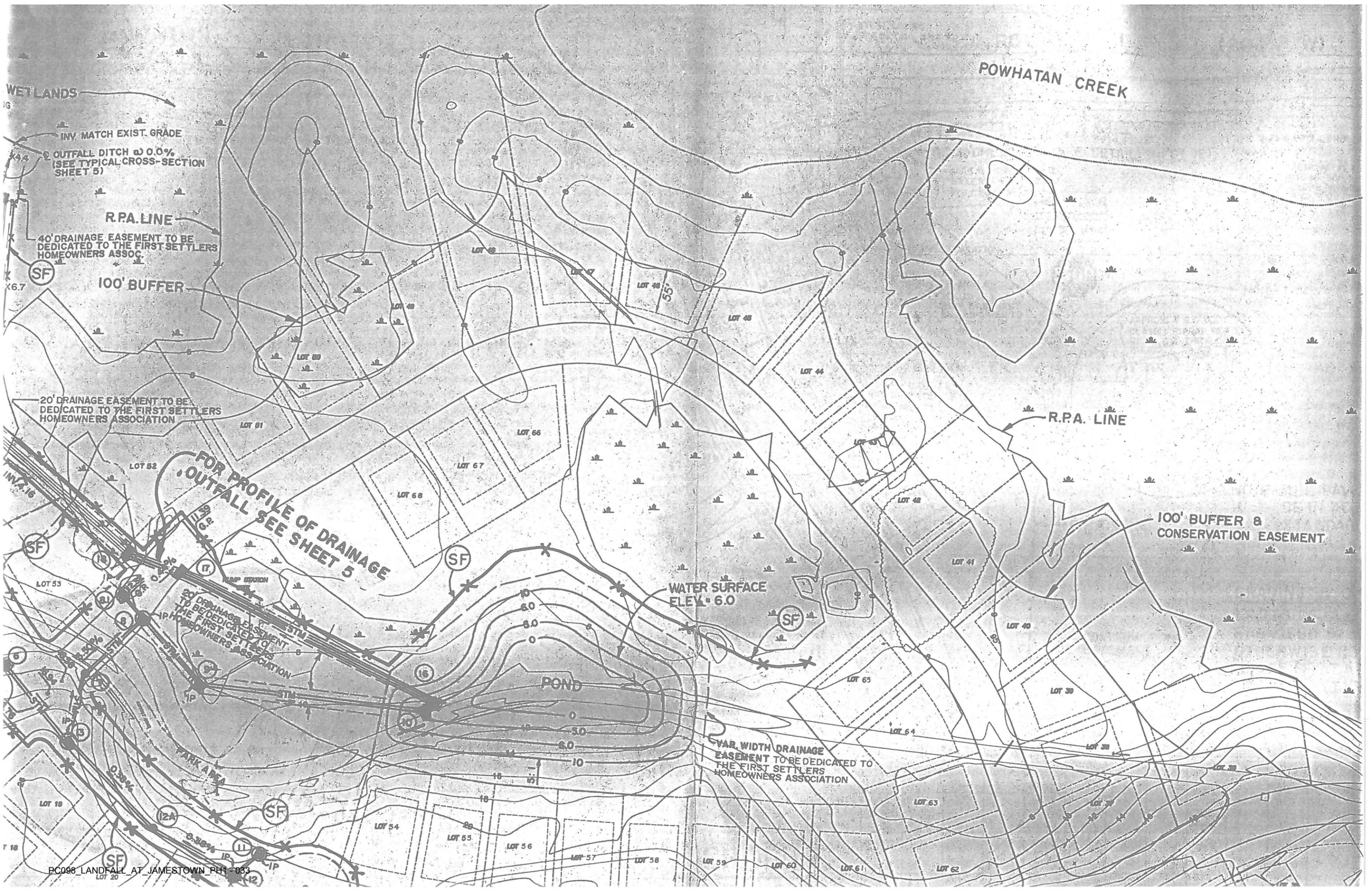
100' BUFFER & CONSERVATION EASEMENT

WATER SURFACE ELEV. = 6.0

POND

VAR. WIDTH DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

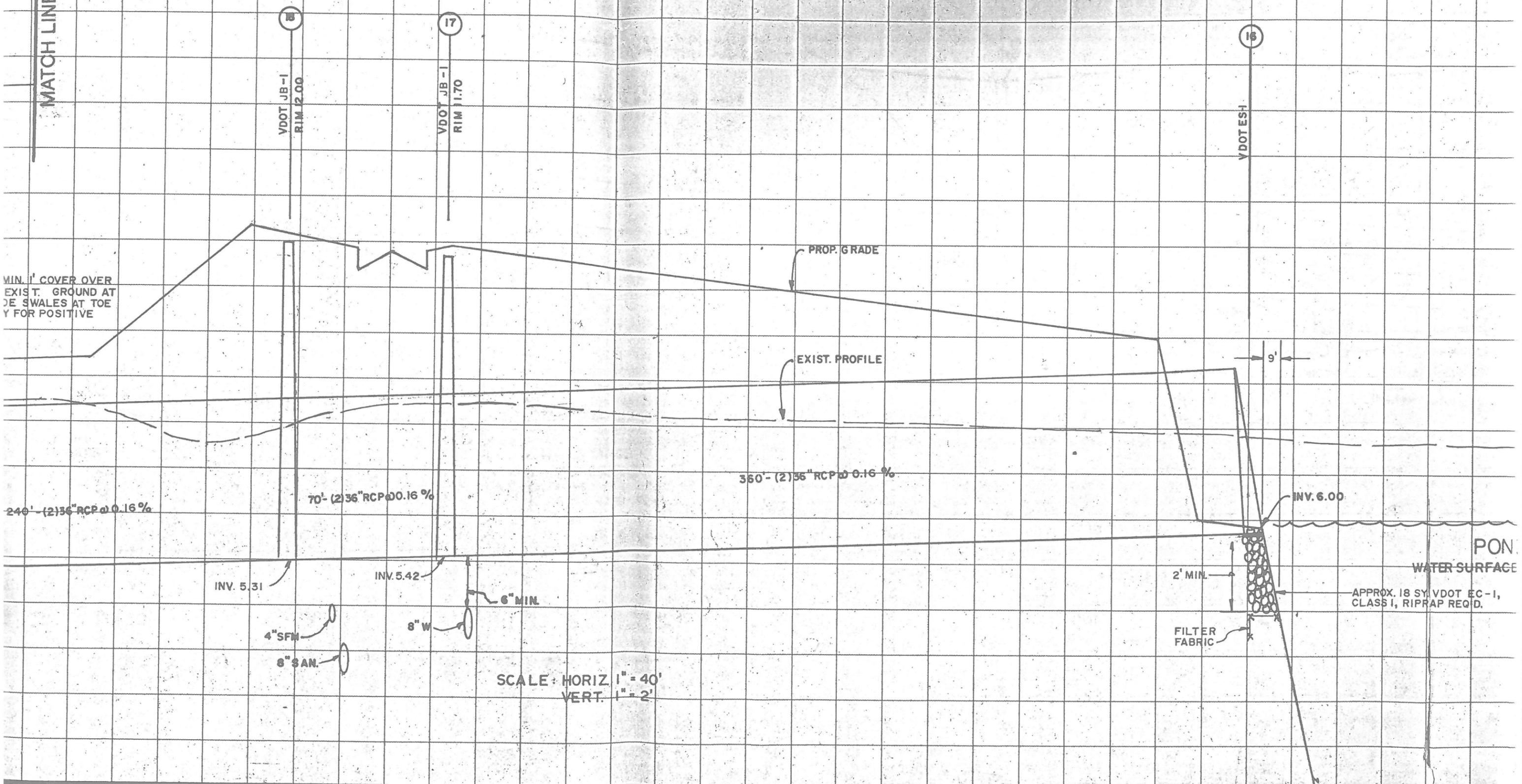
PARK AREA



MATCH LINE - SEE BELOW

DRAINAGE OUTFALL PROFILE

SEE SHEET 7



CONSTRUCTION ENTRANCE

NON-TIDAL WETLANDS

LIMIT OF LAND DISTURBING ACTIVITIES

INV MATCH EXIST. GRADE
OUTFALL DITCH @ 0.0%
(SEE TYPICAL CROSS-SECTION SHEET 5)

CONSERVATION EASEMENT

R.P.A. LINE

40' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOC.

100' BUFFER

100' BUFFER

* N3613020.80
E11985844.17

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

FOR PROFILE OF DRAINAGE OUTFALL SEE SHEET 5

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

5-14-96

96-11-5

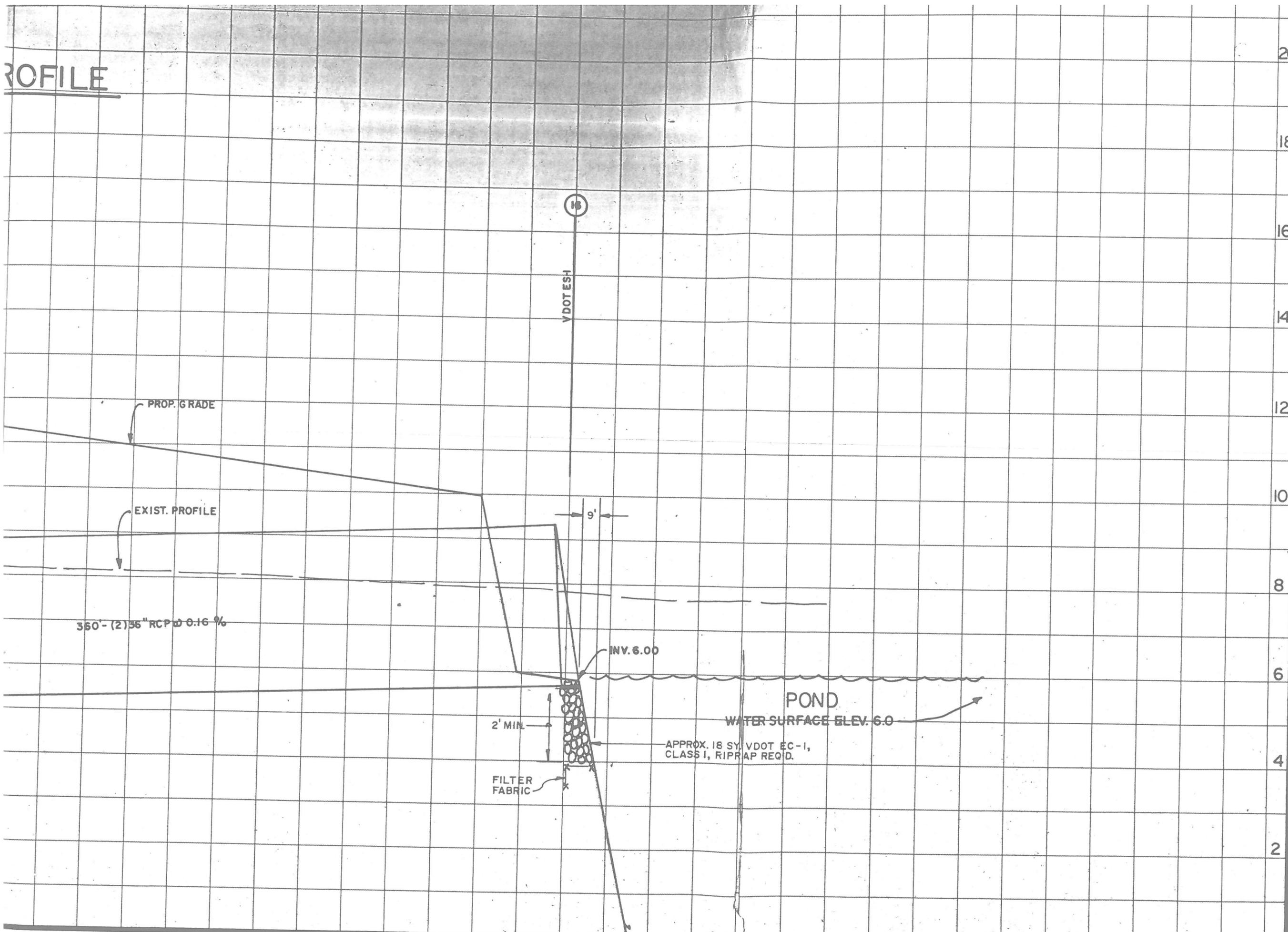
WATER ELEV.

POND

TEMPORARY TURNAROUND



PROFILE



FIRST SETTLERS SUBDIVISION
PHASE ONE
 JAMES CITY COUNTY, VIRGINIA
PLAN & PROFILE

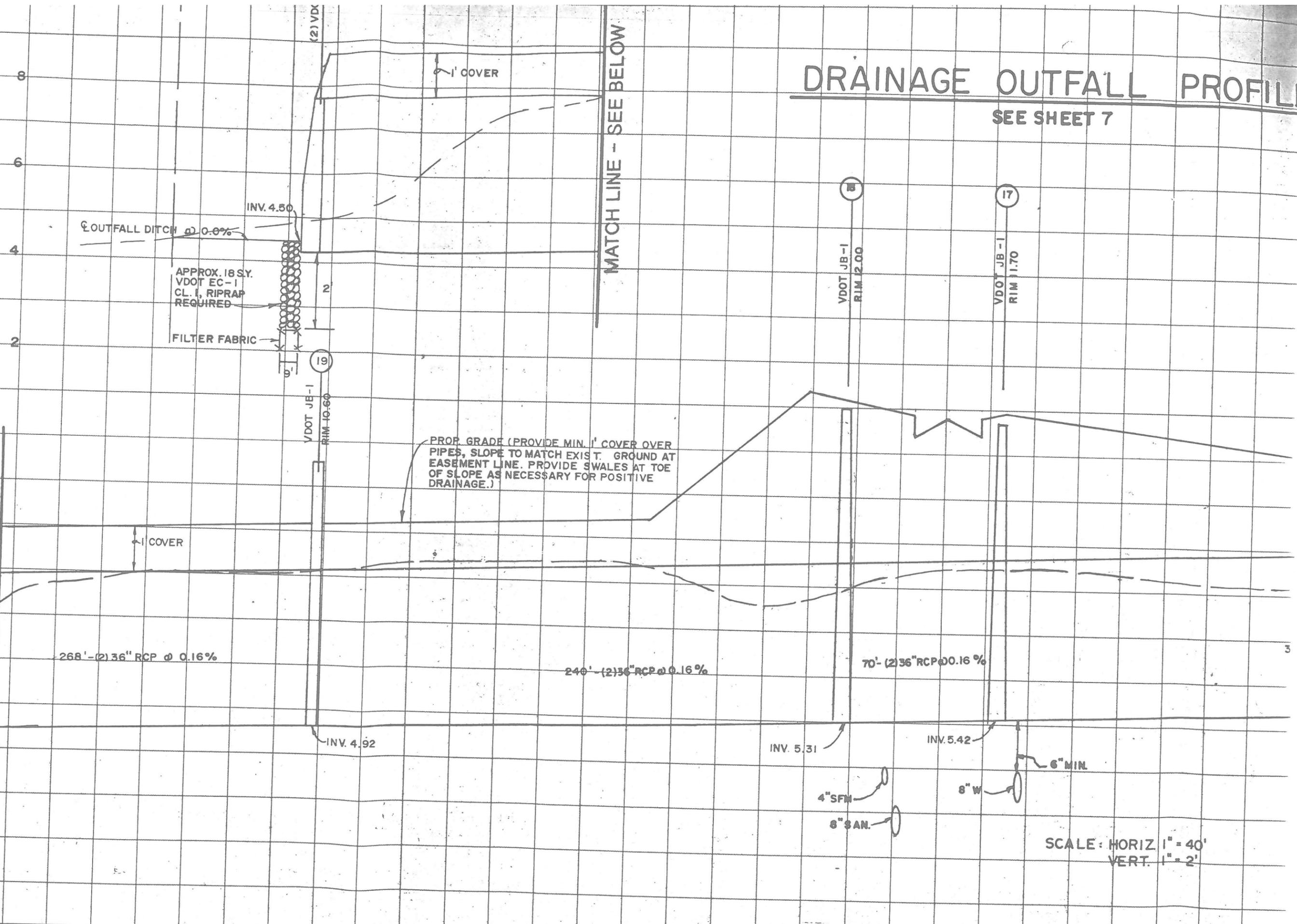
SCALE:	AS SHOWN
DATE:	2/22/96
DESIGNED:	CFL
DRAWN:	PWM/WLR
CHECKED:	CFL
PROJECT NO.	95-010
SHEET NO.	5 OF

DRAINAGE OUTFALL PROFILE

SEE SHEET 7

MATCH LINE - SEE ABOVE

MATCH LINE - SEE BELOW



OUTFALL DITCH @ 0.0%

APPROX. 18 SY.
VDOT EC-1
CL. I, RIPRAP
REQUIRED

FILTER FABRIC

PROP. GRADE (PROVIDE MIN. 1' COVER OVER
PIPES, SLOPE TO MATCH EXIST. GROUND AT
EASEMENT LINE. PROVIDE SWALES AT TOE
OF SLOPE AS NECESSARY FOR POSITIVE
DRAINAGE.)

268' - (2) 36" RCP @ 0.16%

240' - (2) 36" RCP @ 0.16%

70' - (2) 36" RCP @ 0.16%

INV. 4.92

INV. 5.31

INV. 5.42

4" SFM
8" SAN.

8" W

6" MIN.

SCALE: HORIZ 1" = 40'
VERT. 1" = 2'

STA. 12+75.00
TEMPORARY GRASS SWALE
2'-8" STUB W/PLUG
INV. = 4.00

TEMPORARY GRASS SWALE

300'-(2)36" RCP @ 0.16%
SEE PROFILE SHT. 5

SEE SHEET 4 FOR CONTINUATION

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

20' DRAINAGE EASEMENT TO BE DEDICATED TO THE FIRST SETTLERS HOMEOWNERS ASSOCIATION

APPROX. LIMITS OF CLEARING & GRADING

APPROX. LIMITS OF CLEARING & GRADING

EXCLUSIVE UTILITY EASEMENT TO BE DEDICATED TO JAMES CITY SERVICE AUTHORITY

240'-(2)36" RCP @ 0.16%
SEE SHT. 6 FOR CONTINUATION

EXCLUSIVE VAR. WIDTH EASEMENT TO BE DEDICATED TO JAMES CITY SERVICE AUTHORITY

BUILDING SETBACK LINES (TYP.)
MANUAL AIR RELEASE VALVE (FORCEMAIN)

EXIST. WOOD LINE
30' x 20' SIGHT TRIANGLE

45° BENDS

SIGHT TRIANGLE

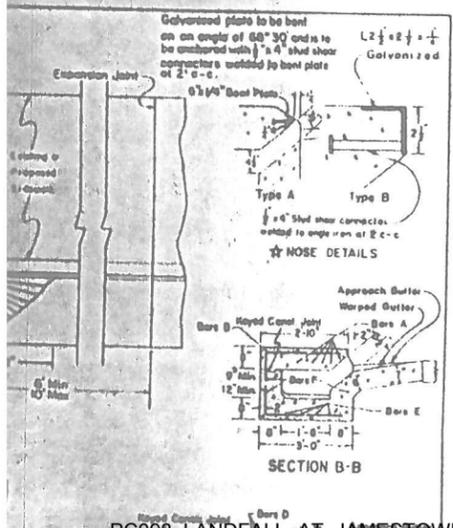
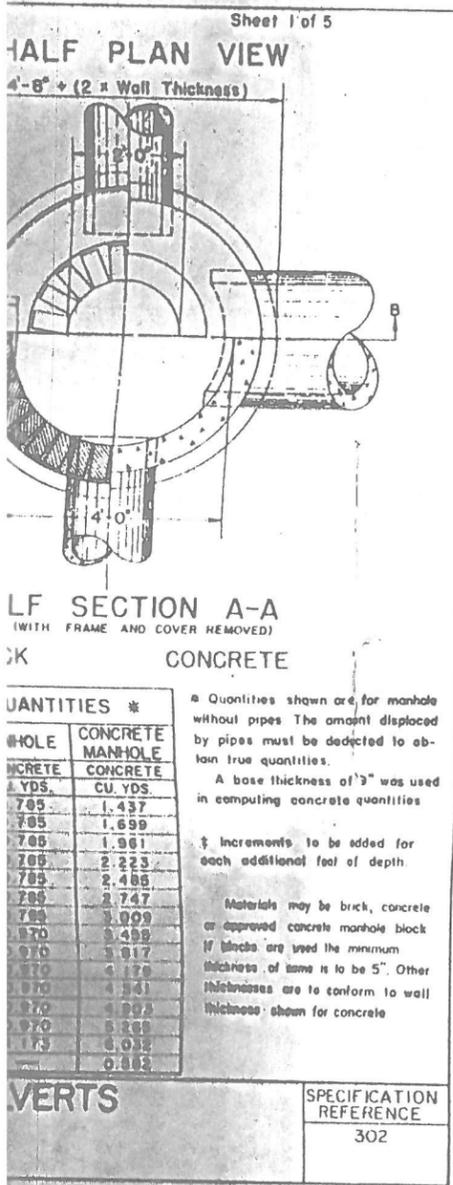
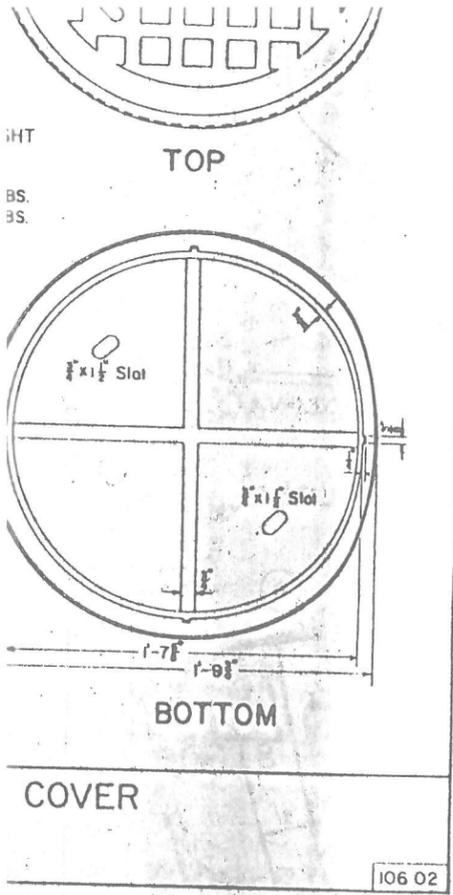
APPROX. LIMITS OF CLEARING & GRADING

STREET "A"
TRANSITION CURBLINE FROM 36' FACE OF CURB TO FACE OF CURB TO 30' FACE OF CURB TO FACE OF CURB BETWEEN STA. 22+35 TO STA. 23+50

END PHASE I
STA. 10+50.00

VDOT EC-2 EROSION CONTROL MATTING REQUIRED WHERE FINISHED SLOPES ARE 25% OR GREATER

NOTE:
ALL UTILITIES SHALL BE PLACED UNDERGROUND



- 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

STORM WATER MANAGEMENT PRELIMINARY DESIGN
FOR
± 107 LOT SUBDIVISION
JAMES CITY COUNTY

1. Total subdivision area = ± 130 acres - 49 ac. of wetlands
2. Number of lots = 107 lots - 21 ac of RPA
- 2 1/2 " isolated wetlands
57.5 ac
3. a. Road length (50' R/W) = ± 8,000 lf + 5 courts
b. Road impervious area = ± 312,000 sf (38' wide pavement)
4. Estimated lots impervious area = 3000 sf per lot
= 321,000 sf total

We are required to achieve 10 points in order to comply with the storm water management ordinance.

5. Total site impervious area and impervious percentage = ± 14.5 acres or 11.2 % impervious of total area
6. **BMP design # 1, Area # 1**
 - a. Lots 1 - 15 (45,000 sf impervious area)
 - 32 - 48 (51,000 sf impervious area)
 - 75 - 107 (99,000 sf impervious area)
 - Roads (191,300 impervious area)
 - Subtotal impervious area = 386,300 sf = 8.87 acres
 - Try design method:
 - (1) Design 7, wet pond (4V) + percentage marsh vegetation and open space

$$(1) V = 0.4 \times (0.05 + 0.009 \times I) \times A \times 3630$$

$$V = 14,000 \text{ cf}, A = \pm 31 \text{ acres}, I = 8.87 / 31 = 29\%$$

$$4V = 56,000 \text{ cf}$$

Lake Area # 1

Top of bank 60,000 sf (3' to WSE)
Bench area for shallow marsh 15' wide
Water surface elevation 35,905 sf
Bottom of lake (7' deep) 18,600 sf (3:1 slope)
Average area 27,252 sf
Lake volume 190,764 cf > 56,000 cf

1ST SETTLERS LANDING

9/14/95

1. TOTAL SITE = 130 ac

2. WETLANDS = 49 ac

3. RPA = 21 ac

4. ISOLATED WETLANDS = 2.5 ac

5. Natural Open Space = $49 + 21 + 2.5 = 72.5$

$72.5 / 130 = 5.6$ Pts

6. Structural BMP Pts = $10 - 5.6 = 4.4$

$4.4 = 9 \times \left(\frac{x}{130} \right) \times \text{grid icon} =$

$x = 63.5$ ac

7. Proposal = $31 + 10.5 + 16 = 57.5$ ac controlled by BMPs.

- ~~4.0~~ Pts \Rightarrow total = 9.6 ?

8. Try excluding wetlands from calcs

130

-49

81 ac

NOS = $\frac{23.5}{81} \times 10 = 2.9$ Pts

BMPs = $9 \times \frac{57.5}{81} = 6.4$

9.3 Pts \Rightarrow TOTAL

9. Remove RPA $\Rightarrow 10 \times \frac{2.5}{69.3} + \frac{57.5}{60} \times 9 = 9.0$ Pts

(over)

3/20/97

Site = 130.8 ac

NOS = 72.5

PTS = $\frac{72.5}{130} = 5.6$

STRU. BMP - $\frac{22.8 \text{ ac}}{57.5} \times 9 \text{ PTS} = 3.6$

95-010
1/15/97

sed Pond Outfall (16-20)

$Q_{100} = 41 \text{ cfs}$

$Q_{10} = 23 \text{ cfs}$

Duct 36" ZCP @ 0.16%

Partial Flow -- Pipe Analysis

For a 36 inch pipe at 0.16% N=0.013
Full Capacity = 26.68 cfs
Full or Half-full Velocity = 3.77 ft/s

Full Flow Area = 7.07 square feet
Full Hydraulic Radius = 0.75 feet
Full Wetted Perimeter = 9.42 feet

$\frac{41}{2} = 20.5 \text{ cfs}$

Amount of Flow = 20.62 cfs
Depth of Flow = 1.98 feet
Area of Flow = 4.95 square feet
Wetted Perimeter = 5.69 feet
Computed Velocity Under Partial Flow Conditions = 4.17 ft/s

Partial Flow -- Pipe Analysis

For a 36 inch pipe at 0.16% N=0.013
Full Capacity = 26.68 cfs
Full or Half-full Velocity = 3.77 ft/s

Full Flow Area = 7.07 square feet
Full Hydraulic Radius = 0.75 feet
Full Wetted Perimeter = 9.42 feet

$\frac{23}{2} = 11.5 \text{ cfs}$

Amount of Flow = 11.55 cfs
Depth of Flow = 1.38 feet
Area of Flow = 3.17 square feet
Wetted Perimeter = 4.47 feet
Computed Velocity Under Partial Flow Conditions = 3.64 ft/s

Landfall @ Jamestown

10/4/01

1. Total Site = 130 ac

2. Wetlands = 49 ac

3. RPA = 21 ac

4. Isolated Wetlands = 2.5 ac

5. BMP watershed = 22.8 ac

6. Point calculation

$$\text{Site Area for Structural BMP} = 130 - 49 - 21 = 60 \text{ ac}$$

$$\frac{22.8}{60} = 3.8 \times \frac{9}{10} = 3.4$$

$$7. \text{ Open Space} = \frac{70}{130} = \frac{5.4}{8.8}$$

DRAINAGE CALCULATIONS FOR FIRST SETTLERS SUBDIVISION

Total site area drainage to the proposed pond is approximately 22.8 acres.
Using the Virginia Department of Highway and Transportation Manual and the Virginia Department of Transportation Manual.

Existing Conditions:

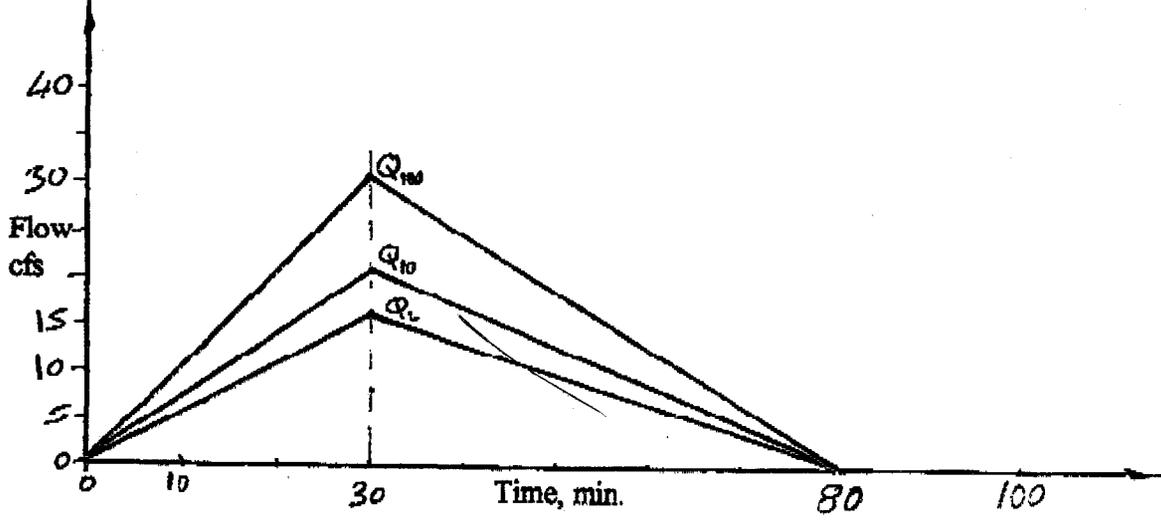
A = 22.8 acres
C = 0.25
 $T_c = 30$ minutes, $T_b = 2.67 \times 30 \approx 80$ min.
 $Q_2 = 15.4$ cfs, $Q_{10} = 20.2$ cfs, $Q_{100} = 30.2$ cfs

Proposed Conditions:

A = 22.8 acres
C = 0.4
 $T_c = 20$ minutes
 $Q_2 = 31$ cfs, $Q_{10} = 41$ cfs, $Q_{100} = 59$ cfs

Using Pagen Method and the SCS storage routing (2 S/T) refer to the next page, where $T_c = 30$ minutes, $T_b = 2.67 tc = 80$ minutes, $Q_2 = 15.4$ cfs, $Q_{10} = 20.2$ cfs and $Q_{100} = 30.2$ cfs for existing conditions, and $T_c = 20$ minutes, $T_b = 53.4$ minutes, and $Q_2 = 31$ cfs, $Q_{10} = 41$ cfs, and $Q_{100} = 59$ cfs for post development

Existing inflow hydrograph for 2 yrs, 10 yrs, and 100 yrs frequency:



**DRAINAGE CALCULATIONS
FOR
FIRST SETTLERS SUBDIVISION**

Total site area drainage to the proposed pond is approximately 22.8 acres.
Using the Virginia Department of Highway and Transportation Manual and the Virginia Department of Transportation Manual.

Existing Conditions:

A = 22.8 acres

C = 0.25

T_c = 30 minutes

Q₂ = 15.4 cfs, Q₁₀ = 20.2 cfs, Q₁₀₀ = 30.2 cfs

Proposed Conditions:

A = 22.8 acres

C = 0.4

T_c = 20 minutes

Q₂ = 31 cfs, Q₁₀ = 41 cfs, Q₁₀₀ = 59 cfs

Using Pagen Method and the SCS storage routing (2 S/T) refer to the next page, where T_c = 30 minutes, T_b = 2.67 tc = 80 minutes, Q₂ = 15.4 cfs, Q₁₀ = 20.2 cfs and Q₁₀₀ = 30.2 cfs for existing conditions, and T_c = 20 minutes, T_b = 53.4 minutes, and Q₂ = 31 cfs, Q₁₀ = 41 cfs, and Q₁₀₀ = 59 cfs for post development

Storage Available:

Elev	Area sf	Avg. Area sf	Volume cf	Acc Volume cf
0 Bottom	12,520			
		20,050		
6 WSE	27,580			0
		44,860	179,440	
10 TB	62,140			179,440

DRAINAGE CALCULATIONS
FOR
FIRST SETTLERS SUBDIVISION
SIA # 95145

Total site area drainage to the proposed pond is approximately 22.8 acres.
Using the Virginia Department of Highway and Transportation Manual and the Virginia Department of Transportation Manual.

Existing Conditions:

A = 22.8 acres
C = 0.25
 $T_c = 30$ minutes
 $Q_2 = 15.4$ cfs, $Q_{10} = 20.2$ cfs, $Q_{100} = 30.2$ cfs

Proposed Conditions:

A = 22.8 acres
C = 0.4
 $T_c = 20$ minutes
 $Q_2 = 31$ cfs, $Q_{10} = 41$ cfs, $Q_{100} = 59$ cfs

Using Pagen Method and the SCS storage routing (2 S/T) refer to the next page, where
 $T_c = 30$ minutes, $T_b = 2.67 t_c = 80$ minutes, $Q_2 = 15.4$ cfs, $Q_{10} = 20.2$ cfs
and $Q_{100} = 30.2$ cfs for existing conditions, and $T_c = 20$ minutes, $T_b = 53.4$ minutes,
and $Q_2 = 31$ cfs, $Q_{10} = 41$ cfs, and $Q_{100} = 59$ cfs for post development

Storage Available:

Elev	Area sf	Avg. Area sf	Volume cf	Acc Volume cf
0 Bottom	12,520			
		20,050		
6 WSE	27,580			0
		44,860	179,440	
10 TB	62,140			179,440

2-YR STORM
POST DEVELOPMENT

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)
0.0	0.0	6.0	0	0.0
5.0	7.8	6.0	1,096	0.4
10.0	15.5	6.1	4,257	1.7
15.0	23.3	6.2	9,245	3.8
20.0	31.0	6.4	15,851	6.4
25.0	26.4	6.5	22,137	9.0
30.0	21.7	6.6	26,387	10.7
35.0	17.1	6.6	28,837	11.7
40.0	12.4	6.7	29,693	12.1
45.0	7.8	6.6	29,138	11.9
50.0	3.2	6.6	27,334	11.1
55.0	0.0	6.5	24,636	10.0
60.0	0.0	6.5	21,802	8.9
65.0	0.0	6.4	19,295	7.8
70.0	0.0	6.4	17,075	6.9
75.0	0.0	6.3	15,111	6.1
80.0	0.0	6.3	13,373	5.4
85.0	0.0	6.3	11,835	4.8
90.0	0.0	6.2	10,473	4.3
95.0	0.0	6.2	9,269	3.8
100.0	0.0	6.2	8,202	3.3
105.0	0.0	6.2	7,259	3.0
110.0	0.0	6.1	6,424	2.6
115.0	0.0	6.1	5,685	2.3
120.0	0.0	6.1	5,031	2.0
125.0	0.0	6.1	4,452	1.8
130.0	0.0	6.1	3,940	1.6
135.0	0.0	6.1	3,487	1.4
140.0	0.0	6.1	3,086	1.3
145.0	0.0	6.1	2,731	1.1
150.0	0.0	6.1	2,417	1.0
155.0	0.0	6.0	2,139	0.9
160.0	0.0	6.0	1,893	0.8
165.0	0.0	6.0	1,675	0.7
170.0	0.0	6.0	1,482	0.6
175.0	0.0	6.0	1,312	0.5
180.0	0.0	6.0	1,161	0.5
185.0	0.0	6.0	1,027	0.4
190.0	0.0	6.0	909	0.4
195.0	0.0	6.0	805	0.3
200.0	0.0	6.0	712	0.3
205.0	0.0	6.0	630	0.3
210.0	0.0	6.0	558	0.2
215.0	0.0	6.0	494	0.2
220.0	0.0	6.0	437	0.2
225.0	0.0	6.0	387	0.2
230.0	0.0	6.0	342	0.1
235.0	0.0	6.0	303	0.1
240.0	0.0	6.0	268	0.1
245.0	0.0	6.0	237	0.1
250.0	0.0	6.0	210	0.1

R E S E R V O I R R O U T I N G

INFLOW HYDROGRAPH		CAPACITY/OUTFLOW RATING		
TIME-min	FLOW-cfs	STAGE-ft	VOLUME-cf	OUTFLOW-cfs
0	0	6	0	0
20	41	10	179440	73
53.4	0			

TIME INCREMENT (min) = 5

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)
40.0		6.9	39,271	16.0

<<< MAXIMUM VALUES

<Shift> <Prt Sc> print <P> hydrograph <Ret> repeat <Space> back to menu

10-YR STORM
POST DEVELOPMENT

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)
0.0	0.0	6.0	0	0.0
5.0	10.3	6.0	1,449	0.6
10.0	20.5	6.1	5,630	2.3
15.0	30.8	6.3	12,227	5.0
20.0	41.0	6.5	20,964	8.5
25.0	34.9	6.7	29,278	11.9
30.0	28.7	6.8	34,900	14.2
35.0	22.6	6.9	38,139	15.5
40.0	16.4	6.9	39,271	16.0
45.0	10.3	6.9	38,537	15.7
50.0	4.2	6.8	36,152	14.7
55.0	0.0	6.7	32,583	13.3
60.0	0.0	6.6	28,835	11.7
65.0	0.0	6.6	25,519	10.4
70.0	0.0	6.5	22,583	9.2
75.0	0.0	6.4	19,986	8.1
80.0	0.0	6.4	17,687	7.2
85.0	0.0	6.3	15,652	6.4
90.0	0.0	6.3	13,852	5.6
95.0	0.0	6.3	12,258	5.0
100.0	0.0	6.2	10,848	4.4
105.0	0.0	6.2	9,601	3.9
110.0	0.0	6.2	8,496	3.5
115.0	0.0	6.2	7,519	3.1
120.0	0.0	6.1	6,654	2.7
125.0	0.0	6.1	5,889	2.4
130.0	0.0	6.1	5,211	2.1
135.0	0.0	6.1	4,612	1.9
140.0	0.0	6.1	4,081	1.7
145.0	0.0	6.1	3,612	1.5
150.0	0.0	6.1	3,196	1.3
155.0	0.0	6.1	2,829	1.2
160.0	0.0	6.1	2,503	1.0
165.0	0.0	6.0	2,215	0.9
170.0	0.0	6.0	1,961	0.8
175.0	0.0	6.0	1,735	0.7
180.0	0.0	6.0	1,535	0.6
185.0	0.0	6.0	1,359	0.6
190.0	0.0	6.0	1,203	0.5
195.0	0.0	6.0	1,064	0.4
200.0	0.0	6.0	942	0.4
205.0	0.0	6.0	833	0.3
210.0	0.0	6.0	738	0.3
215.0	0.0	6.0	653	0.3
220.0	0.0	6.0	578	0.2
225.0	0.0	6.0	511	0.2
230.0	0.0	6.0	452	0.2
235.0	0.0	6.0	400	0.2
240.0	0.0	6.0	354	0.1
245.0	0.0	6.0	314	0.1
250.0	0.0	6.0	278	0.1

8 cfs / ft²

R E S E R V O I R R O U T I N G

INFLOW HYDROGRAPH		CAPACITY/OUTFLOW RATING		
TIME-min	FLOW-cfs	STAGE-ft	VOLUME-cf	OUTFLOW-cfs
0	0	6	0	0
20	59	10	179440	73
53.4	0			

TIME INCREMENT (min) = 5

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)	
40.0		7.3	56,512	23.0	<<< MAXIMUM VALUES

<Shift> <Prt Sc> print <P> hydrograph <Ret> repeat <Space> back to menu

100-YR STORM
POST DEVELOPMENT

TIME (MIN)	INFLOW (CFS)	STAGE (FT)	VOLUME (CF)	OUTFLOW (CFS)
0.0	0.0	6.0	0	0.0
5.0	14.8	6.0	2,085	0.8
10.0	29.5	6.2	8,101	3.3
15.0	44.3	6.4	17,596	7.2
20.0	59.0	6.7	30,168	12.3
25.0	50.2	6.9	42,132	17.1
30.0	41.3	7.1	50,221	20.4
35.0	32.5	7.2	54,883	22.3
40.0	23.7	7.3	56,512	23.0
45.0	14.8	7.2	55,455	22.6
50.0	6.0	7.2	52,023	21.2
55.0	0.0	7.0	46,888	19.1
60.0	0.0	6.9	41,495	16.9
65.0	0.0	6.8	36,722	14.9
70.0	0.0	6.7	32,498	13.2
75.0	0.0	6.6	28,760	11.7
80.0	0.0	6.6	25,452	10.4
85.0	0.0	6.5	22,524	9.2
90.0	0.0	6.4	19,933	8.1
95.0	0.0	6.4	17,640	7.2
100.0	0.0	6.3	15,611	6.4
105.0	0.0	6.3	13,815	5.6
110.0	0.0	6.3	12,226	5.0
115.0	0.0	6.2	10,820	4.4
120.0	0.0	6.2	9,575	3.9
125.0	0.0	6.2	8,474	3.4
130.0	0.0	6.2	7,499	3.1
135.0	0.0	6.1	6,637	2.7
140.0	0.0	6.1	5,873	2.4
145.0	0.0	6.1	5,198	2.1
150.0	0.0	6.1	4,600	1.9
155.0	0.0	6.1	4,071	1.7
160.0	0.0	6.1	3,602	1.5
165.0	0.0	6.1	3,188	1.3
170.0	0.0	6.1	2,821	1.1
175.0	0.0	6.1	2,497	1.0
180.0	0.0	6.0	2,210	0.9
185.0	0.0	6.0	1,955	0.8
190.0	0.0	6.0	1,731	0.7
195.0	0.0	6.0	1,531	0.6
200.0	0.0	6.0	1,355	0.6
205.0	0.0	6.0	1,199	0.5
210.0	0.0	6.0	1,061	0.4
215.0	0.0	6.0	939	0.4
220.0	0.0	6.0	831	0.3
225.0	0.0	6.0	736	0.3
230.0	0.0	6.0	651	0.3
235.0	0.0	6.0	576	0.2
240.0	0.0	6.0	510	0.2
245.0	0.0	6.0	451	0.2
250.0	0.0	6.0	399	0.2

11.5 cfs per pipe

STORM DRAINAGE CALCULATIONS

FROM	TO	AREA	C	CA		Tc	I	Q	INV	INV	LENGHT	SLOPE	DIA	CAP.	VEL	FLOW TIME
		acres		inc	acc											
1	2	0.4	0.7	0.28	0.28	15	5.2	1.46	11.40	11.32	38	0.21	15	3	2.5	0.2
2	3	0.4	0.7	0.28	1.01	15.2	5.1	5.15	11.32	10.94	115	0.33	18	6	3.4	0.6
3	5	0.48	0.4	0.19	1.20	15.8	5	6	10.94	10.63	95	0.33	18	6	3.4	0.5
14	15	1.15	0.4	0.46	0.46	15	5.2	2.4	14.60	14.53	35	0.21	15	3	2.5	0.2
15	4.1	1.24	0.4	0.5	0.96	15.2	5.1	4.9	12.54	12.23	95	0.33	18	6	3.4	0.5
5.1	5	0.23	0.7	0.16	0.16	10	6.0	0.96	11.10	10.97	60	0.21	15	3	2.5	0.4
4.1	4	-	-	-	0.96	15.7	5	4.8	12.23	11.75	145	0.33	18	6	3.4	0.7
4	5	-	-	-	0.96	16.4	4.9	4.7	11.75	11.51	72	0.33	18	6	3.4	0.4
5	6	1.47	0.4	0.59	2.91	16.8	4.9	14.2	10.50	10.21	208	0.14	30	15.5	3.2	1.1
6	13	0.37	0.4	0.15	3.06	17.9	4.8	14.7	10.21	10.05	112	0.14	30	15.5	3.2	0.6
11	12	0.21	0.7	0.15	0.15	10	6.0	0.9	14.38	14.31	34	0.21	15	3	2.5	0.3
12	13	1.13	0.4	0.45	0.6	10.3	5.9	3.5	14.31	13.27	275	0.38	15	4	3.2	1.4
13	7	1.4	0.4	0.56	4.22	18.5	4.7	19.8	7.62	7.38	82	0.29	30	22	4.5	0.3
7	8	-	-	-	4.22	18.8	4.6	19.8	7.38	7.10	95	0.29	30	22	4.5	0.4
8.1	8	0.22	0.4	0.09	0.09	10	6.0	0.5	7.80	7.73	32	0.21	15	3	2.5	0.2
8	9	0.25	0.7	0.18	4.49	19.2	4.6	20.6	7.10	6.78	110	0.29	30	22	4.5	0.41
9	10	0.68	0.4	0.27	4.76	19.6	4.5	21.42	6.78	6.00	270	0.29	30	22	4.5	1.0
16	17	22.8	0.4	9.1	9.1	20	4.5	41	6.00	4.92	360	0.30	2x36	73		
17	18											0.30	2x36	73		
18	19											0.30	2x36	73		

HYDRAULIC GRADE LINE PROGRAM

PROJ: 95145
 DATE: 4/22/96
 NAME: CFL

JUNCTION NO.	M.H.	INLET SHAPE	MANNING'S N	D.OUT	L.OUT	Q.OUT	V.OUT	ANGLE	TW	HF	HO	HI	HD	HT	HTT	HGE	FLE
9	N	Y	0.013	30.00	270.00	22.00	4.48	15	6.70	0.78	0.08	0.11	0.03	0.22	0.14	7.62	10.50
8	N	Y	0.013	30.00	110.00	22.00	4.48	90	7.62	0.32	0.08	0.11	0.22	0.41	0.26	8.20	12.26
7	Y	Y	0.013	30.00	95.00	22.00	4.48	20	8.20	0.27	0.08	0.11	0.06	0.25	0.12	8.60	15.30
13	N	Y	0.013	30.00	82.00	22.00	4.48	90	8.60	0.24	0.08	0.05	0.12	0.25	0.16	8.99	17.19
6	N	Y	0.013	30.00	112.00	15.50	3.16	0	8.99	0.16	0.04	0.05	0.00	0.09	0.06	9.21	16.70
5	N	Y	0.013	30.00	208.00	15.50	3.16	0	9.21	0.30	0.04	0.06	0.00	0.10	0.07	9.58	15.84
3	N	Y	0.013	18.00	95.00	6.00	3.40	0	9.58	0.31	0.04	0.06	0.00	0.11	0.07	9.96	15.79
2	N	Y	0.013	18.00	115.00	6.00	3.40	90	9.96	0.38	0.04	0.03	0.06	0.14	0.09	10.42	15.55
1	N	Y	0.013	15.00	38.00	3.00	2.44	0	10.42	0.08	0.02	0.00	0.00	0.02	0.02	10.52	15.55

REF:VDOT
 ASTERISK (*) REFERS TO HGL ABOVE RIM OR FLE

HYDRAULIC GRADE LINE PROGRAM

PROJ: 95145
 DATE: 4/22/96
 NAME: CFL

JUNCTION NO.	M.H.	INLET SHAPE	MANNING'S N	D.OUT	L.OUT	Q.OUT	V.OUT	ANGLE	TW	HF	HO	HI	HD	HT	HTT	HGE	FLE
4	Y	Y	0.013	18.00	72.00	6.00	3.40	70	9.58	0.23	0.04	0.06	0.11	0.22	0.11	9.92	16.00
<i>4.1</i>	Y	Y	0.013	18.00	145.00	6.00	3.40	0	9.92	0.47	0.04	0.06	0.00	0.11	0.05	10.45	18.20
15	N	Y	0.013	18.00	95.00	6.00	3.40	90	10.45	0.31	0.04	0.03	0.06	0.14	0.09	10.85	18.79
14	N	Y	0.013	15.00	35.00	3.00	2.44	0	10.85	0.08	0.02	0.00	0.00	0.02	0.02	10.94	18.80

REF:VDOT
 ASTERISK (*) REFERS TO HGL ABOVE RIM OR FLE

HYDRAULIC GRADE LINE PROGRAM

PROJ: 95145
 DATE: 4/22/96
 NAME: CFL

JUNCTION NO.	INLET M.H.	SHAPE	MANNING'S N	D.OUT	L.OUT	Q.OUT	V.OUT	ANGLE	TW	HF	HO	HI	HD	HT	HTT	HGE	FLE
12	N	Y	0.013	15.00	275.00	4.00	3.26	70	8.99	1.05	0.04	0.03	0.06	0.13	0.08	10.13	18.61
11	N	Y	0.013	15.00	34.00	3.00	2.44	0	10.13	0.07	0.02	0.00	0.00	0.02	0.02	10.22	18.68

REF:VDOT
 ASTERISK (*) REFERS TO HGL ABOVE RIM OR FLE


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=====
INLET NUMBER 3                LENGTH  2.5                STATION
DRAINAGE AREA = 0.240 ACRES    C VALUE = .400        CA = 0.096
DRAINAGE AREA = 0.240 ACRES    C VALUE = .400        CA = 0.096

FOR THE FIRST SIDE
SUM CA= 0.096 INT= 3.50 CFS= 0.336 CO= 0.000 GUTTER FLOW= 0.336
FOR THE OTHER SIDE
SUM CA= 0.096 INT= 3.50 CFS= 0.336 CO= 0.000 GUTTER FLOW= 0.336
AT THE INLET

SUM CA= 0.192 INT= 3.50 CFS= 0.672 CO= 0.000 GUTTER FLOW= 0.672

GUTTER SLOPE = 0.0035 FT/FT    PAVEMENT CROSS SLOPE = 0.0208 FT/FT

SPREAD AT A SLOPE OF .004 (ft./ft.) AND 0.34 (cfs) IS 2.83 (ft.)

XXXXXXXXXX CURB INLET IN A SUMP XXXXXXXXXXXX
P EFFEC. LENGTH (ft) = 6.10                H (ft) = 0.458
DEPTH OF WATER (ft) = 0.13                SPREAD (ft) = 6.33

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=====
INLET NUMBER 14                LENGTH  6.0                STATION
DRAINAGE AREA = 1.150 ACRES    C VALUE = .400        CA = 0.460
SUM CA= 0.460 INT= 3.50 CFS= 1.610 CO= 0.000 GUTTER FLOW= 1.610

GUTTER SLOPE = 0.0030 FT/FT    PAVEMENT CROSS SLOPE = 0.0208 FT/FT

SPREAD      W      W/T      SW      SW/SX      Eo      a      S'W      SE
8.61      2.0      0.23      0.0833      4.0      0.65      3.5      0.146      0.115

XXXXXXXXXX CURB INLET ON A CONTINUOUS GRADE XXXXXXXXXXXX
REQUIRED LENGTH (ft) = 6.4                EFFICIENCY= 0.99
CFS INTERCEPTED= 1.60                CFS CARRYOVER= 0.01

```

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=====
INLET NUMBER 15                LENGTH  6.0                STATION
DRAINAGE AREA = 1.240 ACRES    C VALUE = .400        CA = 0.496
SUM CA= 0.496 INT= 3.50 CFS= 1.736 CO= 0.000 GUTTER FLOW= 1.736

GUTTER SLOPE = 0.0030 FT/FT    PAVEMENT CROSS SLOPE = 0.0208 FT/FT

SPREAD      W      W/T      SW      SW/SX      Eo      a      S'W      SE
8.92      2.0      0.22      0.0833      4.0      0.63      3.5      0.146      0.112

XXXXXXXXXX CURB INLET ON A CONTINUOUS GRADE XXXXXXXXXXXX
REQUIRED LENGTH (ft) = 6.7                EFFICIENCY= 0.98
CFS INTERCEPTED= 1.71                CFS CARRYOVER= 0.03

```

```

=====
INLET NUMBER 3                LENGTH  2.5                STATION
DRAINAGE AREA = 0.240 ACRES   C VALUE = .400           CA = 0.096
DRAINAGE AREA = 0.240 ACRES   C VALUE = .400           CA = 0.096

FOR THE FIRST SIDE
SUM CA= 0.096 INT= 3.50 CFS= 0.336 CO= 0.030 GUTTER FLOW= 0.366
FOR THE OTHER SIDE
SUM CA= 0.096 INT= 3.50 CFS= 0.336 CO= 0.000 GUTTER FLOW= 0.336
AT THE INLET

SUM CA= 0.192 INT= 3.50 CFS= 0.672 CO= 0.030 GUTTER FLOW= 0.702

GUTTER SLOPE = 0.0035 FT/FT    PAVEMENT CROSS SLOPE = 0.0208 FT/FT

```

SPREAD AT A SLOPE OF .004 (ft./ft.) AND 0.37 (cfs) IS 3.10 (ft.)

XXXXXXXXXX CURB INLET IN A SUMP XXXXXXXXXXXX
P EFFEC. LENGTH (ft) = 6.10 H (ft) = 0.458
DEPTH OF WATER (ft) = 0.14 SPREAD (ft) = 6.52

```

=====
INLET NUMBER 4.1 5.1          LENGTH  2.5                STATION
DRAINAGE AREA = 0.120 ACRES   C VALUE = .700           CA = 0.084
DRAINAGE AREA = 0.110 ACRES   C VALUE = .700           CA = 0.077

FOR THE FIRST SIDE
SUM CA= 0.084 INT= 3.50 CFS= 0.294 CO= 0.000 GUTTER FLOW= 0.294
FOR THE OTHER SIDE
SUM CA= 0.077 INT= 3.50 CFS= 0.269 CO= 0.000 GUTTER FLOW= 0.269
AT THE INLET

SUM CA= 0.161 INT= 3.50 CFS= 0.563 CO= 0.000 GUTTER FLOW= 0.563

GUTTER SLOPE = 0.0035 FT/FT    PAVEMENT CROSS SLOPE = 0.0208 FT/FT

```

SPREAD AT A SLOPE OF .004 (ft./ft.) AND 0.29 (cfs) IS 2.41 (ft.)

XXXXXXXXXX CURB INLET IN A SUMP XXXXXXXXXXXX
P EFFEC. LENGTH (ft) = 6.10 H (ft) = 0.458
DEPTH OF WATER (ft) = 0.12 SPREAD (ft) = 5.63

```

=====
INLET NUMBER 5                LENGTH  8.0                STATION
DRAINAGE AREA = 0.980 ACRES   C VALUE = .400           CA = 0.392
DRAINAGE AREA = 0.490 ACRES   C VALUE = .400           CA = 0.196

```

FOR THE FIRST SIDE

OK

STORM WATER MANAGEMENT (BMP) ANALYSIS

- * Total Site Area: \pm 130.1 ac
- * Total Open Space Area Including 100' Buffer and BMP: \pm 84.7 ac
or $84.7/130.1 = 65.1\%$
- * Natural Open Space Credit = 6.51 points (See worksheet for BMP point system)
- * Required BMP Point 10 Points Minimum
- * Use BMP design JCC No. B(3) wet pond, 4V; or an equivalent of 9 points
- * Area remaining which will be the development area for lots (outside the 100' buffer) and the roads is approximately 45.5 acres.
- * Approximately **22.8 acres** of the developed area will be served by the wet pond or $= 22.8/45.4 = 50.2\%$, water quality volume WQV.
- * $WQV = 4 \times 0.4 R_v \times A \times 3630$
 $4V$, where $V = 0.4 R_v \times A \times 3630$
 $R_v = 0.05 + .009 \times I$
 I , impervious area, assumed to be 50%
- * $R_v = 0.05 + (0.009 \times 50)$, $50\% = I$
 $= 0.5$
- * $A = 22.8$ ac 74,788
- * $WQV = 4 \times 0.4 \times 0.5 \times 22.8 \times 3630 = 66,211$ cf

* Volume Available

Elev	Area sf	Avg. Area sf	Volume cf	Acc. Volume cf
0 Bottom	12,520			0
5.9 WSE	27,580	20,050	118,295	118,295
10 TB	62,140			

Available Volume, WQV = 118,295 cf > 66,211 cf...OK

BMP design # 2, Area # 2

- b. Lots 16-31 (48,000 sf impervious area)
Roads (47,200 sf impervious area)
Subtotal impervious area = 95,200 sf = 2.18 acres
Try design method:
(#2) Design 7, wet pond (4V) + open space

$$\begin{aligned}(\#2) V &= 0.4 \times (0.05 + 0.009 \times I) \times A \times 3630 \\ V &= 3,644 \text{ cf}, A = \pm 10.5 \text{ acres}, I = 21\% \\ 4V &= 14,576 \text{ cf}\end{aligned}$$

Lake Area # 2

Top of bank 14,000 sf (3' to WSE)
Water surface elevation 9,464 sf
Bottom of lake (7' deep) 1,400 sf (3:1 slope)
Average area 5,432 sf
Lake volume 38,024 cf > 14,576 cf

BMP design # 3, Area # 3

- c. Lots 49-74 (78,000 sf impervious area)
Roads (73,500 sf impervious area)
Subtotal impervious area = 151,200 sf = 3.5 acres
Try design method:
(#3) Design 7, wet pond (4V) + open space

$$\begin{aligned}(\#3) V &= 0.4 \times (0.05 + 0.009 \times I) \times A \times 3630 \\ V &= 5,760 \text{ cf}, A = \pm 16 \text{ acres}, I = 22\% \\ 4V &= 23,040 \text{ cf}\end{aligned}$$

Lake Area # 3

Top of bank 18,000 sf (3' to WSE)
Water surface elevation 13,460 sf
Bottom of lake (7' deep) 5,400 sf (3:1 slope)
Average area 9,430 sf
Lake volume 66,010 cf > 23,040 cf

d. Another design method will be evaluated after the soil has been tested, design method #9 -1" infiltration trench/system. Using the same lake's areas for infiltration basin and only 2-3' deep, we have more than the necessary volumes.



Vanasse Hangen Brustlin, Inc.

January 18, 2008

Mr. Gregory B. Johnson
Inspector
Environmental Division
101-A Mounts Bay Road
Williamsburg, VA 23187



Re: Landfall at Jamestown
James City County Plan Number: S-14-96
James City County BMP ID Code: PC-098
(VHB# 31825.01)

Mr. Johnson:

VHB received a copy of your review letter dated November 26, 2007 and offer the following responses to the Record Drawing comments.

Record Drawing:

1. The record drawing set dated 10/17/2007 is not satisfactory. **Noted.**
2. An approved maintenance plan needs to be added to the approved plan on the record drawing. **Complied. Maintenance plan has been provided.**
3. A professional seal and signature is required on the record drawing. **Complied. Seal and signature is provided.**
4. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number S-14-96 and BMP ID Code: PC 098. **Complied. Requested information has been included.**

Construction - Related Items:

Per my conversation with the Developer, all construction related items were completed as of January 16, 2008.

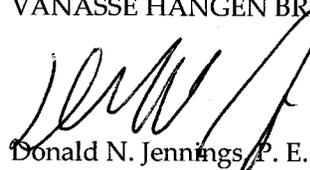
Mr. Gregory B. Johnson
January 18, 2008
Page 2 of 2

Enclosed please find one (1) reproducible copy and one (1) print set of the BMP Record Drawing (Sheet 1 of 1, dated 10/17/07, revised 12/14/07) for your approval.

Please call should you have any questions and/or comments.

Sincerely,

VANASSE HANGEN BRUSTLIN, INC.



Donald N. Jennings, P. E.
Project Manager

DNJ/blg

Enclosures





Easton Park
McCale Development
729 Thimble Shoals Blvd. Suite 4A
Newport News, Virginia 23606

November 26, 2007

Re: James City County Plan Number: S-14-96
James City County BMP ID Code: PC-098

Dear Easton:

The Environmental Divisions has received a record drawing (asbuilts) and construction certification for the stormwater management facility for the above referenced project. The record drawing provides as-built information for an infiltration basin situated in the east corner of the site.

Based on our review of the project and a concurrent field inspection as performed on 11/9/2007 the following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility at the site and to proceed with closing out the project:

Record Drawing:

1. The record drawing set dated 10/17/2007 is **not satisfactory**. 12/3/07 - VBH working on
2. An approved maintenance plan needs to be added to the approved plan on the record drawing.
3. A professional seal and signature is required on the record drawing.
4. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number S-14-96 and BMP ID Code: PC 098.

Construction - Related Items: 11/28/07 - Met with H.B. Hanks and McCale reference items

1. The area in front of the main outflow of the pond needs to be cleaned of sediment and vegetation and insure that a defined channel exist leading into the storm water pipe. In addition verify elevations in this area.
2. Outfall needs to be constructed per plan; the rip rap is not placed properly per plan. More stone needs to be added as per the approved plan.
3. Access to the outfall needs to be made. At present condition access is not possible.
4. South slope of BMP needs to have topsoil, seed, matting or straw added to the areas where erosion is occurring.

5. The north side of the BMP, by water fall structure there is rip rap in the pond. This is not noted on the plan.
6. Storm drain to the right of lot number 65 and on Robert Fenton needs to have the following corrected:
 - a. The channel leading into the storm pipe from the pond needs to be better defined and improved. The inlet is higher than the channel itself which can not be corrected. The channel leading to it can. This will allow some of the increase in water volume from the pond a means of draining.
7. Clear and remove all vegetation, brush, debris and sediment within 25 feet of the principal flow control.
8. Verify BMP elevations. If BMP is not at designed elevations BMP needs to be cleaned of debris and sediment.
9. It is your responsibility to provide proper advance notification to homeowner association members or residents who border the BMP, as appropriate, of any proposed work activity in the area to address construction-related or routine maintenance items.

Once this work is satisfactorily completed, contact our office appropriately for reinspection. We can then proceed with final release of the surety and/or closing out 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 757-253-6683 if you have any further comments or questions.

Sincerely,

Gregory B. Johnson.
Inspector
Environmental Division

ROBERT H. FRYER

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

P.O. Box 8784, Williamsburg, VA 23187-8784

Oct. 8, 2007

Ref. BMP PC098, Detention Pond, Landfall at Jamestown, Landfall Dr. Williamsburg

Dear Scott.

Thank you for talking to me last week.

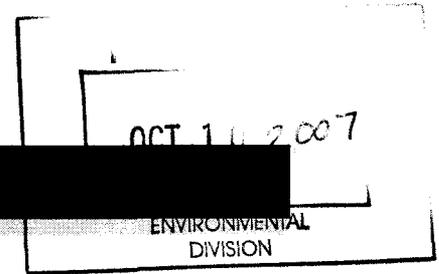
As I said, we (the homeowner's association) will be taking over control of the Landfall Association from the developer, McCale, in January. We are working with him for a smooth and friendly transition, and so far it is going well. We are not interested in making McCale spend more money than is required, but we do have a question regarding the most potentially expensive of the "common elements" we will be taking over responsibility for: --- the above detention pond, which is part of our storm water system. With regard to that pond, I understand from talking with you that the county requires McCale to put it in the same condition as it was when built, and to file plans with your office showing such condition prior to cancellation of his bond with JCC. Since we have not been able to find any plans filed with the county that show the pond as designed or as first built, particularly the elevations of the in-flow and out-flow culverts, vis-à-vis the pond itself, the homeowner's Board of Advisors have a question or concern based on the existing conditions of the pond. To this end, I enclose several photographs taken last spring when the foliage was gone, and a couple taken this fall.

Photo 1. (numbers on the back) taken last spring (2007), when the pond was low, shows the one inflow and two outflow culverts located at the western end of the pond. Note that both inflow and outflow are located closely next to each other. As you know, the outflow goes directly into the Powhatan. Note that, at least as of last spring, the level of the bottom of the pond – at the westerly end-was/is at the same elevation as the outflow culverts.

Photo 2. Also taken last spring, shows the same features as "1", but is taken from the northerly side of the pond.

Photo 3. Was taken from the top of the inflow culvert, looking eastward towards the deepest part of the pond.

The question or concern we have relates to the "bottom" of the pond at the outflow area being at the same level as the outflow culvert. Usually, as I understand it, the outflow culvert for a detention/ settlement pond is built ABOVE the bottom of the "pond" on top of some type of rip-rap or concrete "abutment" so that when silt-carrying water flows in, it has a change to settle, while the water without silt flows out. (While you are the engineer and I am not, I enclose a copy of a diagram of a "typical" detention pond design in case I am using the wrong words to describe this generalized conceptual design, so we are on the same wavelength.) The question or concern thus becomes (since we do not have real as-built drawings from when the pond was built 8-9 years ago), was the pond designed and built with the "dirt" or "land" between the water (and the deepest part of the pond to the east) and the outflow culvert part of the pond's initial construction and design, OR is that land the result of silt/sedimentation build-up during the 8-9 years of construction of homes and roads in Landfall??? To a lay person, it would seem that with this design, any sediment that flows in would flow out immediately and would not have a chance to settle. But that is not our concern as an association.



McCale's representatives have told us that there has been no sedimentation build up and that the pond presently exists as it was originally designed and built. If this proves to be the case, this is good news, since it means with all of the construction now complete, the Home Owners Association should not be required to have sediment removed in the future, barring a hurricane or flood etc. However, if this land DOES composed of sedimentation that has built up during construction that must be removed, it should be up to McCale to do so prior to turning the pond over to the owners, and prior to receiving his bond back.

I also enclose two photos (#s 4 and 5), one taken last spring and one this fall showing some erosion which needs to be filled in and stabilized. (I believe McCale has a contract to fix this, but it has not yet been accomplished. The woodchucks love it!) Photo # 6 also shows the land between the inflow/outflow culverts on the left and the pond on the right taken this fall with all of the vegetation which has grown up this year. Thanking you in advance for all of your help, I remain,

Sincerely,

A handwritten signature in black ink, appearing to read 'Robert H. Fryer', with a long, sweeping underline.

Robert H. Fryer,

cc. Brian Claggett, Jim Mathis, Frank Gibson, Stuart Yowell,

4345 Landfall Drive, Williamsburg, VA. 23185

Tele. (757)-220-0759. E-mail rfryer@cox.net



DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784

E-MAIL: devtman@james-city.va.us

(757) 253-6671

ENVIRONMENTAL DIVISION

(757) 253-6670

ENVIRON@JAMES-CITY.VA.US

PLANNING

(757) 253-6685

PLANNING@JAMES-CITY.VA.US

COUNTY ENGINEER

(757) 253-6678

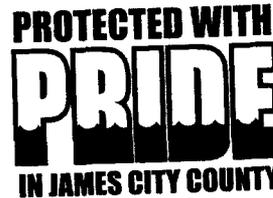
MOSQUITO CONTROL

(757) 259-4116

March 28, 2007

Mr. Robert H. Fryer
Landfall at Jamestown HOA
4345 Landfall Drive
Williamsburg, Va. 23185

Re: Landfall at Jamestown
Stormwater Management Facility
County Plan No.
County BMP ID Code: PC 098



Dear Mr. Fryer:

It was a pleasure to talk with you recently about the stormwater management facility at the Landfall at Jamestown. I have also received your letter dated March 19th 2007 which had some specific questions. Firstly, I am going to provide you with some of our "first contact" information for your community association to use relative to maintenance of the BMP. I will then answer your specific questions after that.

The subject stormwater management facility (PC 098) is a wet pond stormwater management facility situated in the central part of the subdivision. It serves a drainage area of about 23 acres. It was initially constructed during Phase 1 of the Landfall at Jamestown (formerly Settlers Mill) subdivision project (County Plan No. S-14-96).

Watershed Education

Information as attached includes: a general map of the subdivision; a watershed education brochure from our PRIDE program (www.protectedwithpride.org); landscaping tips for stormwater management BMP's; watershed awareness tips, a sample maintenance plan for a wet pond stormwater management facility; and three brochures related to liability and maintenance. One of these brochures is a good informational handout entitled *A Guide for Maintaining and Operating BMP's*. This publication is distributed through our office in response to a cooperative effort from the Hampton Roads Regional Stormwater Management Committee and HR STORM, a regional stormwater education program offered by the Hampton Roads Planning District Commission.

Letter Dated March 19, 2007

1. I previously provided you with a copy of an asbuilt drawing as received by our office. This drawing was dated October 20, 1998. This asbuilt is not yet considered approved by our Division as it does not show information about the primary pipes which control outflow from the pond. Also, condition of approval for Phase 5 of the project required that a construction certification be provided for the BMP. Our Division has not yet

received this information. We will do our best to provide the HOA with a copy of the final approved asbuilt drawing once that milestone is reached. However, upon approval, a reproducible will be available at our office for the HOA to sign out and copy.

2. A copy of the "Declaration of Covenants, Inspection/Maintenance of Runoff Control Facility" was provided to you previously. This document is recorded in the County Land Records under Deed Book 813, Page 553. This inspection/maintenance agreement runs with the land and binds subsequent owners of the property served by the BMP. This includes the HOA. The other maintenance document is an approved maintenance plan which would be located on the approved subdivision/site plan. As the date of this plan preceded the need for a maintenance plan to be provided in the plan set, I am providing you a sample maintenance plan for a wet pond facility. This maintenance plan can be further refined, specific to PC 098, as we coordinate more in the future. Also, additional BMP maintenance information can be found on the BMP Guide portion of the County PRIDE website. Visit: <http://www.protectedwithpride.org/bmpguide.html>

3. Receipt of your attachment entitled "*Landfall at Jamestown, Pond and Wetlands Management*" is acknowledged. This list is a compilation of suggestions from the HOA and residents. It must be understood that our Division can only hold the developer to that required as part of the approved plan(s) and/or any condition which threatens the structural integrity or stormwater function of the BMP. Any other items, as desired by the HOA or residents, cannot be requested by our Division. Therefore, some of the items on the list (plan-approved landscaping, site and pond area erosion, sediment removal, etc.) are under the jurisdiction of our Division and can be addressed prior to bond release. However, some of the others (aesthetic features, additional landscaping, removal of invasive species, chemical treatment, etc.) are at the discretion of the Owner. These items can be pursued by the Owner after the bond is released. Those that are considered a water quality improvement (beyond the approved design – such as wetland plantings) can be considered under the County's PRIDE mini-grant program. Visit: http://www.protectedwithpride.org/mini_grants.html

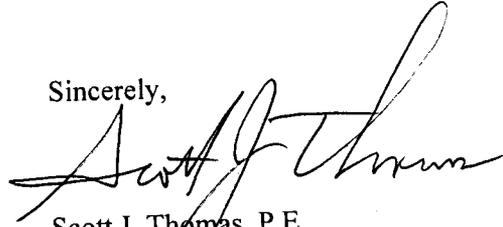
4. The following is current information of bonds being held for all projects from our Division database.

<i>Project Phase</i>	<i>Plan No.</i>	<i>Subdivision Bond</i>	<i>Siltation (E&S) Bond</i>
Phase 1 (form. First Settlers)	S-14-96	Released	\$ 10,000
Phase 2A	S-16-97	\$ 25,000	Released
Phase 2B (form. Landfall Village)	S-95-05	Not received yet.	\$ 43,000
Phase 3	S-26-97	Released	Released
Phase 4	S-100-97	\$ 40,000	Released
Phase 5	S-77-97	\$ 41,000	\$ 25,000
Tennis Court	SP-118-97	\$ 0	\$ 0

4. Other thoughts and suggestions: Our Division always prefers natural methods for algae control as opposed to chemical or biological treatment; although, it is the owner's discretion. Also, use of natural pond buffers are encouraged by our Division in accordance with our Pond Buffer/Setback program (copy attached). Watershed education about the overuse of lawn nutrients and pesticides is critical to algae control and aesthetic conditions of the pond.

Our Division is always readily available to assist owners and HOA representatives with guidance related to stormwater management facilities and drainage and we sincerely look forward working with you in the future. If you have any additional questions or comments, call me at 757-253-6639.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott J. Thomas". The signature is fluid and cursive, with a large initial "S" and "T".

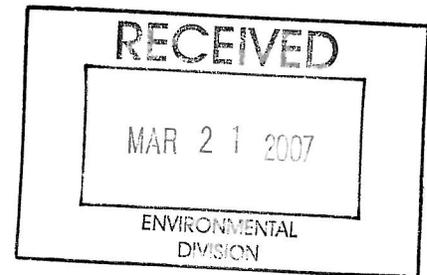
Scott J. Thomas, P.E.
Chief Engineer – Stormwater
Environmental Division

Attachments

SJT/sjt

SWMProg\Education\Subdivisions\VillageSquare.fc

Landfall At Jamestown Board of Advisors



Scott Thomas, P.E. Chief Engineer-Stormwater

James City County
101 Mounts Bay Rd, P.O. Box 8784
Williamsburg, VA 23187-8784

Ref. Landfall at Jamestown.

Dear Scott.

Again, thank you for your help last week.

As I told you last week, I am one of the 5 members of the Landfall Advisory committee, a voluntary board working towards a transition next year of control of the Landfall Home Owners Association from the developer, McCale Development, LLC to the actual homeowners. As such, we are in the process of doing "due diligence" prior to the transition, in order to determine if there are any outstanding non-compliance issues reference the permits and plans for Landfall at Jamestown, previously known as "First Settlers Subdivision". Within what may be your jurisdiction, we have the following requests/ questions we would greatly appreciate your responses on.

1. Copies of any "as-built" plans regarding the retention/detention pond and the drainage into and out of such (BMP # PC098) when such are delivered to your office and before any bonds are release relative thereto.
2. Copies of any Best Practices Management Plan cleaning up and maintaining the aforesaid BMP PC098. In support of such plan, I enclose a copy of some suggestions which some of our residents have put together for the long-term maintenance of such pond and its buffer which forms an outline of what we would like to see adopted and implemented by the Declarant prior to the release of any bond. Dated February 27, 2007, those paragraphs are checked in red; (first paragraph relates to "Conservation area "H"). Any comments or suggestions you might care to add would be greatly appreciated.

March 19, 2007

Page 2

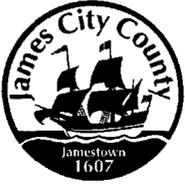
3. Copies of all remaining outstanding bonds and the amount remaining, including the newest section, "Landfall Villages" (Mr. German has this file, I believe) covering stormwater management. You furnished me with one for BMP PC098.

4. Any other thoughts or suggestions you might have to assist us with our transition in your area of expertise would be very much appreciated.

Robert H. Fryer



Robert H. Fryer, 220-0759. Bryan Claggett, 4303 Landfall Drive, 229-2907; Frank Gibson, 2548 Robert Fenton Rd, 345-0005; Jim Mathis, 2505 Nathaniell Powell Rd., 345-3314; Stuart Yowell, 2553 Robert Fenton Rd, 345-5388.



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

County BMP ID Code (if known): 098

Name of Facility: Landfall at Jamestown BMP No.: 1 of 1 Date: 11/2/07

Location: 1890 Jamestown Rd

Name of Owner: McCale Development

Name of Inspector: Gregory B. Johnson

Type of Facility: Wet Pond

Weather Conditions: _____ Type: Final Inspection County BMP Inspection Program Owner Inspection

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

- O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory. No action required.
- Routine - The item checked requires attention, but does not present an immediate threat to the function/integrity of the BMP.
- Urgent - The item checked requires immediate attention to keep the BMP operational and 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				
Tree Growth				
Erosion		✓		
Trash & Debris				
Seepage				
Fencing or Benches				
Interior Landscaping/Planted Areas: <input type="checkbox"/> None <input type="checkbox"/> Constructed Wetland/Shallow Marsh <input 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):				
Condition of Structure	✓			
Erosion		✓		
Trash and Debris	✓			
Sediment			✓	
Outlet Protection			✓	
Other	/			
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type):				
Condition of Structure				
Corrosion				
Trash and Debris				
Sediment				
Vegetation				
Other				
Principal Outlet Structure - Barrel, Conduit, etc. :				
Condition of Structure	NA			
Settlement				
Trash & Debris				
Erosion/Sediment				
Outlet Protection				
Other				
Emergency Spillway (Overflow):				
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:				
Overall Environmental Division Internal Rating: _____				
Signature: _____ Date: _____				
Title: _____				

SWMP\BMP\CoInspProg\InspForms\DetRet.wpd

WATERSHED PC
BMP ID NO 098
PLAN NO S-14-96
TAX PARCEL (47-3)(1-44)
PIN NO 4730100044
CONSTRUCTION DATE
PROJECT NAME Landfall at Jamestown
FACILITY LOCATION 1890 Jamestown Road
CITY-STATE Williamsburg, VA
CURRENT OWNER McCale Development- Landfall LLC
OWNER ADDRESS 729 Thimble Shoals Blvd.
OWNER ADDRESS 2
CITY-STATE-ZIP CODE Newport News, VA 23606
OWNER PHONE
MAINT AGREEMENT Yes
EMERG ACTION PLAN No

MAINTENANCE PLAN No
SITE AREA acre 130.1
LAND USE R2 Gen Residential
old BMP TYP Wet Pond
JCC BMP CODE
POINT VALUE 9
SVC DRAIN AREA acres 22.8
SERVICE AREA DESCRI SF Lots and roadways
IMPERV AREA acres 11.40
RECV STREAM Powhatan Creek tidal
EXT DET-WQ-CTRL Yes
WTR QUAL VOL acre-ft 1.71
CHAN PROT CTRL No
CHAN PROT VOL acre-ft 0
SW/FLOOD CONTROL Yes
GEOTECH REPORT No

CTRL STRUC DESC Single Culv
CTRL STRUC SIZE inches 36
OTLT BARRL DESC RCP Barrel
OTLT BARRL SIZE inch 36
EMERG SPILLWAY No
DESIGN HW ELEV 7.3
PERM POOL ELE 5.90
2-YR OUTFLOW cfs 12.10
10-YR OUTFLOW cfs 16.00
REC DRAWING Yes
CONSTR CERTI No
LAST INSP DATE 10/23/2000
INTERNAL RATING 4
MISC/COMMENTS
 I/M 813/533. Serves Ph 1, 2 and 3.

Get Last BMP No

Return to Menu

Project: LANDFALL AT JAMESTOWN - PHASE 1 (FORMERLY FIRST SETTLER'S)			
Site Plan No: S-14-96	Geo No:	LD Permit No: 97-40	Fiscal Year: 1997
Fee Paid? <input checked="" type="checkbox"/>	Fee Due: \$375	Acres Disturbed: 4.9	Declaration Covenant
Date Paid: 10/21/1996		LD Issue Date: 11/13/1996	Required: Yes
Released? <input type="checkbox"/>	Release Date:	LD Expire Date:	Received: <input checked="" type="checkbox"/>
Comments:	Notations	LD Comment: RELEASED 10/5/99	
ADDED PH. 1A (LOTS 13 & 19) TO SUBD.AGREEMENT ON 2/17/98/SUB.Surety Released 11/6/01.		Cert Const? Yes	CC Iss Date: 11/13/1996
		CC Expiration Date:	
		CC Comment: RENEWED	
Subdivisions			
Issue Date: 12/8/1997	Agreement? Yes	Siltation	
Surety: L/C - 59,000		Agreement? Yes	Surety: L/C - 25,000 RA
Surety Type: L/C	Amount: \$53,000	Surety Type: L/C	Amount: \$10,000
Notation:	Surety Released? <input checked="" type="checkbox"/>	Notation: RA	Surety Released: <input type="checkbox"/>
Expiration Date:		Expiration Date:	
Comment: LOTS 1-12 ONLY; ADDED LOT 13 & 19 ON 2/		Comments:	
Surety Number: 874-096232 WACHOVIA		Surety Number: 294	
Surety Company: WACHOVIA		Surety Company: RESOURCE BANK	
Delete Record	Undo Record	Last Permit No	Add Record
		Find Record	Save Record
			Menu Screen

1. As bui lts
2. Record Drawing
3. Engineer Cert
4. Area next to lot#64 (Robert Foster)
5. Drainage out fall - Bmp ?

Project: LANDFALL AT JAMESTOWN - PHASE 1 (FORMERLY FIRST SETTLER'S)			
Site Plan No: S-14-96	Geo No:	LD Permit No: 97-40	Fiscal Year: 1997
Fee Paid? <input checked="" type="checkbox"/>	Fee Due: \$375	Acres Disturbed: 4.9	Declaration Covenant
Date Paid: 10/21/1996		LD Issue Date: 11/13/1996	Required: Yes
Released? <input type="checkbox"/>	Release Date:	LD Expire Date:	Received: <input checked="" type="checkbox"/>
Comments:	Notations	LD Comment: RELEASED 10/5/99	
ADDED PH. 1A (LOTS 13 & 19) TO SUBD.AGREEMENT ON 2/17/98/SUB.Surety Released 11/6/01.		Cert Const? Yes	CC Iss Date: 11/13/1996
		CC Expiration Date:	
		CC Comment: RENEWED	
Subdivisions			
Issue Date: 12/8/1997	Agreement? Yes	Sitation	
Surety: L/C - 59,000		Agreement? Yes	Surety: L/C - 25,000 RA
Surety Type: L/C	Amount: \$53,000	Surety Type: L/C	Amount: \$10,000
Notation:	Surety Released? <input checked="" type="checkbox"/>	Notation: RA	Surety Released: <input type="checkbox"/>
Expiration Date:		Expiration Date:	
Comment: LOTS 1-12 ONLY; ADDED LOT 13 & 19 ON 2/		Comments:	
Surety Number: 874-096232 WACHOVIA		Surety Number: 294	
Surety Company: WACHOVIA		Surety Company: RESOURCE BANK	
Delete Record	Undo Record	Last Permit No	Add Record
			Find Record
			Save Record
			Menu Screen

-2

Project: LANDFALL AT JAMESTOWN - PHASE 2B (FORMERLY LANDFALL VILLAGE)			
Site Plan No: S-095-05	Geo No:	LD Permit No: 07-22	Fiscal Year: 2007
Fee Paid? <input checked="" type="checkbox"/>	Fee Due: \$1,120	Acres Disturbed: 1.8	Declaration Covenant
Date Paid: 9/30/2005		LD Issue Date: 9/26/2006	Required: No
Released? <input type="checkbox"/>	Release Date:	LD Expire Date: 10/2/2008	Received: <input type="checkbox"/>
Comments:	Notations	LD Comment:	
(LANDFALL PHASE 2B) - PRIOR TO RELEASE OF SURETY MUST HAVE APPROVED AS-BUILTS FOR THE STORMWATER SYSTEM (NON-BMP RELEASED)		Cert Const?	CC Iss Date:
		CC Expiration Date:	
		CC Comment: JCSA	
Subdivisions			
Issue Date: 6/5/2007	Agreement? Yes	Siltation	
Surety:		Agreement? Yes	Surety:
Surety Type: Bond	Amount: \$21,000	Surety Type: Bond	Amount: \$43,000
Notation:	Surety Released? <input type="checkbox"/>	Notation:	Surety Released: <input type="checkbox"/>
Expiration Date:		Expiration Date:	
Comment:		Comments: 9/27/06 TRANSFERRED FROM PHASE 2	
Surety Number: 14BCSEO9702		Surety Number: 890739S	
Surety Company: HARTFORD FIRE INSURANCE CO		Surety Company: DEVELOPERS SURETY AND INDEM	
Delete Record	Undo Record	Last Permit No	Add Record
			Find Record
			Save Record
			Menu Screen

Streets

Transferred from phase 2

Close Traps -
Inlet protection -

Project: LANDFALL AT JAMESTOWN - PHASE 2			
Site Plan No: S-16-97	Geo No:	LD Permit No: 98-54	Fiscal Year: 1998
Fee Paid? <input checked="" type="checkbox"/>	Fee Due: \$475	Acres Disturbed: 14.8	Declaration Covenant
Date Paid: 3/20/1997		LD Issue Date: 1/29/1998	Required: <input type="checkbox"/>
Released? <input type="checkbox"/>	Release Date:	LD Expire Date: 1/29/2008	Received: <input type="checkbox"/>
Comments:	Notations	LD Comment:	
Phase 2B(Landfall Village) needs separate land disturbing permit & surety-plan completely reconfigured from original submittal.		Cert Const? Yes	CC Iss Date: 1/29/1998
		CC Expiration Date:	
		CC Comment: RENEWED	
Subdivisions			
Issue Date: 6/10/1998	Agreement? Yes	Siltation	
Surety: L/C - 40,000 RA		Agreement? Yes	Surety: BOND - 39,000
Surety Type: Bond	Amount: \$25,000	Surety Type: BOND	Amount: \$39,000
Notation: RA	Surety Released? <input type="checkbox"/>	Notation:	Surety Released: <input checked="" type="checkbox"/>
Expiration Date:		Expiration Date:	
Comment: ONLY PH. 2A, LOTS 14,15,17,18 & 53/BOND		Comments: 9/27/06 TRANSFERRED TO PHASE 2B	
Surety Number: 14BSBDV6542		Surety Number: 890739S	
Surety Company: HARTFORD FIRE INSURANCE CO		Surety Company: COMMONWEALTH SURETY ASSOC.	
Delete Record	Undo Record	Last Permit No	Add Record
		Find Record	Save Record
			Menu Screen

Streets ?

Project: LANDFALL AT JAMESTOWN - PHASE 4			
Site Plan No: S-100-97	Geo No:	LD Permit No: 99-66	Fiscal Year: 1999
Fee Paid? <input checked="" type="checkbox"/>	Fee Due: \$675	Acres Disturbed: 2.45	Declaration Covenant
Date Paid: 12/5/1997		LD Issue Date: 4/7/1999	Required: <input type="checkbox"/>
Released? <input type="checkbox"/>	Release Date:	LD Expire Date:	Received: <input type="checkbox"/>
Comments:	Notations	LD Comment: Released 8/29/05	
STREETLIGHT FEE PAID 1/18/00 \$577.08		Cert Const? Yes	CC Iss Date: 4/7/1999
		CC Expiration Date:	
		CC Comment: RENEWED	
Subdivisions			
Issue Date: 2/3/2000	Agreement? Yes	Siltation	
Surety:		Agreement? Yes	Surety: BOND - 55,000
Surety Type: Bond	Amount: \$40,000	Surety Type: BOND	Amount: \$10,000
Notation:	Surety Released? <input type="checkbox"/>	Notation:	Surety Released: <input checked="" type="checkbox"/>
Expiration Date:		Expiration Date:	
Comment:		Comments: RELEASED 11/1/2004	
Surety Number: 891278S		Surety Number: 890741S	
Surety Company: COMMONWEALTH SURETY ASSOC.		Surety Company: COMMONWEALTH SURETY ASSOC.	
Delete Record	Undo Record	Last Permit No	Add Record
			Find Record
			Save Record
			Menu Screen

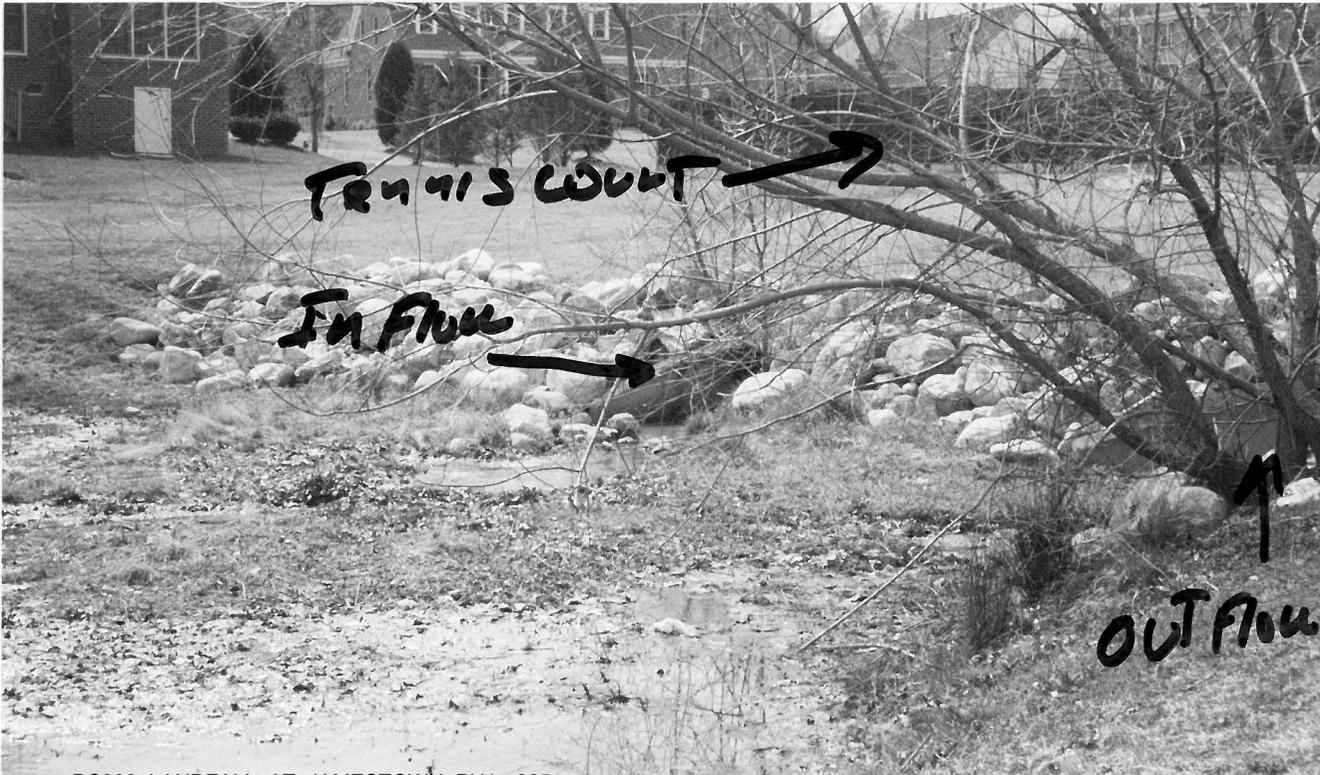
V DOT

Project: LANDFALL AT JAMESTOWN - PHASE 5 (Robert Fenton)			
Site Plan No: S-77-97	Geo No:	LD Permit No: 99-67	Fiscal Year: 1999
Fee Paid? <input checked="" type="checkbox"/>	Fee Due: \$600	Acres Disturbed: 1.67	Declaration Covenant
Date Paid: 8/28/1997		LD Issue Date: 4/7/1999	Required: <input type="checkbox"/>
Released? <input type="checkbox"/>	Release Date:	LD Expire Date: 10/7/2008	Received: <input type="checkbox"/>
Comments:	Notations	LD Comment:	
		Cert Const? Yes	CC Iss Date:
		CC Expiration Date:	
		CC Comment:	
Subdivisions			
Issue Date: 1/14/2002	Agreement? Yes	Siltation	
Surety:		Agreement? Yes	Surety: BOND - 55,000
Surety Type: L/C	Amount: \$41,000	Surety Type: BOND	Amount: \$25,000
Notation:	Surety Released? <input type="checkbox"/>	Notation:	Surety Released: <input type="checkbox"/>
Expiration Date: 1/4/2008		Expiration Date:	
Comment:		Comments: DRAINAGE PIPE PROB. MDW 9/16/05	
Surety Number: 454		Surety Number: 891279S	
Surety Company: RESOURCE BANK		Surety Company: COMMONWEALTH SURETY ASSOC.	
Delete Record	Undo Record	Last Permit No	Add Record
		Find Record	Save Record
			Menu Screen

Subdivision - 21,000.00
 VPOT - \$20,000.00 - Goes before Bas December for delin's

Drainage
 Street signs

Spring 2007







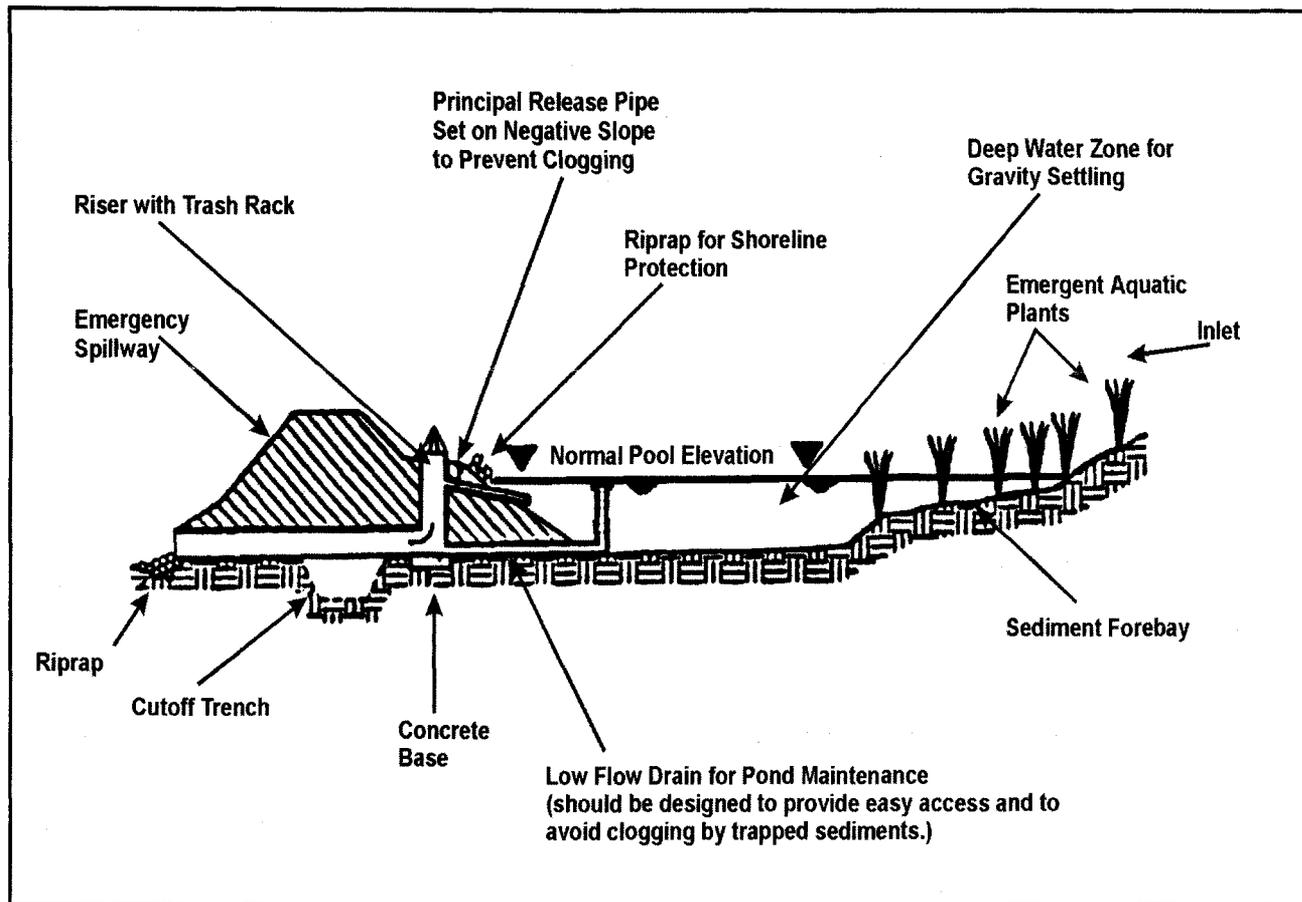


Storm Water Technology Fact Sheet Wet Detention Ponds

DESCRIPTION

Wet detention ponds are storm water control structures providing both retention and treatment of contaminated storm water runoff. A typical wet detention pond design is shown in Figure 1. The pond consists of a permanent pool of water into which storm water runoff is directed. Runoff from each rain event is detained and treated in the pond until it is displaced by runoff from the next storm.

By capturing and retaining runoff during storm events, wet detention ponds control both storm water quantity and quality. The pond's natural physical, biological, and chemical processes then work to remove pollutants. Sedimentation processes remove particulates, organic matter, and metals, while dissolved metals and nutrients are removed through biological uptake. In general, a higher level of nutrient removal and better storm water quantity control can be achieved in wet



Source: Maryland Department of the Environment, 1986.

FIGURE 1 TYPICAL LAYOUT OF A WET DETENTION POND

Surety by Site Name

SUBDIVISION			SILTATION			NAME
SURETY	RELEASED?	EXPIRATION	SURETY	RELEASED?	EXPIRATION	
L/C	\$53,000	<input checked="" type="checkbox"/>	L/C	\$25,000	RA <input type="checkbox"/>	LANDFALL AT JAMESTOWN - PHASE 1 (FORMERLY FIRST SETTLER'S) <i>5-14-96</i>
				<i>\$10,000</i>		
Bond	\$25,000	RA <input type="checkbox"/>	BOND	\$39,000	<input checked="" type="checkbox"/>	LANDFALL AT JAMESTOWN - PHASE 2 <i>A 5-16-97</i>
<i>None</i>		<input type="checkbox"/>	Bond	\$43,000	<input type="checkbox"/>	LANDFALL AT JAMESTOWN - PHASE 2B (FORMERLY LANDFALL VILLAGE) <i>5-95-05</i>
L/C	\$110,000	<input checked="" type="checkbox"/>	BOND	\$29,000	<input checked="" type="checkbox"/>	LANDFALL AT JAMESTOWN - PHASE 3 <i>5-02-97 Released</i>
Bond	\$40,000	<input type="checkbox"/>	BOND	\$10,000	<input checked="" type="checkbox"/>	LANDFALL AT JAMESTOWN - PHASE 4 <i>5-100-97</i>
L/C	\$41,000	<input type="checkbox"/>	BOND	\$25,000	<input type="checkbox"/>	LANDFALL AT JAMESTOWN - PHASE 5 <i>5-77-97</i>
	\$0	<input type="checkbox"/>		\$0	<input type="checkbox"/>	LANDFALL AT JAMESTOWN - TENNIS COURT <i>SP-118-97</i>

Number Listed: 7

*Need revised AB (outfall)
Need const cert*

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

	<u>BMP</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u>	=	<u>Weighted BMP Points</u>
#1	1.4 Ac Design #7	9	x	54%	=	4.9
#2	0.3 Ac Design #7	9	x	18%	=	1.6
#3	0.4 Ac Design #7	9	x	25%	=	2.5
			x		=	
TOTAL WEIGHTED STRUCTURAL BMP POINTS:						<u>9</u>

B. NATURAL OPEN SPACE CREDIT

$$\frac{\frac{8.2}{81.1}}{\text{Fraction of Site}} \times \frac{\text{Natural Open Space Credit}}{(0.1 \text{ per } 1\%)} = \frac{1.1}{\text{Points for Natural Open Space}}$$

C. TOTAL WEIGHTED POINTS

$$\frac{9}{\text{Structural BMP Points}} + \frac{1.1}{\text{Natural Open Space Points}} = \frac{10.1}{\text{TOTAL}}$$

Treated area = 57.5

VOID

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

22.8 Ac.

A. STRUCTURAL BMP POINT ALLOCATION

P00967

	<u>BMP</u>	<u>BMP Points</u>	<u>Fraction of Site Served by BMP</u>	<u>Weighted BMP Points</u>
# 1	1.4 Ac Design #7	9	$\frac{31}{57.5} = 54\%$	$.54 \times 9 = 4.86$
# 2	0.3 Ac Design #7	9	$\frac{10.5}{57.5} = 18\%$	$.18 \times 9 = 1.62$
# 3	0.4 Ac Design #7	9	$\frac{16}{57.5} = 28\%$	$.28 \times 9 = 2.52$
TOTAL WEIGHTED STRUCTURAL BMP POINTS:				<u>9</u>

B. NATURAL OPEN SPACE CREDIT

<u>Fraction of Site</u>	<u>Natural Open Space Credit</u>	<u>Points for Natural Open Space</u>
$\frac{8.2 \text{ Ac}}{81.1 \text{ Ac}}$	\times (0.1 per 1%)	$= 1.1$

C. TOTAL WEIGHTED POINTS

<u>9</u>	$+$	<u>1.1</u>	$=$	<u>10.1</u>
Structural BMP Points		Natural Open Space Points		TOTAL

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u>		<u>Weighted BMP Points</u>
1	9	x	50.2	=	4.5
		x		=	
		x		=	
		x		=	
TOTAL WEIGHTED STRUCTURAL BMP POINTS:					

B. NATURAL OPEN SPACE CREDIT

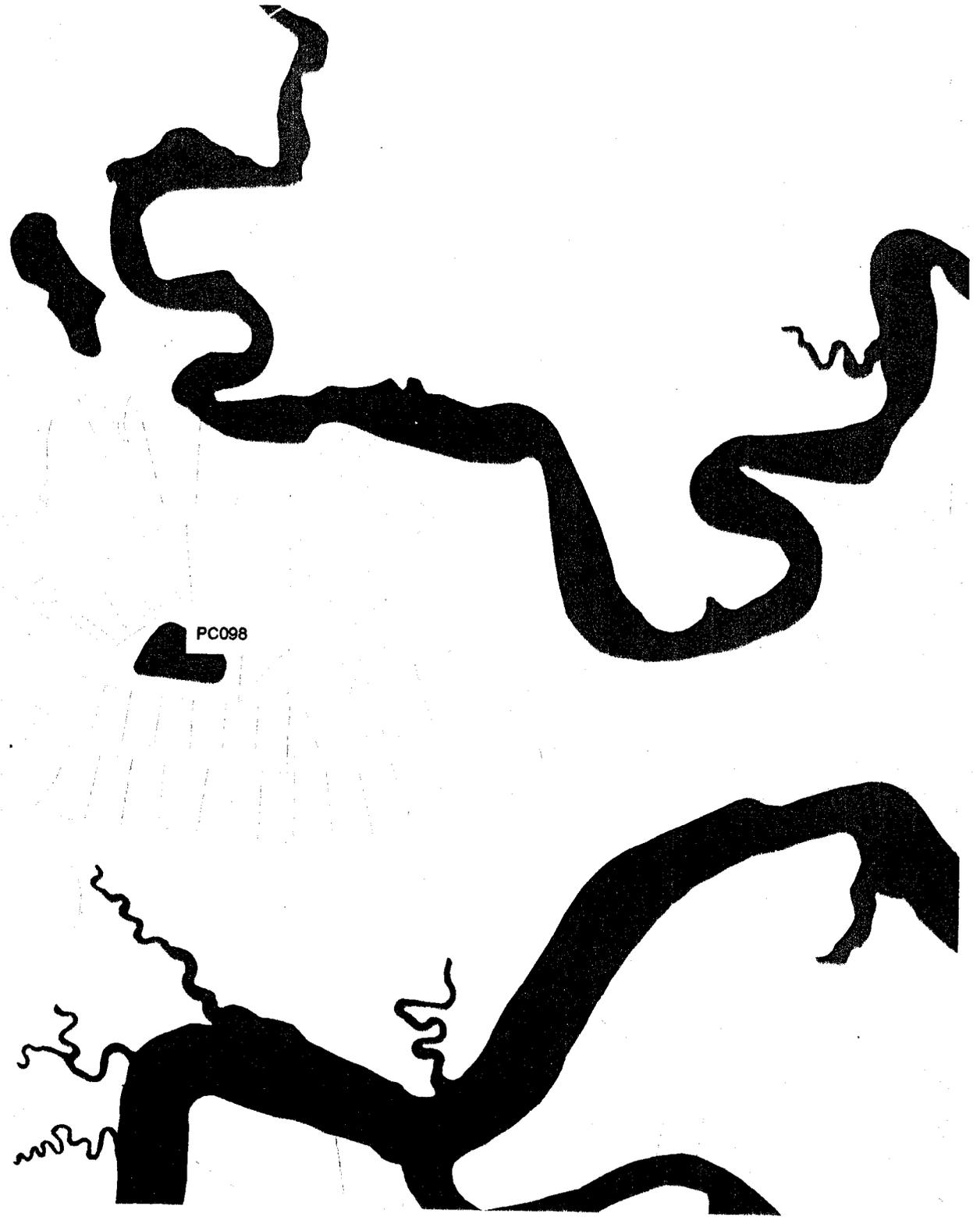
<u>Fraction of Site</u>		<u>Natural Open Space Credit</u>		<u>Points for Natural Open Space</u>
65.1	x	0.1 (0.1 per 1%)	=	6.5

C. TOTAL WEIGHTED POINTS

4.5	+	6.5	=	11
Structural BMP Points		Natural Open Space Points		TOTAL

PC097

PC098



Landfall at Jamestown Pond and Wetlands Management

February 27th, 2007 meeting and workshop

Lou Verner, PhD, Watchable Wildlife Biologist,
Wildlife Diversity Division
Virginia Department of Game and Inland Fisheries
4010 West Broad St., Richmond, VA 23230
804-367-1778

Summary of recommendations from the afternoon walk-around the pond and wetlands, and from the evening presentation:

Swamp :

- plant moisture absorbing trees and plants, such as:
 - trees: bald cypress, tupelo, and black gum
 - plants: native plants such as, Joe pye weed, and cardinal flowers
- Japanese honeysuckle around the swamp is invasive (non-native plant). If we wanted to remove it, we would need a professional service. There is too much of it for homeowners to do.

✓ Erosion from tennis court area to pond:

- Area needs to be planted to prevent erosion. Erosion will continue if not corrected.
Recommended native plant: Bushy bluestem.

✓ Erosion – hole in common area in front of Reeves

- Erosion occurs when an area is filled with non-native soil. The sand that came from the hole area has washed into the pond edge. Recommendation: fill with native soil. Plant buffer zone.

✓ Sediment at end of pond (near tennis court):

- Sediment needs to be removed by dredging. Sediment can be prevented by planting the area with native plants where the erosion is occurring.

✓ Pond Banking:

- A buffer zone (3' to 10') should be made around the pond to help filter nutrients, pesticides, herbicides and fertilizers from the surrounding lands (and roads) that drain into the pond.

During heavy rains, water flows over the roads, homeowners properties, and from common areas into the pond. Fertilizers from homeowners land and from the common land flow into the pond.

- Native plants should be used in the buffer zone. Once established there will be no maintenance needed, thus reducing maintenance costs. Native plants are non-invasive, usually pest free. Many attract birds, hummingbirds, bees.

Notes – Carol Fryer

Landfall at Jamestown
Pond and Wetland Management

- ✓ • Planting a buffer zone will also prevent erosion along the bank of the pond, as well as increase the beauty of the area and add to the overall value of the development.
- ✓ • The problem of Canadian geese will be eliminated with a buffer zone around the pond. Incidentally, the common area and pond homeowners' back yards do not need to be fertilized this spring, due to the excessive droppings from the 100+ geese that wintered here.
- ✓ (Virginia Tech states tall fescue should not be fertilized in the spring – only in the fall.)

✓ **Pond:**

- ✓ • A healthy pond should include plants that can grow at specified water depths.
✓ Recommended plant for shallow water include Pickerelweed and Bulltongue Arrowhead. (refer to handout for listing of plants for aquatic areas in Virginia.)
- ✓ • The bottom of ponds should also have plants to sustain the pond (submerged plants – see plant list).
- ✓ • Chemicals in the water can be discontinued over time with guidance from a pond management expert, once a buffer zone is established, thus reducing costs of pond maintenance.
With a healthy natural pond with native plantings in a buffer zone, algal blooms do not occur.
- ✓ • Invasive water plants to avoid include, duckweed, water lilies, and water hyacinths.

CODE COMPLIANCE REVIEW COMMENTS

FIRST SETTLERS, PHASE 1

PLAN NO. S-14-96

March 21, 1996

DEE

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.
2. A Subdivision Agreement, with surety, shall be executed with the County prior to recordation of lots.
3. Water and sewer inspection fees must be paid prior to the issuance of a Land Disturbing Permit.
4. An Inspection/Maintenance Agreement shall be executed with the county for the BMP facility for this project.
5. As-built drawings must be provided for the detention basin on completion.
6. A streetlight rental fee for 6 lights must be paid prior to the recordation of the subdivision plat.
7. Provide streetlights at the following locations:
 - a. On the northeast side of the intersection of Road A with Jamestown Road. ✓
 - b. On the left side of Street A at station 14+50.
 - c. At the intersection of Street A and Court A on lot 1.
 - d. At the intersection of Streets A and B on lot 53. ✓
 - e. On Court A on property line between lots 3/4 and 7/8. ✓
8. Provide silt fence on both sides of the road to contain the jack and bore pits for the sewer and water extensions under Jamestown Road.
9. Specify the amount of stone to be used as riprap at all pipe outfalls in accordance with Spec 3.19 of the third edition of the Virginia Erosion Control Handbook (VESCH).
10. The detention basin must be examined for performance as a sediment basin during the construction of the project and be designed according to the 1992 VESCH criteria. Submit a Sediment Basin Design Data Sheet to ensure design is in accordance with the criteria.
11. Conservation easements must be provided for all areas claimed toward meeting the county's 10-point BMP criteria.
12. Provide the standard James City County Erosion Control Notes dated 2/3/95 on the plan.
13. Remove the note in all locations on the plan that states drainage easements are to be dedicated to James City County. The language should only state that a drainage easement is being provided and not be dedicated to any party.
14. Increase the width of all drainage easements to a minimum width of 20 feet.
15. Provide a drainage area map to verify the assumptions contained in the drainage calculations.
16. In accordance with the Chesapeake Bay Ordinance, lots cannot be cleared until a building permit has been issued for that particular lot. Therefore, delete any grading of lots except for drainage swales as provided for in the following locations. Provide a detail of the typical ditch section.

Conservation Areas found in subwatershed 302

Existing RPA Area: 9.6% of subwatershed area is protected by RPA (0.43 sm) .

Presence of RTE species? Largest populations of small whorled pogonia and Virginia Least Trillium along the slopes and floodplains of lower Chisel Run in the watershed are confirmed by Virginia Natural Heritage and our survey. Several of these populations are located within the planned New Town development.

Contiguous forest areas? Yes, several tracts of contiguous forest are located along lower Chisel Run, both within and adjacent to the existing RPA.

Wetland areas? Least Trillium commonly associated with streamside seeps. These seeps are in good condition in Lower Chisel Run, but channel incision has noticeably reduced the quality of these micro habitats in the Upper Chisel Run.

Beaver dam complexes? No significant dams in the lower Chisel Run. Extensive old and new beaver activity just upstream of Route 199 in Upper Chisel Run.

General Stream Condition in Subwatershed 302

Initial Habitat Assessment: Initial RSAT evaluation indicates that stream reaches in the Upper Chisel Run are in the Fair to Good range, with several reaches showing clear signs of enlargement, head cutting and overall stream degradation. By contrast, the streams in Lower Chisel Run are currently in excellent condition, and rank among the best in the watershed. These streams, however, are likely to be influenced by extensive planned development in the headwaters (i.e, New Town).

Stormwater Management in Subwatershed 302

No. of stormwater practices in subwatershed: 14, mostly on-site, and many are over 5 years old.

Subwatershed Area Served by Stormwater Practices: 26% of subwatershed *

Retrofit Candidates in Subwatershed: Yes, 5 sites are under investigation

Historical Flooding Problems? Yes, three flooding problem areas have been reported by CDM (1987) within this subdivision. They include: 1) several structures and yards along Patrick Henry Drive (Shepard Farms Subdivisions) for storms with a return interval of ten years or more, 2) Chisel Run at Route 322 north of the Eastern State Hospital for storms with a return interval of ten years or more, 3) road flooding and potential yard flooding at Chisel Run and dirt road west of Hospital..

ENVIRONMENTAL DIVISION REVIEW COMMENTS
LANDFALL AT JAMESTOWN
PHASE 5
PLAN NO. SP-77-97
September 22, 1997

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.
2. A Subdivision Agreement, with surety, shall be executed with the County prior to recordation of lots.
3. Water and sewer inspection fees must be paid prior to the issuance of a Land Disturbing Permit.
- ~~4.~~ An Inspection/Maintenance Agreement shall be executed with the county for the BMP facility for this project.
- ~~5.~~ As-built drawings must be provided for the detention basin on completion. Also, a note shall be provided on the plan stating that upon completion, the construction of the dam will be certified by a professional engineer who has inspected the structure during construction.
6. A streetlight rental fee for 5 lights must be paid prior to the recordation of the subdivision plat.
- ~~7.~~ Provide an environmental inventory in accordance with Chesapeake Bay Ordinance Section 19B-10B.
- ~~8.~~ Provide a soils map to delineate the different soil types in accordance with the James City County Soil Survey.
9. Provide a drainage area map to show the existing and proposed drainage patterns. Include the size of each drainage area.
(DARRYL THE DRAINAGE MAP PROVIDED ONLY INCLUDES THE ROADWAYS)
10. Show the locations for tree protection. Use the standard symbol and abbreviations provided in the 1992 edition of the VESCH, Chapter 3.
11. Show any temporary soil stockpile areas, staging and equipment storage areas.
- ~~12.~~ Submit a Sediment Basin Design Data Sheet for all sediment basins proposed to ensure design is in accordance with the 1992 VESCH criteria. (DARRYL DID THE ORIGINAL DESIGN IN PHASE ONE COVER THE SEDIMENT LOADING FOR THE OTHER PHASES ?)
13. Identify any off-site land disturbing areas and provide details and proper erosion control measures.

LANDFALL @ Jamestown
PHASE I

PC098

S-14-96

AMEND S-118-47

MCCALE DEV - LANDFALL LLC
813/553 11M

464070001A

MCCALE DEV - LANDFALL LLC

COMMON AREA P1 + P-3 LANDFALL @ JAMESTOWN

PC098_LANDFALL_AT_JAMESTOWN_PH1 - 099

Prior to Release

- Perform Final Insp.
- Asbuilt old & very simple, need new ONP.

HOA Contact

Robert: Carol Fryer
4345 LANGRISH DRIVE
WMBG 23185
220-0759
rfryer@cot.net